# SEMESTER - I

**Refer Syllabus Misc Page no 1 file**

# Summary of syllabus: Theory and Practical Training Semester-I

**Refer Syllabus Msc Page No 2**

| 1. AIR LAW, AIRWORTHINESS REQUIREMENTS -I | | | |
|---|---|---|---|
| **S.No** | **CAR Ref:** | **DESCRIPTION** | **Hours :** |
| **1** | | **AIR LAW, AIRWORTHINESS REQUIREMENTS -I (CAR Section - 2 Series A to I)** | **Allotted 110** |
| **1.1** | **Aircraft Manual (India)** | **Aircraft Act 1934:** | **1** |
| | | **Aircraft Rules 1937** | |
| | | Part I Preliminary, Part II General Conditions for flying | **1** |
| | | Part III General Safety Conditions, Part IV Registration and Marking of | **1** |
| | | Part V Personnel of Aircraft, Part VI Airworthiness | **1** |
| | | Part VII Radio Telegraph Apparatus, Part VIII Aeronautical Beacons, Ground Lights and false lights, Part IX Log books | **1** |
| | | Part X Investigation of Accidents and Incidents, Part XI Aerodromes, Part XII A Regulatory Provisions | **1** |
| | | Part XII B Engineering, Inspection and Normal requirements other than Operations, Part XIII Air transport Services. | **1** |
| | | Part XIII A Engineering , Inspection and Manual requirements, Owners or Operators, Part XIV General | **1** |
| | | Schedule I: Areas over which flied by aircraft is prohibited | **3** |
| | | Schedule II : Aircraft Personnel | |
| | | CAR ON Rules of the Air | **2** |
| | | The Indian Aircraft Rules 1920 | **1** |
| | | The Aircraft (Public Health) Rules 1954 | **2** |
| | | Notifications under Aircraft Act (Public Health) Rules 1954 | **1** |
| | | The Aircraft ( Demolition of Obstructions caused by buildings and trees etc. | **1** |
| | | The Aircraft (Carriage of dangerous goods) Rules 2003 | **1** |
| | | Statutory Notification effecting Aviation in India | **1** |
| **1.2** | | Knowledge of Civil Aviation Requirements relating to airworthiness**, Aeronautical Information Circulars: Advisory Circulars: and AME Notices** issued by DGCA.CAR **amendments** and incorporation. | **5** |
| **1.3** | **CAR Sec 2 Series A** | **Procedure for Issue of Civil Airworthiness requirements and Responsibility of Operator vis a vis Airworthiness directorate**: | **1** |
| | | **Part I Cancelled** | |
| | | **Part II Cancelled** | |
| | | **Part III: Objects and targets of airworthiness Directorate of civil aviation department.** | |
| | | **Part IV**: Airworthiness regulation and safety oversight of engineering | **2** |
| **1.4** | **CAR Sec 2 Series B** | **Part I Approval of Check List, MEL, CDL** : | **2** |
| | | Part II Minimum Equipments List/ CDL and preparation. | |
| | | Part III Use of cockpit and emergency checklist. | |

## 1. AIR LAW, AIRWORTHINESS REQUIREMENTS -I

| | | | |
|---|---|---|---|
| **1.5** | **CAR Sec 2 Series C** | **Defect Recording, monitoring, Investigation and Reporting**: | **2** |
| | | Part I Defect recording, reporting, investigation, rectification and analysis. | |
| | | Part II Recording of inflight instrument reading and reporting of flight defect. | **1** |
| | | Part III Reporting/rectification of defects observed on all aircraft except public transport aircraft. | **1** |
| | | Part IV Analytical study of inflight instrument readings/recording of aircraft. | **1** |
| | | Part V Maintenance control by reliability method. | |
| **1.6** | **CAR Sec Series D** | **Aircraft maintenance Programmes** : | **1** |
| | | Part I Reliability program of engines. | |
| | | Part II Aircraft Maintenance program and their approval | |
| | | Part III On condition maintenance of engines. | **1** |
| | | Part IVApproval of TBO and revision program. | **1** |
| | | Part V Maintenance of fuel and oil uplift and consumption records of light aircraft engines. | **1** |
| | | Part VI Fixing of routine maintenance periods of components, TBOs - initial as well as revision | **1** |
| | | Part VII Cancelled | |
| | **CAR 21** | Certification procedure for aircraft and related products | **10** |
| | | Subpart A - General Provisions<br>Subpart B - Type Certificates And Restricted Type | **1** |
| | | Subpart D - Changes To Type Certificates And Restricted Type<br>Subpart E - Supplemental Type Certificates | **1** |
| | | Subpart F - Production Without Production Organisation | **1** |
| | | Subpart G - Production Organisation Approval For Products | **1** |
| | | Subpart H - Certificates Of Airworthiness, Restricted<br>Subpart I - Noise Certificates | **1** |
| | | Subpart JA- Design Organization Approval – Products Or<br>Subpart JB- Design Organization Approval – Parts And | **1** |
| | | Subpart k - Parts And Appliances | **1** |
| | | Subpart M – Repairs | **1** |
| | | Subpart O - Indian Technical Standard Order Authorizations<br>Subpart P - Permit To Fly | **1** |
| | | Subpart Q - Identification Of Products Parts And Appliances AMC AND GM | **1** |
| **1.7** | **CAR Sec 2 Series** | **Approval of organizations**: E<br>Part I Approval of organizations/Operators | **1** |
| | **E** | E Part II, III, IV & V Cancelled | |
| | | E Part VI Cat E - Fuel, Lubricant and special petrolium products | **1** |
| | | E Part VII Cancelled | |
| | | E Part VIII Approval of organisation - Cat G-Training Schools/ Establishments | **1** |
| | | E Part IX Requirements for infrastructure at stations other than parent base. | **1** |

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| **1. AIR LAW, AIRWORTHINESS REQUIREMENTS -I** | | | |
| **1.8** | **CAR 145** | Approved Maintenance Organizations: General, Applicability, Scope, Application, Terms of approval, Facility requirements, Personnel | **5** |
| | | Certifying Staff and appropriately qualified DGCA licensed Engineers, supporting staff, Equipment tools and materials. | **5** |
| | | Acceptance of components, Maintenance data, Production planning, Certification of maintenance, Maintenance records, Occurring reporting, Safety and Quality Policy, Maintenance Procedure and quality system | **5** |
| | | Maintenance Organisation Exposition, Privileges of the Organisation, limitations on the Organisation, Changes to the Organisation. | **5** |
| **1.9** | **CAR Sec 2 Series F** | **Airworthiness and Continued Airworthiness** | |
| | | PART - I Procedures of registration of aircraft. | **1** |
| | | PART - II Cancelled | |
| | | PART - III Procedure and requirements for issue/ revalidation of C of A. | **1** |
| | | PART - IV Cancelled | |
| | | PART - V Supension of C of A and its subsequent revalidation | **1** |
| | | PART - VI Rebuilding of aircraft. | **1** |
| | | PART - VII Special Flight permits | **1** |
| | | PART - VIII . Maintenance and certification of aircraft | **1** |
| | | PART - IX Cancelled | |
| | | PART - X Airworthiness of aging aircraft | **1** |
| | | PART - XI Cancelled | |
| | | PART - XII Inspection of wooden aircraft. | **1** |
| | | PART - XIII Airworthiness requirements for gliders. | **1** |
| | | PART - XIV, XV Registration and airworthiness of Micro light aircraft, Hot air Balloons. | **1** |
| | | PART - XVI Approval of Flight manuals and their amendments. | **1** |
| | | PART - XVII Pooling of aircraft parts by National Airlines of India with Foreign airlines. | **1** |
| | | PART - XVIIIConstruction, Certification and operation of experimental / amateur built aircraft. | **1** |
| | | PART - XIX Cancelled | |
| | | PART - XX Age of aircraft to be imported for character hire or air taxi and other operations. | **1** |
| | | PART - XXI Import/Export of aircraft, spares, item of equipment etc, for use on aircraft. | **1** |
| | | PART - XXII Load and trim sheets- requirements thereof. | **1** |

## 1. AIR LAW, AIRWORTHINESS REQUIREMENTS -I

| | | | |
|---|---|---|---|
| **1.10** | **CAR Sec 2 Series H** | **Requirements of Aircraft Fuel, refilling of aircraft and Calibration of Aircraft fuels :** | |
| | | Un usable fuel supply - calibration of fuel quantity gauge of aircraft, | **2** |
| | | Aircraft fueling procedures. | |
| | | Aviation fuel at airport-storage, handling and quality control. | **1** |
| **1.11** | **CAR Sec 2 Series I** | **Aircraft Instruments, Equipment and Accessories**: | **1** |
| | | Aircrafts instruments overhaul and periodic inspections. | |
| | | Aircraft equipment and instruments. | **1** |
| | | Maintenance of test equipments. | **1** |
| | | Airworthiness of Procedures for clean rooms and environments for aircraft systems/ accessories shop. | **1** |
| | | Flight data recorders. | **1** |
| | | Cockpit voice recorders | |
| | | Ground Proximity Warning Systems (GPWS). | **1** |
| | | Installation of airborne collision avoidance systems (ACAS). | **1** |
| 1.12 | **CAR M** | Continuing Airworthiness Requirements | 10 |
| | | General | |
| | | Section A - Technical Requirements | 1 |
| | | Subpart A General | |
| | | Subpart B Accountability | 1 |
| | | Subpart C Continuing Airworthiness | 1 |
| | | Subpart D Maintenance Standards | 1 |
| | | Subpart E Components | 1 |
| | | Subpart F Maintenance Organisation | 1 |
| | | Subpart G Continuing Airworthiness Management | 1 |
| | | Subpart H Certificate of Release to service | 1 |
| | | Subpart I Airworthiness Review Certificates | 1 |
| | | **APPENDICIES** | 1 |

**SYLLABUS FOR SEMESTER I (Theory)**

## 2. AIRCRAFT MATERIALS AND HARDWARE - I

| 2 | CAR Ref | AIRCRAFT MATERIALS AND HARDWARE - I | Hours 70 |
|---|---|---|---|
| 2.1 | P2.1.1 Aircraft Materials - Ferrous | • Characteristics, properties and identification of common alloy steels used in aircraft; | 5 |
| | | • Heat treatment and application of alloy steels; | 3 |
| | | • Testing of ferrous materials for hardness, tensile strength, fatigue strength and impact resistance. | 5 |
| 2.2 | P2.1.2 Aircraft Materials - Non-Ferrous | Characteristics, properties and identification of common non-ferrous materials used in aircraft; | 5 |
| | | • Heat treatment and application of non-ferrous materials. | 3 |
| | | • Testing of non-ferrous material for hardness, tensile strength, fatigue strength and impact resistance. | 5 |
| 2.3 | P2.1.3.2 Wooden structure | • Construction methods of wooden airframe structures; | 1 |
| | | Characteristics, properties and types of wood and glue used in aeroplanes; | 1 |
| | | Preservation and maintenance of wooden structure; | 1 |
| | | Types of defects in wood material and wooden structures; | 1 |
| | | The detection of defects in wooden structure; Repair of wooden structure. | 2 |
| 2.4 | P2.1.4 Corrosion : | Chemical fundamentals; • Formation by, galvanic action process, microbiological, stress; | 5 |
| | | Types of corrosion and their identification; | 5 |
| | | Causes of corrosion; • Material types, susceptibility to corrosion. | 5 |
| 2.5 | P2.1.5 | **Fasteners** | |
| | P2.1.5.1 Screw threads : | Screw nomenclature; | 3 |
| | | Thread forms, dimensions and tolerances for standard threads used in aircraft; | 3 |
| | | • Measuring screw threads; | 2 |
| | | Bolt types: specification, identification and marking of aircraft bolts, international standards; | 5 |
| | | • Nuts: self locking, anchor, standard types | 4 |
| | | • Machine screws : aircraft Specifications ;• • Studs: types and uses, insertion and removal | 3 |
| | | Self tapping screws, dowels. | 3 |

**SYLLABUS FOR SEMESTER I (Theory)**

## 3. ELECTRICAL FUNDAMENTALS - I

| 3 | CAR Ref | Electrical fundamentals –I | Hours 70 |
|---|---|---|---|
| 3.1 | P2.3.1 | Structure and distribution of electrical charges within: atoms, molecules, ions, compounds | 3 |
| | Electron Theory | Molecular structure of conductors, semiconductors and insulators. | 2 |
| 3.2 | P2.3.2 Static Electricity and Conduction | Static electricity and distribution of electrostatic charges | 1 |
| | | Electrostatic laws of attraction and repulsion; Units of charge, Coulomb's Law | 2 |
| | | Conduction of electricity in solids, liquids, gases and a vacuum. | 2 |
| 3.3 | P2.3.3 Electrical Terminology | The following terms, their units and factors affecting them: | 2 |
| | | Potential difference, electromotive force, voltage, current, resistance, conductance, charge, conventional current flow, electron flow. | 3 |
| 3.4 | P2.3.4 Generation of Electricity | • Production of electricity by the following methods: light, heat, friction, pressure, chemical action, magnetism and motion. | 5 |
| 3.5 | P2.3.5 DC Sources of Electricit | • • Construction and basic chemical action of: primary cells,• • secondary cells | 2 |
| | | Lead acid cells | 3 |
| | | Nickel cadmium cells, other alkaline cells | 2 |
| | | Cells connected in series and parallel;• | 2 |
| | | Internal resistance and its effect on a battery | 2 |
| | | • • Construction, materials and operation of thermocouples | 2 |
| | | • • Operation of photo-cells. | 2 |
| 3.6 | P2.3.6 DC Circuits | • • Ohms Law | 2 |
| | | Kirchoff's Voltage and Current Laws | 2 |
| | | • Calculations using the above laws to find resistance, voltage and current; | 4 |

| | | | |
|---|---|---|---|
| | | • Significance of the internal resistance of a supply. | **2** |

**SYLLABUS FOR SEMESTER I (Theory)**

**3. ELECTRICAL FUNDAMENTALS - I**

| | | | |
|---|---|---|---|
| **3.7** | **P2.3.7 Resistance/ Resistor** | Resistance and affecting factors | **1** |
| | | Specific resistance; Resistor colour code, values and tolerances, preferred values, wattage ratings • | **1** |
| | | Resistors in series and parallel; • Calculation of total resistance using series, parallel and series parallel combinations | **2** |
| | | Operation and use of potentiometers and rheostats • | **1** |
| | | Operation of Wheatstone Bridge.• Positive and negative temperature coefficient conductance | **1** |
| | | • • Fixed resistors, stability, tolerance and limitations, methods of construction; • Variable resistors, thermistors, voltage dependent resistors | **2** |
| | | Construction of potentiometers and rheostats; • Construction of Wheatstone Bridge | **2** |
| **3.8** | **P2.3.8 Power** | • • Power, | **1** |
| | | Work and energy (kinetic and potential); | **1** |
| | | • • Dissipation of power by a resistor; Power formula; | **1** |
| | | • • Calculations involving power, work and energy. | **2** |
| **3.9** | **P2.3.9 Capacitance/Capacitor** | • • Operation and function of a capacitor; | **1** |
| | | • Factors affecting capacitance area of plates, distance between plates, number of plates, dielectric and dielectric • • constant, | **1** |
| | | Working voltage, voltage rating | **1** |
| | | Capacitor types, construction and function | **2** |
| | | Capacitor colour coding | **2** |
| | | Calculations of capacitance and voltage in series and parallel circuits | **2** |
| | | Exponential charge and discharge of a capacitor, time • • constants; Testing of capacitors. | **1** |

**SYLLABUS FOR SEMESTER I (Theory)**

**4. BASIC AERODYNAMICS**

| 4 | **CAR Ref** | **BASIC AERODYNAMICS** | **Hours 40** |
|---|---|---|---|
| **4.1** | **P3.1.1 Physics of the Atmosphere** | International Standard Atmosphere (ISA), application to aerodynamics. | **2** |
| **4.2** | **P3.1.2 Aerodynamics** | Airflow around a body | **1** |
| | | Boundary layer | **1** |
| | | Laminar and turbulent flow, free stream flow, relative airflow, | **1** |
| | | Upwash and downwash, vortices, stagnation; • | **1** |
| | | The terms: camber, chord, mean aerodynamic chord, | **2** |
| | | Profile (parasite) drag, induced drag, | **2** |
| | | Centre of pressure, • angle of attack, | **2** |
| | | Wash in and wash out, | **2** |
| | | Fineness ratio, wing shape and aspect ratio; | **2** |
| | | Thrust, Weight, Aerodynamic Resultant; | **2** |
| | | Generation of Lift and Drag: Angle of Attack, Lift coefficient, Drag coefficient, polar curve, stall;• | **2** |
| | | Aerofoil contamination including ice, snow, frost. | **2** |
| **4.3** | **P3.1.3 Theory of Flight** | Relationship between lift, weight, thrust and drag; | **2** |
| | | Glide ratio; • • Steady state flights, | **2** |
| | | Performance;• • Theory of the turn; | **2** |
| | | • Influence of load factor: stall, flight envelope and structural limitations; • • | **2** |
| | | Lift augmentation. | **2** |
| **4.4** | **P3.1.4 Flight Stability and Dynamics** | • • Longitudinal stability (active and passive). | **3** |
| | | Lateral stability (active and passive). | **3** |
| | | Directional stability (active and passive). | **2** |

**SYLLABUS FOR SEMESTER I (Theory)**

**5. MAINTENANCE PRATICES - I**

| | | | |
|---|---|---|---|
| **5** | CAR Ref | **MAINTENANCE PRATICES - I** | **Hours 60** |
| **5.1** | **P2.2.1 Safety Precautions- Aircraft and Worksho** | Aspects of safe working practices including precautions to take when working with electricity, gases especially oxygen, oils and chemicals. | **3** |
| | | 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. | **2** |
| **5.2** | **P2.2.2 Worksho p** | Care of tools, control of tools, use of workshop materials; | **2** |
| | | Dimensions, allowances and tolerances, standards of workmanship; | **2** |
| | | Calibration of tools and equipment, calibration standards. | **1** |
| **5.3** | **P2.2.3 Tools** | Common hand tool types; | **2** |
| | | Common power tool types; | **2** |
| | | Operation and use of precision measuring tools; | **1** |
| | | Lubrication equipment and methods. | **1** |
| | | Operation, function and use of electrical general test Equipment. | **1** |
| **5.4** | **P2.2.5 Engineering Drawing:** | Drawing types and diagrams, their symbols, dimensions, tolerances and projections;• | **5** |
| | | Identifying title block information • • Microfilm, microfiche and computerized presentations; | **5** |

| | | | |
|---|---|---|---|
| | **Engineering Drawings, Diagrams and Standards** | Specification 100 of the Air Transport Association (ATA) of America; | **5** |
| | | Aeronautical and other applicable standards including ISO, AN, MS, NAS and MIL | **5** |
| | | Wiring diagrams and schematic diagrams | **5** |

**SYLLABUS FOR SEMESTER I (Theory)**

**5. MAINTENANCE PRATICES - I**

| | | | |
|---|---|---|---|
| **5** | **CAR Ref** | **MAINTENANCE PRATICES - I** | **Hours 60** |
| **5.5** | **P2.2.6 Fits and Clearances** | Drill sizes for bolt holes, classes of fits; | **2** |
| | | Common system of fits and clearances; | **2** |
| | | Schedule of fits and clearances for aircraft and engines;<br>Limits for bow, twist and wear; | **2** |
| | | Standard methods for checking shafts, bearings and other parts. | **2** |
| **5.6** | **P2.2.15 Welding, Brazing, Soldering and Bonding** | Soldering methods; inspection of soldered joints. | **3** |
| | | Welding and brazing methods; | **5** |
| | | Inspection of welded and brazed joints; | **5** |
| | | Bonding methods and inspection of bonded joints. | **2** |

**SYLLABUS FOR SEMESTER I (Practicals)**

**1. MAINTENANCE PRACTICES - I**

| 1 | CAR Ref | MAINTENANCE PRACTICES - I | 150 Hours |
|---|---|---|---|
| 1.1 | P2.2.1 Safety Precautions- Aircraft and | Aspects of safe working practices including precautions to take when working with electricity, gases especially oxygen, oils and chemicals. | 3 |
| | | 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. | 2 |
| 1.2 | P2.2.2 Workshop Practices | Care of tools | 5 |
| | | control of tools, use of workshop materials | 5 |
| | | Dimensions Allowances and tolerances Standards of workmanship | 5 |
| | | Calibration of tools and equipment, calibration standards. | 5 |
| 1.3 | P2.2.3 Tools | Common hand tool types | 6 |
| | | Common power tool types | 6 |
| | | Operation and use of precision measuring tools | 6 |
| | | Lubrication equipment and methods. | 6 |
| | | Operation, function and use of electrical general test Equipment. | 6 |
| 1.4 | P2.2.5 Engineering Drawing: Engg Drawings Diagrams and Standard | Drawing types and diagrams, their symbols | 4 |
| | | dimensions, tolerances and projections | 4 |
| | | Identifying title block information | 4 |
| | | • • Microfilm, microfiche and computerized presentations | 4 |
| | | Specification 100 of the Air Transport Association (ATA) of America | 5 |

| | | | |
|---|---|---|---|
| | | Aeronautical and other applicable standards including ISO, AN, MS, NAS and MIL• • | **5** |
| | | Wiring diagrams and schematic diagrams | **4** |
| **1.5** | **P2.2.6 Fits and Clearances** | Drill sizes for bolt holes, classes of fits | **2** |
| | | Common system of fits and clearances | **2** |
| | | Schedule of fits and clearances for aircraft and engines<br>Limits for bow, twist and wear | **2** |
| | | Standard methods for checking shafts, bearings and other parts. | **2** |

**SYLLABUS FOR SEMESTER I (Practicals)**

**1. MAINTENANCE PRACTICES - I**

| **1** | **CAR Ref** | **MAINTENANCE PRACTICES - I** | **150 Hours** |
|---|---|---|---|
| **1.6** | P.2.2.14.1 | Types of Sheet metal bending, | **3** |
| | **Sheet Metal shop:** | Different types of Sheet metal cutting, | **4** |
| | | Square cutting practice | **3** |
| | | Riveting practice | **3** |
| | | Bull joint practice | **4** |
| | | Flange Joint practice | **3** |
| | | Single back plate riveting practice | **4** |
| | | Double back place riveting practice | **3** |
| | | Drilling practice | **4** |
| **1.7** | **P2.2.15** | Soldering methods; inspection of soldered joints. | **8** |
| | **Welding, Brazing, Soldering** | Welding and brazing methods; | **8** |
| | | Inspection of welded and brazed joints; | **5** |
| | | Bonding methods and inspection of bonded joints. | **5** |

**SYLLABUS FOR SEMESTER I (Practicals)**

**2. MATERIALS AND HARD WARE-I**

| 2 | CAR Ref | Materials and Hard Ware: | 80 Hours |
|---|---|---|---|
| 2.1 | P2.1.1 (a) | Identification of Ferrous materials and Non Ferrous materials, | 7 |
| | | Demonstration of Heat treatment and application of alloy steels. | 8 |
| | P2.1.1 (b) | Testing of Ferrous materials for Hardness, | 3 |
| | | Tensile Strength, | 3 |
| | | Fatigue Strength, and | 4 |
| | | Impact resistance. | 5 |
| 2.2 | P2.1.2 | Testing of Non Ferrous materials for Hardness, | 5 |
| | | Tensile Strength, Fatigue Strength, and Impact resistance. | 3 |
| 2.3 | P2.1.3.2 | Identification of types of defects in wood materials and wooden structures. | 6 |
| | | Repair of wooden structures. | 6 |
| 2.4 | P2.1.4 | Types of Corrosion and their Identification, | 5 |
| | | Protection and Preventive treatment. | 5 |
| 2.5 | P2.1.5.1 | Identification of various thread forms, | 5 |
| | | Measuring Screw Threads. | 5 |
| 2.6 | P2.1.5.1 | Identification of different Bolt types, | 5 |
| | | Nuts, machine Screws, Studs, Self Tapping Screws. | 5 |

## SYLLABUS FOR SEMESTER I (Practicals)

### 3. ELECTRICAL FUNDAMENTALS

| 3 | CAR Ref | ELECTRICAL FUNDAMENTALS | Hours: 80 |
|---|---|---|---|
| 3.1 | P 2.3.4 | Generation of Electricity . | 5 |
| 3.2 | P 2.3.5 | To measure potential gradient between EMF and Potential difference of a cell. | 5 |
| | | To study the dependence of a internal resistance of a primary cell. | 5 |
| | | Construction details of Lead Acid Battery | 5 |
| | | Construction details of NiCad batteries | 5 |
| 3.3 | P 2.3.6 | To establish Current, Voltage, relationship verified and Ohms Law. | 5 |
| | | To use a Multimeter for different purposes | 5 |
| | | Familiarization of Kirchoff's Laws | 4 |
| 3.4 | P 2.3.7 | To find unknown Resistance using Wheatston`s Bridge. | 4 |
| | | Familiarization of Potentiometers and Rheostats. | 4 |
| | | Familiarization of various types of resistors | 5 |
| | | Familiarization of Series Circuit | 5 |
| | | Familiarization of Parallel Circuit | 5 |
| | | Colour Coding of Resistors | 5 |
| 3.5 | P 2.3.9 | Familiarization of various types of Capacitors | 4 |
| | | Colour Coding of Capacitors. | 4 |
| | | Charging and Discharging of Capacitors | 5 |

**SYLLABUS FOR SEMESTER I (Practicals)**

**4. BASIC AERODYNAMICS**

| 4 | CAR Reference | BASIC AERODYNAMICS | Hours : 40 |
|---|---|---|---|
| 4.1 | P 3.1.2 | Demonstration of Bernoulli's principle and its applications. | 1 |
| | | Identification of different Aero foils , primary and secondary controls | 3 |
| | | Demonstration of Boundary Layer, Laminar, Turbulent flow, AOA, Washout, Aerofoil Contamination including Ice, Snow and Frost. (with the help of Video films and other aids.) | 8 |
| 4.2 | P 3.2.1.1 | Main parts of aircraft, Femiliarisation of Basic Aircraft Controls ( Response of Control Surface for the action of Control Column) | 5 |
| 4.3 | P 3.1.3 | Demonstration of Drag and various types of drags. | 5 |
| | | Identification of various Lift Augmentation devices- Flaps, Slats, and different types of Flaps. | 5 |
| | | L-D Curves for Basic understanding of Lift Drag relation and understanding of Four Forces acting on Aircraft in flight. | 8 |
| 4.4 | P 3.1.4 | Demonstration of Positive, Negative and Neutral Stability and Longitudinal, Lateral and Directional Stability (With the help of Video films and other aids). | 5 |

# SEMESTER - II

# Summary of syllabus: Theory and Practical Training Semester-II

**Refer Syllabus Msc Page No 19 file**

**SYLLABUS FOR SEMESTER I I (Theory)**

**1. AIR LAW, AIRWORTHINESS REQUIREMENTS-II**

| | | | |
|---|---|---|---|
| **1** | **CAR** | **AIR LAW, AIRWORTHINESS REQUIREMENTS-II** | **Hours:** |
| | **Ref** | (Section 2 Series L to X) | **90** |
| **1.1** | **SERIES** | PART - I Issue of AME Licenses, its classification and experience | **2** |
| | | PART - II Examination for issue/Extension of AME License and BAMEC procedures thereof. Classification and | **2** |
| | **Aircraft Maintenance Engineer – Licensing** | PART - III certification, responsibilities of AME License for helicopters. | **1** |
| | | PART - IV Endorsement of AME Licenses. | **1** |
| | | PART - V Certification privileges of AMEs. | **1** |
| | | PART - VI Grant of Open AME licenses. | **1** |
| | | PART - VII Procedure for renewal of AMEs license. | **1** |
| | | PART - VIII Issue of BAMAC. | **1** |
| | | PART - IX Issue of authorization to AMEs/ Approved personnel. | **1** |
| | | PART - X Grant of approvals. | **2** |
| | | PART -XI Approval of flight engineer examiner and check flight engineer. | **1** |
| | | PART - XII Approval of GET Scheme. | **1** |
| | | PART - XIII Payment /Non payment of fees for issue of duplicate | **2** |
| | | PART - XIV Issue of C of C. | **1** |
| | | PART - XV Procedure for issue/renewal/ extension of SFEs/ FE license, | **2** |
| | | PART - XVI Validation of foreign licenses of Aircraft Maintenance Engineers. | **2** |
| **1.2** | **SERIES – M** | | **5** |

| | | | |
|---|---|---|---|
| | **Mandatory Modification And Inspections** | PART - I Mandatory Modification And Inspections | |

**1. AIR LAW, AIRWORTHINESS REQUIREMENTS-II**

| | | | |
|---|---|---|---|
| **1.3** | **SERIES – O** | PART - I Minimum Requirements to be compiled with by operators light aircraft, | **2** |
| | **Operational Requirement For Aircraft** | PART - II Operation of General Aviation – Aeroplanes | **2** |
| | | PART - III Cancelled | |
| | | PART - IV Cancelled | |
| | | PART - V Cancelled | |
| | | PART - VI Registration, Airworthiness and operation of hang gliders and powered hang gliders | **4** |
| | | PART - VII Exit Row Seating | **2** |
| | | PART - VIII Airworthiness ,maintenance and operational requirements for ETOPS for commercial Air Transport Operations, | **2** |
| | | | **2** |
| | | PART - IX Requirements for operation of aircraft in MNPS airspace | **4** |
| | | PART - X Requirements for preparation of Operation Manuals, | **2** |
| | | PART - XI Requirements for implementation of RVSM | **2** |
| | | PART - XII Aircraft Requirements for required navigational performance (RNP) /Air Navigation (RNAV) | **2** |
| | | PART - XIII Requirements for evaluation Certification and maintenance of aircraft Flight Simulators and Synthetic flight training devices | **2** |
| | | PART - XIV Airworthiness and maintenance requirement for Category II and Category IIIA operations | **2** |
| **1.4** | **SERIES** | PART - I Aircraft Radio Equipment: | **2** |

| | | | |
|---|---|---|---|
| | **Airborne** | | |
| | | PART - II Installation of Communication, Navigation and Radar | **2** |
| | | PART - III Maintenance of Communication, Navigation and Radar Equipment. | |
| | | PART - IV Installation Mod A / C and Mode S transponders. | **2** |
| | | PART - V Control of Electromagnetic interference in modern aircraft. | **2** |
| | | PART - VI Approval of airborne GPS installations in aircraft. | **2** |
| **1.5** | **SERIES – S** | PART - I Storage conditions and storage/Service life of rubber parts and aircraft components containing rubber parts | **3** |
| | **Storage of Aircraft Parts:** | PART - II Fixations of calendar period for determining overhaul life of Reciprocating engine | **3** |

## 1. AIR LAW, AIRWORTHINESS REQUIREMENTS-II

| | | | |
|---|---|---|---|
| **1.6** | **SERIES Flight Testing of Aircraft:** | **PART - I** Flight Testing of (Series) Aircraft for the issue of C of A. | **2** |
| | | **PART - II** Flight testing of aircraft for which a C of A had been previously issued | **2** |
| **1.7** | **SERIES – X** | PART - I Cancelled | |
| | **Miscellaneous Requirements** | PART - II Requirements of weight and balance control of aircraft. | **2** |
| | | PART - III Provision of first aid kit and physician kits in aircraft as applicable. | **1** |
| | | PART - IV Use of furnishing material in aircraft | **2** |
| | | PART - V Grant of concession. | **2** |
| | | PART -VI Aircraft log books | **2** |
| | | PART - VII Documents required to be carried on board. | **2** |
| | | PART - VIII Procedure for Issue of taxi permit | **2** |
| | | PART - IX Cancelled | **2** |

**SYLLABUS FOR SEMESTER II (Theory)**

**2. HUMAN PERFORMANCE - II**

| | | |
|---|---|---|
| **2.1** | **Human Performance** | **Hours** |
| | 1.1.1. General: | **3** |
| | 1.1.2. The Need to take human factors in to account | |
| | 1.1.3. Incidents attribute to Human factors/Human Errors | |
| | 1.1.4 Murphy's Law | |
| **2.2** | **Human performance and limitations** | **3** |
| | 1.2.1. Vision | |
| | 1.2.2. Hearing | |
| | 1.2.3. Information Processing | |
| | 1.2.4. Attention and perception | |
| | 1.2.5. Memory | |
| | 1.2.6. Claustrophobia and physical access | |
| **2.3** | **Social Psychology** | **4** |
| | 1.3.1. Responsibility: Individual and Group | |
| | 1.3.2. Motivation and De-motivation | |
| | 1.3.3. Peer pressure | |
| | 1.3.4. Culture Issues | |
| | 1.3.5. Team Working | |
| | 1.3.6. Management Supervision and Leadership | |
| **2.4** | **Factors and Affecting Performances** | **4** |
| | 1.4.1. Fitness/health | |

| | | |
|---|---|---|
| | 1.4.2. Stress: Domestic and work related | |
| | 1.4.3. Time pressure and dead lines | |
| | 1.4.4. Work load: Over load and under load | |
| | 1.4.5. Sleep and Fatigue, shift work | |
| | 1.4.6. Alcohol, Medication, Drug abuse | |
| | | |
| **2.5** | **Physical Environment** | **3** |
| | 1.5.1. Noise and fumes | |
| | 1.5.2. Illumination | |
| | 1.5.3. Climate and Temperature | |
| | 1.5.4. Motion and Vibration | |
| | 1.5.5. Working Environment | |
| **2.6** | **Tasks** | **3** |
| | 1.6.1. Physical work | |
| | 1.6.2 Repetitive task | |
| | 1.6.3 Visual Inspection | |
| | 1.6.4. Complex Systems | |

**SYLLABUS FOR SEMESTER II (Theory)**

**2. HUMAN PERFORMANCE - II**

| | | |
|---|---|---|
| **2.7** | **Communication** | **4** |
| | 1.7.1. Within and between teams | |
| | 1.7.2. Work logging and recording | |
| | 1.7.3. Keeping up to date, currency | |
| | 1.7.4 Dissemination of information | |
| **2.8** | **Human Error** | **3** |
| | 1.8.1. Error model and theories | |
| | 1.8.2. Types of error in maintenance task | |
| | 1.8.3. Implementation of error (i.e accidents) | |
| | 1.8.4. Avoiding and managing errors | |
| **2.9** | **Hazards in the work place** | **3** |
| | 1.9.1 Recognizing and avoiding hazards | |
| | 1.9.2 Dealing with emergencies | |
| | | |

**SYLLABUS FOR SEMESTER II (Theory)**

**AIRCRAFT MATERIALS AND HARD WARE - I**

| 3 | CAR Ref | AIRCRAFT MATERIALS AND HARD WARE - II | Hours : 80 |
|---|---|---|---|
| 3.1 | P2.1.5.2 Locking devices | Tab and spring washers | 2 |
| | | Locking plates | 1 |
| | | Split pins | 1 |
| | | Pal-nuts | 1 |
| | | Wire locking | 1 |
| | | Quick release fasteners | 1 |
| | | Keys | 1 |
| | | Circlips | 1 |
| | | Cotter pins | 1 |
| 3.2 | P2.1.5.3 Aircraft rivets | Types of solid and blind rivets: specifications | 4 |
| | | Identification | 3 |
| | | Heat treatment. | 3 |
| 3.3 | P2.1.5.4 Pipes and Unions | Identification of, and types of rigid and flexible pipes and their connectors used in aircraft | 5 |
| | | Standard unions for aircraft hydraulic, fuel, oil, pneumatic and air system pipes. | 5 |
| 3.4 | P2.1.5.5 Springs | Types of springs, materials, characteristics and applications | 2 |
| 3.5 | P2.1.6 Bearings | Purpose of bearings, loads, material, construction<br>Types of bearings and their application. | 8 |

| | | | |
|---|---|---|---|
| **3.6** | **P2.1.7 Transmissions** | Gear types and their application; Gear ratios | **2** |
| | | Reduction and multiplication gear systems | **2** |
| | | Driven and driving gears | **2** |
| | | Idler gears | **1** |
| | | Mesh patterns | **1** |
| | | Belts and pulleys | **1** |
| | | Chains and sprockets. | **1** |
| **3.7** | **P2.1.8 Control Cables** | Types of cables | **2** |
| | | End fittings | **2** |
| | | Turnbuckles and compensation devices | **2** |
| | | Pulleys and cable system components | **2** |
| | | Bowden cables | **1** |
| | | • Aircraft flexible control systems. | **1** |

**SYLLABUS FOR SEMESTER II (Theory)**

**3. AIRCRAFT MATERIALS AND HARD WARE - II**

| **3** | **CAR Ref** | **AIRCRAFT MATERIALS AND HARD WARE - II** | **Hours : 80** |
|---|---|---|---|
| **3.8** | **P2.1.9 Electrical Cables and Connectors** | Cable types | **3** |
| | | Construction and characteristics | **3** |
| | | High tension and co-axial cables | **3** |
| | | Crimping | **2** |
| | | Connector types, pins, plugs, sockets, insulators, current and voltage rating, coupling | **2** |
| | | Identification codes | **2** |
| **3.9** | **P 2.1.3.1Composite and non-metallic other than wood and** | (a) Characteristics, properties and identification of common composite and non-metallic materials, other than wood, used in aircraft; Sealant and bonding agents. | **2** |
| | | (b) The detection of defects/deterioration in composite and non-metallic material. | **2** |
| | | Repair of composite and non-metallic material. | **1** |

## SYLLABUS FOR SEMESTER II (Theory)

### 4. ELECTRONIC FUNDAMENTALS & DIGITAL TECHNIQUES-I

| 4 | CAR Ref | ELECTRONIC FUNDAMENTALS & DIGITAL TECHNIQUES-I | Hours:70 |
|---|---|---|---|
| 4.1 | P2.4.1.2 Transistors | • • Transistor symbols ;Component description and orientation; | 1 |
| | | Transistor characteristics and properties.• | 1 |
| | | Construction and operation of PNP and NPN transistors;• | 1 |
| | | Base, collector and emitter configurations; • | 1 |
| | | Testing of transistors. | 1 |
| | | • Basic appreciation of other transistor types and their uses. | 1 |
| | | Application of transistors: classes of amplifier (A, B, C);• | 1 |
| | | Simple circuits including: bias, decoupling, feedback and stabilisation;• | 1 |
| | | Multistage circuit principles: cascades, push-pull, oscillators, multivibrators, | 1 |
| | | Flip-flop circuits. | 1 |
| | P2.4.1.3 Integrated Circuits | • • Description and operation of logic circuits and linear circuits/operational amplifiers. | 2 |
| | | • • Description and operation of logic circuits and linear circuits;• | 2 |
| | | Introduction to operation and function of an operational amplifier used as: integrator, differentiator, voltage follower, comparator; • | 1 |
| | | Operation and amplifier stages connecting methods: resistive | 2 |
| | | capacitive, inductive (transformer), inductive resistive (IR), direct;• | 2 |
| | | Advantages and disadvantages of positive and negative feedback. | 1 |

| | | | |
|---|---|---|---|
| **4.3** | **P2.4.2 Printed Circuit Boards:• •** | Description and use of printed circuit boards. | **5** |
| **4.4** | **P2.4.3 Servomechanisms** | • • Understanding of the following terms: Open and closed loop systems, feedback, follow up, analogue transducers;• | **3** |
| | | Principles of operation and use of the following synchro system components/features: resolvers, differential, control and torque, transformers, inductance and capacitance transmitters. | **2** |
| | | Understanding of the following terms: Open and closed loop, follow up, servomechanism, analogue, transducer, null, damping, feedback, dead band; | **5** |
| | | • • 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; | **4** |
| | | • Servomechanism defects, reversal of synchro leads, hunting. | **1** |
| **4.5** | **P2.5.2 Numbering Systems** | Numbering systems: binary, octal and hexadecimal; | **5** |
| | | • Demonstration of conversions between the decimal and binary, octal and hexadecimal systems and vice versa. | **5** |

## SYLLABUS FOR SEMESTER II (Theory)

### 4. ELECTRONIC FUNDAMENTALS & DIGITAL TECHNIQUES-I

| | | | |
|---|---|---|---|
| **4.6** | **P2.5.4 Data Buses** | • Operation of data buses in aircraft systems, | **3** |
| | | knowledge of ARINC and other specifications. | **2** |
| **4.7** | **P2.5.5 Logic Circuits** | • • Identification of common logic gate symbols, tables and equivalent circuits;• • Applications used for aircraft systems, schematic diagrams. | **3** |
| | | • • Interpretation of logic diagrams. | **2** |
| **4.8** | **P2.5.6 Basic Computer Structure** | • Computer terminology (including bit, byte, software, hardware, | **2** |
| | | CPU, IC, and various memory devices such as RAM, ROM, PROM) | **3** |
| | | • Computer technology (as applied in aircraft systems).• Computer related terminology | **2** |
| | | Operation, layout and interface of the major components in a | **2** |
| | | Micro computer including their associated bus systems; | **2** |
| | | • Information contained in single and multi address instruction words | **3** |
| | | Memory associated terms | **2** |
| | | Operation of typical memory devices | **2** |

| | | | |
|---|---|---|---|
| | | Operation, advantages and disadvantages of the various data storage systems. | **2** |

**SYLLABUS FOR SEMESTER II (Theory)**

**4. ELECTRONIC FUNDAMENTALs - II**

| | | | |
|---|---|---|---|
| **5** | | **ELECTRICAL FUNDAMENTALS-II** | **Hours: 80** |
| **5.1** | **P2.1.9 Electrical.** | • Cable types, construction and characteristics;<br>High tension and co-axial cables; • • Crimping; • Connector types, pins, plugs, sockets, insulators,current and voltage rating, coupling, identification codes. | **5** |
| **5.2** | **P2.2.7 Electrical Cables and Connectors** | • Continuity, insulation and bonding techniques and testing<br>• Use of crimp tools: hand and hydraulic operated;• • Testing of crimp joints;• • Connector pin removal and insertion;•<br>Co-axial cables: testing and installation precautions;• • Wiring protection techniques: Cable looming and loom support, cable clamps, protective sleeving techniques including heat shrink wrapping, shielding. | **5** |
| **5.3** | **P2.3.12 DC Motor/Generator** | • Basic motor and generator theory | **2** |
| | | Construction and purpose of components in DC generator | **2** |
| | | • Operation of, and factors affecting output and direction of current flow in DC generators; | **3** |

| | | | |
|---|---|---|---|
| | | • Operation of, and factors affecting output power, torque, speed and direction of rotation of DC motors; | **2** |
| | | Series wound, shunt wound and compound motors; | **3** |
| | | Starter Generator construction. | **3** |
| **5.4** | **P2.3.13 AC Theory** | Sinusoidal waveform: phase, period, frequency, cycle; | **3** |
| | | Instantaneous, average, root mean square, peak, peak to peak current values | **3** |
| | | Calculations of these values, in relation to voltage, current and power Triangular/Square waves | **3** |
| | | ;• Single/3 phase principles. | **3** |
| **5.5** | **P2.3.14 Resistive (R), Capacitive (C) and Inductive (L) Circuits** | • Phase relationship of voltage and current in L, C and R• circuits, | **2** |
| | | Parallel, series and series parallel; | **2** |
| | | • Power dissipation in L, C and R circuits; • | **2** |
| | | Impedance, phase angle, power factor and current calculations; | **2** |
| | | True power, apparent power and reactive power calculations. | **2** |
| | | • Primary and Secondary current, voltage, turns ratio, power, efficiency; Auto transformers | **2** |

**SYLLABUS FOR SEMESTER II (Theory)**

**4. ELECTRONIC FUNDAMENTALs - II**

| **5** | **CAR Ref** | **ELECTRICAL FUNDAMENTALS-II** | **Hours: 80** |
|---|---|---|---|
| **5.6** | **P2.3.15 Transformers** | • Transformer construction principles and operation; | **1** |
| | | Transformer losses and methods for overcoming them; | **1** |
| | | Transformer action under load and no-load conditions;• | **1** |
| | | Power transfer, efficiency, polarity markings; | **1** |
| | | Calculation of line and phase voltages and currents; | **1** |
| | | Calculation of power in a three phase system | **1** |
| | | Primary and Secondary current, voltage, turns ratio, power, efficiency; Auto transformers | **2** |
| **5.7** | **P2.3.16 Filters** | Operation, application and uses of the following filters: | **3** |
| | | low pass, high pass, band pass, band stop. | **2** |

| | | | |
|---|---|---|---|
| **5.8** | **P2.3.17AC Generators AC Motors** | • Rotation of loop in a magnetic field and waveform produced; | **2** |
| | | • Operation and construction of revolving armature and revolving field type AC generators; | **2** |
| | | Single phase, two phase and three phase alternators; | **2** |
| | | Three phase star and delta connections advantages and uses; | **2** |
| | | Permanent Magnet Generators. | **2** |
| | | Construction, principles of operation and characteristics of: AC synchronous and induction motors both single and polyphase; | **3** |
| | | • Methods of speed control and direction of rotation; | **3** |
| | | • Methods of producing a rotating field: capacitor, inductor, shaded or split pole. | **4** |

**SYLLABUS FOR SEMESTER I I (PRACTICALS)**

**1. AIRCRAFT MATERIALS AND HARDWARE II**

| **1** | **CAR Ref** | **AIRCRAFT MATERIALS AND HARDWARE II** | **Hours: 150** |
|---|---|---|---|
| **1.1** | **P 2.1.5.2** | Identification of locking devices: Tab and Spring washers | **4** |
| | | Identification of Locking plates | **4** |
| | | Identification of Split Pins | **3** |
| | | Identification of Pal-nuts | **4** |
| | | Identification of Wire locking | **3** |
| | | Identification of Quick release fastener | **3** |
| | | Identification of Keys | **3** |
| | | Identification of Circlips | **3** |
| | | Identification of Cotter pins | **3** |
| | | Practicing of various locking methods for above locking devices: Wire locking types | **10** |
| | | Safety precautions. | **10** |
| **1.2** | **P 2.1.5.3** | Identification of Solid and Blind rivets and their specifications. | **10** |

| | | | |
|---|---|---|---|
| **1.3** | **P 2.1.5.4** | Pipes and Unions: Identification of Rigid and Flexible pipes and their connectors used in aircraft. | **10** |
| | | Identification of Standard Unions for Aircraft hydraulic, Fuel, Oil, Pneumatic and air system pipes. | **15** |
| | | Fabrication process of pipes. | **10** |
| **1.4** | **P 2.2.12** | Identification of various types of Gears | **5** |
| | | Pulleys | **5** |
| | | Belts | **5** |
| | | Sprockets | **5** |
| **1.5** | **P 2.2.13** | Identification of various types of aircraft control cables | **7** |
| | | End fittings | **7** |
| | | Turn buckles, etc. including swaging procedure | **6** |
| **1.6** | **P 2.2.14.2** | Identification of Composite and non metallic materials other than used in aircrafts. | **5** |
| | | Detection of defects/ Deterioration in Composites and non metallic material | **5** |
| | | Repair of Composites and non metallic material. | **5** |

**SYLLABUS FOR SEMESTER I I (PRACTICALS)**

**2. ELECTRONIC FUNDAMENTALS AND DIGITAL TECHNIQUES**

| | | | |
|---|---|---|---|
| **2** | | **ELECTRONIC FUNDAMENTALS AND DIGITAL TECHNIQUES** | **Hours:110** |
| **2.1** | **P 2.4.1.2** | Identification of Transistors, Component description and orientation | **10** |
| | | To Identify the box of Collector and confirm using Multimeter. | **10** |
| | | Construction and Operation of PNP Transistors | **5** |
| | | Construction and Operation of NPN Transistors. | **5** |
| | | Testing of Transistors. | **10** |
| | | Familiarisation of Push Pull Oscillators, | **5** |
| | | Familiarisation of multi vibrators, | **5** |
| | | Familiarisation of flip flop circuits | **5** |
| **2.2** | **P 2.4.1.3** | Identification of a diode, LED, LCD, IC, Resistor. | **5** |
| | | Familiarisation of integrator | **5** |
| | | Familiarisation of Differentiator | **5** |
| | | Familiarisation of Voltage Follower | **5** |
| | | Familiarisation of Comparator. | **5** |

| | | | |
|---|---|---|---|
| **2.3** | **P 2.4.1.3** | Operation and Amplifier stages connecting methods: Resistive, Capacitive, Inductive, Inductive resistive, Direct | **10** |
| **2.4** | **P 2.4.2** | Description and use of Printed Circuit Boards. | **5** |
| **2.4** | **P 2.5.5** | Description and operation of Logic Circuits | **10** |
| | | Description and operation of Linear Circuits/Operational Amplifier. | **5** |

**SEMESTER I I (PRACTICALS)**

**ELECTRICAL FUNDAMENTALS - II**

| | | | |
|---|---|---|---|
| **3** | | **ELECTRICAL FUNDAMENTALS - II** | **Hours:90** |
| **3.1** | **P 2.2.7** | Familiarisation with various electrical tools used in workshop | **6** |
| | | Demonstration of Wire Stripping | **6** |
| | | Demonstration of Wire Stripping with different types of cables | **6** |
| | | Demonstration of wire Crimping and its testing. | **6** |
| | | Demonstration Connector Pin removal and Insertion. | **6** |
| | | Demonstration of Wiring Protection techniques. | **6** |
| | | Insulation check using Mega Ohm Meter, Continuity check by Avo Meter. | **6** |
| | | Familiarisation of Plugs and Sockets, insulators. | **6** |
| **3.2** | **P 2.2.9** | Continuity, Insulation and Bonding Techniques and testing of electrical cables | **6** |
| | | Testing an installation of Coaxial Cable. | **6** |
| | | Identification of various types of Cables and Connectors. | **6** |
| **3.3** | **P 2.3.12** | To Prove Faraday's Law. | **6** |

| | | | |
|---|---|---|---|
| **3.4** | **P 2.3.15** | Types of Transformers. | **6** |
| **3.5** | **P 2.3.17** | Principle and Operation of DC Generator | **6** |
| | | Principle and Operation of Alternator. | **6** |

# *SEMESTER - III*

**Summery of syllabus Theory and Practical training**
**SEMESTER - III**

**Refer Syllabus Msc Page No 35 file**

**SYLLABUS FOR SEMESTER III(THEORY)**

**ELECTRONIC FUNDAMENTALS AND DIGITAL TECHNIQUES – II**

| | | | |
|---|---|---|---|
| **1** | | **ELECTRONIC FUNDAMENTALS AND DIGITAL TECHNIQUES - II** | **Hours:80** |
| **1.1** | **P 2.5.1** | Electronic Instrument Systems | 5 |
| | | • • Typical systems arrangements and | **2** |
| | | cockpit layout of electronic instrument systems. | **3** |
| **1.2** | **P 2.5.3** | Data Conversion | **6** |
| | | • • Analogue Data, Digital Data; | **2** |
| | | • • Operation and application of analogue to digital, | **4** |
| | | and digital to analogue converters, inputs and outputs, | |
| | | limitations of various types. | |
| **1.3** | **P 2.5.7** | Microprocessors | **6** |
| | | • • Functions performed and overall operation of a microprocessor; | **2** |
| | | • • Basic operation of each of the following | **4** |
| | | microprocessor elements: control and processing unit, clock, register, arithmetic logic unit. | |
| **1.4** | **P 2.5.8** | Integrated Circuits | **6** |

| | | | |
|---|---|---|---|
| | | • • Operation and use of encoders and decoders; | **2** |
| | | • • Function of encoder types; | **2** |
| | | • • Uses of medium, large and very large scale integration. | **2** |
| **1.5** | **P 2.5.9** | Multiplexing | **5** |
| | | • • Operation, application and identification in logic | **5** |
| | | diagrams of multiplexers and demultiplexers. | |
| **1.6** | **P 2.5.10** | Fibre Optics | 15 |
| | | • • Advantages and disadvantages of fibre optic data transmission over electrical wire propagation; | 2 |
| | | • • Fibre optic data bus | **3** |
| | | • • Fibre optic related terms; | **3** |
| | | • • Terminations; | **3** |
| | | • • Couplers, control terminals, remote terminals; | **2** |
| | | • • Application of fibre optics in aircraft systems. | **2** |

**SYLLABUS FOR SEMESTER III(THEORY)**

**ELECTRONIC FUNDAMENTALS AND DIGITAL TECHNIQUES – II**

| | | | |
|---|---|---|---|
| **1.7** | **P 2.5.11** | Electronic Displays | **4** |
| | | • • Principles of operation of common types of displays | |
| | | used in modern aircraft, including Cathode Ray Tubes, | **4** |
| | | Light Emitting Diodes and Liquid Crystal Display | |
| **1.8** | **P 2.5.12** | Electrostatic Sensitive Devices | **9** |
| | | • • Special handling of components sensitive to | **3** |
| | | electrostatic discharges; | |
| | | • • Awareness of risks and possible damage, | **3** |
| | | component and | |
| | | personnel an ti-static protection devices. | |
| | | • • Basic operation of each of the following | **3** |
| | | microprocessor elements: control and processing unit, clock, register, arithmetic logic unit. | |
| **1.9** | **P 2.5.13** | Software Management Control | **3** |
| | | • • Awareness of restrictions, airworthiness | |

| | | | |
|---|---|---|---|
| | | requirements and possible catastrophic effects of unapproved changes to software programmes. | |
| **1.1** | **P 2.5.14** | Electromagnetic Environment | **6** |
| | | • • Influence of the following phenomena on | **2** |
| | | maintenance practices for electronic system | |
| | | • • EMC-Electromagnetic Compatibility EMI-Electromagnetic Interference HIRF-High Intensity | **3** |
| | | Radiated Field Lightning/lightning protection | |
| **1.11** | **P 2.5.15** | **Typical Electronic/Digital Aircraft Systems** | **14** |
| | | • • General arrangement of typical electronic/digital | **1** |
| | | aircraft systems and associated BITE(Built In Test | |
| | | Equipment) testing such as: | |
| | | • • ACARS-ARINC Communication and Addressing and Reporting System | **2** |
| | | • • ECAM-Electronic Centralised Aircraft Monitoring | **1** |
| | | • • EFIS-Electronic Flight Instrument System | **1** |
| | | • • EICAS-Engine Indication and Crew Alerting System | **1** |
| | | • • FBW-Fly by Wire | **1** |
| | | • • FMS-Flight Management System | **2** |
| | | • • GPS-Global Positioning System | **2** |
| | | • • IRS-Inertial Reference System | **1** |
| | | • • TCAS-Traffic Alert Collision Avoidance System | **2** |

**SEMESTER I II (THEORY)**

**2. AIRCRAFT ELECTRICAL SYSTEM - I**

| | | | |
|---|---|---|---|
| **2** | | **AIRCRAFT ELECTRICAL SYSTEM - I** | **Hours:80** |
| **2.1** | **P 3 Av 2.5** | **Electrical Power (ATA 24)**<br>• • Batteries Installation and Operation; | **5** |
| | | • • DC power generation | **10** |
| | | • • AC power generation; | **10** |
| | | • • Emergency power generation; | **10** |
| | | • • Voltage regulation; | **10** |
| | | • • Power distribution; | **10** |
| | | • • Inverters, transformers, rectifiers; | **10** |
| | | • • Circuit protection; | **5** |
| | | • • External/Ground power. | **10** |

**SYLLABUS FOR SEMESTER I II (THEORY)**

**3.AIRCRAFT INSTRUMENT SYSTEM - I**

| | | | |
|---|---|---|---|
| **3** | | **AIRCRAFT INSTRUMENT SYSTEM - I** | **Hours:60** |
| **3.1** | **P 3 Av 2.8** | Instrument Systems (ATA 31)<br>• • Classification; | **4** |
| | | • • Atmosphere; | **2** |
| | | • • Terminology; | **2** |
| | | • • Pressure measuring devices and systems; | **5** |
| | | • • Pitot static systems; | **5** |
| | | • • Altimeters; | **4** |
| | | • • Vertical speed indicators; | **4** |
| | | • • Airspeed indicators; | **4** |
| | | • • Machmeters; | **5** |
| | | • • Altitude reporting/alerting systems; | **2** |

| | | | |
|---|---|---|---|
| | | • • Air data computers; | **3** |
| | | • • Instrument pneumatic systems | **5** |
| | | • • Direct reading pressure and temperature gauges; | **5** |
| | | • • Temperature indicating systems; | **5** |
| | | • • Fuel quantity indicating systems; | **5** |

**SYLLABUS FOR SEMESTER III (THEORY)**

**4. COMMUNICATION & NAVIGATION SYSTEM - I**

| | | **COMMUNICATION & NAVIGATION SYSTEM - I** | **Hours:80** |
|---|---|---|---|
| **4.1** | **P 3 Av 2.4** | **Communication/Navigation (ATA 23/34)** | **20** |
| | | • • Fundamentals of radio wave propagation, antennas, transmission | |
| | | • • lines, communication, receiver and transmitter | **60** |
| | | Simple Radio Reciever and explanation | 5 |
| | | Inter communication System in A/b Radio | 5 |
| | | H/F R/T function & purpose of the system | 5 |
| | | VHF R/T function & purpose of the system | 10 |
| | | Antenna theory explanation & different types of antennas available in A/b Radio equipments | 15 |
| | | Types of Transmission lines used in A/b radio communication system | 5 |

| | | | |
|---|---|---|---|
| | | Simple B/D of Transmitter & Receiver, including B/D & function of trans receiver used in A/b Radio/Radar equipments | 15 |

**SYLLABUS FOR SEMESTER I II (THEORY)**

**5.MAINTENANCE PRACTICES - I I**

| | | **MAINTENANCE PRACTICES - I I** | **Hours:50** |
|---|---|---|---|
| **5.1** | **P 2.2.8** | Riveting<br>• • Riveted joints, rivet spacing and pitch; | **3** |
| | | • • Tools used for riveting and dimpling; | **2** |
| | | • • Inspection of riveted joints. | **3** |
| **5.2** | **P 2.2.9** | Pipes and Hoses<br>• • Bending and belling/flaring aircraft pipes; | **5** |
| | | • • Inspection and testing of aircraft pipes and hoses; | **3** |
| | | • • Installation and clamping of pipes. | **2** |
| **5.3** | **P 2.2.10** | 10 Springs<br>• • Inspection and testing of springs. | **4** |

| | | | |
|---|---|---|---|
| **5.4** | **P2.2.11** | Bearings<br>• • Testing, cleaning and inspection of bearings; | **3** |
| | | • • Lubrication requirements of bearings; | **2** |
| | | • • Defects in bearings and their causes. | **3** |
| | | • • 28.11.2003 L 315/100 Official Journal of the European Union EN | **2** |
| **5.5** | **P2.2.12** | Transmissions<br>• • Inspection of gears, backlash; | **3** |
| | | • • Inspection of belts and pulleys, chains and sprockets | **4** |
| | | • • Inspection of screw jacks, lever devices, push-pull rod systems. | **3** |
| **5.6** | **P2.2.13** | Control Cables<br>• • Swaging of end fittings; | **4** |
| | | • • Inspection and testing of control cables; | **2** |
| | | • • Bowden cables; aircraft flexible control systems. | **2** |

**SYLLABUS FOR SEMESTER III(Practicals)**

**ELECTRONIC FUNDAMENTALS AND DIGITAL TECHNIQUES – II**

| | | | |
|---|---|---|---|
| **1** | | **ELECTRONIC FUNDAMENTALS AND DIGITAL TECHNIQUES - II** | **Hours:80** |
| **1.1** | **P 2.5.1** | Electronic Instrument Systems | 5 |
| | | • • Typical systems arrangements and cockpit layout of electronic instrument systems. | **23** |
| **1.2** | **P 2.5.3** | Data Conversion | **6** |
| | | • • Analogue Data, Digital Data; | **2** |
| | | • • Operation and application of analogue to digital, and digital to analogue converters, inputs and outputs, limitations of various types. | **4** |
| **1.3** | **P 2.5.7** | Microprocessors | **6** |
| | | • • Functions performed and overall operation of a microprocessor; | **2** |

| | | | |
|---|---|---|---|
| | | • • Basic operation of each of the following microprocessor elements: control and processing unit, clock, register, arithmetic logic unit. | **4** |
| **1.4** | **P 2.5.8** | Integrated Circuits | **6** |
| | | • • Operation and use of encoders and decoders; | **2** |
| | | • • Function of encoder types; | **2** |
| | | • • Uses of medium, large and very large scale integration. | **2** |
| **1.5** | **P 2.5.9** | Multiplexing | **5** |
| | | • • Operation, application and identification in logic diagrams of multiplexers and demultiplexers. | **5** |
| **1.6** | **P 2.5.10** | Fibre Optics | 15 |
| | | • • Advantages and disadvantages of fibre optic data transmission over electrical wire propagation; | 2 |
| | | • • Fibre optic data bus | **3** |
| | | • • Fibre optic related terms; | **3** |
| | | • • Terminations; | **3** |
| | | • • Couplers, control terminals, remote terminals; | **2** |
| | | • • Application of fibre optics in aircraft systems. | **2** |

**SYLLABUS FOR SEMESTER III(Practicals)**

**ELECTRONIC FUNDAMENTALS AND DIGITAL TECHNIQUES – II**

| | | | |
|---|---|---|---|
| **1.7** | **P 2.5.11** | Electronic Displays | **4** |
| | | • • Principles of operation of common types of displays used in modern aircraft, including Cathode Ray Tubes, Light Emitting Diodes and Liquid Crystal Display | **4** |
| **1.8** | **P 2.5.12** | Electrostatic Sensitive Devices | **9** |
| | | • • Special handling of components sensitive to electrostatic discharges; | **3** |
| | | • • Awareness of risks and possible damage, personnel an ti-static protection devices. | **3** |
| | | • • Basic operation of each of the following microprocessor elements: control and processing unit, clock, register, arithmetic logic unit. | **3** |

| | | | |
|---|---|---|---|
| **1.9** | **P 2.5.13** | Software Management Control | **3** |
| | | • • Awareness of restrictions, airworthiness requirements and possible catastrophic effects of unapproved changes to software programmes. | |
| **1.1** | **P 2.5.14** | Electromagnetic Environment | **5** |
| | | • • Influence of the following phenomena on maintenance practices for electronic system | 2 |
| | | • • EMC-Electromagnetic Compatibility EMI-Electromagnetic Interference HIRF-High Intensity Radiated Field Lightning/lightning protection | **3** |
| **1.11** | **P 2.5.15** | **Typical Electronic/Digital Aircraft Systems** | **14** |
| | | • • General arrangement of typical electronic/digital aircraft systems and associated BITE(Built In Test Equipment) testing such as: | 1 |
| | | • • ACARS-ARINC Communication and Addressing and Reporting System | 2 |
| | | • • ECAM-Electronic Centralised Aircraft Monitoring | 1 |
| | | • • EFIS-Electronic Flight Instrument System | 1 |
| | | • • EICAS-Engine Indication and Crew Alertimng System | 1 |
| | | • • FBW-Fly by Wire | 1 |
| | | • • FMS-Flight Management System | 2 |
| | | • • GPS-Global Positioning System | 2 |
| | | • • IRS-Inertial Reference System | 1 |
| | | • • TCAS-Traffic Alert Collision Avoidance System | 2 |

**SYLLABUS FOR SEMESTER I II (Practical)**

**2.AIRCRAFT ELECTRICAL SYSTEM - I**

| | | | |
|---|---|---|---|
| **2** | | **AIRCRAFT ELECTRICAL SYSTEM - I** | **Hours:70** |
| **2.1** | **P 3 Av 2.5** | **Electrical Power (ATA 24)**<br>• • Batteries Installation and Operation; | **6** |
| | | • • DC power generation | **8** |
| | | • • AC power generation; | **8** |
| | | • • Emergency power generation; | **8** |
| | | • • Voltage regulation; | **8** |
| | | • • Power distribution; | **8** |
| | | • • Inverters, transformers, rectifiers; | **8** |
| | | • • Circuit protection; | **6** |

| | | | |
|---|---|---|---|
| | | • • External/Ground power. | **10** |

**SYLLABUS FOR SEMESTER III (Practical)**

**3.AIRCRAFT INSTRUMENT SYSTEM - I**

| | | | |
|---|---|---|---|
| **3** | | **AIRCRAFT INSTRUMENT SYSTEM - I** | **Hours:60** |
| **3.1** | **P 3 Av 2.8** | Instrument Systems (ATA 31)<br>• • Classification; | **4** |
| | | • • Atmosphere; | **2** |
| | | • • Terminology; | **2** |
| | | • • Pressure measuring devices and systems; | **5** |
| | | • • Pitot static systems; | **5** |
| | | • • Altimeters; | **4** |
| | | • • Vertical speed indicators; | **4** |
| | | • • Airspeed indicators; | **4** |

| | | | |
|---|---|---|---|
| | | • • Machmeters; | **5** |
| | | • • Altitude reporting/alerting systems; | **2** |
| | | • • Air data computers; | **3** |
| | | • • Instrument pneumatic systems | **5** |
| | | • • Direct reading pressure and temperature gauges; | **5** |
| | | • • Temperature indicating systems; | **5** |
| | | • • Fuel quantity indicating systems; | **5** |

**SYLLABUS FOR SEMESTER III (Practical)**

**4.COMMUNICATION & NAVIGATION SYSTEM - I 4**

| | | **COMMUNICATION & NAVIGATION SYSTEM - I** | **Hours:60** |
|---|---|---|---|
| **4.1** | **P 3 Av 2.4** | **Communication/Navigation (ATA 23/34)**<br>• • Fundamentals of radio wave propagation, antennas, transmission | **10** |
| | | • • lines, communication, receiver and transmitter | **50** |
| | | Simple Radio Reciever and explanation | 5 |
| | | Inter communication System in A/b Radio | 5 |
| | | H/F R/T function & purpose of the system | 5 |
| | | VHF R/T function & purpose of the system | 5 |

| | | | |
|---|---|---|---|
| | | Antenna theory explanation & different types of antennas available in A/b Radio equipments<br>Types of Transmission lines used in A/b radio communication system<br>Simple B/D of Transmitter & Receiver, including B/D & function of trans receiver used in A/b Radio/Radar equipments | 10<br>5<br>15 |

**SYLLABUS FOR SEMESTER I II (Practical)**

**5. MAINTENANCE PRACTICES - I I**

| | | **MAINTENANCE PRACTICES - I I** | **Hours:80** |
|---|---|---|---|
| **5.1** | **P 2.2.8** | Riveting | **10** |
| | | • • Riveted joints, rivet spacing and pitch; | 3 |
| | | • • Tools used for riveting and dimpling; | 3 |
| | | • • Inspection of riveted joints. | 4 |
| **5.2** | **P 2.2.9** | Pipes and Hoses | **10** |
| | | • • Bending and belling/flaring aircraft pipes; | 3 |
| | | • • Inspection and testing of aircraft pipes and hoses; | 3 |
| | | • • Installation and clamping of pipes. | 4 |

| | | | |
|---|---|---|---|
| **5.3** | **P 2.2.10** | 10 Springs<br>• • Inspection and testing of springs. | 10 |
| **5.4** | **P2.2.11** | Bearings | **15** |
| | | • • Testing, cleaning and inspection of bearings; | 4 |
| | | • • Lubrication requirements of bearings; | 4 |
| | | • • Defects in bearings and their causes. | 4 |
| | | • • 28.11.2003 L 315/100 Official Journal of the European Union EN | 3 |
| **5.5** | **P2.2.12** | Transmissions | **15** |
| | | • • Inspection of gears, backlash; | 5 |
| | | • • Inspection of belts and pulleys, chains and sprockets | 5 |
| | | • • Inspection of screw jacks, lever devices, push-pull rod systems. | 5 |
| **5.6** | **P2.2.13** | Control Cables | **20** |
| | | • • Swaging of end fittings; | 6 |
| | | • • Inspection and testing of control cables; | 6 |
| | | • • Bowden cables; aircraft flexible control systems. | 8 |

# SEMESTER IV

**Syllabus for AME ab - initio courses Avionics Stream**
**SEMESTER - IV**

**Refer Syllabus Msc Page 49 file**

**SYLLABUS FOR SEMESTER IV (Theory)**

**Theory of Flight and Propulsion**

| Sl. No. | CAR Ref. No. | DESCRIPTION | Hrs50 |
|---|---|---|---|
| 1 | P3Av2.1 (A) | **Theory of Flight**<br><br>**<u>A. Aeroplane Aerodynamics and Flight Controls</u>**<br>Operation and effect of: | **20:00** |
| | | i. Roll control: ailerons | 1:00 |
| | | ii. Operation and effects of spoilers | 1:00 |
| | | iii. Pitch control operation and effect of elevators | 2:00 |
| | | iv. Operation of Stabilators and its effects | 2:00 |

| | | | |
|---|---|---|---|
| | | v. Variable incidence stabilizers and canards | 2:00 |
| | | vi. Yaw control and its effects | 2:00 |
| | | vii. Rudder limiters | 1:00 |
| | P3 Av2.1 (B) | • Control using elevon, | 1:00 |
| | | • Control using Ruddervators | 1:00 |
| | | • High lift devices slots, slats | 2:00 |
| | | • Flaps, its types and operation | 1:00 |
| | | • Drag inducing devices: spoilers | 1:00 |
| | | • Lift dumpers, speed brakes | 1:00 |
| | | • Operation and effect of trim tabs, servo tabs | 1:00 |
| | P3Av 2.1 (C) | • Control surface bias. | 1:00 |
| | | **B. High Speed Flight** | **10:00** |
| | | • Speed of sound and its effects on high speed flight | 2:00 |
| | | • Subsonic flight and its effects on aircraft | 2:00 |
| | | • Transonic flight and its effects on aircraft | 2:00 |

**SYLLABUS FOR SEMESTER IV (THEORY)**

**Theory of Flight and Propulsion**

| | | | |
|---|---|---|---|
| | | Supersonic flight and its effects on aircraft | |
| | | • Mach number critical Mach number | 2:00 |
| | | **C. Rotary Wing Aerodynamics** | **10:00** |
| | | • Terminology: Terms and definitions are used for rotary wing a/c | 3:00 |
| | | • Cyclic pitch control, its operation, effect on aircraft | 2:00 |
| | | • Collective pitch control its operation, effect on aircraft | 2:00 |
| | | • Anti torque controls using Tail rotor/Anti torque rotor & operation | 3:00 |
| 2 | P3Av 3.1 | **Turbine Engines** | **10:00** |
| | | • Description of Turbine engine | 1:00 |

| | | | |
|---|---|---|---|
| | | • Constructional arrangement of Turbine Engine | 2:00 |
| | | • Description and Operation of Turbojet engine | 2:00 |
| | | • Description and Operation of Turbofan engine | 1:00 |
| | | • Description and Operation of Turbo shaft engine | 2:00 |
| | | • Description and operation of Turbo propeller engines | 2:00 |

**SYLLABUS FOR SEMESTER IV(Theory)**

**Aircraft Electrical System - II**

| S.No | Ref. No. | TOPICS | Hrs |
|---|---|---|---|
| 1 | P3AV 2.5 | **(i) Electrical power ATA 24** | **20:00** |
| | | * Aircraft Battery charging procedure | 10:00 |
| | | * Aircraft Battery capacity test procedure; Aircraft Battery final checks, leakage current from live point to container | 5:00 |
| | | * Aircraft battery faults and remedies and final certification | 5:00 |
| 2 | P3AV 2.5 | **(ii) AC / DC power generation** | **20:00** |
| | | * DC alternator circuit light aircraft | 2:00 |
| | | * Electrical power- voltage regulation overvoltage protection | 2:00 |
| | | * Electrical power – differential voltage reverse current cutout | 2:00 |

| | | | |
|---|---|---|---|
| | | * electrical power distribution – bus bar control devices, and transfer of power system | 2:00 |
| | | * Inverters rotary and static type-Principle, operation, maintenance | 2:00 |
| | | * Transformers various types – Inspection, maintenance and tests | 2:00 |
| | | * Rectifiers – Transformer Rectifier Units voltage and current rating | 2:00 |
| | | * AC Generator – Testing procedure | 2:00 |
| | | * AC Generator - Power distribution | 2:00 |
| | | * AC / DC Generator – Maintenance; faults and remedies and inspection procedures | 2:00 |
| 3 | P3AV2.5 | **Voltage Regulation** | **10:00** |
| | | * Carbon pile type voltage regulator | 4:00 |
| | | * Transistorized and transistor type voltage regulator | 3:00 |
| | | * Voltage regulator – Maintenance Testing – trouble shooting faults and remedies | 3:00 |
| 4 | P3AV 2.6 | **Equipment & Furnishings ATA25** | **10:00** |
| | | * Electronic emergency equipment requirements | 3:00 |
| | | * Emergency Locator Transmitter construction, operation, location of installation | 2:00 |
| | | * Testing and ELT and service for an ELT | 3:00 |
| | | * Flight Data and Voice Recorder | 2:00 |
| 5 | P3AV 2.6 | **Cabin Entertainment Equipment** | **10:00** |
| | | * Radio Telephones; Cabin Interphone, Service Interphone; Passenger address – Audio Integrating system / Flight telephone | 3:00 |
| | | * Audio channels (Music) | 2:00 |
| | | * Video Channels (Films) | 3:00 |
| | | * Net work connections for personal laptop and SMS facility for E-mailing | 2:00 |

**SYLLABUS FOR SEMESTER IV(Theory)**
**Aircraft Instrument System-II**

| Sl. No. | Ref. No. / Units | TOPICS | Hrs90 |
|---|---|---|---|
| 1 | P3AV2.8 (ATA 31) | **GYROSCOPIC PRINCIPLES** | **12:00** |
| | | • Definition of axis and plane of spin | 1:00 |
| | | • Degree of freedom spinning freedom | 1:00 |
| | | • Tilting freedom and veering freedom input and output axis, displacement gyro and topple. | 2:00 |
| | | • Definition of Newtown's first law of motion and how it | 1:00 |
| | | • relates to gyroscopes. | 1:00 |

| | | | |
|---|---|---|---|
| | | • Definition and factors affecting rigidity and precision. | 1:00 |
| | | • Description and factors affecting apparent drift and real | 1:00 |
| | | • drift. | 2:00 |
| | | • Description of free, tide, earth and raie gyros. | 1:00 |
| | | • Knowledge of precautions associated with the used and handling gyroscopic instruments. | 1:00 |
| 2 | P3AV 2.8 | **ARTIFICIAL HORIZON** | **13:00** |
| | | • Construction, operation and function of air | 2:00 |
| | | • Electricity driven artificial horizons | 1:00 |
| | | • Identification of information displayed on artificial horizon. Description of acceleration. | 1:00 |
| | | • Turn and erection errors and the methods used to overcome. | 1:00 |
| | | • Description of operation of the following erection system. | 2:00 |

**SYLLABUS FOR SEMESTER IV(Theory)**

**Aircraft Instrument System-II**

| | | | |
|---|---|---|---|
| | | · Pendulous vane | 1:00 |
| | | · Ball type, torque motor and leveling switch. | 2:00 |
| | | · Reason for fast erection operation and precautions | 1:00 |
| | | · associated with the use of the system. | 2:00 |
| 3 | P3AV2.8 | **SLIP INDICATOR** | **5:00** |
| | | · Construction operation and functions of air and the electrical driven turn coordinators | 2:00 |
| | | · Turn and slip indicator. | 1:00 |
| | | · Interpretation of information displayed from typical indication. | 2:00 |

| | | | |
|---|---|---|---|
| 4 | P3AV2.8 | **DIRECTIONAL GYROS** | **8:00** |
| | | · Description of the function operation and construction of directional gyros. | 2:00 |
| | | · Operation and used of the manual caging knobs. | 2:00 |
| | | · Description of gimbals re balancing and gimbals errors | 2:00 |
| | | · The effect on the operation of the instruments. | 2:00 |
| | | COMPASS SYSTEM | **20:00** |
| | | · Aircraft magnetism and its effect on compass | 3:00 |
| | | · Magnetic compass | 3:00 |
| | | · Compass construction and operation | 2:00 |
| | | · Acceleration, Turning error deviation compensation | 3:00 |
| | | · device. | 3:00 |
| | | · Detector element Gyroscopic and indicator | 2:00 |
| | | · Modes of operation | 2:00 |
| | | · Compass swinging and preparation of deviation card. | 2:00 |

**SYLLABUS FOR SEMESTER IV(Theory)**

**Aircraft Instrument System-II**

| | | | |
|---|---|---|---|
| | | VIBRATIONS MEASUREMENT AND INDICATION :<br>• Introduction, construction and operation of various types of vibration measuring instruments. | 3:00<br>3:00 |
| | | OXYGEN SYSTEM: | 5:00 |
| | | • Oxygen System Introduction | 1:00 |
| | | • Purpose continuous flow oxygen system | 1:00 |
| | | • Dilute demand system, Chemical oxygen system | 1:00 |
| | | • Portable oxygen sets, Oxygen storage cylinders | 1:00 |
| | | • Pipelines, oxygen Charging precaution | 1:00 |
| | | Electronic Engine Control and Fuel Metering System (FADEC) | |

| | | | |
|---|---|---|---|
| | | | 6:00 |
| | | • Introduction | 2:00 |
| | | • Construction | 2:00 |
| | | • Operation | 2:00 |
| | | ENGINE INDICATING SYSTEMS: | 12:00 |
| | | • Exhaust gas temperature /interstage turbine | |
| | | • temperature indicating system | 2:00 |
| | | • Engine speed indicating system | 2:00 |
| | | • Engine thrust indication | 2:00 |
| | | • Engine pressure ratio | 2:00 |
| | | • Engine turbine discharge pressure or jet pipe pressure system | 1:00 |
| | | • Oil pressure and temperature indicating systems | 1:00 |
| | | • Fuel pressure, temperature and flow indicator manifold pressure indicating system | 1:00 |
| | | • Engine torque and propeller speed indicating system | 1:00 |
| | | STALL WARNING SYSTEM AND ANGLE OF ATTACK INDICATING SYSTEM | 6:00 |

**SYLLABUS FOR SEMESTER IV(Theory)**

**Communication & Navigation System – II**

| Sl. No. | Ref. No. / Units | TOPICS | Hrs90 |
|---|---|---|---|
| 1 | P2.2.4 | **Aviation General Test Equipments** | **30:00:00** |
| | | * Variable stabilized power supply | 2:00 |
| | | * AF / RF Signal Generator | 2:00 |
| | | * AF Oscillator | 2:00 |
| | | * Spectrum Analyzer | 2:00 |
| | | * CRO (Cathode Ray Oscilloscope) | 2:00 |
| | | * Frequency Meters | 2:00 |

| | | | |
|---|---|---|---|
| | | * Moving Coil, Volt, Ohm milli ammeter and multi meter | 2:00 |
| | | * Digital Multi meter | 2:00 |
| | | * RLC Probe | 2:00 |
| | | * Logic Probe | 2:00 |
| | | * Standing Wave Ratio meters | 2:00 |
| | | * VTVM Vacuum Tube Voltage Meters | 2:00 |
| | | * AC Bridges | 2:00 |
| | | * WIEN Bridges | 2:00 |
| | | * HAY Bridges | 2:00 |
| 2 | P3 AV 2.4 | **Communication and Navigation (ATA 23/4)** | **20:00** |
| | | * Fundamentals of Radio Wave Propagation | 5:00 |
| | | * Antennas | 5:00 |
| | | * Transmission lines | 5:00 |
| | | * Communication Receiver and Transmitter | 5:00 |
| | | **Working Principles of the Following Systems**<br>**a. VHF – Very High Frequency** | **5:00** |
| | | i. VHF – Introduction<br>ii. Working Principles | 1:00 |
| | | iii. Frequency allocation, aerials, Antenna orientation | 1:00 |
| | | iv. Design features of Air Borne VHF Transmitter and Receiver | 1:00 |
| | | v. Block diagrams explanation | 1:00 |
| | | vi. Testing Procedures | 1:00 |

**SYLLABUS FOR SEMESTER IV(Theory**

**Communication & Navigation System – II**

| Sl. No. | Ref. No. / Units | TOPICS | Hrs |
|---|---|---|---|
| | P3AV 2.4 | **b. HFS – High Frequency System** | **5:00** |
| | | i. Introduction and Working Principles<br>ii. Design features of Air Borne HF Transmitter and Receiver | 1:00 |
| | | iii. Block Diagram explanation of TXR and RXR | 1:00 |
| | | iv. Antenna Tuning Units<br>v. Frequency Selection and operation | 1:00 |
| | | vi. Squelch Control purpose and Operation<br>vii. SELCAL System | 1:00 |

| | | | |
|---|---|---|---|
| | | viii. Block diagram explanation , purpose and operation of the system | 1:00 |
| | | **c. AIS – Audio Integration System** | **3:00** |
| | | i. Type of Services | 2:00 |
| | | ii. Sub Parts Explanation | 1:00 |
| | | **d. ELT – Emergency Locator Transmitter** | **3:00** |
| | | i. Introduction and working principles | 1:00 |
| | | ii. Explanation of Transmitter, Frequency bands | 1:00 |
| | | iii. Battery Pack and Antennas | 1:00 |
| | | **e. CVR – Cockpit Voice Recorder** | **3:00** |
| | | i. Introduction | 1:00 |
| | | ii. Block diagram Explanation | 1:00 |
| | | iii. Utilization of the System | 1:00 |
| | | **f. FDR – Flight Data Recorder** | **3:00** |
| | | i. Introduction | 1:00 |
| | | ii. Block Diagram Explanation | 1:00 |
| | | iii. Utilization of the System | 1:00 |
| | | **g. ADF – Automatic Direction Finder** | **5:00** |
| | | i. Introduction | 1:00 |
| | | ii. Principle of Loop and Sense Antennas | 1:00 |
| | | iii. Directional Characteristics and Polar, Radiation Pattern diagrams | 1:00 |
| | | iv. ADF Receiver and Block diagram and Theory of Operation | 1:00 |
| | | v. Frequency Allocation and Testing Procedures | 1:00 |

**SYLLABUS FOR SEMESTER IV(Theory)**

**Communication & Navigation System – II**

| Sl. No. | Ref. No. / Units | TOPICS | Hrs |
|---|---|---|---|
| | P3AV 2.4 | **h. VOR – VHF Omni Range System** | **5:00** |
| | | i. Principles of Ground Station and types of Signals Generated and Transmitted | 1:00 |
| | | ii. VOR Receiver Block diagram explanation and phase comparison techniques | 1:00 |
| | | iii. Uses and limitations of VOR | 1:00 |
| | | iv. Explanation of Radials, To / From FLAG Circuitry | 1:00 |

| | | | |
|---|---|---|---|
| | | v. Frequency allocation for TVOR, CVOR and DVOR<br>vi. Explanation of VOR Airborne Antennas | 1:00 |
| | | **j. ILS – Instrument Landing System** | **5:00** |
| | | i. Principles of localizer ground station, transmitter, lateral guidance localizer receiver. | 1:00 |
| | | ii. Block diagram and principles of glide path ground stations. | 1:00 |
| | | iii. Pattern of signals transmitted, vertical guidance, coordination. | 1:00 |
| | | iv. Block diagram explanation of glide path receiver, flag Circuitry, course softening and deflection system | 1:00 |
| | | v. Indication for both localizer and glide path<br>vi. Marker System – Principles of ground station, types of different signals emitted and their modulation, Outer Middle and Inner Markers Identification<br><br>**k. MLS - Micro Wave Landing System** | 1:00 |
| | | i. Principle of operation, explanation of transmitters radiation and pattern | 1:00 |
| | | ii. TRSB – Time Reference Scan Beam | 1:00 |
| | | iii. Advantages of MLS over ILS | 1:00 |

**SYLLABUS FOR SEMESTER IV(Theory)**

**Maintenance Practices - III**

| Sl. No. | Ref. No. / Units | TOPICS | Hrs50 |
|---|---|---|---|
| 1 | P2.2.14.1 | **Material Handling** | **5:00** |
| | | * Marking and calculation of bend allowance | 1:00 |
| | | * Process of bending sheet metal | 1:00 |
| | | * Process of forming sheet metal | 1:00 |
| | | * Inspection sheet metal work | 1:00 |
| | | * Checking of sheet metal work | 1:00 |
| 2 | P2.2.14.2 | **Composite and Non- metallic** | **4:00** |
| | | * Practices of bonding | 1:00 |

| | | | |
|---|---|---|---|
| | | * Processing of bonding | 1:00 |
| | | * Environmental conditions | 1:00 |
| | | * Inspection methods | 1:00 |
| 3 | P2.2.16 | **Aircraft Weight and Balance** | **6:00** |
| | | * Theory of weight and balance, centre of gravity | 1:00 |
| | | * Balance limit calculation, use of relevant documents | 1:00 |
| | | * Weight and balance data, different terminology | 1:00 |
| | | * Preparation of aircraft for weighing | 1:00 |
| | | * Balance computation , EWCG | 1:00 |
| | | * Weight and balance extreme condition loading graph & CG envelopes | 1:00 |
| 4 | P2.2.17 | **Aircraft handling and storage** | **10:00** |
| | | * Aircraft taxing and towing procedure | 1:00 |
| | | * General safety precautions | 1:00 |
| | | * Description of general jacking procedures | 1:00 |
| | | * Use and methods of operation of jacking equipment | 1:00 |
| | | * Description of general chocking, securing and associated safety precautions | 1:00 |
| | | * Aircraft storage methods | 1:00 |
| | | * Aircraft refueling / defueling procedures | 1:00 |
| | | * De-icing / anti – icing procedure | 1:00 |
| | | * Electrical, hydraulic and pneumatic ground supplies | 1:00 |
| | | * Effects of environmental conditions on aircraft handling | 1:00 |

**SYLLABUS FOR SEMESTER IV(Theory)**

**Maintenance Practices - III**

| Sl. No. | Ref. No. | TOPICS | Hrs |
|---|---|---|---|
| 5 | P2.2.18 | **Disassembly, Inspection, Repair and Assembly Techniques** | **11:00** |
| | | (a) * Types of defects and vidual inspection techniques | 1:00 |
| | | * Corrosion removal, assessment and reprotection | 1:00 |
| | | (b) * General repair methods, structural repair manual | 1:00 |
| | | * Ageing, fatigue and corrosion control programmes | 1:00 |
| | | (c) * Non destructive inspection techniques including penetration | 1:00 |
| | | * Magnetic particle inspection | 1:00 |

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|---|---|---|---|
| | | * Magnetizing equipments | 1:00 |
| | | * Dye- penetrant inspection, Radiography | 1:00 |
| | | * Eddy current, ultra sonic and baroscope method | 1:00 |
| | | (d) * Disassembly and re-assembly technique<br>(e) * Trouble shooting techniques 1:00 | 1:00 |
| 6 | P2.2.19 | **Abnormal events** | **3:00** |
| | | (a) * Inspections following lighting strike and HIRF penetration | 1:00 |
| | | (b) * Inspection following abnormal events such as heavy landings | 1:00 |
| | | * Fight through severe turbulence, tyre bust incidents and damage from set blast | 1:00 |
| 7 | P2.2.20 | **Maintenance Procedure** | **11:00** |
| | | * Maintenance planning | 1:00 |
| | | * Modification procedures | 1:00 |
| | | * Stores procedures | 1:00 |
| | | * Certification / release procedures | 1:00 |
| | | * Interface with aircraft operation | 1:00 |
| | | * Maintenance inspection | 1:00 |
| | | * Inspection techniques; Hard Time, On Condition and Condition Monitoring | 1:00 |
| | | * Inspection fundamentals | 1:00 |
| | | * Quality control / Quality assurance | 1:00 |
| | | * Additional maintenances procedure | 1:00 |
| | | * Control of life limited components | 1:00 |

**SYLLABUS FOR SEMESTER IV (Practicals)**

**THEORY OF FLIGHT AND PROPULSION**

| S. No. | Ref. No./ Units | Practicals / Demonstration | Total Hrs 50 |
|---|---|---|---|
| 1 | 4.7.2.1 | Demonstration of primary controls such as ailerons , elevators Rudder and its operation | 3:00 |
| 2 | 4.7.2.1 | Demonstration of operation of stabilators and its variable incidence angle | 2:00 |
| 3 | 4.7.2.1 | Demonstration of operation of flaps | 2:00 |
| 4 | 4.7.2.1 | Demonstration operation of trim tabs, servo tabs | 3:00 |
| 5 | 4.7.2.1 | Control surfaces removal and their fitment | 5:00 |

| | | | |
|---|---|---|---|
| 6 | 4.7.2.1 | Demonstration of cyclic pitch control and its operation | 3:00 |
| 7 | 4.7.2.1 | Demonstration of collective pitch control and its operation | 3:00 |
| 8 | 4.7.2.1 | Demonstration of anti torque control using tail rotor | 3:00 |
| 9 | 4.7.2.1 | Demonstration and operation of spoilers | 3:00 |
| 10 | 4.8.1.3 | Demonstration of Turbine engine constructional arrangement and its operation | 4:00 |
| 11 | 4.8.1.3 | Demonstration of and operation of turbojet engine | 4:00 |
| 12 | 4.8.1.3 | Demonstration and operation of turbo shaft engine | 4:00 |
| 13 | 4.8.1.3 | Demonstration and operation of turbo propeller engine | 4:00 |
| 14 | 4.7.2.1 | Demonstration and operation of Yaw control | 3:00 |
| 15 | 4.7.2.1 | Demonstration and operation of speed breaks | 2:00 |
| 16 | 4.7.2.1 | Demonstration and operation of slots and slats | 2:00 |

**SYLLABUS FOR SEMESTER IV(Practlcal)**

## AIRCRAFT ELECTRICAL SYSTEM – II

| S.No. | Ref.No. / Units | Practical / Demonstration | Total Hrs 70 |
|---|---|---|---|
| 1 | P3AV 2.5 | (i) Electrical Power | **20:00** |
| | | * Familiarization of aircraft storage battery | 2:00 |
| | | * Identification of parts of Lead Acid Battery | 2:00 |
| | | * Demonstration of charging methods (constant / Current and voltage) | 4:00 |
| | | * Demonstration use of hydro meter | 2:00 |
| | | * Demonstration of capacity test | 2:00 |

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|---|---|---|---|
| | | * Dismantle procedure cell removal / nstallation of Nickel Cadmium battery | 4:00 |
| | | * Demonstration of different parts of Nickel Cadmium cell | 2:00 |
| | | * Demonstration of insulation test – current leakage test capacity test | 2:00 |
| 2 | P3Av2.5 | (ii)DC Power Generation | **20:00** |
| | | * Familiarization of DC and AC Generator. Identification of different parts. | 2:00 |
| | | * Generator - Armature Insulation test; Growler test, Concentricity check of Armature shaft with the aid of D.T.I | 4:00 |
| | | * Generator field coils insulation test | 2:00 |
| | | * Demonstration of Assembly – Testing | 4:00 |
| | | * DC Generator Brush Bedding – | 4:00 |
| | | * Brush Holder spring landing test | 2:00 |
| | | * DC Generator output test with no load to full load on Generator Test Bench | 2:00 |
| 3 | P3AV 2.5 | (iii) AC Power Generation | **5:00** |
| | | * AC Generator – familiarization identification of different parts | 1:00 |
| | | * Dismantle, Inspection, Insulation test | 2:00 |
| | | * Assembly – Test on AC Generator Test Bench; Current leakage test | 2:00 |

**SYLLABUS FOR SEMESTER IV(Practical)**

## AIRCRAFT ELECTRICAL SYSTEM – II

| S.No. | Ref.No. | Practical / Demonstration | Hours |
|---|---|---|---|
| 4 | P3AV 2.5 | (iv)Voltage Regulation | **5:00** |
| | | * Familiarization voltage regulator dismantle, Identify different part, Inspection | 1:00 |
| | | * Demonstrate Disassembly Assembly – | 1:00 |
| | | * Bench Test Along with Generator – Check Performance | 2:00 |
| | | * Demonstrate Adjustment procedure | 1:00 |

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|---|---|---|---|
| 5 | P3AV 2.5 | (v) Inverters / Transformers/ Rectifiers | **10:00** |
| | | * Familiarize / Identify Inverter static – Rotary Inverter | 2:00 |
| | | * Demonstrate – operation | 2:00 |
| | | * Identify Different Transformer | 2:00 |
| | | * Demonstrate short circuit open circuit test | 2:00 |
| | | * Demonstrate Rectifier function | 2:00 |
| **6** | **P3AV 2.6** | Cabin Entertainment Equipment | **10:00** |
| | | * Radio Telephones; Cabin Interphone, Service Interphone; Passenger address – Audio Integrating system / Flight telephone | |
| | | * Audio channels (Music) | 2:00 |
| | | * Video Channels (Films) | 3:00 |
| | | * Net work connections for personal laptop and SMS facility for E-mailing | 2:00 |

**SYLLABUS FOR SEMESTER IV(Practlcal)**

**AIRCRAFT INSTRUMENT SYSTEMS – II**

| Sl. No. | Ref. No. | Practical / Demonstration | Total Hrs 90 |
|---|---|---|---|
| 1 | 4.11.3 | **Gyroscopic Instruments** | **5:00** |
| | | Air-driven gyroscopic instruments<br>1. Partial dismantling | 2:00 |
| | | 2. Examination | 2:00 |
| | | 3. Reassembly | 1:00 |
| 2 | 4.11.3 | Electrically-drive gyroscopic instruments | **5:00** |
| | | 1. Partial dismantling | 2:00 |
| | | 2. Examination | 2:00 |

| | | | |
|---|---|---|---|
| | | 3. Reassembly | 1:00 |
| 3 | 4.11.3 | Artificial Horizon | **5:00** |
| | | 1. Partial dismantling | 2:00 |
| | | 2. Inspection | 2:00 |
| | | 3. Reassembly | 1:00 |
| 4 | 4.11.3 | Directional gyro | **6:00** |
| | | 1. Partial dismantling | 2:00 |
| | | 2. Inspection | 2:00 |
| | | 3. Reassembly | 2:00 |
| 5 | 4.11.3 | Turn and bank indicator | **5:00** |
| | | 1. Dismantling | 2:00 |
| | | 2. Inspection | 2:00 |
| | | 3. Reassembly | 1:00 |
| 6 | 4.11.3 | Calibration checks on gyroscope test turntable | **6:00** |
| 7 | 4.11.7 | **Compass systems** Magnetic compasses | **6:00** |
| | | 1. Friction and damping tests | 1:00 |
| | | 2. Practice compass swing | 4:00 |
| | | 3. Compensation | 1:00 |
| 8 | 4.11.7 | Remote compass | **6:00** |
| | | 1. Examination | 2:00 |
| | | 2. Demonstration. | 4:00 |
| 9 | 4.11.7 | Tests of compass swinging site. | **6:00** |
| 10 | 4.11.7 | Swing of compass in available aircraft: compensation practice. | **6:00** |

**SYLLABUS FOR SEMESTER IV(Practlcal)**

## AIRCRAFT INSTRUMENT SYSTEMS – II

| | | | |
|---|---|---|---|
| 11 | 4.11.7 | Remote compass | **10:00** |
| | | 1. Partial dismantling | 3:00 |
| | | 2. Inspection | 2:00 |
| | | 3. Reassembly | 3:00 |
| | | 4. Test. | 2:00 |
| 12 | 4.11.6 | **Fuel contents indication** Float-operated desynn contents gauges | **8:00** |
| | | 1. Examination | 2:00 |
| | | 2. Demonstration of operation | 1:00 |
| | | 3. Dismantling | 1:00 |
| | | 4. Inspection | 2:00 |

| | | | |
|---|---|---|---|
| | | 5. Reassembly | 1:00 |
| | | 6. Test | 1:00 |
| 13 | 4.11.6 | Capacitance type contents gauges | **6:00** |
| | | 1. Examination | 2:00 |
| | | 2. Demonstration of operation | 2:00 |
| | | 3. Reassembly | 1:00 |
| | | 4. Test | 1:00 |
| 14 | 4.11.6 | Flowmeter | **5:00** |
| | | 1. Dismantling | 2:00 |
| | | 2. Inspection | 1:00 |
| | | 3. Reassembly | 1:00 |
| | | 4. Test | 1:00 |
| 15 | 4.11.8 | **Miscellaneous instruments**<br><br>Examination and demonstration of other types of instruments<br>1. Flowmeters | <br><br>**5:00**<br>2:00 |
| | | 2. Navigation | 2:00 |
| | | 3. Landing aid presentations | 1:00 |

**SYLLABUS FOR SEMESTER IV(Practical)**

## COMMUNICATION AND NAVIGATION SYSTEMS – II

| Sl. No. | Ref. No./ Units | Practical / Demonstration | Total Hrs 70 |
|---|---|---|---|
| -1 | -2 | -4 | -6 |
| 1 | 4.13.4 | Familiarization of all the test equipment, meters and Mockups in Avionics Lab | 5:00 |
| 2 | 4.13.4 | Pulse generator multi vibrator | 2:00 |
| 3 | 4.13.4 | AF/ RF Single Generator, AF oscillator – Operation | 6:00 |
| 4 | 4.13.4 | Radar Transmitter and receiver Characteristics verification of PPI presentation | 5:00 |

| | | | |
|---|---|---|---|
| 5 | 4.13.4 | Radio test equipment – VTVM<br>System Operation, Testing the parameters | 5:00 |
| 6 | 4.13.4 | CRT oscilloscope<br>Principle construction, time base, horizontal deflection, vertical deflection, measurement of voltage, frequency, phase difference of wave forms | 7:00 |
| 7 | 4.13.4 | Radio navigation – ADF principle, ground station, directional characteristics and theory of operation | 4:00 |
| 8 | 4.13.4 | VOR principle, ground station, phase comparison, Radials To/FM indicator and Flag circuits | 4:00 |
| 9 | 4.13.4 | Instrument Landing System (ILS)<br>- Localizer<br>- Ground station<br>- Glide slope receiver<br>- Marker receiver, outer, middle and inner marker transmitter | 8:00 |
| 10. | 4.13.4 | Aircraft Radio Station communication installation on modern transport aircraft<br>VHF, HF with Selcal System Incorporated | 6:00 |
| 11. | 4.13.4 | Warning System – ELT | 6:00 |
| 12. | 4.13.4 | Audio Integration System (AIS) | 4:00 |
| 13. | 4.13.4 | Interphone | 4:00 |
| 14. | 4.13.4 | Recording System | 4:00 |

**SYLLABUS FOR SEMESTER IV(Practical)**

## MAINTENANCE PRACTICES – III

| Sl. No. | Ref. No. / Units | TOPICS | Total Hrs 70 |
|---|---|---|---|
| 1 | P2.2.14.1 | **Material Handling** | **8:00** |
| | | * Process of bending sheet metal | 3:00 |
| | | * Process of forming sheet metal | 3:00 |
| | | * Inspection sheet metal work | 2:00 |
| 2 | P2.2.14.2 | **Composite and Non- metallic**<br>* Inspection methods | **2:00**<br>2:00 |
| 3 | P2.2.16 | **Aircraft Weight and Balance** | **3:00** |

| | | | |
|---|---|---|---|
| | | * Balance computation , EWCG | 3:00 |
| 4 | P2.2.17 | **Aircraft handling and storage** | **####** |
| | | * Aircraft taxing and towing procedure | 4:00 |
| | | * Description of general jacking procedures | 6:00 |
| | | * Use and methods of operation of jacking equipment | 6:00 |
| | | * Description of general chocking, securing and associated safety precautions | 2:00 |
| | | * Aircraft refueling / defueling procedures | 6:00 |
| | | * Electrical, hydraulic and pneumatic ground supplies | 6:00 |
| 5 | P2.2.18 | **Disassembly, Inspection, Repair and Assembly Techniques** | **9:00** |
| | | (a) * Types of defects and vidual inspection techniques<br>* Corrosion removal, assessment and reprotection | 3:00 |
| | | (b) Disassembly and re-assembly technique | 3:00 |
| | | (c) Trouble shooting techniques | 3:00 |
| 6 | P2.2.19 | **Abnormal events** | **9:00** |
| | | (a) * Inspections following lighting strike and HIRF penetration | 3:00 |
| | | (b) * Inspection following abnormal events such as heavy landings | 3:00 |
| | | * Fight through severe turbulence, tyre bust incidents and damage from set blast | 3:00 |
| 7 | P2.2.20 | **Maintenance Procedure** | **9:00** |
| | | * Maintenance inspection | 3:00 |
| | | * Inspection techniques; Hard Time, On Condition nd Condition Monitoring | 3:00 |
| | | * Inspection fundamentals | 3:00 |

# SEMESTER - V

**Summery**
**SEMESTER - V**

**Refer Syllabus Msc Page 69 file**

## SYLLABUS FOR SEMESTER V (Theory)

**Aircraft Structures and Flight Controls**

| Sl. No. | Ref. No. | TOPICS | Hrs50 |
|---|---|---|---|
| 1 | P3Av2.2 | **Structures — General Concepts** | **15:00** |
| | | (a) Fundamentals of structural systems and its description | 3:00 |
| | | • (b) Zonal identification systems are used on aircraft | 2:00 |
| | | • Station identification systems are used on aircraft | 2:00 |
| | | • Electrical bonding and its necessity | 2:00 |
| | | • Lightning strike and its description | 2:00 |
| | | • Protection is given on aircraft | 2:00 |
| | | • Provision are followed for lightning strike | 2:00 |

| | | | |
|---|---|---|---|
| 2 | P3Av 2.7 | **Flight Controls (ATA 27)** | **35:00:00** |
| | | (a)<br>• Primary controls: aileron, elevator, rudder | 3:00 |
| | | • Spoiler and Trim control | 3:00 |
| | | • Active load control | 2:00 |
| | | • High lift devices, slots, slats, flaps | 3:00 |
| | | • Lift dump, speed brakes | 3:00 |
| | | • System operation: manual | 3:00 |
| | | • System operation hydraulic | 3:00 |
| | | • System operation pneumatic | 3:00 |
| | | • Artificial feel, Yaw damper | 2:00 |
| | | • Mach trim, rudder limiter, gust locks. | 3:00 |
| | | • Stall protection systems. | 3:00 |
| | | (b) System operation; electrical fly by wire | 4:00 |

## SYLLABUS FOR SEMESTER V (Theory)

### AIRCRAFT ELECTRICAL SYSTEM – III

| Sl. No. | Ref. No. / | TOPICS | Hrs 70 |
|---|---|---|---|
| 1 | P3AV2.9 | **(i) LIGHTS – ATA 33**<br>* External lights – Navigation, Anti-collision, landing, taxiing | **8:00** |
| | | Runway turn off; ice inspection light, logo light and strobe (flash)<br>Light | 3:00 |
| | | * Internal lights ; cabin, cockpit cargo | 3:00 |
| | | * Emergency light | 2:00 |
| 2 | P3AV2.9 | **(ii) AIR CONDITIONING – ATA 21** | **8:00** |

| | | | |
|---|---|---|---|
| | | Cooling System | |
| | | * Vapour cycle cooling machine | 1:00 |
| | | * Electronic temperature control regulator | 1:00 |
| | | * Air cycle cooling machine | 1:00 |
| | | Heating Systems | |
| | | * Exhaust heating systems | 1:00 |
| | | * Electric Heating System | 1:00 |
| | | * Combustion Heater systems | 1:00 |
| | | * Heating with Engine Bleed Air | 1:00 |
| | | * Electronic cabin temperature control system | 1:00 |
| 3 | P3AV2.9 | **(iii) FIRE PROTECTION – ATA 26** | **8:00** |
| | | * Types of Fire or Overheat Detectors | 1:00 |
| | | * Installation and Routing of Sensing Units | 1:00 |
| | | * Smoke and Toxic – Gas – Detection System | 1:00 |
| | | * Fire Extinguishing Agents | 1:00 |
| | | * Electrical circuit diagrams and testing procedures | 2:00 |
| | | * Trouble shooting theory and practice | 2:00 |
| 4 | P3AV 2.9 | **(iv) Flight Control – ATA 27** | **4:00** |
| | | * Introduction to Flight Control Surfaces<br>* Control Surface Indicating Systems | 1:00 |
| | | * Take off Warning Indicator Systems | 1:00 |
| | | * Stall Warning Indicator Systems<br>* Flight – Control – Position Indicating Systems | 1:00 |
| | | * Trouble Shooting Theory and Practice | 1:00 |

**SYLLABUS FOR SEMESTER V (Theory)**

**AIRCRAFT ELECTRICAL SYSTEM – III**

| | | | |
|---|---|---|---|
| 5 | P3Av2.9 | **(v) Hydraulic Power - ATA – 29** | **4:00** |
| | | * Introduction to Hydraulic Power | 1:00 |
| | | * Hydraulic Power Pressure Control Devices | 1:00 |
| | | * Hydraulic Pressure Switches / Hydraulic Pumps Electrically Operated) | 2:00 |
| 6 | P3Av2.9 | **(vi) Ice and Rain protection ATA – 30** | **10:00** |
| | | * Icing effects | 1:00 |

| | | | |
|---|---|---|---|
| | | * Ice detection- Method and indications | 1:00 |
| | | * Ice prevention : Pneumatic deicing system | 1:00 |
| | | * Electrical and Electronic Timer | 1:00 |
| | | * Thermal anti icing systems | 1:00 |
| | | * Ground Deicing of aircraft | 1:00 |
| | | * Wind shield icing control systems | 1:00 |
| | | * Pilot and A.O.A sensors electrical anti icing | 1:00 |
| | | * Window Defrost system / wind shield and carburetor alcohol Deicing systems/water and toilet Drain heaters | 1:00 |
| | | * Rain Eliminating systems/wind shield wiper system/wind shield rain repellant/ Pneumatic Rain removal systems | 1:00 |
| 7 | P3Av2.9 | **Indicating / Recording system( Central Warning System)** | **10:00** |
| | | * Electrical Indicating Instruments for Power plants Ammeters, Voltmeter Shunts, Instrument, Transformer Frequency meter and Power meter | 3:00 |
| | | * Electrical Indicating instruments for aircraft system and ontrol | 2:00 |
| | | * Electronics flight systems: Central Warning System EICAS, ECAM, EFIS, PDS, (Electronic Display System) BITE, Announciator panel, CRT Display | 3:00 |
| | | * Warming and Indicating lights, Magnetic Indicators | 2:00 |

**SYLLABUS FOR SEMESTER V (Theory)**

**AIRCRAFT ELECTRICAL SYSTEM – III**

| | | | |
|---|---|---|---|
| 8 | P3Av2.9 | **Landing Gear/Positioning and Warning system – II ATA -32** | **2:00** |
| | | * Extension & Retraction level switch | 1:00 |
| | | * Position indication/ warming / ground safety switch | 1:00 |
| 9 | P3Av2.9 | **Electrical and Electronic panel ATA – 39** | **3:00** |
| | | * Electrical and Electronic Equipment Racks<br>* Electrical and Electronic Junction Boxes | 1:00 |
| | | * Multipurpose Electronic components | 1:00 |
| | | * Printed Circuit Card Assemblies | 1:00 |

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|---|---|---|---|
| 10 | P3Av2.9 | **Doors ATA -52** | **3:00** |
| | | * Door warning / Entrance stair / Landing Gear | 2:00 |
| | | * Passenger / Crew Door proximity switch – warning and indication | 1:00 |
| 11 | P3Av2.9 | **Ignition ATA – 74** | **5:00** |
| | | * Magneto Ignition and High Energy Ignition | 2:00 |
| | | * Spark plugs and Igniter plugs | 1:00 |
| | | * Different types of Magneto and Auxiliary Ignition units. | 1:00 |
| | | * Electrical Power supply, Distribution Ignition cable harness | 1:00 |
| 12 | P3Av2.9 | **Engine Starting System ATA – 80** | **5:00** |
| | | * Piston Engine ( Reciprocating) | 2:00 |
| | | * Gas Turbine Engine | 2:00 |
| | | * Different types of starting system | 1:00 |

**SYLLABUS FOR SEMESTER V (Theory)**

**AIRCRAFT INSTRUMENT SYSTEM – III**

| Sl. No. | Ref. No. / Units | TOPICS | Hrs100 |
|---|---|---|---|
| 1 | P3AV2.8 (ATA31) | **FLIGHT DATA RECORDING SYSTEM :** | **11:00** |
| | | • Aircraft integrated data system (AIDS) | 2:00 |
| | | • Methods of recording. | 1:00 |

| | | | |
|---|---|---|---|
| | | • Track Recording | 1:00 |
| | | • Electro-magnetic recording recorders. | 3:00 |
| | | • Accelerometer and fatigue meters - basic accelerometer principle, construction and operation. | 2:00 |
| | | • Fatigue meter principle necessity construction and operation | 2:00 |
| 2 | P3AV2.8 (ATA 31) | **ELECTRONIC FLIGHT INSTRUMENT SYSTEM (EFIS) :** | **7:00** |
| | | • Introduction | 1:00 |
| | | • Display units, Symbol generators control panel | 2:00 |
| | | • Remote light sensor | 1:00 |
| | | • Display presentations, failure annunciation. | 2:00 |
| | | • Data source selection and display of air data. | 1:00 |
| 3 | P3AV2.8 (ATA31) | **INSTRUMENT WARNING SYSTEM, MASTER WARNING SYSTEM AND CENTRALIZED WARNING PANEL.** | **10:00** |
| | | • Warning and indicating lights- warning lights, caution lights, indicating or advisory lights | 5:00 |
| | | • Magnetic indicators | 2:00 |
| | | • Central warning system centralized warning system annunicator panel | 3:00 |
| 4 | P3AV2.7 (b) | **SYSTEM OPERATION, ELECTRICAL FLY BY WIRE** | **10:00** |

**SYLLABUS FOR SEMESTER V (Theory)**
**AIRCRAFT INSTRUMENT SYSTEM – III**

| | | | |
|---|---|---|---|
| 5 | P3AV2.10 (ATA 45) | **On board maintenance systems** | **10:00** |
| | | • Central maintenance computers<br>• Data loading system | 2:00 |
| | | • Electronic library system | 2:00 |
| | | • Printing | 2:00 |
| | | Structure monitoring (damage tolerance monitoring) | 2:00 |
| 6 | P3AV 2.3 (ATA | **AUTO FLIGHT** | **22:00** |

| | | | |
|---|---|---|---|
| | | • Fundamentals of automatic flight control including working principles and current terminology | 2:00 |
| | | • Command signal processing | 4:00 |
| | | • Modes of operation, Roll , Pitch and Yaw channels | 2:00 |
| | | • Yaw dampers | 2:00 |
| | | • Stability augmentation system in helicopters | 2:00 |
| | | • Automatic trim control | 2:00 |
| 7 | P3AV 2.4 | **FLIGHT DIRECTOR SYSTEM:** | **15:00** |
| | | • Integrated Instrument and flight director system. | 2:00 |
| | | • Basic presentation of flight director system | 3:00 |
| | | • Indicators ADI & HIS primary altitude sensing and presentations. Command signal passage and presentation on command bars. | 3:00<br>2:00 |
| | | • Different modes of operations. | 5:00 |
| 8 | P3AV2.8 | **GROUND PROXIMITY WARNING SYSTEM:** | **8:00** |
| | | • Introduction | 1:00 |
| | | • Operating modes, | 4:00 |
| | | • Advanced GPWS, terrain avoidance warning systems (TAWS). | 3:00 |
| 9 | P3AV2.4 | **FLIGHT MANAGEMENT SYSTEM.** | **7:00** |
| | | • Introduction | 1:00 |
| | | • Performance data computer system (PDCS)- computer | 2:00 |
| | | • Mode annunciator, display flight management system, (FMS)- flight management computer, control and display unit, data pages and flight plan construction, performance and in-flight display, system configuration. | 4:00 |

**SYLLABUS FOR SEMESTER V (Theory)**

**Communication & Navigation System – III ( ATA 23 / 34 )**

| Sl. No. | Ref. No./ Units | TOPICS | Hrs100 |
|---|---|---|---|
| 1 | P3 AV 2.4 | **Communication / Navigation (ATA 24 / 34)**<br>**DME – Distance Measuring Equipment** | **10:00** |
| | | * Introduction | 1:00 |
| | | * Principle of operation | 1:00 |
| | | * Pulse navigation system | 1:00 |
| | | * Description of interrogator | 1:00 |
| | | * Description of Reply generator | 1:00 |

| | | | |
|---|---|---|---|
| | | * Reply presentation | 1:00 |
| | | * Allotted frequencies | 1:00 |
| | | * Block diagram explanation | 1:00 |
| | | * Details of Antenna system | 1:00 |
| | | *Test procedures | 1:00 |
| 2 | P3 AV 2.4 | **Doppler Navigation** | **7:00** |
| | | * Intrduction | 1:00 |
| | | * Principles of operation | 1:00 |
| | | * Explanation of Doppler effects | 1:00 |
| | | * Moving targets | 1:00 |
| | | * Doppler shift and ground speed | 1:00 |
| | | * Explanation of Antennas | 1:00 |
| | | * Explanation of Drift meter and ground speed meter | 1:00 |
| 3 | P3 AV 2.4 | **Area Navigation** | **8:00** |
| | | * Introduction | 1:00 |
| | | * Principles of operation | 1:00 |
| | | * Development of Air space organization | 1:00 |
| | | * VOR / DME based RNAV | 1:00 |
| | | * Integrated navigation principles | 1:00 |
| | | * Testing methods | 1:00 |
| | | * Utilization of the system | 1:00 |
| | | * Explanation of display system | 1:00 |
| 4 | P3 AV 2.4 | **Flight Management System (FMS)** | **12:00** |
| | | * Introduction, explanation of sub systems- such as and FMC – Flight Management Computer and FCC – Flight Control Computer | 4:00 |

## SYLLABUS FOR SEMESTER V (Theory)

**Communication & Navigation System – III ( ATA 23 / 34 )**

| | | | |
|---|---|---|---|
| | | * TMC – Thrust Management Control | 2:00 |
| | | * ADC – Air Data Computer | 2:00 |
| | | * EICAS – Engine Indicating and Crew Alerting System | 2:00 |
| | | • Explanation of Combined block iagram of all the above | 2:00 |
| 5 | P3 AV 2.4 | **Global Positioning System – (GPS)** | **3:00** |
| | | * Introduction and principle of operation | 1:00 |
| | | * Categorization of Segments and explanation of each Segment | 1:00 |
| | | * Theory of Operation and System Utilization | 1:00 |
| 6 | P3 AV | **Global Navigation System** | **10:00** |

| | | | |
|---|---|---|---|
| | 2.4 | * Hyperbolic System | 2:00 |
| | | * CW, RHO- RHO- System | 1:00 |
| | | * Omega Navigation System | 1:00 |
| | | * Stations - different locations in the world | 2:00 |
| | | * Broad Costing patterns | 1:00 |
| | | * Timing signals and frequency of operation | 2:00 |
| | | * Monitoring systems | 1:00 |
| 7 | P3 AV 2.4 | **SATELLITE SYSTEMS (GNSS)** | **7:00** |
| | | Global Navigation Star Satellite System – Introduction | 2:00 |
| | | **Inertial Navigation System (INS)** | 1:00 |
| | | * Introduction | |
| | | * Block diagram explanation | 1:00 |
| | | * Newton's laws | 1:00 |
| | | * Accelerometers | 1:00 |
| | | * Gimbal platform | 1:00 |
| 8 | P3 AV 2.4 | **ATC Transponder (SSR)** | **10:00** |
| | | * Introduction | 1:00 |
| | | * Block Diagram explanation | 2:00 |
| | | * Details of mode A, C , and S | 1:00 |
| | | * Pulse coding | 1:00 |
| | | * Code selection switches | 2:00 |
| | | * Pattern of interrogation and reply pulses | 2:00 |
| | | * Test procedures | 1:00 |

**SYLLABUS FOR SEMESTER V (Theory)**

**Communication & Navigation System – III ( ATA 23 / 34 )**

| | | | |
|---|---|---|---|
| 9 | P3AV 2.4 | **Traffic Alert And Collision Avoidance System(TCAS)** | **3:00** |
| | | * Introduction and explanation of sub systems | 1:00 |
| | | * Explanation of Traffic Advisory | 1:00 |
| | | * Resolution Advisory | 1:00 |
| 10 | P3AV 2.4 | **Weather Avoidance Radar** | **15:00** |
| | | * Principle of operation | 1:00 |
| | | * Nature of Radar Signals | 1:00 |
| | | * Details of Modulator | 1:00 |

| | | | |
|---|---|---|---|
| | | * Transmitter and Receiver | 1:00 |
| | | * Types of display systems – PPI Indicators | 5:00 |
| | | * Antennas | 1:00 |
| | | * Control Pannel | 1:00 |
| | | * Wave guides | 1:00 |
| | | * Radomes | 1:00 |
| | | * Safety precautions should to be observed | 2:00 |
| 11 | P3 AV 2.4 | **Radio Altimeter** | **10:00** |
| | | * Principles of operation | 1:00 |
| | | * Explanation of Transmitter / Receiver system | 2:00 |
| | | * Antennas | 2:00 |
| | | * Control panel | 1:00 |
| | | * Transmission lines and altitude indicator | 2:00 |
| | | * Frequency modulation, frequency deviation and range calculation | 2:00 |
| 12 | P3 AV 2.4 | **ACARS - ARINC Communication and Reporting System** | **5:00** |
| | | * Introduction | 1:00 |
| | | * Working Principle | 1:00 |
| | | * Network | 1:00 |
| | | * Sub parts | 1:00 |
| | | * Testing Procedures | 1:00 |

## SYLLABUS FOR SEMESTER V (Theory)

**Avionics System Maintenance**

| SL NO. | Ref. No:/UNITS | Topics | Hrs #### |
|---|---|---|---|
| **I** | --- | **Aircraft instrumentation** | **10:00** |
| 1 | | - Auto / flight control system | 2:00 |
| 2 | | - EICAS – Engine Indication and Crew Alert system | 2:00 |
| 3 | | - IRS – Inertial Reference System | 2:00 |
| 4 | | - FDI – Flight Director System | 2:00 |
| 5 | | - RRC – Remote Reading Compass | 2:00 |
| **II** | --- | **Aircraft Electrical System** | **10:00** |

| | | | |
|---|---|---|---|
| 1 | | - EDS – Electronic Display System (Central warning system and Master warning and caution lights and annunciator panel ) | 2:00 |
| 2 | | - CWS –( Central Warning System ), CDU – (Control display unit), CRT Display | 2:00 |
| 3 | | - ECAM – Electronic Centralized Aircraft Monitor (Generator power control, generation , regulation and distribution) | 2:00 |
| 4 | | - EFIS – Electronic Flight Instrument System | 2:00 |
| 5 | | -FMS – Flight Management System, MCDU – (Multipurpose control display unit ) BITE – ( Built – in Test Equipment) BPCU – (Bus power control unit) CMCS – (Central maintenance computer system) | 2:00 |
| **III** | | **Aircraft Radio System** | **10:00** |
| 1 | | **- FMS – Flight Management System** | |
| 2 | | - FMC – Flight Maintenance Computer | 2:00 |
| 3 | | - FCC – Flight Control Computer | 1:00 |
| 4 | | - TMC – Thrust Management Control | 1:00 |
| 5 | | - ADC – Air Data Computers | 1:00 |
| 6 | | - MFD – Multi Functional Display | 2:00 |
| 7 | | - MPU – Multi Functional Processor Unit | 2:00 |
| 8 | | - CDU – Control Display Unit | 1:00 |

**SYLLABUS FOR SEMESTER V (Practical)**

## AIRCRAFT STRUCTURES AND FLIGHT CONTROLS

| Sl. No. | Ref. No. | TOPICS | Total Hrs 50 |
|---|---|---|---|
| 1. | 4.7.1.8 | **Structures — General Concepts** | **15:00** |
| | | • Identification of types of structures | 3:00 |
| | | • Identification of aircraft zones | 3:00 |
| | | • Identification of aircraft stations | 3:00 |
| | | • Identification of electrical bonding | 3:00 |
| | | • Identification of protection given for lightning strike | 3:00 |
| 2. | 4.7.2.1 | **Flight Controls (ATA 27)** | **35:00** |

| | | | |
|---|---|---|---|
| | | • Identification of primary controls | 3:00 |
| | | • Demonstration of response of primary controls for control stick movement | 3:00 |
| | | • Demonstration of operation of spoiler and trim control | 3:00 |
| | | • Demonstration of high lift devices - slots, slats, flaps | 3:00 |
| | | • Functional check of above operations | 3:00 |
| | | • Demonstration and functional check of spoilers and speed breaks | 5:00 |
| | | • Demonstration and functional check of artificial feel, yaw damper | 3:00 |
| | | • Demonstration of mach trim, rudder limiter, gust locks. | 3:00 |
| | | • Demonstration of Stall protection systems. | 3:00 |
| | | • System operation - Fly by wire | 3:00<br>3:00 |

**SYLLABUS FOR SEMESTER V (Practical)**

**AIRCRAFT ELECTRICAL SYSTEM – I**

| S.No. | Ref. No. /Units | Topics/ Practical / Demonstration | Hours |
|---|---|---|---|
| 1. | P3AV 2.9 | **Light – ATA 33** | |
| | | Familiarize location of external lights and demonstrate their function with elect power supply | **5:00** |
| | | Familiarize internal light demonstrate their function emergency lights demonstrate their operation maintenance inspection procedure | **5:00** |
| 2. | P3Av2.9 | **Air-condition - System ATA 21** | **5:00** |

| | | | |
|---|---|---|---|
| | | Identify and familiarize different parts components of the system / maintenance inspection procedure | |
| | | Familiarization the location of vapour cycle machine check its operation with suitable external supply connected | |
| | | Check for temperature sensors associated with vapour cycle machine for their location | |
| | | Air cycle machine identify and familiarization various components associated with system<br>Check for flow temperature and humidity control sensors | |
| | | Check for air supply components like engine bleed valve for their location on the engine<br>Check A.P.U for different components associated with pneumatic system | |
| | | Check for all electrical connectors of different components associated with air condition system | |
| | | Check for indication in the cockpit related to air condition system (overheat panel; centre console front panel) | |
| 3. | P3AV 2.9 | **Fire Protection – ATA 26** | **5:00** |
| | | Identify and familiarize different components of the system installation and maintenance procedure (Inspection procedure) | |
| | | Identify and familiarize component and demonstrate their operation / maintenance procedure installation and inspection rocedure | |
| 4. | P3AV 2.9 | **Hydraulic power ATA – 29**<br>Identify and familiarize components and their maintenance procedure, inspection procedure pertaining to electrical | **5:00** |

**SYLLABUS FOR SEMESTER V (Practical)**

**AIRCRAFT ELECTRICAL SYSTEM – I**

| | | | |
|---|---|---|---|
| 5. | P3AV 2.9 | **Electrical and Electronic panel ATA – 39**<br>Electrical and Electronic Equipment racks<br>Electrical and Electronic Junction Boxes<br>Electrical Components Printed Circuit Card Assemblies | **5:00** |
| 6. | P3AV 2.9 | **Door ATA 52**<br>Door warning / Entrance stair / landing gear<br>Passenger / crew door proximity switch warning and indication | **5:00** |
| 7. | P3AV 2.9 | **Ignition ATA 74**<br>Magneto ignition and High Energy ignition | **5:00** |

| | | | |
|---|---|---|---|
| | | Spark plugs and igniter plugs | |
| | | Different types of magneto and auxiliary ignition units | |
| | | Electrical power; Distribution ignition cable harness | |
| | | Magneto – Inspection | |
| | | Assembly – Bench Test Procedure | |
| | | Spark/ igniter plug- visual familiarization | |
| | | Cleaning of carbon deposit | |
| | | Check-gap – centre electrode and earth point | |
| | | Check for ear, testing of spark plug / igniter plug by suitable magneto test bench check for current consumption of unit under test | |
| | | High energy ignition unit- | |
| | | Bench test prior to dismantle for overhaul | |
| | | Allow 2 minutes lapse before handling after test | |
| | | Dismantle to the extent required check for sealed gap in glass for any damage | |
| | | Check capacitor, check for transistor, diodes | |
| | | Check for transformer | |
| | | Check input/ output connection | |
| | | Assembly to the extent dismantle | |
| | | Bench test and check for current consumption by the unit observe safety precautions | |

**SYLLABUS FOR SEMESTER V (Practical)**

## AIRCRAFT ELECTRICAL SYSTEM – I

| | | | |
|---|---|---|---|
| 8. | P3AV 2.9 | **Ice & Rain protection ATA – 30** | **5:00** |
| | | Visual familiarization of different types of ICE detectors | |
| | | Deicing boots – check for any damage check for inflation / deflation of rubber boots by using pneumatic ground cart supply | |
| | | Check for serviceability of heater element for physical condition | |

| | | | |
|---|---|---|---|
| | | Check continuity of heater element on pitot heat / drain system. | |
| | | Wind screen wiper – visual familiarization check for its operation | |
| | | Pneumatic – do not operate wiper on dry surfaces. | |
| | | Check temperature control sensor carry out electrical test to ensure serviceability of sensor (Ref: Approved / Manufacturer's guide lines) | |
| | | Check for security of installation of rain repellent system | |
| 9. | P3AV 2.9 | **Engine Staring System ATA 80** | **5:00** |
| | | Piston engine (reciprocating) | |
| | | Gas turbine Engine | |
| | | Different types of starting system | |
| | | Inspection of the electrical components related to engine starting system. Check for operation and inspect as per approved guide lines | |

**SYLLABUS FOR SEMESTER V (Practical)**

## AIRCRAFT INSTRUMENT SYSTEMS – III

| S.No. | Ref. | Topic | Hrs100 |
|---|---|---|---|
| 1 | 4.12.1 | **Autopilots** | **8:00** |
| | | 1. Examination and demonstration of autopilot mock-up | 4:00 |
| | | 2. Examination and demonstration of components | 4:00 |
| 2. | 4.12.2 | **Flight control systems** | **20:00** |
| | | Autopilots (electrical or electronic): | |
| | | 1. Dismantling | 4:00 |

| | | | |
|---|---|---|---|
| | | 2. Examination of components | 3:00 |
| | | 3. Reassembly | 5:00 |
| | | | 9:00 |
| | | 4. Installation in aircraft or on simulator by following manufacturer's test programme; practice with portable test kit. | |
| 3. | 4.12.2 | Autopilots (pneumatic or hydraulic actuation) | **20:00** |
| | | 1. Dismantling of components parts | 4:00 |
| | | 2. Reassembly | 4:00 |
| | | 3. Installation in aircraft or simulator | 6:00 |
| | | 4. Function tests | 6:00 |
| 4. | 4.12.2 | Examination and testing of elements of flight director ystems, automatic flare and automatic landing systems, as required | **20:00** |
| 5. | 4.11.4 | **Engine Speed Indication (ESI)** | **6:00** |
| | | ESI generators (DC and AC types) | |
| | | 1. Partial dismantling | 2:00 |
| | | 2. Inspection | 2:00 |
| | | 3. Reassembly | 2:00 |
| 6. | 4.11.4 | ESI Gauges | **8:00** |
| | | 1. Partial dismantling | 3:00 |
| | | 2. Inspection | 2:00 |
| | | 3. Reassembly | 3:00 |
| 7. | 4.11.4 | Engine speed Synchronizing gear | **8:00** |
| | | 1. Examination | 3:00 |
| | | 2. Demonstration | 2:00 |
| | | 3. Principles | 3:00 |
| 8. | 4.11.4 | Generators and gauges | **10:00** |
| | | 1. Dismantling | 2:00 |
| | | 2. Inspection | 2:00 |
| | | 3. Reassembly | 2:00 |
| | | 4. Calibration checks | 4:00 |

**SYLLABUS FOR SEMESTER V (Practical)**

## COMMUNICATION AND NAVIGATION SYSTEMS – III

| Sl. No. | Ref. No. / Units | Practical / Demonstration | Total Hrs 50 |
|---|---|---|---|
| (1) | (2) | (4) | (6) |
| 1. | 4.13.4 | Transmission lines | 2:00 |
| 2. | 4.13.4 | Different types of Antennas | 3:00 |
| 3. | 4.13.4 | Current and futures developments | 5:00 |
| | | SAT com, GPS, SATNAV and MADGE | |
| | | Systems Introduction and Explanation | |

| | | | |
|---|---|---|---|
| 4. | 4.13.4 | TCAS – Traffic Alert and Collision Avoidance System | 3:00 |
| 5. | 4.13.4 | Frequency measurements | 2:00 |
| 6. | 4.13.4 | Radio Navigation – Radio altimeter | 4:00 |
| 7. | 4.13.4 | Doppler Navigation System | 4:00 |
| 8. | 4.13.4 | Micro wave Landing System (MLS) | 3:00 |
| 9. | 4.13.4 | Hyperbolic NAV system | 6:00 |
| 10. | 4.13.4 | Weather Radar | 10:00 |
| 11. | 4.13.4 | DME | 4:00 |
| 12. | 4.13.4 | ATC transponder (SSR) | 4:00 |

**SYLLABUS FOR SEMESTER V (Practical)**

## AVIONICS SYSTEM MAINTENANCE

| S.No | Ref. No | Topics | Hrs 30 |
|---|---|---|---|
| **I** | ---- | **Aircraft Instrumentation** | **10:0** |
| 1 | | - Auto / flight control system functional check | 2:00 |
| 2 | | - EICAS – Engine Indication and Crew Alert system, Familiarization of different components and location and inspection procedures | 2:00 |
| 3 | | - IRS – Inertial Reference System – functional check | 2:00 |
| 4 | | - FDI – Flight Director indicator, functional check | 2:00 |
| 5 | | - RRC – Remote Reading Compass, functional check | 2:00 |

| | | | |
|---|---|---|---|
| **II** | | **Aircraft Electrical System** | **10:0** |
| 1 | | - EDS – Electronic Display System( central warning system, master warning, caution lights and annunciator panel) familiarization of different parts location and functional check as per approved inspection procedure and maintenance rocedure ) | 2:00 |
| 2 | | - CWS,CDU,CRT - Familiarize functional check as per approved maintenance procedure | 2:00 |
| 3 | | - ECAM – Electronic Centralized Aircraft Monitor – Familiarize location functional check and approved maintenanceprocedure | 2:00 |
| 4 | | - EFIS – Electronic Flight Instrument System – Familiarize functional check and approved maintenance procedure | 2:00 |
| 5 | | - FMS,MCDU,BITE,BPCU,CMCS – Familiarize functional inspection as per approved maintenance procedure | 2:00 |
| **III** | | **Aircraft Radio System** | **10:00** |
| 1 | | FMS – familiarize functional check as per approved maintenance procedure | 2:00 |
| 2 | | - FMC - familiarize functional check as per approved maintenance procedure | 2:00 |
| 3 | | - FCC - familiarize functional check as per approved maintenance procedure | 1:00 |
| 4 | | - TMC - familiarize functional check as per approved maintenance procedure | 2:00 |
| 5 | | - ADC - familiarize functional check as per approved maintenance procedure | 1:00 |
| 6 | | - MFD - familiarize functional check as per approved maintenance procedure | 1:00 |
| 7 | | - MPU and CDU - familiarize functional check as per approved maintenance procedure | 1:00 |

I

| 1. AIR LAW, AIRWORTHINESS REQUIREMENTS -I | | | |
|---|---|---|---|
| **S.No** | **CAR Ref:** | **DESCRIPTION** | **Hours :** |
| **1** | | **AIR LAW, AIRWORTHINESS REQUIREMENTS -I (CAR Section -2 Series A to I)** | **Allotted 110** |
| **1.1** | **Aircraft Manual (India)** | **Aircraft Act 1934:** | **1** |
| | | **Aircraft Rules 1937** | |
| | | Part I Preliminary, Part II General Conditions for flying | **1** |
| | | Part III General Safety Conditions, Part IV Registration and Marking of Aircraft | **1** |
| | | Part V Personnel of Aircraft, Part VI Airworthiness | **1** |
| | | Part VII Radio Telegraph Apparatus, Part VIII Aeronautical Beacons, Ground Lights and false lights, Part IX Log books | **1** |
| | | Part X Investigation of Accidents and Incidents, Part XI Aerodromes, Part XII A Regulatory Provisions | **1** |
| | | Part XII B Engineering, Inspection and Normal requirements other than Operations, Part XIII Air transport Services. | **1** |
| | | Part XIII A Engineering , Inspection and Manual requirements, Owners or Operators, Part XIV General | **1** |
| | | Schedule I: Areas over which flied by aircraft is prohibited | **3** |
| | | Schedule II : Aircraft Personnel | |
| | | CAR ON Rules of the Air | **2** |
| | | The Indian Aircraft Rules 1920 | **1** |
| | | The Aircraft (Public Health) Rules 1954 | **2** |
| | | Notifications under Aircraft Act (Public Health) Rules 1954 | **1** |
| | | The Aircraft ( Demolition of Obstructions caused by buildings and trees etc. | **1** |
| | | The Aircraft (Carriage of dangerous goods) Rules 2003 | **1** |
| | | Statutory Notification effecting Aviation in India | **1** |
| **1.2** | | Knowledge of Civil Aviation Requirements relating to airworthiness**, Aeronautical Information Circulars: Advisory Circulars: and AME Notices** issued by DGCA.CAR **amendments** and incorporation. | **5** |
| **1.3** | **CAR Sec 2 Series A** | **Procedure for Issue of Civil Airworthiness requirements and Responsibility of Operator vis a vis Airworthiness directorate**: | **1** |
| | | **Part I Cancelled** | |
| | | **Part II Cancelled** | |
| | | **Part III: Objects and targets of airworthiness Directorate of civil aviation department.** | |
| | | **Part IV**: Airworthiness regulation and safety oversight of engineering activities | **2** |
| **1.4** | **CAR Sec 2 Series B** | **Part I Approval of Check List, MEL, CDL** : | **2** |
| | | Part II Minimum Equipments List/ CDL and preparation. | |
| | | Part III Use of cockpit and emergency checklist. | |

| | | | |
|---|---|---|---|
| **1.5** | **CAR Sec 2 Series C** | **Defect Recording, monitoring, Investigation and Reporting**: | **2** |
| | | Part I Defect recording, reporting, investigation, rectification and analysis. | |
| | | Part II Recording of inflight instrument reading and reporting of flight | **1** |
| | | Part III Reporting/rectification of defects observed on all aircraft except public transport aircraft. | **1** |
| | | Part IV Analytical study of inflight instrument readings/recording of | **1** |
| | | Part V Maintenance control by reliability method. | |
| **1.6** | **CAR Sec Series D** | **Aircraft maintenance Programmes** :<br>Part I Reliability program of engines.<br>Part II Aircraft Maintenance program and their approval | **1** |
| | | Part III On condition maintenance of engines. | **1** |
| | | Part IVApproval of TBO and revision program. | **1** |
| | | Part V Maintenance of fuel and oil uplift and consumption records of light aircraft engines. | **1** |
| | | Part VI Fixing of routine maintenance periods of components, TBOs - initial as well as revision | **1** |
| | | Part VII Cancelled | |
| | **CAR 21** | Certification procedure for aircraft and related products | |
| **1.7** | **CAR Sec 2 Series E** | **Approval of organizations**:<br>E Part I Approval of organizations/Operators | **1** |
| | | E Part II Cancelled | |
| | | E Part III Cancelled | |
| | | E Part IV Cancelled | |
| | | E Part V Cancelled | |
| | | E Part VI Cat E - Fuel, Lubricant and special petrolium products | **1** |
| | | E Part VII Cancelled | |
| | | E Part VIII Approval of organisation - Cat G - Training Schools/Establishments | **1** |
| | | E Part IX Requirements for infrastructure at stations other than parent base. | **1** |
| **1.8** | **CAR 145** | Approved Maintenance Organizations: General, Applicability, Scope, Application, Terms of approval, Facility requirements, Personnel requirements. | **5** |
| | | Certifying Staff and appropriately qualified DGCA licensed Engineers, supporting staff, Equipment tools and materials. | **5** |
| | | Acceptance of components, Maintenance data, Production planning, Certification of maintenance, Maintenance records, Occurring reporting, Safety and Quality Policy, Maintenance Procedure and quality system | **5** |
| | | Maintenance Organisation Exposition, Privileges of the Organisation, limitations on the Organisation, Changes to the Organisation. | **5** |

**SYLLABUS FOR SEMESTER I (Theory)**

**1. AIR LAW, AIRWORTHINESS REQUIREMENTS –I**

| Sl No | CAR Ref: | DESCRIPTION | Hours : |
|---|---|---|---|
| **1** | | **AIR LAW, AIRWORTHINESS REQUIREMENTS -I (CAR Section -2 Series A to I)** | **Allotted 110** |
| **1.9** | **CAR Sec 2 Series F** | **Airworthiness and Continued Airworthiness** | |
| | | PART - I Procedures of registration of aircraft. | **1** |
| | | PART - II Cancelled | |
| | | PART - III Procedure and requirements for issue/ revalidation of C of A. | **1** |
| | | PART - IV Cancelled | |
| | | PART - V Supension of C of A and its subsequent revalidation | |
| | | PART - VI Rebuilding of aircraft. | **1** |
| | | PART - VII Special Flight permits | **1** |
| | | PART - VIII . Maintenance and certification of aircraft | **2** |
| | | PART - IX Cancelled | |
| | | PART - X Airworthiness of aging aircraft | |
| | | PART - XI Cancelled | **2** |
| | | PART - XII Inspection of wooden aircraft. | **1** |
| | | PART - XIII Airworthiness requirements for gliders. | **1** |
| | | PART - XIV, XV Registration and airworthiness of Micro light aircraft, Hot air Balloons. | **1** |
| | | PART - XVI Approval of Flight manuals and their amendments. | **1** |
| | | PART - XVII Pooling of aircraft parts by National Airlines of India with Foreign airlines. | **1** |
| | | PART - XVIIIConstruction, Certification and operation of experimental / amateur built aircraft. | **2** |
| | | PART - XIX Cancelled | **2** |
| | | PART - XX Age of aircraft to be imported for character hire or air taxi and other operations. | **1** |
| | | PART - XXI Import/Export of aircraft, spares, item of equipment etc, for use on aircraft. | **1** |
| | | PART - XXII Load and trim sheets- requirements thereof. | **1** |

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## 1. AIR LAW, AIRWORTHINESS REQUIREMENTS –I

| SI. No | CAR Ref: | DESCRIPTION | Hours : |
|---|---|---|---|
| 1 | | **AIR LAW, AIRWORTHINESS REQUIREMENTS -I (CAR Section -2 Series A to I)** | **Allotted 110** |
| 1.10 | CAR Sec 2 Series H | **Requirements of Aircraft Fuel, refilling of aircraft and Calibration of Aircraft fuels :** | 2 |
| | | Un usable fuel supply - calibration of fuel quantity gauge of aircraft, | |
| | | Aircraft fueling procedures. | 2 |
| | | Aviation fuel at airport-storage, handling and quality control. | 1 |
| 1.11 | CAR Sec 2 Series I | **Aircraft Instruments, Equipment and Accessories**: | 1 |
| | | Aircrafts instruments overhaul and periodic inspections. | |
| | | Aircraft equipment and instruments. | 1 |
| | | Maintenance of test equipments. | 1 |
| | | Airworthiness of Procedures for clean rooms and environments for aircraft systems/ accessories shop. | 1 |
| | | Flight data recorders. | 1 |
| | | Cockpit voice recorders | 1 |
| | | Ground Proximity Warning Systems (GPWS). | 1 |
| | | Installation of airborne collision avoidance systems (ACAS). | 1 |
| 1.12 | **CAR M** | CONTINUING AIRWORTHINESS REQUIREMENTS | 15 |
| | | GENERAL | 1 |
| | | SECTION A - TECHNICAL REQUIREMENTS | 1 |
| | | SUBPART A GENERAL | 1 |
| | | SUBPART B ACCOUNTABILITY | 1 |
| | | SUBPART C CONTINUING AIRWORTHINESS | 1 |
| | | SUBPART D MAINTENANCE STANDARDS | 1 |
| | | SUBPART E COMPONENTS | 1 |
| | | SUBPART F MAINTENANCE ORGANISATION | 1 |
| | | SUBPART G CONTINUING AIRWORTHINESS MANAGEMENT | 1 |
| | | SUBPART H CERTIFICATE OF RELEASE TO SERVICE | 1 |
| | | SUBPART I AIRWORTHINESS REVIEW CERTIFICATE | 1 |
| | | APPENDICIES | 1 |
| | | Acceptable Means of Compliance to CAR- M | 1 |
| | | SECTION B PROCEDURE FOR DGCA | 1 |
| | | SECTION B PROCEDURE FOR DGCA – AMC | 1 |
| | | | 1 |