**SUBPART D. COMMERCIAL PILOT LICENCE — CPL**

***AMC 1.* FCL. 310 ; FCL. 515 ( b ) ; FCL. 615 ( b )**

*SYLLABUS of THEORETICAL KNOWLEDGE for the ATPL, CPL and IR*

The following Tables contain the detailed theoretical knowledge syllabus for the ATPL, CPL and IR.

Aspects related to non-technical skills shall be included in an integrated manner, taking into account the particular risks associated to the licence and the activity.

The applicable items for each licence or rating are marked with “ **x** “ .

An “ **x** “ on the main title of a subject means that all the sub-divisions are applicable.

a ) Aeroplanes and Helicopters :

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **Aeroplane** | | **Helicopter** | | | **IR** |
| **CODE** | **ITEM** | **ATPL** | **CPL** | **ATPL**  **/ IR** | **ATPL** | **CPL** |
| **010.00 00 00** | **AIR LAW and ATC PROCEDURES** | **x** | **x** | **x** | **x** | **x** | **x** |
| **010**.01 00 00 | INTERNATIONAL LAW : CONVENTIONS, AGREEMENTS and ORGANISATIONS |  |  |  |  |  |  |
| **010**.02 00 00 | AIRWORTHINESS of AIRCRAFT |  |  |  |  |  |  |
| **010**.03 00 00 | AIRCRAFT NATIONALITY and REGISTRATION MARKS |  |  |  |  |  |  |
| **010**.04 00 00 | PERSONNEL LICENSING |  |  |  |  |  |  |
| **010**.05 00 00 | RULES of the AIR |  |  |  |  |  |  |
| **010**.06 00 00 | PROCEDURES for AIR NAVIGATION SERVICES : AIRCRAFT OPERATIONS |  |  |  |  |  |  |
| **010**.07 00 00 | AIR TRAFFIC SERVICES and AIR TRAFFIC MANAGEMENT |  |  |  |  |  |  |
| **010**.08 00 00 | AERONAUTICAL INFORMATION SERVICE |  |  |  |  |  |  |
| **010**.09 00 00 | AERODROMES or HELIPORTS |  |  |  |  |  |  |
| **010**.10 00 00 | FACILITATION |  |  |  |  |  |  |
| **010**.11 00 00 | SEARCH and RESCUE |  |  |  |  |  |  |
| **010**.12 00 00 | SECURITY |  |  |  |  |  |  |
| **010**.13 00 00 | AIRCRAFT ACCIDENT and INCIDENT INVESTIGATION |  |  |  |  |  |  |
| **021. 00 00 00** | **AIRCRAFT GENERAL KNOWLEDGE : AIRFRAME and SYSTEMS, ELECTRICS, POWERPLANT and EMERGENCY EQUIPMENT** | **x** | **x** | **x** | **x** | **x** | **x** |
| **021.** 01 00 00 | SYSTEM DESIGN, LOADS, STRESSES and MAINTENANCE |  |  |  |  |  |  |
| **021.** 02 00 00 | AIRFRAME |  |  |  |  |  |  |
| **021.** 03 00 00 | HYDRAULICS |  |  |  |  |  |  |
| **021.** 04 00 00 | LANDING GEAR, WHEELS, TYRES and BRAKES |  |  |  |  |  |  |
| **021.** 05 00 00 | FLIGHT CONTROLS |  |  |  |  |  |  |
| **021.** 06 00 00 | PNEUMATICS :  PRESSURISATION and AIR CONDIT IONING |  |  |  |  |  |  |
| **021.** 07 00 00 | ANTI and DE - ICING SYSTEMS |  |  |  |  |  |  |
| **021.** 08 00 00 | FUEL SYSTEM |  |  |  |  |  |  |
| **021.** 09 00 00 | ELECTRICS |  |  |  |  |  |  |
| **021.** 10 00 00 | PISTON ENGINES |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **Aeroplane** | | **Helicopter** | | | **IR** |
| **CODE** | **ITEM** | **ATPL** | **CPL** | **ATPL**  **/ IR** | **ATPL** | **CPL** |
| **021. 00 00 00** | **AIRCRAFT GENERAL KNOWLEDGE : AIRFRAME and SYSTEMS, ELECTRICS, POWERPLANT and EMERGENCY EQUIPMENT** | **x** | **x** | **x** | **x** | **x** | **x** |
| **021.** 11 00 00 | TURBINE ENGINES |  |  |  |  |  |  |
| **021.** 12 00 00 | PROTECTION and DETECTION SYSTEMS |  |  |  |  |  |  |
| **021.** 13 00 00 | OXYGEN SYSTEMS |  |  |  |  |  |  |
| **021.** 14 00 00 | HELICOPTER : MISCELLANEOUS SYSTEMS |  |  |  |  |  |  |
| **021.** 15 00 00 | HELICOPTER : ROTOR HEADS |  |  |  |  |  |  |
| **021.** 16 00 00 | HELICOPTER : TRANSMISSION |  |  |  |  |  |  |
| **021.** 17 00 00 | HELICOPTER : BLADES |  |  |  |  |  |  |
| **022. 00 00 00** | **AIRCRAFT GENERAL KNOWLEDGE :**  **INSTRUMENTATION** | **x** | **x** | **x** | **x** | **x** | **x** |
| **022.** 01 00 00 | SENSORS and INSTRUMENTS |  |  |  |  |  |  |
| **022.** 02 00 00 | MEASUREMENT of AIR DATA PARAMETERS |  |  |  |  |  |  |
| **022.** 03 00 00 | MAGNETISM : DIRECT READING COMPASS and FLUX VALVE |  |  |  |  |  |  |
| **022.** 04 00 00 | GYROSCOPIC INSTRUMENTS |  |  |  |  |  |  |
| **022.** 05 00 00 | INERTIAL NAVIGATION and REFERENCE SYSTEMS |  |  |  |  |  |  |
| **022.** 06 00 00 | AEROPLANE : AUTOMATIC FLIGHT CONTROL SYSTEMS |  |  |  |  |  |  |
| **022.** 07 00 00 | HELICOPTER : AUTOMATIC FLIGHT CONTROL SYSTEMS |  |  |  |  |  |  |
| **022.** 08 00 00 | TRIMS, YAW DAMPER and  FLIGHT ENVELOPE PROTECTION |  |  |  |  |  |  |
| **022.** 09 00 00 | AUTOTHROTTLE : AUTOMATIC THRUST  CONTROL SYSTEM |  |  |  |  |  |  |
| **021.** 10 00 00 | COMMUNICATION SYSTEMS |  |  |  |  |  |  |
| **022.** 11 00 00 | FMS *[ Flight Management System ]* |  |  |  |  |  |  |
| **022.** 12 00 00 | ALERTING SYSTEMS and PROXIMITY  SYSTEMS |  |  |  |  |  |  |
| **022.** 13 00 00 | INTEGRATED INSTRUMENTS : ELECTRONIC  DISPLAYS |  |  |  |  |  |  |
| **022.** 14 00 00 | MAINTENANCE, MONITORING and  RECORDING SYSTEMS |  |  |  |  |  |  |
| **022.** 15 00 00 | DIGITAL CIRCUITS and COMPUTERS |  |  |  |  |  |  |
| **030. 00 00 00** | **FLIGHT PERFORMANCE and PLANNING** | **x** | **x** | **x** | **x** | **x** |  |
| **031. 00 00 00** | **MASS and BALANCE : AEROPLANES or**  **HELICOPTERS** | **x** | **x** | **x** | **x** | **x** |  |
| **031.** 01 00 00 | PURPOSE of MASS and BALANCE  CONSIDERATIONS |  |  |  |  |  |  |
| **031.** 02 00 00 | LOADING |  |  |  |  |  |  |
| **031.** 03 00 00 | FUNDAMENTALS of CG CALCULATIONS |  |  |  |  |  |  |
| **031.** 04 00 00 | MASS and BALANCE DETAILS of AIRCRAFT |  |  |  |  |  |  |
| **031.** 05 00 00 | DETERMINATION of CG POSITION |  |  |  |  |  |  |
| **031.** 06 00 00 | CARGO HANDLING |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **Aeroplane** | | **Helicopter** | | | **IR** |
| **CODE** | **ITEM** | **ATPL** | **CPL** | **ATPL**  **/ IR** | **ATPL** | **CPL** |
| **032. 00 00 00** | **PERFORMANCE : *AEROPLANES*** | **x** | **x** |  |  |  |  |
| **032.** 01 00 00 | GENERAL |  |  |  |  |  |  |
| **032.** 02 00 00 | PERFORMANCE CLASS **B** : **SE** AEROPLANES |  |  |  |  |  |  |
| **032.** 03 00 00 | PERFORMANCE CLASS **B** : **ME**  AEROPLANES |  |  |  |  |  |  |
| **032.** 04 00 00 | PERFORMANCE CLASS **A** : AEROPLANES  CERTIFICATED under CS - 25 ONLY |  |  |  |  |  |  |
| **033. 00 00 00** | **FLIGHT PLANNING and FLIGHT**  **MONITORING** | **x** | **x** | **x** | **x** | **x** | **x** |
| **033.** 01 00 00 | FLIGHT PLANNING for VFR FLIGHTS |  |  |  |  |  |  |
| **033.** 02 00 00 | FLIGHT PLANNING for IFR FLIGHTS |  |  |  |  |  |  |
| **033.** 03 00 00 | FUEL PLANNING |  |  |  |  |  |  |
| **033.** 04 00 00 | PRE - FLIGHT PREPARATION |  |  |  |  |  |  |
| **033.** 05 00 00 | ATS FLIGHT PLAN |  |  |  |  |  |  |
| **033.** 06 00 00 | FLIGHT MONITORING and IN - FLIGHT  RE - PLANNING |  |  |  |  |  |  |
| **034. 00 00 00** | **PERFORMANCE : *HELICOPTERS*** |  |  | **x** | **x** | **x** |  |
| **034.** 01 00 00 | GENERAL |  |  |  |  |  |  |
| **034.** 02 00 00 | PERFORMANCE CLASS **3** :  **SE** HELICOPTERS ONLY |  |  |  |  |  |  |
| **034.** 03 00 00 | PERFORMANCE CLASS **2 :** |  |  |  |  |  |  |
| **034.** 04 00 00 | PERFORMANCE CLASS 1 : HELICOPTERS  CERTIFICATED under CS - 29 ONLY |  |  |  |  |  |  |
| **040. 00 00 00** | **HUMAN PERFORMANCE** | **x** | **x** | **x** | **x** | **x** | **x** |
| **040**. 01 00 00 | HUMAN FACTORS : BASIC CONCEPTS |  |  |  |  |  |  |
| **040**. 02 00 00 | BASIC AVIATION PHYSIOLOGY and  HEALTH MAINTENANCE |  |  |  |  |  |  |
| **040**. 03 00 00 | BASIC AVIATION PSYCHOLOGY |  |  |  |  |  |  |
| **050. 00 00 00** | **METEOROLOGY** | **x** | **x** | **x** | **x** | **x** | **x** |
| **050**. 01 00 00 | THE ATMOSPHERE |  |  |  |  |  |  |
| **050**. 02 00 00 | WIND |  |  |  |  |  |  |
| **050**. 03 00 00 | THERMODYNAMICS |  |  |  |  |  |  |
| **050**. 04 00 00 | CLOUDS and FOG |  |  |  |  |  |  |
| **050**. 05 00 00 | PRECIPITATION |  |  |  |  |  |  |
| **050**. 06 00 00 | AIR MASSES and FRONTS |  |  |  |  |  |  |
| **050**. 07 00 00 | PRESSURE SYSTEMS |  |  |  |  |  |  |
| **050**. 08 00 00 | CLIMATOLOGY |  |  |  |  |  |  |
| **050**. 09 00 00 | FLIGHT HAZARDS |  |  |  |  |  |  |
| **050**. 10 00 00 | METEOROLOGICAL INFORMATION |  |  |  |  |  |  |
| **060. 00 00 00** | **NAVIGATION** | **x** | **x** | **x** | **x** | **x** | **x** |
| **061. 00 00 00** | **GENERAL NAVIGATION** | **x** | **x** | **x** | **x** | **x** | **x** |
| **061**. 01 00 00 | BASICS of NAVIGATION |  |  |  |  |  |  |
| **061**. 02 00 00 | MAGNETISM and COMPASSES |  |  |  |  |  |  |
| **061**. 03 00 00 | CHARTS |  |  |  |  |  |  |
| **061**. 04 00 00 | DEAD RECKONING NAVIGATION |  |  |  |  |  |  |
| **061**. 05 00 00 | IN - FLIGHT NAVIGATION |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **Aeroplane** | | **Helicopter** | | | **IR** |
| **CODE** | **ITEM** | **ATPL** | **CPL** | **ATPL**  **/ IR** | **ATPL** | **CPL** |
| **062. 00 00 00** | **RADIO NAVIGATION** | **x** | **x** | **x** | **x** | **x** | **x** |
| **062**. 01 00 00 | BASIC RADIO PROPAGATION THEORY |  |  |  |  |  |  |
| **062**. 02 00 00 | RADIO AIDS |  |  |  |  |  |  |
| **062**. 03 00 00 | RADAR |  |  |  |  |  |  |
| **062**. 04 00 00 | *INTENTIONALLY LEFT BLANK* |  |  |  |  |  |  |
| **062**. 05 00 00 | AREA NAVIGATION SYSTEMS and RNAV or FMS |  |  |  |  |  |  |
| **062**. 06 00 00 | GNSS |  |  |  |  |  |  |
| **070. 00 00 00** | **OPERATIONAL PROCEDURES** | **x** | **x** | **x** | **x** | **x** |  |
| **071.** 01 00 00 | GENERAL REQUIREMENTS |  |  |  |  |  |  |
| **071.** 02 00 00 | SPECIAL OPERATIONAL PROCEDURES and  HAZARDS *( General Aspects )* |  |  |  |  |  |  |
| **071.** 03 00 00 | HELICOPTER EMERGENCY PROCEDURES |  |  |  |  |  |  |
| **080. 00 00 00** | **PRINCIPLES of FLIGHT** | **x** | **x** | **x** | **x** | **x** |  |
| **081. 00 00 00** | **PRINCIPLES of FLIGHT : *AEROPLANE*** | **x** | **x** |  |  |  |  |
| **081**. 01 00 00 | SUBSONIC AERODYNAMICS |  |  |  |  |  |  |
| **081**. 02 00 00 | HIGH SPEED AERODYNAMICS |  |  |  |  |  |  |
| **081**. 03 00 00 | *INTENTIONALLY LEFT BLANK* |  |  |  |  |  |  |
| **081**. 04 00 00 | STABILITY |  |  |  |  |  |  |
| **081**. 05 00 00 | CONTROL |  |  |  |  |  |  |
| **081**. 06 00 00 | LIMITATIONS |  |  |  |  |  |  |
| **081**. 07 00 00 | PROPELLERS |  |  |  |  |  |  |
| **081**. 08 00 00 | FLIGHT MECHANICS |  |  |  |  |  |  |
| **082. 00 00 00** | **PRINCIPLES OF FLIGHT : *HELICOPTER*** |  |  | **x** | **x** | **x** |  |
| **082**. 01 00 00 | SUBSONIC AERODYNAMICS |  |  |  |  |  |  |
| **082**. 02 00 00 | TRANSONIC AERODYNAMICS and  COMPRESSIBILITY EFFECTS |  |  |  |  |  |  |
| **082**. 03 00 00 | ROTORCRAFT TYPES |  |  |  |  |  |  |
| **082**. 04 00 00 | MAIN ROTOR AERODYNAMICS |  |  |  |  |  |  |
| **082**. 05 00 00 | MAIN ROTOR MECHANICS |  |  |  |  |  |  |
| **082**. 06 00 00 | TAIL ROTORS |  |  |  |  |  |  |
| **082**. 07 00 00 | EQUILIBRIUM, STABILITY and CONTROL |  |  |  |  |  |  |
| **082**. 08 00 00 | HELICOPTER FLIGHT MECHANICS |  |  |  |  |  |  |
| **090. 00 00 00** | **COMMUNICATIONS** | **x** | **x** | **x** | **x** | **x** | **x** |
| **091. 00 00 00** | **VFR COMMUNICATIONS** |  |  |  |  |  |  |
| **091**. 01 00 00 | DEFINITIONS |  |  |  |  |  |  |
| **091**. 02 00 00 | GENERAL OPERATING PROCEDURES |  |  |  |  |  |  |
| **091**. 03 00 00 | RELEVANT WEATHER INFORMATION  TERMS ( VFR ) |  |  |  |  |  |  |
| **091**. 04 00 00 | ACTION REQUIRED to be TAKEN in case of  COMMUNICATION FAILURE |  |  |  |  |  |  |
| **091**. 05 00 00 | DISTRESS and URGENCY PROCEDURES |  |  |  |  |  |  |
| **091**. 06 00 00 | GENERAL PRINCIPLES of VHF PROPAGATION and ALLOCATION of FREQUENCIES |  |  |  |  |  |  |
| **092. 00 00 00** | **IFR COMMUNICATIONS** |  |  |  |  |  |  |
| **091**. 01 00 00 | DEFINITIONS |  |  |  |  |  |  |
| **091**. 02 00 00 | GENERAL OPERATING PROCEDURES |  |  |  |  |  |  |
| **091**. 03 00 00 | ACTION REQUIRED to be TAKEN in case of COMMUNICATION FAILURE |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | **Aeroplane** | | **Helicopter** | | | **IR** |
| **CODE** | **ITEM** | **ATPL** | **CPL** | **ATPL**  **/ IR** | **ATPL** | **CPL** |
| **092. 00 00 00** | **IFR COMMUNICATIONS** |  |  |  |  |  |  |
| **091**. 04 00 00 | DISTRESS and URGENCY PROCEDURES |  |  |  |  |  |  |
| **091**. 05 00 00 | RELEVANT WEATHER INFORMATION TERMS  ( IFR ) |  |  |  |  |  |  |
| **091**. 06 00 00 | GENERAL PRINCIPLES of VHF PROPAGATION  and ALLOCATION of FREQUENCIES |  |  |  |  |  |  |
| **091**. 07 00 00 | MORSE CODE |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

b ) Airships

|  |  |  |  |
| --- | --- | --- | --- |
| **N0** | **ITEM** | **CPL** | **IR** |
| **1.** | **AIR LAW and ATC PROCEDURES** | **x** |  |
|  | INTERNATIONAL LAW : CONVENTIONS, AGREEMENTS and ORGANISATIONS |  |  |
|  | AIRWORTHINESS of AIRCRAFT |  |  |
|  | AIRCRAFT NATIONALITY and REGISTRATION MARKS |  |  |
|  | PERSONNEL LICENSING |  | **x** |
|  | RULES of the AIR |  | **x** |
|  | PROCEDURES for AIR NAVIGATION SERVICES : |  | **x** |
|  | AIRCRAFT OPERATIONS |  | **x** |
|  | AIR TRAFFIC SERVICES and AIR TRAFFIC MANAGEMENT |  | **x** |
|  | AERONAUTICAL INFORMATION SERVICE |  | **x** |
|  | AERODROMES |  | **x** |
|  | FACILITATION |  |  |
|  | SEARCH and RESCUE |  |  |
|  | SECURITY |  |  |
|  | AIRCRAFT ACCIDENT and INCIDENT INVESTIGATION |  |  |
| **2.** | **AIRSHIP GENERAL KNOWLEDGE : ENVELOPE, AIRFRAME and SYSTEMS,** **ELECTRICS, POWERPLANT and EMERGENCY EQUIPMENT** | **x** |  |
|  | DESIGN, MATERIALS, LOADS and STRESSES |  |  |
|  | ENVELOPE and AIRBAGS |  |  |
|  | FRAMEWORK |  |  |
|  | GONDOLA |  |  |
|  | FLIGHT CONTROLS |  |  |
|  | LANDING GEAR |  |  |
|  | HYDRAULICS and PNEUMATICS |  |  |
|  | HEATING and AIR CONDITIONING |  |  |
|  | FUEL SYSTEM |  |  |
|  | PISTON ENGINES |  |  |
|  | TURBINE ENGINES *( BASICS )* |  |  |
|  | ELECTRICS |  |  |
|  | FIRE PROTECTION and DETECTION SYSTEMS MAINTENANCE |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **N0** | **ITEM** | **CPL** | **IR** |
| **3.** | **AIRSHIP GENERAL KNOWLEDGE : INSTRUMENTATION** | **x** |  |
|  | SENSORS and INSTRUMENTS |  |  |
|  | MEASUREMENT of AIR DATA and GAS PARAMETERS |  |  |
|  | MAGNETISM : DIRECT READING COMPASS and FLUX VALVE |  |  |
|  | GYROSCOPIC INSTRUMENTS |  |  |
|  | COMMUNICATION SYSTEMS |  |  |
|  | ALERTING SYSTEMS |  |  |
|  | INTEGRATED INSTRUMENTS : ELECTRONIC DISPLAYS |  |  |
|  | FLIGHT MANAGEMENT SYSTEM *( General Basics )* |  |  |
|  | DIGITAL CIRCUITS and COMPUTERS |  |  |
| **4.** | **FLIGHT PERFORMANCE and PLANNING** | **x** |  |
| **4.1** | **MASS AND BALANCE : AIRSHIPS** | **x** |  |
|  | PURPOSE of MASS and BALANCE CONSIDERATIONS |  |  |
|  | LOADING |  |  |
|  | FUNDAMENTALS of CG CALCULATIONS |  |  |
|  | MASS and BALANCE DETAILS of AIRCRAFT |  |  |
|  | DETERMINATION of CG POSITION |  |  |
|  | PASSENGER, CARGO and BALLAST HANDLING |  |  |
| **4.2** | **FLIGHT PLANNING and FLIGHT MONITORING** |  |  |
|  | FLIGHT PLANNING for VFR FLIGHTS | **x** |  |
|  | FLIGHT PLANNING for IFR FLIGHTS |  | **x** |
|  | FUEL PLANNING | **x** | **x** |
|  | PRE - FLIGHT PREPARATION | **x** | **x** |
|  | ATS FLIGHT PLAN | **x** | **x** |
|  | FLIGHT MONITORING and IN - FLIGHT RE - PLANNING | **x** | **x** |
| **4.3** | **PERFORMANCE : AIRSHIPS** | **x** |  |
|  | AIRWORTHINESS REQUIREMENTS |  |  |
|  | BASICS of AIRSHIP PERFORMANCE |  |  |
|  | DEFINITIONS and TERMS |  |  |
|  | STAGES of FLIGHT |  |  |
|  | USE of FLIGHT MANUAL |  |  |
| **5.** | **HUMAN PERFORMANCE** | **x** |  |
|  | HUMAN FACTORS : BASIC CONCEPTS |  |  |
|  | BASIC AVIATION PHYSIOLOGY and HEALTH MAINTENANCE |  |  |
|  | BASIC AVIATION PSYCHOLOGY |  |  |
| **6.** | **METEOROLOGY** | **x** |  |
|  | THE ATMOSPHERE |  |  |
|  | WIND |  |  |
|  | THERMODYNAMICS |  |  |
|  | CLOUDS AND FOG |  |  |
|  | PRECIPITATION |  |  |
|  | AIR MASSES AND FRONTS |  |  |
|  | PRESSURE SYSTEMS |  |  |
|  | CLIMATOLOGY |  |  |
|  | FLIGHT HAZARDS |  |  |
|  | METEOROLOGICAL INFORMATION |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **N0** | **ITEM** | **CPL** | **IR** |
| **7.** | **NAVIGATION** |  |  |
| **7.1** | **GENERAL NAVIGATION** | **x** |  |
|  | BASICS of NAVIGATION |  |  |
|  | MAGNETISM and COMPASSES |  |  |
|  | CHARTS |  |  |
|  | DR NAVIGATION |  |  |
|  | IN - FLIGHT NAVIGATION |  |  |
| **7.2** | **RADIO NAVIGATION** |  |  |
|  | BASIC RADIO PROPAGATION THEORY | **x** | **x** |
|  | RADIO AIDS | **x** | **x** |
|  | RADAR | **x** | **x** |
|  | *INTENTIONALLY LEFT BLANK* |  |  |
|  | AREA NAVIGATION SYSTEMS and RNAV / FMS |  | **x** |
|  | GNSS | **x** | **x** |
| **8.** | **OPERATIONAL PROCEDURES AIRSHIP** | **x** |  |
|  | GENERAL REQUIREMENTS |  |  |
|  | SPECIAL OPERATIONAL PROCEDURES AND HAZARDS *( General Aspects )* |  |  |
|  | EMERGENCY PROCEDURES |  |  |
| **9.** | **PRINCIPLES of FLIGHT** | **x** |  |
| **9.1** | **PRINCIPLES OF FLIGHT : *AIRSHIPS*** | **x** |  |
|  | BASICS of AEROSTATICS |  |  |
|  | BASICS of SUBSONIC AERODYNAMICS |  |  |
|  | AERODYNAMICS of AIRSHIPS |  |  |
|  | STABILITY |  |  |
|  | CONTROLLABILITY |  |  |
|  | LIMITATIONS |  |  |
|  | PROPELLERS |  |  |
|  | BASICS of AIRSHIP FLIGHT MECHANICS |  |  |
| **10.** | **COMMUNICATIONS** |  |  |
| **10.1** | **VFR COMMUNICATIONS** | **x** |  |
|  | DEFINITIONS | **x** |  |
|  | GENERAL OPERATING PROCEDURES | **x** |  |
|  | RELEVANT WEATHER INFORMATION TERMS ( VFR ) | **x** |  |
|  | ACTION REQUIRED to be taken in case of COMMUNICATION FAILURE | **x** |  |
|  | DISTRESS and URGENCY PROCEDURES | **x** |  |
|  | GENERAL PRINCIPLES of VHF PROPAGATION and ALLOCATION of FREQUENCIES | **x** |  |
| **10.2** | **IFR COMMUNICATIONS** |  |  |
|  | DEFINITIONS |  | **x** |
|  | GENERAL OPERATING PROCEDURES |  | **x** |
|  | ACTION REQUIRED to be taken in case of COMMUNICATION FAILURE |  | **x** |
|  | DISTRESS and URGENCY PROCEDURES |  | **x** |
|  | RELEVANT WEATHER INFORMATION TERMS ( IFR ) |  | **x** |
|  | GENERAL PRINCIPLES of VHF PROPAGATION and ALLOCATION of FREQUENCIES |  | **x** |
|  | MORSE CODE |  | **x** |
|  |  |  |  |

*INTENTIONALLY LEFT BLANK*