Savitribai Phule Pune University

(Formerly University of Pune)

Three Year B.Sc. Degree Program in Aviation

(Faculty of Science & Technology)

T.Y.B.Sc. (Aviation)

Choice Based Credit System Syllabus

to be implemented from

Academic Year 2020-2021

Third Year BAV (Under Science & Technology Faculty) Semester-V

Course Code: BAV 501 Course Title: Aircraft Mechanical and Electrical System

Total Contact Hour: 48 Hrs. Total Credits: 04 Total Marks: 100

(60 Lectures)

Teaching Scheme: Theory-05 Lectures/Week

Objectives:

1. To study about aircraft mechanical operated controls and synchronization with electrical system.
2. To get familiar with Air conditioning system and general concept.
3. To know Electrical Power.
4. To understand the concepts of Fire and Rain Protection.
5. To Study about Landing Gear and its Pneumatic/Vacuum System.

Learning Outcomes:

Students will be able to:

1. Understand the aircraft mechanical operated controls and how it get synchronized with electrical power.
2. Understand structure general concept of Air-conditioning and its source of supply.
3. Understand the various aspects of Electrical Power and how other electrical systems are involved with this.
4. Understand Fire Protection, Ice and Rain Protection, Landing Gear and Pneumatic/Vacuum System lay-out

1. Mechanical and electrical bonding (10 Lectures)

General Concept, Electrical bonding, hydraulic power, pressure generation of electrical mechanical and pneumatic. .

2. Air Conditioning (10 Lectures)

Air supply Sources of air supply including engine bleed, APU and ground cart, air cycle and vapour cycle machines; Distribution systems, Flow, temperature and humidity control system.

3. Electrical Power (20 Lectures)

Batteries Installation and Operation, power generation, Voltage regulation, Power distribution, Circuit protection; External/Ground power**,** lights management

4. Protection **(10 Lectures)**

Fire and smoke detection, extinguishing systems, Anti-icing systems, de-icing systems, Landing Gear extension and retraction, antiskid and auto braking.; .

5. Pneumatic/Vacuum System **(10 Lectures)**

Lay-out: Sources, engine/APU, compressors, ground supply, pressure control and distribution, Interfaces with other systems.

Reference Books Author

Books	Author
1. Basic Electricity for A & P Mechanics	Dale Crane
2. Aircraft Electrical & Electronic Systems	Mike Tooley & David Wyatt
3. Aircraft Electricity & Electronics	Thomas K Eismin
4. Avionics Fundamental	Jeppesen
5. Electrical Fundamental System	EPJ Pallet
6. Aircraft Structure and System	EASA Module 13

Third Year BAV (Under Science & Technology Faculty) Semester-V

Course Code: BAV 502 **Course Title: Aircraft Instrument System**

Total Contact Hour: 48 Hrs. **Total Credits: 04** **Total Marks: 100**

(60 Lectures)

Teaching Scheme: Theory-05 Lectures/Week

Objectives:

1. To study various conventional types of Instruments with its construction and principle of operation.
2. To get familiar with Auto Flight Control System with its constructional as well as operational part.
3. To know about Electronics Flight instrument.
4. To learn about direct reading and Remote reading Compass.
4. Familiarization with Oxygen System and charging of Oxygen.
5. To be familiarized with Flight Data Recorder.

Learning Outcomes:

Students will be able to:

1. Understand the various conventional Instruments of Aircraft.
2. Understand general concept of Auto Flight Control System.

3. Understand Electronics Flight instrument.
4. Understand the utilization of Flight Data Recorder.

1. Instruments **(20 Lectures)**

Classification of Instrument, Pitot static systems, Altimeters, Vertical speed indicators, Airspeed indicators, Mach meters, Air data computers, Instrument pneumatic systems, Artificial horizons, Slip indicators, Directional gyros, Compass systems, Stall warning systems and angle of attack indicating systems, Vibration measurement and indication.

2. Auto flight **(20 Lectures)**

Fundamentals of automatic flight control, Command signal processing, Modes of operation: roll, pitch and yaw channels, Yaw dampers, Stability Augmentation System in helicopters, Automatic trim control, Autopilot navigation aids interface, Auto throttle systems, Automatic Landing Systems, modes of operation, approach, glide slope, land, go-around, system monitors and failure conditions. Fly-by-wire system.

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3. Electronic Flight Instrument **(10 Lectures)**

Introduction of EFIS, Primary Flight Display. Multiple Flight Display, Engine Instruments display, Navigation Display, Warning Panel.GPS, weather Radar.

4. Cockpit Voice Recorder and Flight Data Recorder **(10 Lectures)**

Introduction, different generation FDR, Methods of recording, Aircraft integrated flight data system, decoding panel, methods of decoding, cockpit voice recorder characteristics, activation of FDR.

Reference Books	**Author**
1. Aircraft Instrument Second Edition	EHJ Pallet.
2. Aircraft Instruments and Integrated System	EHJ Pallet
3. Aircraft Instrument	CA Williams
4. Auto flight Control	EHJ Pallet & Shawn Coyle
5. Flight Instrument Sixth edition	David Harries
6. Civil Aviation Inspection Vol –II	Civil Aviation Authority
7. Aircraft Structure and System	EASA Module 13

Third Year BAV (Under Science & Technology Faculty) Semester- V

Course Code: BAV 503 **Course Title:** **Propulsion II**

Total Contact Hours: 40 **Total Credits: 04** **Total Marks: 100**

(60 Lectures)

Teaching scheme: Theory -05 lectures per week

Objectives:

1. To understand basic fuel system.
2. To understand the concept of FADEC system
3. To understand the concept of Engine Indicating Systems.
4. To understand the procedure of engine starting.
5. To understand the concept of ignition system in aircraft.

Learning outcomes:

1. To understand the concept of fuel system and process to supply for engine.
2. Understand the concept of FADEC system
3. Understand the concept of Engine Indicating Systems.
4. Understand the procedure of engine starting.
5. Understand the concept of ignition system in aircraft.

Unit 1: Basic fuel system & oil system layout (**15 lectures)**

Turbine engine fuel system, turbine fuel control, hydro-mechanical and electronic fuel control, fuel system operation, components, fuel heater, fuel filter, fuel pressurizing and dumping valves, indication of fuel and oil.

Unit 2: Electronic Engine Control & Fuel Metering Systems (FADEC) (15 lectures)

Introduction of FADEC fuel control system, FADEC for auxiliary power unit, FADEC fuel control propulsion engine, system control by electronic engine control.

Unit 3: Engine Indicating Systems (15 lectures)

Exhaust gas temperature/ inter stage turbine temperature systems, Engine Speed, Thrust Indication, Pressure Ratio, Turbine Discharge Pressure, Jet Pipe Pressure Systems, Oil Pressure and Temperature, Fuel Pressure, Temperature, and fuel Flow, Fuel Manifold Pressure, engine vibration, engine interfaces, maintenance.

Unit 4: Starting and Ignition Systems (15 lectures)

Operation of Engine Start Systems and Components, Ignition Systems and Components, gas turbine engine starter, electric starting systems and starter generator starting system,

air turbine starter, turbine engine ignition system, igniter plugs, turbine ignition system inspection and maintenance, turbine starter system trouble shooting procedure.

REFERENCE OF BOOK:

1. Jet aircraft power system third edition **Ralphd. Bent**

2. Aircraft gas turbine engine technology third edition **Treager**

3. Airframe Power plant mechanics power plant handbook **FAA-AC65-12A**

4. Propulsion -14 **EASA module -14**

5. Jet Engine **Roll Royce**

Third Year BAV (Under Science & Technology Faculty) Semester-V

Course Code: BAV 504 **Course Title: Material Science and Metallurgy**

Total Contact Hour: 48 Hrs. **Total Credits: 04** **Total Marks: 100**

(60 Lectures)

Teaching Scheme: Theory-05 Lectures/Week

Objective:

1. To understand the structural properties of various materials.
2. To understand the different types of ferrous and non ferrous metals and alloys.
3. To understand the basic concept of selection and processing of metals and materials.
4. To understand the concept of metallurgy**.**

Course outcome:

1. Understand the basic concept of Material science and Metallurgy.
2. Know about the ferrous and non ferrous metals and alloys and their applications.
3. Understand different non destructive testing methods.
4. Find the cause and prevention of metallic corrosion.

Unit 1: **(Lecture 15)**

Introduction to Material science and Metallurgy.

Engineering materials and their classification. Properties of engineering materials. Selection of materials. Introduction of Metallurgy.

Unit 2: **(Lecture 15)**

Ferrous and Non Ferrous materials.

Various ferrous and non ferrous materials and their alloys. Identification of metals and alloys. Insulating Materials.

Unit 3: **(Lecture 15)**

Physical Metallurgy:

Crystallography. Phase diagram. TTT diagram. Solidification of metals. Heat treatment processes. Corrosion**.**

Unit 4: **(Lecture 15)**

Mechanical Metallurgy:

Testing of materials. Powder metallurgy. Deformation of metals. Failure of Metals.

Reference of Books:

1. Introduction of Engineering Materials.TMH **B. K. Agrawal**

2. Physical Metallurgy Principles and Practice **PHI Raghvan V**

3. Engineering Materials and Metallurgy TMH **Shriniwasan R**

4. Material Science and Metallurgy **O.P.Khanna**

Third Year BAV (Under Science & Technology Faculty) Semester – V

Course code: BAV 505	**Course Title:**	**Lab-I Aircraft Flight Controls**
Total Contact Hours: 48 hrs	**Total Credits: 04**	**Total Marks: 100**

Teaching Scheme: – 02 Practical/Week

Learning Outcomes:

Students will be able to:

1. Carry out check the operation of control column.
2. Removal and fitment of Mach Trim switch of aircraft.
3 Removal and fitment of Auto pilot electrical box.
4. Removal and fitment of various flight Instruments, location and its safety hazard.
5. Operation and service management of Pitot static probes and its maintenance.
6. Understand the testing prospects of various Instrument in Avionics Lab. .

Student Have to perform minimum 12 Practical

1. Installation and removal of Autopilot Electrical Box Removal & Fitment
2. *Mach/Over speed Switch Removal & Fitment*

3 . Removal Installation of Autopilot controller.

4. Removal Installation of Autopilot Altitude controller

5. Removal Installation of Air Data sensor

6. Removal Installation of oxygen mask

7. Removal Installation of oxygen gauge

8. Performing the calibration of pressure by using Dead weight Tester.

9. Performing Altimeter leak test by using Altimeter test chamber mock up

10. Functioning of Airspeed Indicator mock up

11. Replacement and installation of Airspeed indicator in aircraft
12. Removal and installation of clock

13. Check flight management system through simulation.

14. Removal and installation of Ram Air Temperature bulb.

15. Removal and installation of Artificial horizon in aircraft

16. Removal and installation of Shut off valve and regulator assembly.

Third Year BAV (Under Science & Technology Faculty) Semester – V

Course code: BAV 506 Course Title: Lab-II Aircraft Mechanical and Electrical System

Total Contact Hours: 48 hrs **Total Credits: 04** **Total Marks: 100**

Teaching Scheme: – 02 Practical/Week

Learning Outcomes:

Students will be able to:

1. Carry out visual inspection of structural parts.
2. Operation and service management of fire protection system
3. Learn about various lights system and removal and installation..
4. Know how to maintain AC and DC BUS Bar, carryout routine inspections.

5. Operation and service management of Micro switch involved in landing gears.
6 To get familiarized with Wheel bay.

Student Have to perform minimum 12 Practical

1. Installation and removal of battery
2. Maintenance practice of lead acid and nickel cadmium battery
3. Charging of battery Lead acid and Nickel cadmium
4. Demonstration, location and maintenance of AC and DC BUS Bar
5. Identification, removal fitment of invertors
6. Identification of various controlling and protection device
7. Maintenance practice on GPU and battery trolley
8. Installation and removal of Landing and taxing light
9. Installation and removal of Navigation lights
10. Installation and removal of Anti-collision lights
11. Installation and removal of Strobe Lights
12. Installation and removal of passenger light.
13. Removal and installation of fire detection control unit
14. Removal and installation Fire annunciator/switch
15. Installation and removal of micro switches fitted in wheel bay.

Third Year BAV (Under Science & Technology Faculty) Semester – V

Course code: BAV 507	**Course Title:**	**Activity 1**
Total Contact Hours: 12 hrs	**Total Credits: 02**	**Total Marks: 50**

Teaching Scheme: – 02 Practical/Week

Learning Outcomes:

Students will be able to:

1. Carry out check the operation of control column.
2. Removal and fitment of different parts of aircraft
3 Removal and fitment of electronic and radio systems
4. Removal and fitment of various flight Instruments, location and its safety hazard.
5. Operation and maintenance of aircraft
6. Understand the testing procedures of various systems in Avionics Lab. .

Student Have to perform minimum 1 Activity

1. Visit to airport /HAL/MRO
2. System simulation

3. Techno commercial study
4. Advanced instrumentation study
5. Documentation of advanced instruments used in various fields with all technical details.
6. Seminar
7. Documentation of ISO/ISI/IEEE standards used in different field
8. Team building , Cooperations
9. Grand challenges and solutions
10. Green energy
11. Any other with permission of batch in charge.

Third Year BAV (Under Science & Technology Faculty) Semester-VI

Course Code: BAV 601 Course Title: Aircraft Electronics and Digital System

Total Contact Hour: 48 Hrs. Total Credits: 04 Total Marks: 100

(60 Lectures)

Teaching Scheme: Theory-05 Lectures/Week

Objectives

1. To get familiarized with integrated modular avionics (IMA).
2. To get familiar with multiple functions, combined into a single piece of equipment.
3. Used for navigation, communication, control of the aircraft.
4. To improve the overall reliability of avionics with less components.
5. Having ease of fault isolation and additional facilities such as BITE (built—in-test-equipment).

Learning Outcomes

Students will be able to:

1. Understand the avionics integration of aircraft
2. Understand general concept of digital data bus
3. Understand the design concept of common networking.
4. Understand Boing information management system

3. Integration of Avioni (15 Lectures)

Introduction of Integrated into an IMA System, Bleed Management, Air Pressure Control, Air Ventilation and Control, Avionics and Cockpit Ventilation Control, Air Traffic Communication, Avionics Communication Router, Electrical Load Management, Circuit Breaker Monitoring, Electrical System Built In Test Equipment (BITE), Fuel Management, Braking Control, Steering Control.

4. Digital data bus (15 Lectures)

Purpose and introduction, ARINC 429, ARINC 629, Avionics full duplex, VHF communication receiver, VHF communication system interconnections, VHF communication system tuning, computer architecture.

3. Design concept (15 Lectures)

Introduction, common core system, network components, Information management cabinet.

4. BOEING 777 AIMS (15 Lectures)

Airplane information management system, Line replaceable modules, Primary Display System (PDS), Flight Management Computer System (FMCS), Thrust Management Computer System (TMCS), Central Maintenance Computer System (CMCS), Airplane Condition Monitoring System (ACMS), Data Communication Management System (DCMS), Flight Data Recorder System (FDRS).

Reference Books Author

Books	Author
1. Digital Integrated electronics	Herbert Taub, Donald Schilling
2. Digital Fundamental	Floyd
3. Digital signal processing	S. Salivahananan, A Vallavaraj, C. Gnanapriya
4. Electronics communication system	George, Kennedy, Bernard Devis
5. Aircraft electricity & electronics 5th edition	Thomas K Esmine
6. Aircraft communication & Navigation system	Mike Tolley
7. Aviation Electronics Vol-I	John M
8. Digital computer electronics	Malvino
9. Electronics communication System	George Kennedy
10. Aircraft structure and system	EASA Module 13 sub module 22

Third Year BAV (Under Science & Technology Faculty) Semester-VI

Course Code: BAV 602 Course Title: Aircraft Ground Handling System

Total Contact Hour: 48 Hrs. Total Credits: 04 Total Marks: 100

(60 Lectures)

Teaching Scheme: Theory-05 Lectures/Week

Objectives:

1. The applicant should be able to understand the theoretical fundamentals of the subject.
2. The applicant should be able to give a general description of the subject using, as appropriate, typical examples.

3. The applicant should be able to use mathematical formula in conjunction with physical laws describing the subject.
4. The applicant should be able to read and understand sketches, drawings and schematics describing the subject.

Learning Outcomes:

Students will be able to:
1. Understand the aircraft taxing, towing and safety precaution.
2. Understand general concept of jacking and leveling procedure.
3. Understand the general concept of various ground handling servicing equipment..
4. Understand the procedure of refueling and de fueling.
5. Familiarize with ground run and on ground staring procedure.

1. Aircraft taxing/towing and associated safety precautions (15 Lectures)

Tie down procedures preparing of aircraft, Tie down procedures for helicopter, procedure for securing weight shift control aircraft, procedure for securing powered parachutes, towing bars, ground movements of Aircraft, towing of aircraft, taxing of aircraft, ground marshaling signal day time as well as night time, safety measured adopted.

2. Aircraft jacking, choking (15 Lectures)

Introduction of packing, errors made while jacking, verifying points for jacking, leveling maintenance, purpose of choking,

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3. Aircraft servicing method (10 Lectures)

Aircraft air/nitrogen, oil and fluid servicing, ground support equipment, ground power unit, hydraulic ground power unit, oxygen servicing equipment, utility of ladders and safety adoption, effect of environmental condition on aircraft, ground deicing and anti icing of aircraft.

4. Refueling/defueling procedure (10 Lectures)

Fuel servicing of aircraft, types of fuel and identification, contamination control, fueling hazards, grounding and bonding, fueling procedure, defueling

5. Ground movement of Aircraft (10 Lectures)

Engine starting and operation, Reciprocating engines, hand cranking engine, extinguishing engine fires, turboprop engines, turboprops starting procedures, turbofan engines and starting procedures, false or hunting start.

Reference Books	**Author**
1. Maintenance practice Module 07A	EASA Part 66/147
2. Introduction to Aircraft Maintenance Engineering	CAP 715 CAA
3. CAP 718 - Human Factors in Aircraft Maintenance and Inspection	CAA

4. Civil Aircraft Inspection Procedures (CAP 459) - Part I	CAIP I
5. Civil Aircraft Inspection Procedures (CAP 459) - Part II	CAIP II
6. Aviation Maintenance Technician Series	Dale Crane

Third Year BAV (Under Science & Technology Faculty) Semester-VI

Course Code: BAV 603 Course Title: Airport Planning and Operation

Total Contact Hour: 48 Hrs. Total Credits: 04 Total Marks: 100

(60 Lectures)

Teaching Scheme: Theory-05 Lectures/Week

Objectives:

Objective: To Introduce the Students about Various Components of the Airport And Its Operations

Learning Outcomes:

Students will be able to:
1. Understand the Airport Operational System.
2. Understand general concept of Airport Planning.
3. Understand the general concept of Ground Handling
4. Understand Passenger Terminal Operations and Cargo Operations.
5. Familiarize with Airport Technical Services and Access.

UNIT-1

Airport Operational System: (15 Lectures)

Private Airports And Public Use Airports, Commercial Service Airports And Primary Commercial Service Airports, General Aviation Airports, Reliever Airports. Hub Classification –Large Hubs, Medium Hubs, Small Hubs, Non-Hubs. Components Of An Airports- Airside, L And Side. Airport As A System-Function Of Airport –Complexity of airport operation.

UNIT-II

Airport Planning: (10 Lectures)

Airport System Planning, Airport Master Plan ,Airport Layout Plan –Forecasting, Facilities Requirements, Design Alternatives .Financial Plans, Land Use Planning, Environmental Planning.

UNIT-III

Ground Handling (15 Lectures)

Passenger Handling, Ramp Handling-Aircraft Ramp Servicing , Ramp Lay Out. Departure Control. Division Of Ground Handling Responsibility. Control Of Groundling Handling Efficiency. Baggage Handling Baggage Operations –Operating Characteristics Of Baggage Handling Systems-Inbound Baggage Systems, Outbound Baggage System-Operating Performance-Organizing For The Task.

UNIT-IV

Passenger Terminal Operations and Cargo Operations (15 Lectures)

Function Of The Passenger Terminal, Philosophies Of Terminal Management. Direct Passenger Services, Airline Related Passenger Services .Airline Related Operations Functions. Governmental Requirements-Non-Passenger Related Airport Authority Functions, Processing Very Important Persons .Passenger Information System. Space Components Adjacencies-Aids To Circulation Hubbing Considerations. Air Cargo Market – Expanding The Movement. Flow Through The Cargo Terminal Unit Loading Devices. Handling Within The Terminal-Cargo Apron Operations-Computerization Of Facilitation-Example Of Modern Cargo Design-Freight Operations For The Integrated Carrier.

UNIT-V

Airport Technical Services and Access (10 Lectures)

Scope of Technical Services-Air traffic Control-Telecommunications-Metrology-Aeronautical Information, Access as Part of Airport System-Access users And Model Choice, Access Interaction with Passenger Terminal Operation, Access –Modes-In-Town And Off-Airport Terminals. Factor Effecting Access Mode Choice

Reference Books	**Author**
1. Airport Planning and Management, 5th edn, McGraw-Hill, 2004.	Wells, A.T. and Young, S.B.
2. Airport Operations, McGraw-hill, 1997	Ashford, N., Stanton, H.P.M. and Moore.
3. Airport Design and Operation, 2nd edn, Elsevier, 2007.	Kazda, A. and Caves, R.E.
4. Planning and Design of Airport, 5th edn. McGraw-Hill, 2010.	Horonjeff, R., McKelvey, F.X., Sproule, W.J. and Young, S.B.,

SEMESTER 6

Course Code: BAV 604

Course Title: Soft Skill And Organizational Behavior

Total Contact Hours: 60 **Total Credit: 04**

Total Marks: 100

Teaching Scheme: Theory- 04

Lectures/week

Course Objective:

1. This Course aims to provide hands on skills to work practically in actual field and its basic terms.

2. It supports their concurrent and subsequent studies.

3. Providing a thorough layout and foundation for actual industry.

Learning outcomes:

1. Students who successfully complete this course will be able to familiarize about basic aviation tools and vocabulary.

2. Students can identify various tools of communication.

3. Students can apply the basic theoretical things into practical.

UNIT 1: Framework for Skill Development:

Concept of MES,age of participants,corecompetencies,duration of programme**.** **(15l)**

UNIT II :**Instructional media packages**. **(15l)**

Assessment ,certificates

UNIT iii :Modules **(15L)**

Course matrics ,level3 ,level 2, level,1

UNIT IV :Methodology **(15l)**

How tofocus on programing, training methods and demonstrations.

Reference books: soft skill employability by CSTRI kolkatta

Third Year BAV (Under Science & Technology Faculty) Semester – VI

Course code: BAV 605 Course Title: Lab-I Aircraft Electronic and Digital System

Total Contact Hours: 48 hrs **Total Credits: 04** **Total Marks: 100**

Teaching Scheme: – 02 Practical/Week

Learning Outcomes

Students will be able to:

1. Understand the avionics and cockpit ventilation control
2. Understand general concept of digital data bus
3. Understand the design concept of networking components.
4. Understand airplane conditioning monitoring system

Student Have to perform minimum 12 Practical

1. Installation and removal of vhf communication reciever
2. Installation and removal of vhf communication system tuning.
3. Demonstration of avionics and cockpit ventilation control.
4. Demonstration, location and maintenance of fuel management.
5. Identification, removal fitment of invertors
6. Identification of various controlling and protection device
7. Maintenance practice of flight data recorder system.
8. Installation and removal of network components.
9. Installation and removal of information management cabinet.
10. Installation and removal of Airplane conditioning monitoring system.
11. Demonstration of air traffic controls.
12. Demonstration of electrical system built in test equipment.
13. Demonstration of electrical load management.

Third Year BAV (Under Science & Technology Faculty) Semester – VI

Course code: BAV 606 Course Title: Lab-II Project course

Total Contact Hours: 48 hrs **Total Credits: 04** **Total Marks: 100**

Teaching Scheme: – 02 Practical/Week

Learning Outcomes

Students will be able to:

1. Understand the avionics and mechanical sytems.
2. Maintain team work and gather technical details
3. Understand different challenges and solutions
4. Maintain documentation of project and aircraft.

Student will have to do project related to their academy or can make proto type model on various innovations going on and research and development on new aviation topics. (group work)

Third Year BAV (Under Science & Technology Faculty) Semester – VI

Course code: BAV 607	**Course Title:**	**Activity 2**
Total Contact Hours: 12 hrs	**Total Credits: 02**	**Total Marks: 50**

Teaching Scheme: – 02 Practical/Week

Learning Outcomes:

Students will be able to:

1. Carry out check the operation of control column.
2. Removal and fitment of different parts of aircraft
3 Removal and fitment of electronic and radio systems
4. Removal and fitment of various flight Instruments, location and its safety hazard.
5. Operation and maintenance of aircraft
6. Understand the testing procedures of various systems in Avionics Lab. .

Student Have to perform minimum 1 Activity

1. Visit to airport /HAL/MRO
2. System simulation
3. Techno commercial study
4. Advanced instrumentation study
5. Documentation of advanced instruments used in various fields with all technical details.
6. Seminar
7. Documentation of ISO/ISI/IEEE standards used in different field
8. Team building , Cooperations
9. Grand challenges and solutions
10. Green energy
11. Any other with permission of batch in charge.