



Savitribai Phule Pune University

Savitribai Phule Pune University

**Four Year B.Sc. Degree Program in Aviation
(Faculty of Science & Technology)**

Third Year B.Sc. (Aviation)

To be implemented from Academic Year 2026-2027

Course Structure:**B.Sc. (Aviation) Semester-V**

Course Code	Title of Course	Credits		Lectures / Week		Evaluation		
		Th.	Pr.	Th.	Pr.	CA	UE	Total
BAV-301-T	Aircraft Electrical System	4		4		30	70	100
BAV-302-T	Aircraft Instruments System	4		4		30	70	100
BAV-303-T	Skill Enhancement Course Project-I	2		2		15	35	50
BAV-304-T	Field Visit		2		2	50	00	50
BAV-305-T	Aircraft Modular Avionics & Digital System	2		2		15	35	50
BAV-306-P	Aircraft Electrical System Lab		4		4	30	70	100
BAV-307-P	Aircraft Instruments System Lab		4		4	30	70	100
Total=		12	10	12	10	200	350	550

B.Sc. (Aviation) Semester-VI

Course Code	Title of Course	Credits		Lectures / Week		Evaluation		
		Th.	Pr.	Th.	Pr.	CA	UE	Total
BAV-351-T	Aircraft Mechanical System	4		4		30	70	100
BAV-352-T	Propulsion-II	4		4		30	70	100
BAV-353-P	Skill Enhancement Course Project-II		4		4	30	70	100
BAV-355-P	On Job Training		2		2	50	00	50
BAV-356-P	Propulsion-II Lab		4		4	30	70	100
BAV-357-P	Aircraft Mechanical System Lab		4		4	30	70	100
Total=		8	14	8	14	200	350	550

Semester-V**Course Code: BAV-301-T****Course Title: Aircraft Electrical System****Total Contact Hours: 50 hrs****Total Credits: 04****Total Marks: 100****Teaching Scheme: Theory – 04 Lectures/ Week****Course Objectives:**

1. To study Electrical Systems installed in aircraft.
2. To study voltage regulation & distribution in aircraft.
3. To study different type of lights used in aircraft.

Learning Outcomes:

After learning this course, the students will be able to:

1. Understand basic electrical systems used in aircraft.
2. Understand the use of circuit protections in aircraft.
3. Understand lights used in internal & external of aircraft.

Sl. No.	Description	Allotted hours
Unit-I: Electrical Power		
1.	- Batteries Installation and Operation; - DC power generation; - AC power generation; - Emergency power generation.	15 hrs
Unit-II: Voltage Regulation & Distribution		
2.	- Voltage regulation; - Power distribution; - Inverters, transformers, rectifiers; - Circuit protection; - External/Ground power.	20 hrs
Unit-III: Aircraft Lights		
3.	- External: navigation, anti-collision, landing, taxiing, ice; - Internal: cabin, cockpit, cargo; - Emergency.	15 hrs

Reference Books:

Sl. No.	Author / Publisher	Nomenclature of Book
1.	Aircraft Tech Book Co.	EASA Module-11A: Turbine Aero Plane Structures & Systems
2.	Aircraft Tech Book Co.	EASA Module-13: Aircraft Aerodynamics Structures & Systems
3.	E.H.J. Pallett	Aircraft Electrical System

Semester-V**Course Code: BAV-302-T****Course Title: Aircraft Instruments System****Total Contact Hours: 50 hrs****Total Credits: 04****Total Marks: 100****Teaching Scheme: Theory – 04 Lectures/ Week****Course Objectives:**

1. To study pitot-static system of aircraft.
2. To study gyroscopic instruments.
3. To study compass system used in aircraft.

Learning Outcomes:

After learning this course, the students will be able to:

1. Understand basic principles of pitot-static system of aircraft.
2. Understand use of gyroscopic instruments.
3. Understand basic principles of aircraft compass system.

Sl. No.	Description	Allotted hours
Unit-I: Pitot Static System		
1.	• Altimeter, air speed indicator, vertical speed indicator.	10 hrs
Unit-II: Gyroscopic Instruments		
2.	• Artificial horizon; • Attitude director; • Direction indicator; • Horizontal situation indicator; • Turn and slip indicator; • Turn coordinator.	20 hrs
Unit-III: Compass System		
3.	• Compasses: direct reading, remote reading; • Angle of attack indication, stall warning systems; • Glass Cockpit; • Other aircraft system indication.	20 hrs

Reference Books:

Sl. No.	Author / Publisher	Nomenclature of Book
1.	Aircraft Tech Book Co.	EASA Module-11A: Turbine Aero Plane Structures & Systems
2.	Aircraft Tech Book Co.	EASA Module-13: Aircraft Aerodynamics Structures & Systems
3.	C.A. Williams	Aircraft Instruments
4.	E.H.J. Pallett	Aircraft Instruments

Semester-V

Course Code: BAV-303-T

Course Title: Skill Enhancement Course: Project-I

Total Contact Hours: 30 hrs

Total Credits: 02

Total Marks: 50

Teaching Scheme: Theory – 02 Lectures/ Week

Learning Outcomes:

1. Students will be able to enhance their additional technical skill which will help in their carrier development.
2. Students will be able to enhance their managerial skills which will help in their personality development.

1. Student have to undergo one of the following course to enhance their Technical skills (Hard Skills):
 - a. Course on NDT (10 hrs)
 - b. Course on Composite Material (10 hrs)
 - c. Course on Aircraft Maintenance Tools (10 hrs)
2. Student have to undergo one of the following course to enhance their Managerial skills (Soft Skills):
 - a. Leadership Course (10 hrs)
 - b. Critical Thinking Skills (10 hrs)
 - c. Positive Thinking (10 hrs)
 - d. Team Work (10 hrs)
3. Students have to submit a project report (as part of UE) on the course undergone to enhance their Technical & non-Technical skills.

Semester-V

Course Code: BAV-304-T

Course Title: Field Visit

Total Contact Hours: 30 hrs

Total Credits: 02

Total Marks: 50

Teaching Scheme: Practical – 02/ Week

Learning Outcomes:

After completion of field visit, the students will be able to:

1. Understand the use of different type of shops in MRO.
 2. Understand the operation of flight controls of aircraft.
 3. Understand the maintenance procedure of aircraft.
-
1. Visit to any one of the MRO establishment for the actual environmental practical training.
 2. Students have to submit an individual report on the field visit.

Semester-V**Course Code: BAV-305-T****Course Title: Aircraft Modular Avionics & Digital System****Total Contact Hours: 30 hrs****Total Credits: 02****Total Marks: 50****Teaching Scheme: Theory – 02 Lectures/ Week****Course Objectives:**

1. To study integrated modular avionics.
2. To study aircraft cabin systems
3. To study aircraft information systems

Learning Outcomes:

After learning this course, the students will be able to:

1. Understand integrated modular avionics
2. Understand aircraft cabin systems
3. Understand aircraft information systems

Sl. No.	Description	Allotted hours
Unit-I: Integrated Modular Avionics		
1.	Functions that may be typically integrated in the Integrated Modular Avionic (IMA) modules are, among others: Fuel Management, Braking Control, Steering Control, Landing Gear Extension and Retraction, Tyre Pressure Indication, Oleo Pressure Indication, Brake Temperature Monitoring, etc.	10 hrs
Unit-II: Cabin Systems		
2.	• The units and components which furnish a means of entertaining the passengers and providing communication within the aircraft (Cabin Intercommunication Data System) and between the aircraft cabin and ground stations (Cabin Network Service). Includes voice, data, music and video transmissions. • The Cabin Intercommunication Data System provides an interface between cockpit/cabin crew and cabin systems. These systems support data exchange of the different related LRU's and they are typically operated via Flight Attendant Panels. • The Cabin Network Service typically consists on a server, typically interfacing with, among others, the following systems: ➤ Data/Radio Communication, In-Flight Entertainment System.	10 hrs
Unit-III: Information Systems		
3.	• The units and components which furnish a means of storing, updating and retrieving digital information traditionally provided on paper, microfilm or microfiche. Includes units that are dedicated to the information storage and retrieval function such as the electronic library mass storage and controller. Does not include units or components installed for other uses and shared with other systems, such as flight deck printer or general use display. • Typical examples include Air Traffic and Information Management Systems and Network Server Systems.	10 hrs

Reference Books:

Sl. No.	Author / Publisher	Nomenclature of Book
1.	Aircraft Tech Book Co.	EASA Module-11A: Turbine Aero Plane Structures & Systems
2.	Aircraft Tech Book Co.	EASA Module-13: Aircraft Aerodynamics Structures & Systems
3.	FAA	Aviation Maintenance Technician Hand Book- Airframe

Semester-V**Course Code: BAV-306-P****Course Title: Aircraft Electrical System Lab****Total Contact Hours: 40 hrs****Total Credits: 04****Total Marks: 100****Teaching Scheme: Practical – 04/ Week****Learning Outcomes:**

After successful completion, the students will be able to:

1. Learns about aircraft battery system.
2. Learns about transformers, inverters, generators & circuit protection devices.
3. Learns about exterior & interior lights.

Students have to perform minimum 06 Practical listed below:

Sl. No.	Basic Practical Tasks
1.	Demonstration of battery system circuit
2.	Associated with charging of the lead acid battery and check correct specific gravity of the electrolyte
3.	Check AC power generator
4.	Check DC power generator
5.	Associated with external/ ground power connection in aircraft
6.	Demonstration & inspection of static & rotary inverter
7.	Demonstration & inspection of step down transformers
8.	Associated with circuit protection device
9.	Demonstration of exterior lights
10.	Operational check of navigation, anti-collision and landing lights

Semester-V**Course Code: BAV-307-P****Course Title: Aircraft Instruments System Lab****Total Contact Hours: 40 hrs****Total Credits: 04****Total Marks: 100****Teaching Scheme: Practical – 04/ Week****Learning Outcomes:**

After successful completion, the students will be able to:

1. Learns about layout of aircraft instruments system.
2. Learns about pitot-static system used in aircraft.
3. Learns about different instruments used in aircraft.

Students have to perform minimum 06 Practical listed below:

Sl. No.	Basic Practical Tasks
1.	Familiarization of layout of aircraft instruments system
2.	Operational check of pitot tube heating system
3.	Demonstration of instruments related to pitot-static system
4.	Familiarization of direction indicator
5.	Familiarization to operation of angle of attack indicator
6.	Familiarization of stall warning systems
7.	Familiarization of turn and slip indicator & turn coordinator
8.	Demonstration of magnetic compass
9.	Familiarization of other instruments used in aircraft

Semester-VI**Course Code: BAV-351-T****Course Title: Aircraft Mechanical Systems****Total Contact Hours: 50 hrs****Total Credits: 04****Total Marks: 100****Teaching Scheme: Theory – 04 Lectures/ Week****Course Objectives:**

1. To get familiarize with Air-conditioning and Cabin pressurization system of aircraft.
2. To get familiarize with Fuel system of aircraft.
3. Introduction to Ice & Rain protection system of aircraft.
4. Introduction to Oxygen system of aircraft.

Learning Outcomes:

After learning this course, the students will be able to:

1. Understand the general concept of Air Conditioning and its source of supply.
2. Understand fuel system, refuelling & defueling of aircraft.
3. Understand the Ice & Rain protection, oxygen system.
4. Understand the water/ waste system of aircraft.

Sl. No.	Description	Allotted hours
Unit-I: Air Conditioning and Cabin Pressurization		
1.	Air supply • Sources of air supply including engine bleed, APU and ground cart. Air Conditioning • Air conditioning systems; • Air cycle and vapour cycle machines; • Distribution systems; • Flow, temperature and humidity control system. Pressurization • Pressurization systems; • Control and indication including control and safety valves; • Cabin pressure controllers. Safety and warning devices • Protection and warning devices.	15 hrs
Unit-II: Fuel Systems		
2.	• System lay-out; • Fuel tanks; • Supply systems; • Dumping, venting and draining; • Cross-feed and transfer; • Indications and warnings; • Refueling and defueling; • Longitudinal balance fuel systems.	15 hrs

Sl. No.	Description	Allotted hours
Unit-III: Ice & Rain Protection		
3.	- Ice formation, classification and detection; - Anti-icing systems: electrical, hot air and chemical;	12 hrs
	De-icing systems: electrical, hot air, pneumatic, chemical;	
	Rain repellent;	
	Probe and drain heating;	
	Wiper Systems.	
Unit-IV: Oxygen System		
4.	- System lay-out: cockpit, cabin; - Sources, storage, charging and distribution; - Supply regulation; - Indications and warnings.	8 hrs

Reference Books:

Sl. No.	Author / Publisher	Nomenclature of Book
1.	Aircraft Tech Book Co.	EASA Module-11A: Turbine Aero Plane Structures & Systems
2.	Aircraft Tech Book Co.	EASA Module-13: Aircraft Aerodynamics Structures & Systems
3.	FAA H- 8083-31	Aviation Maintenance Technician Handbook-Airframe (Vol-I)
4.	FAA H- 8083-31	Aviation Maintenance Technician handbook-Airframe (Vol-II)
5.	Kroes, Watkins, Delp	Aircraft Maintenance & Repair

Semester-VI**Course Code: BAV-352-T****Course Title: Propulsion-II****Total Contact Hours: 50 hrs****Total Credits: 04****Total Marks: 100****Teaching Scheme: Theory – 04 Lectures/ Week****Objectives:**

1. To study various types of jet engines.
2. To study FADEC system.
3. To know operation of engine indicating systems.
4. To understand the starting & ignition system.

Learning Outcomes:

After learning this course, students will be able to:

1. Understand the various types of jet engines and their applications.
2. Understand the FADEC system.
3. Understand the various aspects of engine indicating systems.
4. Understand the engine starting & ignition system.

Sl. No.	Description	Allotted hours
Unit-I: FADEC		
1.	Electronic Engine control and fuel metering systems (FADEC).	15 hrs
Unit-II: Engine Indicating Systems		
2.	- Exhaust gas temperature/ Interstage turbine temperature systems; - Engine speed; - Engine Thrust Indication: Engine Pressure Ratio, engine turbine discharge pressure or jet pipe pressure systems; - Oil pressure and temperature; - Fuel pressure, temperature and flow; - Manifold pressure; - Engine torque; - Propeller speed.	25 hrs
Unit-III: Starting and Ignition Systems		
3.	- Operation of engine start systems and components; - Ignition systems and components; - Maintenance safety requirements.	10 hrs

Reference Books:

Sl. No.	Author / Publisher	Nomenclature of Book
1.	Aircraft Tech Book Co.	EASA Module-14 Propulsion
2.	FAA H- 8083-32	Aviation Maintenance Technician Handbook-Power plant (Vol-II)
3.	Irwin Treager	Aircraft Gas Turbine Technology
4.	Kroes & Wild	Aircraft Power Plants

Semester-VI

Course Code: BAV-353-P

Course Title: Skill Enhancement Course Project-II

Total Contact Hours: 50 hrs

Total Credits: 04

Total Marks: 100

Teaching Scheme: Practical – 04/ Week

Learning Outcomes:

1. Students will be able to enhance their presentation skills which will lead to improve their managerial skill.
2. Students will be able to apply their enhanced technical skill in a project in form of working model in group as decided by the institute as per their area of interest.

1. Students/ student have to make a presentation covering one of the subject listed below (or as decided by the institute): **(15 hrs)**
 - a. Composite Material
 - b. New Aviation Technology
 - c. Aircraft Ground Support Equipment
 - d. Maintenance Repair Overhaul (MRO) Establishment
 - e. Flying Training Organization (FTO)
 - f. Aerospace Technology
 - g. Drone/ UAV
 - h. Aircraft Documentation
 - i. Aircraft Electrical/ Mechanical System
 - j. Aircraft Maintenance Management/ Program
 - k. Aircraft Structure/ Materials

2. Students/ student have to make a technical project (as decided by the project guide). **(35 hrs)**

Semester-VI

Course Code: BAV-355-P

Course Title: On Job Training

Total Contact Hours: 30 hrs

Total Credits: 02

Total Marks: 50

Teaching Scheme: Practical – 02/ Week

Learning Outcomes:

After completion of On Job Training, the students will be able to:

1. Understand mechanical systems of aircraft.
 2. Understand avionics systems of aircraft.
 3. Understand the standard maintenance procedures of aircraft.
-
1. Visit to any one of the MRO establishment for the actual environmental practical training.
 2. Students have to submit an individual report on the On Job Training.

Semester-VI**Course Code: BAV-356-P****Course Title: Propulsion-II Lab****Total Contact Hours: 40 hrs****Total Credits: 04****Total Marks: 100****Teaching Scheme: Practical – 04/ Week****Learning Outcomes:**

After learning this course, students will be able to:

1. Identify engine components.
2. Identify engine indication system components.
3. Identify engine starting & ignition system components.

Students have to perform minimum 06 Practical listed below:

Sl. No.	Basic Practical Tasks
1.	Associated with synchronizer control box
2.	Associated with pressure ratio transducer and instruments
3.	Associated with oil pressure indicator
4.	Associated with oil pressure transmitter
5.	Associated with Fuel flow meter
6.	Associated with manifold pressure gauge
7.	Associated with RPM gauge and tachogenerator
8.	Check turbine engine ignition system
9.	Check ignition cable

Semester-VI

Course Code: BAV-357-P

Course Title: Aircraft Mechanical Systems Lab

Total Contact Hours: 40 hrs

Total Credits: 04

Total Marks: 100

Teaching Scheme: Practical – 04/ Week

Learning Outcomes:

After learning this course, students will be able to:

1. Identify air conditioning & pressurization system components.
2. Identify fuel system & hydraulic system components.
3. Identify oxygen system components.

Students have to perform minimum 06 Practical listed below:

Sl. No.	Basic Practical Tasks
1.	Identification of air-conditioning system components
2.	Identification of pressurization system components
3.	Identification of safety & warning devices of air conditioning & pressurization system
4.	Identification of fuel system components
5.	Familiarization with refueling procedures
6.	Familiarization with defueling procedures
7.	Identification of oxygen system components
8.	Perform inspection/ check/ cleaning of passenger masks
9.	Check oxygen & air cylinders for security and condition