Savitribai Phule Pune University

Four Year B.Sc. Degree Program in Aviation
(Faculty of Science & Technology)
As per NEP 2020

First Year B.Sc. (Aviation)

To be implemented from Academic Year 2024-2025

Title of the Course: B.Sc. (Aviation)/ B.Sc. (Aviation by Research)

1. Preamble of the Syllabus:

NEP 2024 is being implemented from the academic year 2024-25. New syllabi with the addition of the fourth year will facilitate students to undertake research project dissertation in the field of aviation. The systematic and planed curriculum from 1st year to 4th years shall motivate and encourage the students pursuing the higher education in the aviation field. B.Sc. (Aviation) is a very specialized course unlike any other courses in sciences. It includes classroom teaching as well as practical on aircraft and its related systems.

2. **Introduction**:

a) In the First Year of Under-Graduation: The basic topics related to the workshop technology, electrical fundamentals, physics of aerodynamics aviation legislation and maintenance concepts, assembly techniques are dealt with. The practical course is designed to emphasize practical skills required for Aircraft Maintenance testing and trouble-shooting.

b) In the Second Year Under-Graduation: The level of the theory and practical courses shall be of advanced stage as compared to the first year B.Sc. Courses. The course on Human Factors is introduced to understand its context in aviation. The Language Proficiency & computer programming course is also introduced to build the professional ability of students.

c) In the Third Year Under-Graduation: Proportionate number of laboratory exercises will be included in the practical courses. In addition, skill enhancement project- I & II are included in third year at 5th & 6th Semester respectively in which students can independently think and carry out the project work with the aim to enhance the technical & managerial skills. The list of activities to be performed is given in the syllabi. In 6th Semester, the student is expected to complete any 4 activities from the list.

d) In the Fourth Year Under-Graduation: After completion of three years of curriculum, students have option to go for the fourth year to obtain degree in B.Sc. (Aviation by Research). Fourth year is exclusively for studying advance subjects in aviation, in-plant training and research project dissertation.

3. Need for Launching B.Sc. Aviation Degree Course:

a) To provide capable and trained human resource to Aviation Industry.
b) To fulfil the minimum academic qualification requirement so as to enable the graduates to compete for higher studies/ Job Opportunities in the Aviation Industry.
c) To encourage and facilitate students to opt for research in aviation field.
d) To expose students to gain hands-on experience in airlines/ MROs/ technical publications/ DRDO/ HAL/ Training establishments.

4. The Aviation Industry is poised for substantial growth in India and this will go a long way for the country's overall development to be maintained at a high rate. The country has already witnessed the Open skies policy which led to significant increase in Air services which in turn required parallel growth in infra-structure. The need of the future therefore will be felt in much greater requirement of skilled manpower in all streams connected with Aviation like management of increased number of airplanes and their maintenance. The movement of goods and people will have to be quick and safe and this can only be achieved by an efficient, reliable and economic aviation industry. The industry therefore needs more and more aircraft and large workforce to keep them flying safely.

5. The Syllabus of B.Sc. (Aviation) degree is designed to enable the student to acquire the necessary qualification to enter into the Job market in any of the related fields of Aviation such as Traffic Control, Crew and Man power Scheduling, In-flight service department, Security, Civil Works department and Line and Major maintenance department of Engineering etc. The existing highly qualified work force of AMEs (Aircraft Maintenance Engineers) shouldering huge responsibility in the certification of an Aircraft carrying large number of passengers say 400 to 500 passenger capacity, are denied the higher positions in the Industry merely for not possessing Graduate degree in Aeronautics. The existing curriculum of B.Sc. (Aviation) and B.Sc. (Aviation by Research) will provide many opportunities in the field of aviation.

6. On completion of B.Sc. degree in Aviation student may start his / her career as Trainee Technician with some stipend and then as Jr. Technician. Further promotional avenues could be Sr. Technician etc, depending on his / her achievements. The undergraduate study will significantly enhance the competency of the student to appear in the AME (Aircraft Maintenance Engineer) license examination conducted by DGCA (Director General of Civil Aviation). After acquiring License qualification, he / she can start his / her career as Aircraft Maintenance Engineer category. However, it is also possible that the graduates of B. Sc. (Aviation) enter the field of Non-Technical streams in the Aviation Industry like Commercial Department, In-flight service Department, Ground Support Department and Security Department etc. With the B.Sc. (Aviation by Research) degree, students will be able to undertake any research project in government and private sector of the aviation field. It is therefore, in fitness of things that such a degree course would help the students to make his/ her career in aviation.

7. Objectives:

The systematic and planned curriculum from first year to the fourth year is aimed at focusing attention to the skills required for practicing in the field of Aircraft Maintenance. This is expected that student become more confident in working and shall motivate and encourage the student for pursuing higher studies in Aviation Maintenance and for becoming self-employed. The B.Sc. Aviation course shall have the following objectives.

- To provide in-depth knowledge of technological aspects of aviation maintenance.
- To familiarize with current and recent technological developments in aviation industry.
- To enrich knowledge through programmes such as industrial visits, hobby projects, market survey, projects etc.
- To train students in skills related to aviation industry and market.
- To create foundation for perfecting practical skills in aircraft maintenance and operation.
- To develop analytical abilities towards real aviation problems.
- To help students build-up a progressive and successful career in Aircraft maintenance and operation.

Course Structure:

B.Sc. (Aviation) Semester-I

Course Code	Title of Course	Credits		Lectures / Week		Evaluation		
		Th.	Pr.	Th.	Pr.	CA	UE	Total
BAV 101	Workshop Technology (Subject-1)	4		4		30	70	100
BAV 102	Electrical Fundamentals (Subject-2)	4		4		30	70	100
BAV 103	Physics of Aerodynamics (GE/ OE)	2		2		15	35	50
BAV 104	Aviation Legislation-I (IKS)	2		2		15	35	50
BAV 105	Mathematics-I (VEC)	2		2		15	35	50
BAV 106	Analog Electronics-I (AEC)	2		2		15	35	50
BAV 107	Analog Electronics-I Lab (SEC)		2		4	15	35	50
BAV 108	Workshop Technology Lab		2		4	15	35	50
BAV 109	Electrical Fundamentals Lab		2		4	15	35	50
Total=		**16**	**6**	**16**	**12**	**165**	**385**	**550**

B.Sc. (Aviation) Semester-II

Course Code	Title of Course	Credits		Lectures / Week		Evaluation		
		Th.	Pr.	Th.	Pr.	CA	UE	Total
BAV 201	Aircraft Ground Handling (Subject-1)	4		4		30	70	100
BAV 202	Aircraft Material Science (Subject-2)	4		4		30	70	100
BAV 203	Engineering Graphics (GE/ OE)		2		2	15	35	50
BAV 204	Analog Electronics-II (AEC)	2		2		15	35	50
BAV 205	Analog Electronics-II Lab (SEC)	2		2		15	35	50
BAV 206	Mathematics-II (VEC)	2		2		15	35	50
BAV 207	Aviation Legislation-II (CC)	2			4	15	35	50
BAV 208	Aircraft Ground Handling Lab		2		4	15	35	50
BAV 209	Aircraft Material Science Lab		2		4	15	35	50
Total=		**16**	**6**	**14**	**14**	**165**	**385**	**550**

Course Structure:

B.Sc. (Aviation) Semester-III

Course Code	Title of Course	Credits		Lectures / Week		Evaluation		
		Th.	Pr.	Th.	Pr.	CA	UE	Total
BAV 301	Aircraft Structure (Major Core)	4		4		30	70	100
BAV 302	Thermodynamics (VSC)	2		4		15	35	50
BAV 303	Industrial Visit (FP)	2		2		15	35	50
BAV 304	Aircraft Hardware (Minor)	2		2		15	35	50
BAV 305	Fundamentals of Computer & Programming Languages (GE/OE)	2		2		15	35	50
BAV 306	Human Factors (IKS)	2		2		15	35	50
BAV 307	Language Proficiency (CC)	2				15	35	50
BAV 308	Computer Programming Lab (AEC)		2		4	15	35	50
BAV 309	Aircraft Hardware Lab		2		4	15	35	50
BAV 310	Aircraft Structure Lab		2		4	15	35	50
	Total=	**16**	**6**	**16**	**12**	**165**	**385**	**550**

B.Sc. (Aviation) Semester-IV

Course Code	Title of Course	Credits		Lectures / Week		Evaluation		
		Th.	Pr.	Th.	Pr.	CA	UE	Total
BAV 401	Communication and Navigation System (Major Core)	4		4		30	70	100
BAV 402	Digital Electronics (VSC)	2		2		15	35	50
BAV 403	Industrial Visit (CEP)	2		2		15	35	50
BAV 404	Propulsion-I (Minor)	2		2		15	35	50
BAV 405	Professional Communication Skill (GE/ OE)	2		2		15	35	50
BAV 406	Basic Radar & Radio System (AEC)	2		2		15	35	50
BAV 407	Digital Electronics Lab (SEC)		2		4	15	35	50
BAV 408	Soft Skills and Organisational Behaviour (CC)	2		2		15	35	50
BAV 409	Communication & Navigation Lab		2		4	15	35	50
BAV 410	Propulsion-I Lab		2		4	15	35	50
	Total=	**16**	**6**	**16**	**12**	**165**	**385**	**550**

Course Structure:

B.Sc. (Aviation) Semester-V

Course Code	Title of Course	Credits		Lectures / Week		Evaluation		
		Th.	Pr.	Th.	Pr.	CA	UE	Total
BAV 501	Aircraft Electrical System (Major Core)	4		4		30	70	100
BAV 502	Aircraft Instruments System (Major Elective)	4		4		30	70	100
BAV 503	Skill Enhancement Course Project-I (VSC)	2		2		15	35	50
BAV 504	Field Visit (FP)	2		2		15	35	50
BAV 505	Aircraft Modular Avionics & Digital System (Minor)	2		2		15	35	50
BAV 506	Aircraft Electrical System Lab		4		4	15	35	50
BAV 507	Aircraft Instruments System Lab		4		4	15	35	50
	Total=	**14**	**8**	**14**	**8**	**135**	**315**	**450**

B.Sc. (Aviation) Semester-VI

Course Code	Title of Course	Credits		Lectures / Week		Evaluation		
		Th.	Pr.	Th.	Pr.	CA	UE	Total
BAV 601	Aircraft Mechanical System (Major Core)	4		4		30	70	100
BAV 602	Propulsion-II (Major Elective)	4		4		30	70	100
BAV 603	Skill Enhancement Course Project-II (VSC)		4		4	30	70	100
BAV 604	On Job Training		2		2	15	35	50
BAV 605	Propulsion-II Lab		4		4	15	35	50
BAV 606	Aircraft Mechanical System Lab		4		4	15	35	50
	Total=	**8**	**14**	**8**	**14**	**135**	**315**	**450**

Course Structure:

B.Sc. (Aviation) Semester-VII

Course Code	Title of Course	Credits		Lectures / Week		Evaluation		
		Th.	Pr.	Th.	Pr.	CA	UE	Total
BAV 701	Research Methodology (RM)	4		4		30	70	100
BAV 702	Engineering Aerodynamics & Flight Mechanics (Major Core)	4		4		30	70	100
BAV 703 (Major Elective)	a) Aircraft Maintenance Engineering & Management **Or** b) Aviation Embedded Systems & Programming	4		4		30	70	100
BAV 704	Engineering Aerodynamics & Flight Mechanics Lab		4	4		30	70	100
BAV 705	Major Elective Lab		4		4	20	30	50
BAV 706	Research Project-I		2		4	20	30	50
	Total=	**12**	**10**	**16**	**12**	**165**	**385**	**550**

B.Sc. (Aviation) Semester-VIII

Course Code	Title of Course	Credits		Lectures / Week		Evaluation		
		Th.	Pr.	Th.	Pr.	CA	UE	Total
BAV 801	Unmanned Aerial vehicle (Major core)	4		4		30	70	100
BAV 802	Airport Planning and Operations	4		4		30	70	100
BAV 803	On Job Training (OJT)		8		8	60	140	200
BAV 804	Research Project-II		4		8	30	70	100
BAV 805	Seminar		2		4	15	35	50
	Total=	**8**	**14**	**8**	**20**	**165**	**385**	**550**

Semester-I

Course Code: BAV 101 **Course Title: Workshop Technology**

Total Contact Hours: 50 hrs **Total Credits: 04** **Total Marks: 100**

Teaching Scheme: Theory – 04 Lectures/ Week

Course Objectives:

1. To study workshop safety norms, precaution and Fire safety.
2. To get familiar with Hand tool, Power tool, Precision Measuring equipment's and their use.
3. To understand Aircraft welding, Brazing, Soldering.

Learning Outcome:

Through this course, the students will be able to

1. Understand applications of hand tools and power tools.
2. Select the appropriate tools required for specific operation.
3. Comprehend the safety measures required to be taken while using the tools.
4. Identify and use the precision measuring instruments.
5. Compare welding, brazing, soldering and riveting.

Sl. No.	Description
Unit-I: Basics of Workshop Practice	10 hrs
1.	**Safety Precautions-Aircraft and Workshop** Aspects of safe working practices including precautions to take when working with electricity, gases especially oxygen, oils and chemicals. Also, instruction in the remedial action to be taken in the event of a fire or another accident with one or more of these hazards including knowledge on extinguishing agents.
2.	**Workshop Practices** • Care of tools, control of tools, use of workshop materials; • Dimensions, allowances and tolerances, standards of workmanship; • Calibration of tools and equipment, calibration standards.
Unit-II: Basics Tools	25 hrs
3.	**Tools** • Common hand tool types; • Common power tool types; • Operation and use of precision measuring tools; • Lubrication equipment and methods. • Operation, function and use of electrical general test equipment;
4.	**Avionic General Test Equipment** • Operation, function and use of avionic general test equipment.
Unit-III: Fits and Clearances	05 hrs
5.	• Drill sizes for bolt holes, classes of fits; • Common system of fits and clearances; • Schedule of fits and clearances for aircraft and engines; • Limits for bow, twist and wear; • Standard methods for checking shafts, bearings and other parts.

Sl. No.	Description
Unit-IV: Welding, Brazing, Soldering and Bonding	10 hrs
6.	• Soldering methods; inspection of soldered joints. • Welding and brazing methods; • Inspection of welded and brazed joints; • Bonding methods and inspection of bonded joints.

Reference Books

Sl. No.	Author / Publisher	Nomenclature of Book
1.	Aircraft Tech Book Co	EASA Module-07A Maintenance Practices
2.	CAIP I	Civil Aircraft Inspection Procedure - Part I
3.	CAIP II	Civil Aircraft Inspection Procedure - Part II
4.	Dale Crane	Aviation Maintenance technician Series- General
5.	FAA H 8083-30	Aviation Maintenance Technician Handbook- General
6.	J. A Enderson & Tatro	Shop Theory
7.	Jeppesen	A & P Technician General Text Book
8.	Lalit Gupta	Aircraft General Engineering

Semester-I

Course Code: BAV 102 **Course Title: Electrical Fundamentals**

Total Contact Hours: 50 hrs **Total Credits: 04** **Total Marks: 100**

Teaching Scheme: Theory – 04 Lectures/ Week

Course Objectives:

1. To get familiar with basic electricity, passive components
2. To understand DC and AC circuit theorems and their use in circuit analysis
3. To introduce Electromagnetism and Transformer.
4. To understand the construction of DC, AC Motor and Generator

Learning Outcome:

Through this course, the students will be able to

1. Find resistor, capacitor values with a color code and meter.
2. Use an electrical meter to measure voltage, current, Power in the circuit.
3. Simplify electrical circuit using, network theorems.
4. Understand leading/ lagging phase relationship, power factor
5. Understand the DC/ AC Generator and Motor.

Sl. No.	Description
Unit-I: Passive Components	15 hrs
1.	**Resistance/ Resistor** • Resistance and affecting factors; • Specific resistance; • Resistor colour code, values and tolerances, preferred values, wattage ratings • Resistors in series and parallel; • Calculation of total resistance using series, parallel and series parallel combinations; • Operation and use of potentiometers and rheostats; • Operation of Wheatstone bridge. • Positive and negative temperature coefficient conductance; • Fixed resistors, stability, tolerance, limitations, methods of construction • Variable resistors, thermistors, voltage dependent resistors; • Construction of potentiometers and rheostats; • Construction of Wheatstone Bridge
2.	**Power** • Power, work and energy (kinetic and potential); • Dissipation of power by a resistor; • Power formula; • Calculations involving power, work and energy.

Sl. No.	Description
3.	**Capacitance/ Capacitor** • Operation and function of a capacitor; • Factors affecting capacitance area of plates, distance between plates, number of plates, dielectric and dielectric constant, working voltage, voltage rating; • Capacitor types, construction and function; • Capacitor colour coding; • Calculations of capacitance and voltage in series and parallel circuits; • Exponential charge and discharge of a capacitor, time constants; • Testing of capacitors.
4.	**Inductance/Inductor** • Faraday's Law; • Action of inducing a voltage in conductor moving in a magnetic field; • Induction principles; • Effects of the following on the magnitude of an induced voltage: magnetic field strength, rate of change of flux, No. of conductor turns; • Mutual induction; • The effect the rate of change of primary current and mutual inductance has on induced voltage; • Factors affecting mutual inductance: number of turns in coil, physical size of coil, permeability of coil, position of coil with respect to each other • Lenz's Law and polarity determining rules; • Back emf, self induction; • Saturation point; • Principle uses of inductors;
Unit-II: DC and AC Circuits	10 hrs
5.	**DC Sources of Electricity** • Construction and basic chemical action of: primary cells, secondary cells, lead acid cells, nickel cadmium cells, other alkaline cells; Cells connected in series and parallel; Internal resistance and its effect on a battery; • Construction, materials and operation of thermocouples; Operation of photo-cells.
6.	**DC Circuits** • Ohms Law, Kirchoff's Voltage and Current Laws; • Calculations using the above laws to find resistance, voltage and current; • Significance of the internal resistance of a supply.
7.	**AC Theory** • Sinusoidal waveform: phase, period, frequency, cycle; Instantaneous, average, root mean square, peak, peak to peak current values and calculations of these values, in relation to voltage, current and power • Triangular/Square waves; • Single/3 phase principles.

Sl. No.	Description
Unit-III: Magnetism and Transformer	10 hrs
8.	**Magnetism** • Theory of magnetism including Right Hand Thumb rule Cork Screw Rule • Properties of a magnet • Action of a magnet suspended in the Earth's magnetic field; • Magnetization and demagnetization; • Magnetic shielding; • Various types of magnetic material; • Electromagnets construction and principles of operation; • Hand clasp rules to determine: magnetic field around current carrying conductor. (Fleming's Left Hand Rule, Faraday's Law) • Magneto motive force, field strength, magnetic flux density, permeability, hysteresis loop, retentivity, coercive force reluctance, saturation point, eddy currents; • Precautions for care and storage of magnets.
9.	**Transformers** • Transformer construction principles and operation; • Transformer losses and methods for overcoming them; • Transformer action under load and no-load conditions; • Power transfer, efficiency, polarity markings; • Calculation of line and phase voltages and currents; • Calculation of power in a three phase system; • Primary and Secondary current, voltage, turns ratio, power, efficiency; • Auto transformers.
Unit-IV: Electrical Machines	15 **hrs**
10.	**DC Motor/ Generator Theory** • Basic motor and generator theory; • Construction and purpose of components in DC generator; • Operation of, and factors affecting output and direction of current flow in DC generators; • Operation of, and factors affecting output power, torque, speed and direction of rotation of DC motors; • Series wound, shunt wound and compound motors; • Starter Generator construction.
11.	**AC Generators** • Rotation of loop in a magnetic field and waveform produced; • Operation and construction of revolving armature and revolving field type AC generators; • Single phase, two phase and three phase alternators; • Three phase star and delta connections advantages and uses; • Permanent Magnet Generators.
12.	**AC Motors** • Construction, principles of operation and characteristics of: AC synchronous and induction motors both single and polyphase; • Methods of speed control and direction of rotation; • Methods of producing a rotating field: capacitor, inductor, shaded or split pole.

Reference Books:

Sl. No.	Author / Publisher	Nomenclature of Book
1	Aircraft Tech Book Co.	EASA Module-03 Electrical Fundamental
2	B. L. Theraja	Electrical Technology
3	Bernard Grob	Basic Electronics
4	Dale Crane	Basic Electricity for A & P Mechanics
5	E.H.J. Pallett	Aircraft Electrical System
7	FAA H 8083-30	Aviation Maintenance Technician Hand Book-General
9	Thomas K Eismin	Aircraft Electricity & Electronics

Semester-I

Course Code: BAV 103 **Course Title: Physics of Aerodynamics**

Total Contact Hours: 30 hrs **Total Credits: 02** **Total Marks: 50**

Teaching Scheme: Theory – 02 Lectures/ Week

Course Objectives:

1. To understand the physics of Atmosphere.
2. To understand the physics of Aerodynamics, airflow over body of aircraft at low and high speed, forces generated on body.
3. To understand the shape of aerofoils and wing and how they affect lift and drag, effect of boundary layer on flow around the body.
4. To understand the different types of flights and calculate basic performance in steady, straight, climbing, turning, gliding and diving flight.

Learning Outcome:

After learning this course, the students will be able to

1. Understand basic physics of fluid flow and generation of forces on bodies in air in particular.
2. Apply Newton's laws of motion to calculate the flight path under various flight conditions.
3. Determine how aerodynamic lift, drag and pitching moment are generated from the pressure and stress distributions on aerofoils.
4. Understand various devices used in connection with flight to augment or obtain required performance.

Sl. No.	Description
Unit-I: Physics of the Atmosphere	03 hrs
1.	**Physics of the Atmosphere** • Basic Aerodynamics, • Physics of the atmosphere, • International Standard Atmosphere (ISA), • Application to aerodynamics.
Unit-II: Physics of Aerodynamics	13 hrs
2.	**Aerodynamics** • Airflow around a body; • Boundary layer, laminar and turbulent flow, free stream flow, relative airflow, upwash and downwash, vortices, stagnation; • The terms: camber, chord, mean aerodynamic chord, profile (parasite) drag, induced drag, centre of pressure, angle of attack, wash in and wash out, fineness ratio, wing shape and aspect ratio; Thrust, Weight, Aerodynamic Resultant; Generation of Lift and Drag: Angle of Attack, Lift coefficient, Drag coefficient, polar curve, stall; Aerofoil contamination including ice, snow, frost.

Sl. No.	Description
Unit-III: Theory of Flight	10 hrs
3.	• Relationship between lift, weight, thrust and drag; • Glide ratio; • Steady state flights, performance; • Theory of the turn; • Influence of load factor: stall, flight envelope and structural limitations; • Lift augmentation.
Unit-IV: Flight Stability and Dynamics	04 hrs
4.	• Static & dynamic stability • Longitudinal stability, • Lateral stability, • Directional stability (active and passive).

Reference Books

Sl. No.	Author / Publisher	Nomenclature of Book
1.	AC Kermode	Mechanics of Flight
2.	Aircraft Tech Book Co.	EASA Module- 08 Basic Aerodynamics
3.	L. J. Clancy	Aerodynamics
4.	Jeppesen	A & P Technician Airframe Text Book

Semester-I

Course Code: BAV 104 **Course Title: Aviation Legislation-I**

Total Contact Hours: 30 hrs **Total Credits: 02** **Total Marks: 50**

Teaching Scheme: Theory – 02 Lectures/ Week

Course Objectives:

1. This course aims to provide students with the knowledge with the regulatory framework.
2. It supports their understanding of Aircraft act and rules.
3. It supports their understanding of aircraft operations.
4. Providing a thorough knowledge of applicable national and international aviation requirements.

Learning Outcomes:

1. To understand the regulatory framework of aviation.
2. Students can understand the requirements of Aircraft operations.
3. Students can understand applicable national and international aviation requirements.

Sl. No.	Description
Unit-I: Regulatory Framework	12 hrs
1.	• Role of International Civil Aviation Organization; • The Aircraft Act and Rules made there under • Role of the DGCA; • Relationship between CAR-21, CAR-M, CAR-145, CAR-66, CAR 147 • The Aircraft Rules (Applicable to Aircraft Maintenance and Release) • Aeronautical Information Circulars (Applicable to Aircraft Maintenance and Release)
Unit-II: Civil Aviation Requirements	10 hrs
2.	• CAR Sections 1 and 2
Unit-III: Aircraft Operations	04 hrs
3.	• Commercial Air Transport/Commercial Operations • Air Operators Certificates; • Operators Responsibilities, in particular regarding continuing airworthiness and maintenance; • Documents to be carried on board; • Aircraft Placarding (Markings);
Unit-IV: Applicable National and International Requirements	04 hrs
4.	• Maintenance Programme, Maintenance checks and inspections; • Master Minimum Equipment Lists, Minimum Equipment List, Dispatch Deviation Lists; • Airworthiness Directives; Service Bulletins, manufacturers service information; Modifications and repairs; • Maintenance documentation: maintenance manuals, structural repair manual, illustrated parts catalogue, etc.;

Reference Books

Sl. No.	Author / Publisher	Nomenclature of Book
1.	DGCA	Airworthiness Advisory Circulars
2.	DGCA	Civil Aviation Requirements (CAR) relevant to CAR-66 Syllabus
3.	DGCA	Civil Aviation Procedures (CAP) relevant to CAR-66 Syllabus
4.	Govt. of India	Aircraft Act 1934
5.	Govt. of India	Aircraft Rule 1937

Semester-I

Course Code: BAV 105 **Course Title: Mathematics-I**

Total Contact Hours: 30 hrs **Total Credits: 02** **Total Marks: 50**

Teaching Scheme: Theory – 02 Lectures/ Week

Course Objectives:

1. This course aims to provide students with the mathematical knowledge and skills.
2. It supports their concurrent and subsequent studies.
3. Providing a thorough grounding in mathematics and laying a foundation for further studies in aviation.

Learning Outcomes:

1. Students who successfully complete this course will be able to use tables of derivatives and integrals for simple functions.
2. Students can identify and use appropriate techniques to differentiate and integrate more complicated functions.
3. Students can apply the rules of differentiation and integration to classify stationary points.
4. Also to identify the nature of the function.
5. Apply integration to study Work and Fluid Forces.

Sl. No.	Description	
Unit-I: Functions		08 hrs
1.	• Functions and Their Graphs. • Combining Functions; Shifting and scaling Functions and Their Graphs.	
Unit-II: Limits and Continuity		06 hrs
2.	• Limit of a Function and Limit Laws. • The Precise Definition of a Limit, Limits Involving Infinity.	
Unit-III: Derivatives		10 hrs
3.	• Derivative as a Function. • Differentiation Rules. • Derivative as a Rate of Change.	
Unit-IV: Applications of Derivatives and Integrals		06 hrs
4.	• The Mean Value Theorem, Monotonic Functions • Indeterminate Forms and L'Hopital's Rule. • Definite Integrals	

Reference Books:

Sl. No.	Author / Publisher	Nomenclature of Book
1.	George B. Thomas	Jr. Thomas'Calculus
2.	Shantinarayan and S.K. Mittal	Integral Calculus
3.	Robert G. Bartle and Donald R. Sherbert	Introduction to Real Analysis
4.	W. Rudin	Principles of Mathematical analysis

Semester-I

Course Code: BAV 106 **Course Title: Analog Electronics-I**

Total Contact Hours: 30 hrs **Total Credits: 02** **Total Marks: 50**

Teaching Scheme: Theory – 02 Lectures/ Week

Course Objectives:

1. To study semiconductor diodes.
2. To study transistors.
3. To study Integrated Circuits and applications.

Learning Outcomes:

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

1. Acquire a basic knowledge of semiconductor diodes.
2. Acquire a basic knowledge of transistors.
3. Acquire a basic knowledge of integrated circuits.

Sl. No.	Description
Unit-I: Semiconductor	06 hrs
1.	• Basics of Semiconductors • PN junction • Majority and minority carriers • PN junctions and the basic diode • Unbiased PN junction • Forward bias PN junction
Unit-II: Diodes	12 hrs
2.	• Diode symbols; • Diode characteristics and properties; • Diodes in series and parallel; • Main characteristics and use of silicon controlled rectifiers (thyristors), • Light emitting diode, photo conductive diode, varistor, rectifier diodes; • Functional testing of diodes.
Unit-III: Transistors	08 hrs
3.	• Transistor symbols; • Component description and orientation; • Transistor characteristics and properties.
Unit-IV: Integrated Circuits	04 hrs
4.	• Description and operation of logic circuits and linear circuits/operational amplifiers.

Reference Books:

Sl. No.	Author / Publisher	Nomenclature of Book
1.	Aircraft Tech Book Co.	EASA Module- 04 Electrical Fundamentals
2.	Bernard Grob	Basic Electronics
3.	CAIP	Civil Aircraft Inspection Procedure (Part-I)
4.	John M Ferrara	Aviation Electronics
5.	Millman and Halkias	Integrated Electronics
6.	Thomas K Eismin	Aircraft Electricity & Electronics
7.	V K Mehta	Principle of Electronics

Semester-I

Course Code: BAV 107 **Course Title: Analog Electronics-I Lab**

Total Contact Hours: 40 hrs **Total Credits: 02** **Total Marks: 50**

Teaching Scheme: Practical – 04/ Week

Learning Outcomes:

After successfully completing this laboratory course, the students will be able to:

1. Understand the use and application of DMM/ AMM.
2. Understand the use and application and testing of diode.
3. Understand the use and application and testing of transistors.

Students have to perform minimum 06 Practical listed below:

Sl. No.	Basic Practical Tasks
1.	Identify the electronic components and perform testing by DMM/ AMM
2.	Study the characteristics of PN Junction by using trainer kit
3.	Study Half wave in trainer kit
4.	Study Full wave bridge rectifier circuit in trainer kit
5.	Study the Zener Diode by using trainer kit
6.	Study Bipolar Junction Transistor characteristics
7.	Study the voltage doublers by using trainer kit
8.	Study the voltage triplers by using trainer kit
9.	Study of transistor biasing by using trainer kit
10.	Use of multimeter (Analog and Digital) for: • Measurement of AC/ DC voltage and Current – on different ranges Measurement of R & C • Testing of Diodes & Transistors

Semester-I

Course Code: BAV 108 **Course Title: Workshop Technology Lab**

Total Contact Hours: 40 hrs **Total Credits: 02** **Total Marks: 50**

Teaching Scheme: Practical – 04/ Week

Learning Outcome:

After successfully completing this Workshop course, the students will be able to

1. Use tools and measuring instruments.
2. Perform operation like drilling, welding soldering and brazing, turning.
3. Work in workshop environment while following standard procedure and safety practices.

Students have to perform minimum 06 Practical listed below:

Sl. No.	Basic Practical Tasks
1.	Safe working practices and precautions to be taken when working with electricity, gases especially oxygen, oils and chemicals. Instruction in the remedial action to be taken in the event of a fire
2.	Care of tools, control of tools and use of workshop materials. Use of common tools, tool safety and storage
3.	Cutting practice with Hacksaw. To make a square shape of 48 mm sides for given M.S. piece
4.	Drilling a hole by either hand tool or power tool and threading in 48 mm square MS Piece
5.	External threading practice with Dies and Die – holder. Tapping practice (Internal Threading)
6.	Use of torque wrench and measurement of torque value
7.	Use of dial test indicator. Use of callipers, feeler gauge, radius gauge, telescopic gauges
8.	Perform simple soldering tasks and inspect
9.	Perform electric arc welding (Stick Welding)
10.	Perform oxy Acetylene welding (Gas Welding)

Semester-I

Course Code: BAV 109 **Course Title: Electrical Fundamentals Lab**

Total Contact Hours: 40 hrs **Total Credits: 02** **Total Marks: 100**

Teaching Scheme: Practical – 04/ Week

Learning Outcome:

After successfully completing this laboratory course, the students will be able to:

1. Understand the fundamental of DC/AC circuits.
2. Identify the electrical component
3. Understand the basic use and working of the electrical related components.
4. To understand various types of operation characteristics and applications of Motor/ Generator/ Transformer.

Students have to perform minimum 06 Practical listed below:

Sl. No.	Basic Practical Tasks
1.	Familiarize with construction of primary cells, secondary cells, leads acid cells, nickel cadmium cells. Conduct connections in series and parallel
2.	Identify various types of resisters and make calculations to find the value of resistance, voltage and current. Demonstrate the resisters in series, parallel and in combination. Measure the value of resisters
3.	Identify various types of capacitors, color code, and practice the value of capacitor. Connect the capacitors in series, parallel and in combination. Measure the value of capacitors through capacitor meter
4.	Identify the various type of Inductor, Connect the Inductor in series, parallel and in combination. Measure the value of inductor through Inductor meter
5.	Test the armature in Growler and through multimeter/ test lamp
6.	Show the constructional part of DC Generator & perform the inspection and operation of DC Generator
7.	Show the constructional part of DC motor and perform the inspection and operation of DC motor
8.	Show the constructional part of various transformers. Check value of input & output. Perform the application of current and voltage transformer by simple circuit
9.	Show the constructional part of single phase, two phase and three phase AC generator
10.	Show the constructional part of single phase and three phase Induction & synchronous motor

Semester-II

Course Code: BAV 201 **Course Title: Aircraft Ground Handling**

Total Contact Hours: 50 hrs **Total Credits: 04** **Total Marks: 100**

Teaching Scheme: Theory – 04 Lectures/ Week

Course Objectives:

1. To understand the necessity and importance of aircraft weighing.
2. To understand the necessity and importance of Ground handling and storage of aircraft.
3. To study disassembly, inspection, repair and assembly techniques.
4. To learn importance of maintenance procedures of Aircraft.

Learning Outcomes:

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

1. The student would understand basics of aircraft Taxing, Towing and safety Precautions around aircraft.
2. Understand general concept of jacking and levelling Procedures
3. Understand procedure of refuelling and de-fuelling of aircraft and safeties to be observed during the operation.
4. Understand different abnormal events.
5. Familiarize with aircraft maintenance procedures.

Sl. No.	Description
Unit-I: Aircraft Weight and Balance	10 hrs
1.	• Weight and balance terminology • Centre of Gravity/Balance limits calculation: • Use of relevant documents;
Unit-II: Aircraft Handling and Storage	15 hrs
2.	• Aircraft taxiing/towing and associated safety precautions; • Aircraft jacking, chocking, securing and associated safety precautions; • Aircraft storage methods; • Refueling/ defueling procedures; • De-icing/ anti-icing procedures; • Electrical, hydraulic and pneumatic ground supplies. • Effects of environmental conditions on aircraft handling and operation.
Unit-III: Disassembly, Inspection, Repair and Assembly Techniques	15 hrs
3.	• Types of defects and visual inspection techniques. • Corrosion removal, assessment and reproduction. • Nondestructive inspection techniques including, penetrant, radiographic, eddy current, ultrasonic and boroscope methods. • Disassembly and re-assembly techniques. • Trouble shooting techniques. **Abnormal Events** Inspections following lightning strikes and HIRF penetration

Sl. No.	Description
Unit-IV: Maintenance Procedures	10 hrs
4.	• Maintenance planning; • Modification procedures; • Stores procedures; • Certification/release procedures; • Interface with aircraft operation; • Maintenance Inspection/Quality Control/Quality Assurance; • Additional maintenance procedures. • Control of life limited components

Reference Books:

Sl. No.	Author / Publisher	Nomenclature of Book
1.	Aircraft Tech Book Co	EASA Module-07A Maintenance Practices
2.	CAIP I	Civil Aircraft Inspection Procedure - Part I
3.	CAIP II	Civil Aircraft Inspection Procedure - Part II
4.	FAA H 8083-30	Aviation Maintenance Technician Handbook- General
5.	J. A Enderson & Tatro	Shop Theory

Semester-II

Course Code: BAV 202 **Course Title: Aircraft Material Science**

Total Contact Hours: 50 hrs **Total Credits: 04** **Total Marks: 100**

Teaching Scheme: Theory – 04 Lectures/ Week

Course Objectives:

1. Introduction to ferrous & non-ferrous materials.
2. To discuss the different types of Composite and Non-Metallic materials.
3. To introduce corrosion.

Learning Outcomes:

1. Understand the basic concept of ferrous materials.
2. Understand the basic concept of non-ferrous materials.
3. Understand the Characteristic and application of Composite and Non- Composite aircraft materials.
4. Know importance of Corrosion and its prevention in Aviation.

Sl. No.	Description
Unit-I: Aircraft Materials- Ferrous	15 hrs
1.	• Characteristics, properties and identification of common alloy steels used in aircraft; • Heat treatment and application of alloy steels; • Testing of ferrous materials for hardness, tensile strength, fatigue strength and impact resistance.
Unit-II: Aircraft Materials- Non Ferrous	10 hrs
2.	• Characteristics, properties and identification of common non-ferrous materials used in aircraft; • Heat treatment and application of non-ferrous materials; • Testing of non-ferrous material for hardness, tensile strength, fatigue strength and impact resistance.
Unit-III: Aircraft Materials - Composite and Non-Metallic	15 hrs
3.	**Composite and Non-Metallic** • Characteristics, properties and identification of common composite and non-metallic materials, other than wood, used in aircraft; • Sealant and bonding agents. **Wooden Structures** • Construction methods and wooden airframe structures. • Characteristics, properties, • Types of wood and glue used in aircraft
Unit-IV: Corrosion	10 hrs
4.	• Chemical fundamentals; • Formation by, galvanic action process, microbiological, stress; • Types of corrosion and their identification; • Causes of corrosion; • Material types, susceptibility to corrosion.

Reference Books:

Sl. No.	Author / Publisher	Nomenclature of Book
1.	Aircraft Tech Book Co	EASA Module-06 Hardware And Materials
2.	CAIP I	Civil Aircraft Inspection Procedures - Part I, Basic
3.	Cindy Foreman	Advanced Composites
4.	FAA H 8083-30	Aviation Maintenance Technician Handbook- General
5.	George F. Titterton	Aircraft Materials and Processes
6.	J. A Enderson & Tatro	Shop Theory
7.	Jeppesen	A & P Technician Airframe Text Book

Semester-II

Course Code: BAV 203 **Course Title: Engineering Graphics**

Total Contact Hours: 40 hrs **Total Credits: 02** **Total Marks: 50**

Teaching Scheme: Theory cum Practical – 02/ Week

Course Objectives:

1. To develop understanding of Aeronautical and other applicable standards including ISO, AN, MS, NAS and MIL.
2. To develop imagination of Physical Objects to be represented on paper for engineering communication.
3. To develop the manual drawing skill, drawing interpretation skill.
4. To develop physical realization of the dimension of the object.

Learning Outcomes:

After learning this course students will be able to:

1. Understand basics of engineering drawing.
2. Understand specification 100 of the Air Transport Association (ATA).
3. Read wiring diagrams and schematic diagrams.
4. Apply the basic principles of projections in First angle and third angle projection method.

Sl. No.	Description
Unit-I: Introduction of Engineering Drawing	06 hrs
1.	• Introduction to drawing instrument and their uses, Drawing sheet layout and sizes, • Types of lines and their applications, Dimensioning terminology, Quadrant and its positions, • First angle and third angle projection method and their comparison
Unit-II: Engineering Drawings, Diagrams and Standards	12 hrs
2.	• Drawing types and diagrams, their symbols, dimensions, tolerances and projections; • Identifying title block information • Microfilm, microfiche and computerized presentations; • Specification 100 of the Air Transport Association (ATA) of America; • Aeronautical and other applicable standards including ISO, AN, MS, NAS and MIL; • Wiring diagrams and schematic diagrams.
Unit-III: Projection of Point and Lines	10 hrs
3.	• Theory of projections (First angle and third angle projection method, reference planes, auxiliary planes), • Theory, Demonstration & Practical: Projection of point only in first and third quadrant with all possible positions, • Theory, Demonstration & Practical: Projection of lines (only first angle projection method) inclined to HP or VP or both planes (Min of 3 problems)
Unit-IV: Projection of Planes	12 hrs
4.	• Theory, Demonstration & Practical. Projection of planes (only first angle projection method) inclined to HP or VP or both planes (Min of 3 problems) • Theory, Demonstration & Practical. Engineering Curves: Ellipse, parabola and hyperbola only focus-diretrix method (Min. 03 Problems)

Reference Books:

Sl. No.	Author / Publisher	Nomenclature of Book
1.	N.D. Bhatt and V.M. Panchal	Engineering Drawing, Plane and solid geometry
2.	Dhananjay A. Jolhe	Engineering Drawing
3.	Tata Magraw Hill publishing company Ltd	Engineering Drawing

Semester-II

Course Code: BAV 204 **Course Title: Analog Electronics-II**

Total Contact Hours: 30 hrs **Total Credits: 02** **Total Marks: 50**

Teaching Scheme: Theory – 02 Lectures/ Week

Course Objectives:

1. To study design of filters.
2. To study amplifiers.
3. To study printed circuit boards.
4. To study servomechanism.

Learning Outcomes:

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

1. Acquire a basic knowledge of filters.
2. Acquire a basic knowledge of amplifiers.
3. Acquire a basic knowledge of printed circuit boards.
4. Acquire a basic knowledge of servomechanism.

Sl. No.	Description
Unit-I: Filters	05 hrs
1.	• Common Filter Configurations • Basic LC Filters • Operation of filters • Application and uses of the following filters: low pass, high pass, band pass, band stop.
Unit-II: Amplifiers	08 hrs
2.	• Amplifier circuit • Classes of Amplifier (A, B, AB and C types) • Methods of Coupling • Operational Amplifiers & its applications • Magnetic Amplifiers & its applications
Unit-III: Printed Circuit Boards	05 hrs
3.	• Description of printed circuit boards. • Uses of printed circuit boards.
Unit-IV: Servomechanisms	12 hrs
4.	• Understanding of the following terms: Open and closed loop systems, feedback, follow up, analogue transducers; • Principles of operation and use of the following synchro system components/features: resolvers, differential, control and torque, transformers, Inductance and capacitance transmitters.

Reference Books:

Sl. No.	Author / Publisher	Nomenclature of Book
1.	Aircraft Tech Book Co.	EASA Module- 04 Electrical Fundamentals
2.	Bernard Grob	Basic Electronics
3.	FAA H 8083-30	Aviation Maintenance Technician Handbook- General
4.	John M Ferrara	Aviation Electronics
5.	Thomas K Eismin	Aircraft Electricity & Electronics
6.	V K Mehta	Principle of Electronics

Semester-II

Course Code: BAV 205 **Course Title: Analog Electronics-II Lab**

Total Contact Hours: 40 hrs **Total Credits: 02** **Total Marks: 50**

Teaching Scheme: Practical – 04/ Week

Learning Outcomes:

After successfully completing this laboratory course, the students will be able to:

1. Understand voltage doublers & voltage triplers.
2. Understand LC & RC oscillator.
3. Understand OPAMP.

Students have to perform minimum 06 Practical listed below:

Sl. No.	Basic Practical Tasks
1.	Study the design of LC filter
2.	Study LC oscillator circuit
3.	Study RC oscillator circuit
4.	Study the multivibrator circuit by using trainer kit
5.	To verify adder and subtractor circuits using OPAMP
6.	To demonstrate Schmitt Trigger using OP AMP
7.	To verify Astable Multivibrator using IC 555
8.	Study the design of Printed Circuit Boards
9.	Study the uses of Printed Circuit Boards
10.	Study servomechanism

Semester-II

Course Code: BAV 206 **Course Title: Mathematics-II**

Total Contact Hours: 30 hrs **Total Credits: 02** **Total Marks: 50**

Teaching Scheme: Theory – 02 Lectures/ Week

Course Objectives:

1. Reflecting the broad nature of the subject and developing mathematical tools for continuing further study in Aviation.
2. Students will develop skill and understanding in the meaning of planes, cones and cylinder.
3. Also able to do the classification of conic sections.
4. Use matrices to represent a system of equations.
5. To solve linear system of equations using matrices.

Learning Outcomes:

Students who successfully complete this course will be able to:

1. Use reflections and rotation to transform the given second degree equation to its standard form and identify the conic section.
2. Determine planes satisfying different conditions.
3. To state equation of cone and cylinder with given vertex.
4. To find solution of given linear system of equations using matrices.

Sl. No.	Description	
Unit-I: Analytical Geometry of two dimensions		06 hrs
1.	• Change of axes and translation. • General equation of second degree. • Nature of conic, Reduction to standard form.	
Unit-II: Planes in 3-Dimension		06 hrs
2.	• Equations of the first degree in x, y, z. • Systems of planes, two sides of a plane. • Bisectors of angles between two planes.	
Unit-III: Cones and Cylinders		08 hrs
3.	• Definition of cone and cylinder. • Equation of cone and cylinder with a given vertex. • The right circular cone, the equation of a right circular cone. • The right circular cylinder, the equation of a right circular cylinder.	
Unit-IV: Matrices and System of linear equations		10 hrs
4.	• System of linear equations, Matrix form of system of linear equations, Rank of a matrix. • Gauss Elimination and Gauss Jordan Methods. • Eigen values, Eigen vectors, characteristic equation of a matrix of order up to 3x3. • Cayley Hamilton theorem.	

Reference Books:

Sl. No.	Author / Publisher	Nomenclature of Book
1.	Shantinarayan	Analytical Solid Geometry
2.	H. Anton and C. Rorres	Elementary Linear Algebra with Applications
3.	P. K. Jain and Khalil Ahmed	A Text Book of Analytical Geometry of Three Dimensions
4.	K.B. Datta	Matrix and Linear Algebra

Semester-II

Course Code: BAV 207 **Course Title: Aviation Legislation-II**

Total Contact Hours: 30 hrs **Total Credits: 02** **Total Marks: 50**

Teaching Scheme: Theory – 02 Lectures/ Week

Course Objectives:

1. To get familiar with aircraft certification.
2. To get familiar with aircraft documents.
3. To study safety management system.
4. To study fuel tank safety.

Learning Outcomes:

Through this course:

1. Students will be able to refer and follow rules and regulations laid down in connection with aircraft operations and maintenance in particular.
2. Students will understand aircraft documentation procedures.
3. Students will understand safety management system.
4. Students will understand fuel tank safety to be followed.

Sl. No.	Description	
Unit-I: Aircraft Certification		12 hrs
1.	• Certification rules: such as FAA & EACS 23/25/27/29; • Type Certification; • Supplemental Type Certification; • CAR-21 Design/Production Organization Approvals. • Aircraft Modifications and repairs approval and certification • Permit to fly requirements	
Unit-II: Aircraft Documents		06 hrs
2.	• Certificate of Airworthiness; • Certificate of Registration; • Noise Certificate; • Weight Schedule; • Radio Station Licence and Approval.	
Unit-III: Safety Management System		06 hrs
3.	• State Safety Programme • Basic Safety Concepts • Hazards & Safety Risks • SMS Operation • SMS Safety performance • Safety Assurance	

Sl. No.	Description
Unit-IV: Fuel Tank Safety	06 hrs
4.	• Special Federal Aviation Regulations (SFARs) from 14 CFR SFAR 88 of the FAA and of JAA TGL 47 • Concept of CDCCL, • Airworthiness Limitations Items (ALI)

Reference Books:

Sl. No.	Author / Publisher	Nomenclature of Book
1.	DGCA	Civil Aviation Procedures (CAP) relevant to CAR-66 Syllabus
2.	DGCA	Civil Aviation Requirements (CAR) Vol-I
3.	DGCA	Civil Aviation Requirements (CAR) Vol-II

Semester-II

Course Code: BAV 208 **Course Title: Aircraft Ground Handling Lab**

Total Contact Hours: 40 hrs **Total Credits: 02** **Total Marks: 50**

Teaching Scheme: Practical – 04/ Week

Learning Outcomes:

After successful completion, the students will be able to:

1. Learn safety precautions to be taken around aeroplane.
2. Learn the use of ground support equipment.
3. Learn jacking procedure of aircraft.
4. Learn aircraft operation procedures.

Students have to perform minimum 06 Practical listed below:

Sl. No.	Basic Practical Tasks
1.	Conversant with safety precautions around aircraft, protection at engine exhaust areas
2.	Conversant with use of fire extinguishers around the aircraft and shops
3.	Conversant with safety from noise, FOD, tools & equipment
4.	Perform the use of chocks, trestles. Check the tire pressure
5.	Perform the use of sling, ladder and other ground support equipment
6.	Perform parking procedures and use of protective covers of aircraft
7.	Perform marshalling practices
8.	Perform tie down procedures and mooring procedures
9.	Connection and uses of external electrical power supply. Perform grounding/ earthing of aircraft
10.	Perform jacking of nose or main wheel and/or complete aircraft
11.	Conversant with scheduled inspection procedure

Semester-II

Course Code: BAV 209 **Course Title: Aircraft Material Science Lab**

Total Contact Hours: 40 hrs **Total Credits: 02** **Total Marks: 50**

Teaching Scheme: Practical – 04/ Week

Learning Outcomes:

After successful completion, the students will be able to:

1. Learn safety precautions to be taken in lab.
2. Learn the identification of ferrous & non-ferrous metals used in aircraft.
3. Learn the identification of composite materials used in aircraft.
4. Learn the identification & removal of aircraft corrosion.

Students have to perform minimum 06 Practical listed below:

Sl. No.	Basic Practical Tasks
1.	Conversant with lab safety precautions, safety of tools & equipment
2.	Identification of common ferrous metals used in aircraft construction
3.	Identification of common Non- ferrous metals used in aircraft construction
4.	Identification of various non-metallic materials and composite material used in aircraft
5.	Identification of reinforcing fibre cloths used in composite structures
6.	Familiarization of use of resin, hardener & pigments. Familiarization with different type of tools used in composite construction
7.	Perform the simple fabrication of composite structure
8.	Study types fabrics used in aeroplane
9.	Identification of different types of corrosion
10.	Factors affecting corrosion and corrosion removal