Semester 1st		Contact Hrs			Marks			Credits
Subject Code	**Subject Name**	**L**	**T**	**P**	**Int.**	**Ext.**	**Total**	
BAEE3-101	Aerodynamics	3	1	0	40	60	100	4
BAEE3-102	Aerodynamics Lab.	0	0	4	60	40	100	2
BAEE3-103	Human Factors	5	1	0	40	60	100	6
BAEE3-104	English Communication	3	1	0	40	60	100	4
BAEE3-105	Mathematics	5	1	0	40	60	100	6
BAEE3-106	Corrosion and NDI Techniques	3	1	0	40	60	100	4
BAEE3-107	Corrosion and NDI Techniques Lab.	0	0	4	60	40	100	2
Total		**19**	**5**	**8**	**320**	**380**	**700**	**28**

Semester 2nd		Contact Hrs			Marks			Credits
Subject Code	**Subject Name**	**L**	**T**	**P**	**Int.**	**Ext.**	**Total**	
BAEE3-208	Electrical Fundamentals-I	3	1	0	40	60	100	4
BAEE3-209	Electrical Fundamentals-I Lab.	0	0	4	60	40	100	2
BAEE3-210	Aviation Legislation	5	1	0	40	60	100	6
BAEE3-211	Environmental Science	3	1	0	40	60	100	4
BAEE3-212	Physics	3	1	0	40	60	100	4
BAEE3-213	Physics Lab.	0	0	4	60	40	100	2
BAEE3-214	Quality Management System	5	1	0	40	60	100	6
Total		**19**	**5**	**8**	**320**	**380**	**700**	**28**

Semester 3rd		Contact Hrs			Marks			Credits
Subject Code	**Subject Name**	**L**	**T**	**P**	**Int.**	**Ext.**	**Total**	
BAEE3-315	Aircraft Structure And Associated Systems	3	1	0	40	60	100	4
BAEE3-316	Aircraft Structure And Associated Systems Lab.	0	0	4	60	40	100	2
BAEE3-317	Electrical Fundamentals-II	3	1	0	40	60	100	4
BAEE3-318	Electrical Fundamentals-II Lab.	0	0	4	60	40	100	2
BAEE3-319	Gas Turbine Engine	3	1	0	40	60	100	4
BAEE3-320	Gas Turbine Engine Lab.	0	0	4	60	40	100	2
BAEE3-321	Aircraft Systems-1	3	1	0	40	60	100	4
BAEE3-322	Aircraft Systems-1 Lab.	0	0	4	60	40	100	2
Total		**12**	**4**	**16**	**400**	**400**	**800**	**24**

Semester 4th		Contact Hrs			Marks			Credits
Subject Code	**Subject Name**	**L**	**T**	**P**	**Int.**	**Ext.**	**Total**	
BAEE3-423	Electronic Fundamentals and Digital Techniques-I	3	1	0	40	60	100	4
BAEE3-424	Electronic Fundamentals and Digital Techniques-I Lab.	0	0	4	60	40	100	2
BAEE3-425	Aircraft Materials and Hardware	3	1	0	40	60	100	4
BAEE3-426	Aircraft Materials and Hardware Lab.	0	0	4	60	40	100	2
BAEE3-427	Aircraft Maintenance Practices	3	1	0	40	60	100	4
BAEE3-428	Aircraft Maintenance Practices Lab.	0	0	4	60	40	100	2
BAEE3-429	Avionics	3	1	0	40	60	100	4
BAEE3-430	Avionics Lab.	0	0	4	60	40	100	2
Total		**12**	**4**	**16**	**400**	**400**	**800**	**24**

Semester 5th		Contact Hrs			Marks			Credits
Subject Code	**Subject Name**	**L**	**T**	**P**	**Int.**	**Ext.**	**Total**	
BAEE3-531	Electronic Fundamentals and Digital Techniques-II	3	1	0	40	60	100	4
BAEE3-532	Electronic Fundamentals and Digital Techniques-II Lab.	0	0	4	60	40	100	2
BAEE3-533	Workshop Practices	3	1	0	40	60	100	4
BAEE3-534	Workshop Practices Lab.	0	0	4	60	40	100	2
BAEE3-535	Aircraft Systems-II	3	1	0	40	60	100	4
BAEE3-536	Aircraft Systems-II Lab.	0	0	4	60	40	100	2
BAEE3-537	Piston Engines and Propellers	3	1	0	40	60	100	4
BAEE3-538	Piston Engines and Propellers Lab.	0	0	4	60	40	100	2
Total		**12**	**4**	**16**	**400**	**400**	**800**	**24**

Semester 6th		Contact Hrs			Marks			Credits
Subject Code	**Subject Name**	**L**	**T**	**P**	**Int.**	**Ext.**	**Total**	
BAEE3-639	Ground Handling, Safety And Support System	3	1	0	40	60	100	4
BAEE3-640	Ground Handling, Safety And Support System LAB	0	0	4	60	40	100	2
BAEE3-641	Approval of Maintenance Organization	3	1	0	40	60	100	4
BAEE3-642	Approval of Maintenance Organization LAB	0	0	4	60	40	100	2
BAEE3-643	Typical Aircraft Maintenance - Fixed Wing Heavy / Complex Aircraft	3	1	0	40	60	100	4
BAEE3-644	Typical Aircraft Maintenance - Fixed Wing Heavy / Complex Aircraft LAB	0	0	4	60	40	100	2
BAEE3-645	Typical Aircraft Maintenance - Fixed Wing Light / Composite Aircraft	3	1	0	40	60	100	4
BAEE3-646	Typical Aircraft Maintenance - Fixed Wing Light / Composite Aircraft LAB	0	0	4	60	40	100	2
Total		**12**	**4**	**16**	**400**	**400**	**800**	**24**

Total Credits: 28 + 28 + 24 + 24 + 24 + 24 = 152

AERODYNAMICS

Subject Code: BAEE3-101 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale:
As the AME students will involve in supervising the Maintenance, Repair and Overhauling of aircraft, they must possess adequate knowledge on atmosphere, fundamental principles of aerodynamics, instrument system and theory of flight.

Learning Outcomes:
After undergoing the subject, the students will be able to:
1. Understand the different layers of atmosphere
2. Basic principles of aerodynamics
3. Aircraft controls and stability
4. Functions of control surfaces and tabs
5. Lift, drag, thrust and weight
6. Aircraft instrument system
7. High speed theory
8. Principles of rotary wing aircraft
9. Basic terms and terminology of aerodynamics

Contents	Hrs.
Physics of the Atmosphere International Standard Atmosphere (ISA), application to aerodynamics	**2**
Aerodynamics ➢ **Airflow Around a Body:** Boundary layer, laminar and turbulent flow, free stream flow, relative airflow, up wash and downwash, vortices, stagnation; ➢ **The Terms:** camber, chord, mean aerodynamic chord, aerodynamic centre, centre of pressure, stagnation point, profile (parasite) drag, induced drag, 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.	**12**
Theory of Flight ➢ **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.	**10**
Flight Stability and Dynamics ➢ Longitudinal stability (active and passive) ➢ Lateral (active and passive) ➢ Directional stability (active and passive).	**3**
Theory of Flight ➢ Aeroplane Aerodynamics and Flight Controls ➢ Operation and effect of: Roll control--ailerons and spoilers; Pitch control-- elevators, stabilators, variable incidence stabilisers and canards; Yaw control--rudder limiters; ➢ Control using elevons, ruddervators; ➢ **High Lift Devices:** slots, slats, flaps, flaperons; ➢ **Drag Inducing Devices:** spoilers, lift dumpers, speed brakes; ➢ Effects of wing fences, saw tooth leading edges;	**16**

➢ Boundary layer control using, vortex generators, stall wedges or leading edge devices; ➢ Operation and effect of trim tabs, balance and anti-balance (leading) tabs, servo tabs, spring tabs, mass balance, control surface bias, aerodynamic balance panels.	
Basic Instrument Systems ➢ Classification; Atmosphere; Terminology; Pressure measuring devices and systems; ➢ Pitot static systems; Altimeters; Vertical speed indicators; Airspeed indicators; ➢ Machmeter; Altitude reporting/alerting systems; Air data computers; rate of climb /vertical speed indicator, cabin pressure indicator, pneumatic systems instruments; ➢ Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator; ➢ Compasses: direct reading, remote reading; ➢ Angle of attack indication, stall warning systems; ➢ Glass Cockpit, Other aircraft system indication.	**5**
High Speed Flight ➢ Speed of sound, subsonic flight, transonic flight, supersonic flight, Mach number, critical Mach number, compressibility effect, buffet, shock wave, aerodynamic heating, area rule; ➢ Factors affecting airflow in engine intakes of high speed aircraft; ➢ Effects of sweepback on critical Mach number.	**8**
Rotary Wing Aerodynamics ➢ Elementary rotary wing and aerodynamic Terminology; ➢ Basic operation and effect of cyclic, collective and anti-torque controls.	**4**

Instructional Strategy:

1. Teachers should lay special emphasis in making the students conversant with the basics principles of aerodynamics and terms and terminologies of theory of flight.
2. Use of audio-visual aids/video films should be made to demonstrate the Bernoulli's principle, four forces, operation of controls, stability and high speed theory.
3. Exposure to control surfaces and cockpit so that students can learn how control surfaces are operated from cockpit.
4. Observing the flying of aircraft: operation of control surfaces and high lift/drag devices during landing and take-off.
5. Demonstration of the functions of aircraft parts and control surfaces
6. Practical demonstration of flying controls through a **drone** would be a greater advantage.

Recommended Books:

1. Clancey, 'Aerodynamics'.
2. A.C. Kermode, 'Mechanics of Flight'.
3. 'Force Measurement on Symmetric Airfoil'.
4. 'Force Measurement on Cambered Airfoil'.
5. E.H.J. Pallett, 'Aircraft Instruments'.
6. C.A. Williams, 'Aircraft Instruments'.

AERODYNAMICS LAB.

Subject Code: BAEE3-102 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

S.N.	Contents	Hrs.
01	Flow around various objects in a 'Water Channel' - Square, Cylinder, Aerofoil, Understanding laminar flow, turbulent flow, stagnation point, flow separation, boundary layer	4
02	Fabricate Aerofoil Model - Understanding associated terms	4
03	Water Channel - Effect of vortex generator on boundary layer control	4
04	Effect of angle of attack and airflow velocity on lift and Stalling	4
05	Study of flow over streamlined bodies with different angle of attack by flow visualization technique	4
06	Identification of flight control surfaces and their effect on flight control - Aircraft Model	4
07	Identifying High lift devices and practical understanding of their effect on lift with respect to aircraft speed (Air flow)	4
08	Practical understanding of lift spoiling devices	4
09	Removal / installation of Pitot Static Instruments	4
10	Calibration of a Pitot Static System using a Pitot Static Leak tester	4
11	Fabrication of model - high speed flight	4
12	Practical study of various factors affecting lift and drag on an aerofoil	4
13	Factors affecting flow of fluid over an aerofoil surface and demonstrate the Venturi effect	4
14	Identify various type of flap surfaces and their effect on high lift and high drag characteristic	4
15	Identification of various parts of Rotary wing	4

HUMAN FACTORS

Subject Code: BAEE3-103 **L T P C** **Duration: 90 Hrs.**
5 1 0 6

Rationale:
The term “human factors” in the context of aviation maintenance engineering is relatively new. It refers to the study of human capabilities and limitations in the workplace. Human factors researchers study the interaction of maintenance personnel, the equipment they use, the written and verbal procedures and rules they follow, and the environmental conditions of any system. The aim of human factors is to optimise the relationship between maintenance personnel and systems with a view to improving safety, efficiency and well-being”. For this purpose, AME students in this course are required to teach the concepts of human factor to develop knowledge for keeping the person and object safe with maximum output during the maintenance work.

Learning Outcomes:
After undergoing this course, the students will be able to know:
1. Human performance and limitations, social psychology, physical environment and factors affecting performance of a person.
2. Task, communication and human error during the work.
3. Hazards in the workplace, human error in the maintenance environment.
4. Human factors in the aircraft maintenance and inspection.
5. Human errors in the aircraft maintenance and inspection.

6. Error prevention and considerations strategies.

Contents	Hrs.
General ➢ The need to take human factors into account; ➢ Incidents attributable to human factors/ human error; ➢ 'Murphy's' law.	**5**
Human Performance and Limitations ➢ Vision; ➢ Hearing; ➢ Information processing; ➢ Attention and perception; ➢ Memory; ➢ Claustrophobia and physical access.	**5**
Social Psychology ➢ Responsibility: individual and group; ➢ Motivation and de-motivation; ➢ Peer pressure; ➢ 'Culture' issues; ➢ Team working; ➢ Management, supervision and leadership.	**5**
Factors Affecting Performance ➢ Fitness/health; ➢ Stress: domestic and work related; ➢ Time pressure and deadlines; ➢ Workload: overload and under-load; ➢ Sleep and fatigue, shift work; ➢ Alcohol, medication, drug abuse.	**5**
Physical Environment ➢ Noise and fumes; ➢ Illumination; ➢ Climate and temperature; ➢ Motion and vibration; ➢ Working environment.	**5**
Tasks ➢ Physical work; ➢ Repetitive tasks; ➢ Visual inspection; ➢ Complex systems.	**5**
Communication ➢ Within and between teams; ➢ Work logging and recording; ➢ Keeping up to date, currency; ➢ Dissemination of information.	**5**
Human Error ➢ Error models and theories; ➢ Types of error in maintenance tasks; ➢ Implications of errors (i.e. accidents); ➢ Avoiding and managing errors.	**5**

Hazards in the Workplace ➢ Recognizing and avoiding hazards; ➢ Dealing with emergencies.	**5**
Human Factors in Aircraft Maintenance and Inspection ➢ Human Factors — Aircraft Maintenance and Inspection; Contemporary ➢ Maintenance Problems; the SHEL Model; the Reason Model; Human Error.	**5**
Human Error in Aircraft Maintenance and Inspection ➢ **(an organizational perspective)**	**5**
Human Error in the Maintenance Environment ➢ Human Factors Issues Affecting Aircraft Maintenance and Dirty Dozen; ➢ Information Exchange and Communication; ➢ Training; Aircraft Maintenance ➢ Technician Facilities and Work Environment.	**5**
Teams and Organizational Issues in Aircraft Maintenance ➢ Team Work; ➢ Job Design; ➢ Reward Systems; ➢ Selection and Staffing; ➢ Training.	**5**
Automation and Advanced Technology System ➢ Automation and Computerization; ➢ Advanced Job Aid Tools.	**5**
Error Prevention, Considerations and Strategies	**5**

Instructional Strategy:
While imparting instructions, teacher should give demonstration of various models concerned to human factors to the students. Different transparencies and animated projections should be shown to the students for better understanding of the lesson.

Recommended Books:

1. CAP 715 - An Introduction to Aircraft Maintenance Engineering Human Factors for JAR 66, Civil Aviation Authority, UK.
2. CAP 718 - Human Factors in Aircraft Maintenance and Inspection, Civil Aviation Authority, UK.
3. FAA-H-8083-30 - Aircraft Maintenance Technician Handbook - General, US. Department of Transportation, Federal Aviation Administration
4. ICAO Doc 9806

TUTORIAL	
Contents	**Hrs.**
➢ Application of Human Factors in development of Aircraft Maintenance ➢ Programme and Inspection Schedule.	**1**
➢ Application of Human Factors in Aircraft Maintenance Planning and Execution.	**1**
➢ Application of Human Factors in Aircraft Maintenance.	**1**
➢ Detail study of Murphy's' law.	**1**
➢ To study Shel Model.	**2**
➢ Study of Dirty Dozen.	**1**
➢ Stress Management in Aircraft Maintenance environment.	**2**
➢ To study human behavior in performing aircraft inspection in adverse weather conditions.	**2**

➢ Develop procedure and environment for aircraft inspection for error prevention, considerations and strategies.	**2**
➢ Study of social impact on aircraft maintenance engineer.	**2**

ENGLISH COMMUNICATION

Subject Code: BAEE3-104 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale:
Although the art of communication is natural to all living beings, people with effective communication skills succeed in their professions and business in today's world of complexities. After studying this course, the students are expected to gain the fundamental knowledge of communication and learn the tools and techniques to develop the interpersonal communication skills so that they will become excellent in dyadic and corporate communication.

Learning Outcomes:
After studying this subject, the students will have the adequate knowledge on:
1. The importance of communication
2. The process of communication
3. The keys or characteristics of effective communication
4. The barriers of communication
5. The techniques of breaking the communication barriers

After studying this subject, the students will be able to perform the following activities with the enhanced level of confidence:
1. Writing
2. Listening
3. Reading
4. Speaking
5. Interview
6. Non-verbal communication

Contents	Hrs.
Introduction ➢ Theory of Communication ➢ Types and modes of Communication	**5**
Language of Communication ➢ Verbal and Non-verbal (Spoken and Written), ➢ Personal, Social and Business Barriers and Strategies, ➢ Intra-personal, Inter personal and Group communication	**15**
Speaking Skills ➢ Monologue ➢ Dialogue ➢ Group Discussion ➢ Effective Communication/ Miscommunication ➢ Interview ➢ Public Speech	**20**
Reading and Understanding ➢ Close Reading ➢ Comprehension ➢ Summary	**15**

➢ Paraphrasing ➢ Analysis and Interpretation ➢ Translation (from Indian language to English and vice-versa) ➢ Literary/Knowledge Texts	
Writing Skills ➢ Documenting ➢ Report Writing ➢ Making notes ➢ Letter writing	**15**

Instructional Strategy:

1. Teachers should lay special emphasis in making the students conversant with concepts, process and practices related to effective communication skills.
2. It is recommended to use audio-visual aids/video films to impart the knowledge on the English language and communication skills.

Recommended Books:

1. 'Fluency in English', Part-II, Oxford University Press, **2006**.
2. V.R. Narayanaswami, 'Strengthen Your Writing', 3rd Edn., Orient Longman, **2005**.
3. Andrea J. Rutherford, 'Basic Communication Skills for Technology', 1st Edn., Pearson Business English, Pearson, **2008**.
4. 'Language, Literature and Creativity', Orient Blackswan, **2013**, Education Asia (Singapore) Pvt. Ltd., Bangalore, **2001**..
5. 'Language through Literature', (forthcoming Edn.). Gauri Mishra, Ranjana Kaul, Brati Biswas, Nell Ann Pickett, Ann A. Laster, Katherine E. Staples,
6. 'Technical English (Writing, Reading and Speaking)', 8th Edn., Pearson Education, USA, Addison Wesley Longman Inc., **2001.**

MATHEMATICS-I

Subject Code: BAEE3-105 **L T P C** **Duration: 90 Hrs.**
5 1 0 6

Rationale:

Contents of this course provide fundamental base for understanding engineering problems and their solution algorithms. Contents of this course will enable students to use basic tools like logarithm, binomial theorem, partial fractions, matrices, t-ratios and co-ordinates for solving complex engineering problems with exact solutions in a way which involve less computational task. By understanding the logarithm, they will be able to make long calculations in short time and it is also a pre-requisite for understanding Calculus.

Learning Outcomes:

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

1. Apply complex number in engineering problems.
2. Apply permutation and combination to count without actual counting.
3. Apply permutation and combination to understand binomial theorem.
4. Calculate the approximate value of roots of certain expressions in engineering problems by application of binomial theorem.
5. Resolve rational functions to partial fractions for the use in Integral Calculus.
6. Use matrices to provide solution to engineering problems.
7. Solve different problems using trigonometry.
8. Understand the geometric shapes used in engineering problems by Co-ordinate Geometry.
9. Explore the idea of location, graph, and linear relationships between two variables.

Contents	Hrs.
PART-1 **Linear Algebra** Elementary Row Transformation, Reduction of a Matrix to Row Echelon Form, Rank of a Matrix, Consistency of Linear Simultaneous Equations, Gauss Elimination Method, Gauss-Jordan Method, Eigen Values and Eigen Vectors of a Matrix, Caley-Hamilton Theorem, Diagonalization of a Matrix,	**10**
PART-2 **Trigonometry Functions** Elementary trigonometry, sine, cosine and tan functions, reciprocals of trig functions, angle values of trig functions, geometrical problems, trigonometric inverse functions	**5**
PART-3 **Multivariable Differential Calculus** Functions of 2 Variables, Limits and continuity, Partial differentiation, Euler's Theorem, Maxima and Minima of two variables, Method of Lagrange Multipliers, Taylor Series and Maclaurin Series of two variables, Jacobian.	**20**
PART-4 **Multivariable Integral Calculus** Multiple Integrals-Double integrals, Change of order, Applications to areas, volumes, Triple Integral.	**20**
PART-5 **Vector Calculus** Gradient, Divergence, Curl, Evaluation of Line Integral, Green's Theorem in Plane (without proof), Stoke's Theorem (without proof), Gauss Divergence Theorem (without proof).	**20**

Instructional Strategy:

1. Basic elements of algebra, trigonometry and co-ordinate geometry can be taught in the light of their applications in the field of engineering and technology.
2. By laying more emphasis on applied part, teacher can also help in providing a good continuing education base to the students.
3. Students need to be taught the skills needed to use software tools built by experts through multiple problem solving based on the topics related to Algebra, Trigonometry and Coordinate Geometry that the industry requires.
4. Examples to be used should be related to engineering.
5. Students should be able to relate to the actual use of these examples and the way mathematical calculations will help them in doing their job.

Recommended Books:

1. Shanti Narain, 'Differential Calculus'.
2. Shanti Narain, 'Integral Calculus'.
3. 'Linear Algebra', Schaum Outline Series.
4. B.S. Grewal, 'Engineering Mathematics'.

CORROSION AND NDI TECHNIQUES

Subject Code: BAEE3-106 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale:
Lot of development has taken place in the field NDT to investigate different types of corrosion. New equipment and technologies are being developed continuously since its inception. AME students in this
Course are required to have knowledge of various types NDT equipment and its applications. For this purpose, it is necessary to teach them basics of the NDT and corrosion in aircraft. This subject aims at developing knowledge about the basics of NDT used in the Aircraft industries.

Learning Outcomes:
After undergoing this subject, the students will be able to:
1. Understand principle of different NDT techniques.
2. Classify different types of corrosion.
3. Know effects, properties and identification and removal of corrosion.

Contents	Hrs.
PART-1 Type of Corrosion, Corrosion Theory; General Development: Development of Corrosion, Factors influencing corrosion. Forms of Corrosion, Corrosion and Mechanical Factors, Common Corrosive Agents. Metallic Mercury Corrosion on Aluminum Alloys, Micro Organisms.	**6**
PART-2 Importance of NDT in quality assurance; Different types of non-destructive techniques to obtain information regarding size, location and orientation of Damage or cracks. Visual inspection techniques coin tapping technique for Composite structures and adhesive bonds. Ultrasonic testing (UT Level 1, 2), Radiography Inspection (RT Level 1, 2), Magnetic particle testing (MT Level 1, 2), Microwave testing, Pulse echo technique, pitch-catch technique, through transmission technique, A-scan, B-Scan, C-scan. Acoustic emission: Sources of acoustic emission in composites, peak amplitude, rise time during events, ring-down counts duration of events. X-ray radiography: Absorption spectra, short wave length, X-ray for detection of voids. Die penetration technique.	**10**
PART-3 Liquid/Dye penetrant test (PT level 1, 2), Visual testing (VT-level 1, 2), Eddy current testing (ET level 1, 2), Guided wave testing.	**10**
PART-4 TKY joints ultrasonic inspection, Basics of NDT, Metallurgy for non-metallurgists.	**8**
PART-5 Effects of Corrosion on Metals, Corrosion Prone Areas and Preventative Maintenance Battery Compartments and battery vent openings, Lavatories, Buffets and Galleys, Bilge Areas, Wheel wells and landing gear, External skin areas, Water entrapment areas, Engine Frontal Areas and cooling air vents, Electronic package compartments.	**6**

PART-6 Factors in corrosion control, preventative maintenance, frequency of inspection, recommended depth of inspection, non-destructive inspection (NDI), Corrosion removal techniques, Standard methods, Preparations for rework, Paint removal, special techniques, fairing or blending reworked areas, chemical testing, chemical spot analysis of magnetic metals, surface treatment testing, chemical spot testing of non-magnetic metals, post identification cleaning and refinishing, mechanical corrosion removal by blasting.	**8**
PART-7 Corrosion Damage and Rework Limits on Aluminum and Aluminum Alloys, Treatment, Processing of Aluminum Surfaces, Repair, Corrosion Removal Corrosion damage and rework limits on Magnesium and Alloy treatment, Processing of Aluminum surfaces, repair, corrosion removal. Corrosion damage and rework limits on Ferrous Corrosion Damage and Rework.	**8**
PART-8 Limits on Ferrous & Alloy Treatment, Processing of Aluminum Surfaces, Repair, Corrosion Removal; Corrosion damages on composite material Mercury spills/corrosion damage. Corrosion protection for agricultural aircraft.	**4**

Instructional Strategy:
While imparting instructions, teacher should give demonstration of various types NDT equipment to the students. Transparencies and animated videos should be shown to the students for better understanding of the lesson.

Recommended Books:
1. AC-43-4A
2. AC-43-1B
3. Prasad J. and C.G. Krishnadas Nair, 'Non-Destructive Test and Evaluation of Materials'.
4. Non-Destructive Testing Handbook, Vol. - 1. Aerospace NDT – The American Society for Non-destructive Testing.

CORROSION AND NDI TECHNIQUES LAB.

Subject Code: BAEE3-107 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

S.N.	Contents	Hrs.
01	Identify different types of corrosion, factors contribute to corrosion, areas prone for corrosion, corrosive agents avoidance of corrosion	**5**
02	Detection of corrosion, defects and recording	**8**
03	Various Corrosion preventive technique - practice	**10**
04	Surface cleaning, rework and protection technique of ferrous and non-ferrous (Magnesium and Aluminum alloys) metallic surface	**10**
05	Accidental spillage of corrosive agents, cleaning and restoration	**10**
06	Ultrasonic Thickness testing	**2**
07	Liquid Penetrant testing	**2**
08	Eddy current	**2**
09	Magnetic Particle	**2**
10	Visual Inspection	**2**
11	Radiography testing	**2**
12	Guided wave testing	**3**

ELECTRICAL FUNDAMENTALS-I

Subject Code: BAEE3-208 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale:
Electricity & Magnetism is devoted to the utilization of the forces of nature and materials for the benefits of mankind. Harnessing the vast sources of energy and transforming them to the most convenient form (electrical) for the overall benefit of the society for sustenance is prime objective. For this purpose, it is necessary to teach the students basics of electrical science, fundamental laws of electricity and different electrical components. This subjects aims at developing knowledge of electricity and its application used in domestic and aviation industries.

Learning Outcomes:
After undergoing this course, the students will be able to:
1. Understand about fundamentals of electron theory.
2. Distinguish between conductor, semi-conductor & insulator.
3. Characteristics of static electricity & properties of electrostatic charges.
4. Understand about different electrical terminology.
5. Understand various laws of electricity - Coulomb's law; Kirchhoff's law; Ohm's Law.
6. Distinguish between resistor, capacitor and inductor.
7. Distinguish between alternating current and direct current.
8. Characteristics & properties of magnetism and interrelation with electricity.
9. Understand properties & application of Transformers and Filters.

Contents	Hrs.
Electron Theory ➢ Structure and distribution of electrical charges within: atoms, molecules, ions, compounds ➢ Molecular structure of conductors, semiconductors and insulators.	**03**
Static Electricity and Conduction ➢ Static electricity and distribution of electrostatic charges; Electrostatic laws of attraction and repulsion; Units of charge, Coulomb's Law; Conduction of electricity in solids, liquids, gases and a vacuum.	**03**
Electrical Terminology ➢ The following terms, their units and factors affecting them: potential difference, electromotive force, voltage, current, resistance, conductance, charge, conventional current flow, electron flow.	**02**
DC Circuits ➢ Ohms Law, Kirchhoff's Voltage and Current Laws; Calculations using the above laws to find resistance, voltage and current; Significance of the internal resistance of a supply.	**04**
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 and limitations, methods of construction; Variable resistors, thermistors, voltage dependent resistors; Construction of potentiometers and	**05**

rheostats; Construction of Wheatstone Bridge.	
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.	**04**
Magnetism ➢ Theory of magnetism; 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. ➢ 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.	**05**
Inductance/Inductor ➢ Faraday's Law; Action of inducing a voltage in a 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, number 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 coils with respect to each other; Lenz's Law and polarity determining rules; Back emf, self-induction; Saturation point; Principle uses of inductors.	**06**
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.	**08**
Resistive (R), Capacitive (C) and Inductive (L) Circuits ➢ Phase relationship of voltage and current in L, C and R circuits, parallel, series and series parallel; Power dissipation in L, C and R circuits; Impedance, phase angle, power factor and current calculations; True power, apparent power and reactive power calculations.	**08**
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.	**06**
Filters ➢ Operation, application and uses of the following filters: low pass, high pass, band pass, band stop.	**06**

Instructional Strategy:
While imparting instructions, teacher must show various images or videos related to Topic by using projector. Students should be asked to collect different electrical

Components available in the market. Visits to industry should be planned to demonstrate Electrical power generation, distribution & utilization in the industry.

Recommended Books:

1. B.L. Theraja, 'Electrical Technology'.
2. E.H.J. Pallett, 'Aircraft Electrical System'.

ELECTRICAL FUNDAMENTALS-I LAB.

Subject Code: BAEE3-209 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

S.N.	Contents	Hrs.
01	Simple experiments with static electricity and the coulomb's law	4
02	Application of Electromotive forces and Potential difference; Ballistic Galvanometer - Measurement of charge & current sensitivity	4
03	Measuring (a) Resistances (b) AC and DC Voltages (c) DC Current & checking electrical fuses and connection	4
04	Use of a range of test meters to measure volts, amps and resistance.	4
05	Resistor colour codes - Calculation of resistance value using colour codes	4
06	Potentiometer, rheostat & wheat stone bridges and determine unknown resistance	4
07	Use a Multimeter for measuring Resistance, checking electrical fuses, identify various types of resistance	4
08	Identify various types of capacitors	4
09	Measurement of magnetic field strength, Magnetic field density & permeability using flux meter.	4
10	Production of electricity by inductance methods	4
11	Single phase and three phase power supply distribution using star and delta connection	4
12	Construct series LCR circuit and determine its (a) Resonant Frequency (b) Quality Factor	4
13	Construct parallel LCR circuit and determine its (a) Anti-resonant frequency (b) Quality factor Q	4
14	Use of transformer in power distribution and measurements.	4
15	Make filters circuit to study function of low pass, high pass, band pass & band stop	4

AVIATION LEGISLATION

Subject Code: BAEE3-210 **L T P C** **Duration: 90 Hrs.**
5 1 0 6

Rationale:

The Civil Aviation Safety Authority is responsible for establishing and administrating the regulatory framework in relation to aircraft safety. This subject will enable the students to learn about civil aviation rules and requirements. A healthy, well-managed Civil Aviation sector, supported by good aviation policy-making and regulation, is vital to the economy of every state. Civil Aviation Authorities (CAAs) are responsible for the oversight and regulation of civil aviation with a focus on aviation safety, security, airspace policy, economic regulation, efficiency, sustainability, consumer protection and respect for the environment.

Learning Outcomes:

1. To get the knowledge of ICAO, FAR, EASA procedures through CAR
2. Acquire knowledge of documentation and procedures of certificate of airworthiness and registration.
3. Procedures of maintenance programme and inspections.
4. Understanding of the legislation and regulations that must be adhered to when manufacturing and maintaining aircraft.

Contents	Hrs.
Regulatory Framework Role of International Civil Aviation Organization; Introduction to Chicago Convention, 1944; Introduction to ICAO, Convention, Standards and Recommended Practices; The Aircraft Act, 1934; The Aircraft Rules, 1937 - Part I, II, III, IV, VI, VII, IX, XIIA, XIIB, XIIC, XIII, XIV. Role of the DGCA; Relationship between CAR-21, CAR-M, CAR-145, CAR-66, CAR 147; Aeronautical Information Circulars (Applicable to Aircraft Maintenance and Release); CAR - Sections 1 and 2.	**6**
CAR-M Detail understanding of CAR M provisions related to Continuing Airworthiness; Detailed understanding of CAR-M.	**15**
CAR-145 — Approved Maintenance Organisations Detailed understanding of CAR-145 and CAR M Subpart F.	**15**
CAR-66 Certifying Staff – Maintenance Detailed understanding of CAR-66.	**5**
CAR-147 Approved Maintenance Training Organization Detailed understanding of CAR-147.	**5**
Aircraft Operations 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);	**5**
Aircraft Certification **a) General:** Certification rules: such as FAA & EACS 23/25/27/29; Type Certification Supplemental Type Certification; Type Approval; CAR-21 Sub-Part F, G, H, I, M, P & Q. Aircraft Modifications and repairs approval and certification; permit to fly requirements. **b) Documents:** Certificate of Airworthiness; Certificate of Registration; Noise Certificate; Weight Schedule; Radio Station License and Approval.	**10**
Applicable National and International Requirements Introduction to ICAO, FAR, EASA Regulations - Aircraft Maintenance and certification **a)** 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.; **b)** Continuing airworthiness; Test flights; ETOPS /EDTO, maintenance and dispatch requirements; RVSM, maintenance and dispatch requirements; RNP, MNPS Operations All Weather Operations; Category 2/3 operations and minimum equipment,	**5**

maintenance, training and certification requirements.	
Safety Management System State Safety Programme; Basic Safety Concepts; Hazards & Safety Risks; SMS Operation; SMS Safety performance; Safety Assurance.	**10**
Fuel Tank Safety 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).	**4**

Instructional Strategy:
While imparting instructions, teacher should show various types of certificates and necessary documentation to the students. Students should be asked to fill all the forms and maintain log books.

Recommended Books:
1. The Aircraft Act, 1934
2. The Aircraft Rules, 1937, VOL 1
3. The Aircraft Rules, 1937, VOL 3
4. Aeronautical Information Circular
5. CAR - Section - 1, 2, & 8 SMS,
6. CAR - 21, M, 145, 66 & 147
7. Special Federal Aviation Regulations (SFARs) - 14 CFR, SFAR 88 & JAA TGL 47 Airworthiness Procedure Manual

ENVIRONMENTAL SCIENCE

Subject Code: BAEE3-211 **L T P C** **3 1 0 4** **Duration: 60 Hrs.**

Rationale:
Environmental science is important to save our world from destruction. Because of man's abusive actions, the environment is not safe anymore. There are more calamities experienced such as flashfloods, hurricanes and draughts and climate change. If we do not study the environment, then there is a great danger that everything that we know as home with all that surround us, will lead to extinction, yes including the extinction of our specie.
We need to study the environment and the sciences applied into it to find solutions to different environmental issues so that children of tomorrow will still enjoy the healthy and productive environment we still have now. If man will only make use of the different discoveries through environmental science, then this world will definitely be a better place to be called home not only for us but for the next generation.

Learning Outcomes:
The Environmental Studies major prepares students for careers as leaders in understanding and addressing complex environmental issues from a problem-oriented, interdisciplinary perspective. Students:
1. Master core concepts and methods from ecological and physical sciences and their application in environmental problem solving.
2. Master core concepts and methods from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.
3. Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.
4. Understand the transnational character of environmental problems and ways of addressing them, including interactions across local to global scales.

5. Apply systems concepts and methodologies to analyse and understand interactions between social and environmental processes.
6. Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.
7. Demonstrate proficiency in quantitative methods, qualitative analysis, critical thinking, and written and oral communication needed to conduct high-level work as interdisciplinary scholars and/or practitioners.

Contents	Hrs.
PART-1 Multidisciplinary nature of environmental studies Scope and importance; Concept of sustainability and sustainable development	**2**
PART-2 What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems: ➢ Forest ecosystem ➢ Grassland ecosystem ➢ Desert ecosystem ➢ Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).	**6**
PART-3 **Natural Resources: Renewable and Non-renewable Resources** ➢ **Land Resources and Land Use Change:** Land degradation, soil erosion and desertification ➢ **Deforestation:** Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations. ➢ **Water:** Use and over--exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter--state). ➢ **Energy Resources:** Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.	**8**
PART-4 **Biodiversity and Conservation** ➢ Levels of biological diversity: genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots. ➢ India as a mega-biodiversity nation; Endangered and endemic species of India ➢ Threats to biodiversity: Habitat loss, poaching of wildlife, man--wildlife conflicts, biological invasions; Conservation of biodiversity: In--situ and Ex-situ conservation of biodiversity. ➢ Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.	**8**
PART-5 **Environmental Pollution** ➢ Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution. ➢ Nuclear hazards and human health risks ➢ Solid waste management: Control measures of urban and industrial waste. ➢ Pollution case studies.	**8**

PART-6 **Environmental Policies & Practices** ➢ Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture ➢ Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD). ➢ Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context	**7**
PART-7 **Human Communities and the Environment** ➢ Human population growth: Impacts on environment, human health and welfare. ➢ Resettlement and rehabilitation of project affected persons; case studies. ➢ Disaster management: floods, earthquake, cyclones and landslides. ➢ Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan. ➢ Environmental ethics: Role of Indian and other religions and cultures in environmental conservation. ➢ Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).	**6**
PART-8 **Field Work** ➢ Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc. ➢ Visit to a local polluted site--Urban/Rural/Industrial/Agricultural. ➢ Study of common plants, insects, birds and basic principles of identification. ➢ Study of simple ecosystems--pond, river etc.	**15**

Instructional Strategy:

The learning outcomes provide the planning framework for teachers.

- In their planning, teachers in Lower Primary schools use the learning outcomes from the syllabuses, and the elaborations in this Teacher Guide, to identify specific knowledge, skills and attitudes that can be developed at each grade.
- Continuous assessment of student learning against the outcomes will ensure a supportive classroom environment that will meet the students' individual learning needs.
- Here is a discovery-learning motto to keep in mind when planning activities for students who are learning in two languages.

Recommended Books:

1. M. Gadgil & R. Guha, 'This Fissured Land: An Ecological History of India', Univ. of California Press, **1993**.
2. Gilbert M. Masters, 'Introduction to Environmental Engineering and Science', 2nd Edn., Pearson Education Pvt., Ltd., ISBN 81-297-0277-0, **2004**.
3. T.G. Miller JR., 'Environmental Science', Wadsworth Publishing Co.
4. E.P. Odum, H.T. Odum & J. Andrews, 'Fundamentals of Ecology', Philadelphia: Saunders, Andrews, **1991**.
5. R. Sengupta, 'Ecology and Economics: An Approach to Sustainable Development', OUP, **2003**.
6. J.S. Singh, S.P. Singh and S.R. Gupta, 'Ecology, Environmental Science and Conservation', S. Chand Publishing, New Delhi, **2014**.
7. N.S. Sodhi, L. Gibson & P.H. Raven (eds), 'Conservation Biology: Voices from the Tropics', John Wiley & Sons, **2013**.

8. V. Thapar, 'Land of the Tiger: A Natural History of the Indian Subcontinent', **1998**.
9. M.N. Rao & A.K. Datta. 'Waste Water Treatment', Oxford and IBH Publishing Co. Pvt. Ltd., **1987**.

PHYSICS

Subject Code: BAEE3-212 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale:
Applied physics includes the study of a large number of diverse topics all related to things that go on in the world around us. It aims to give an understanding of this world both by observation and by prediction of the way in which objects will behave. Concrete use of physical principles and analysis in various fields of engineering and technology are given prominence in the course content.
Note: Teachers should give examples of engineering/technology applications of various concepts and principles in each topic so that students are able to appreciate learning of these concepts and principles. In all contents, SI units should be followed. Working in different sets of units can be taught through relevant software.

Learning Outcomes:
After undergoing this subject, the students will be able to:
1. Identify physical quantities, parameters and select their units for use in engineering solutions.
2. Compute units and dimensions of different physical quantities.
3. Represent physical quantities as scalar and vectors. Solve difficult problems (walking of man, motion of lawn roller.)
4. Analyze and design banking of roads and apply conservation of momentum principle to explain recoil of gun etc.
5. Define work, energy and power and their units. Derive work, power and energy relationship and solve problems about work and power State the principle of conservation of energy.
6. Identify forms of energy, conversion from one form to another. Compare and contrast the physical properties associated with linear motion and rotational motion and give examples of conservation of angular momentum.
7. Describe the surface tension phenomenon and its units, cause of surface tension and effects of temperature on surface tension.
8. Describe the viscosity of liquids. Define stress and strain. State Hooke's law and conditions under which it is valid.
9. Measure temperature in various processes on different scales (Celsius, Kelvin Fahrenheit etc.)
10. Distinguish between conduction, convection and radiation.
11. Use equipment like Vernier caliper, screw gauge, spherometer.

Contents	Hrs.
PART-1 Vector algebra. Scalar and vector products. Derivatives of a vector with respect to a parameter.	**4**
PART-2 **Elasticity:** Hooke's law - Stress-strain diagram - Elastic Moduli-Relation between elastic constants - Poisson's Ratio-Expression for Poisson's ratio in terms of elastic constants - Work done in stretching and work done in twisting a wire - Twisting couple on a cylinder	**14**

- Determination of Rigidity modulus by static torsion - Torsional pendulum- Determination of Rigidity modulus and moment of inertia - q, η and s by Searle's method.	
PART-3 **Momentum and Energy:** Conservation of momentum. Work and energy. **Conservation of Energy.** Motion of rockets. **Rotational Motion:** Angular velocity and angular momentum. Torque. Conservation of angular momentum. **Laws of Motion:** Frames of reference. Newton's Laws of motion. Dynamics of a System of particles. Centre of Mass.	**12**
PART-4 **Gravitation:** Newton's Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Kepler's Laws (statement only). Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness. Basic idea of global positioning system (GPS).	**10**
PART-5 **Oscillations:** Simple harmonica motion. Differential equation of SHM and its solutions. Kinetic and Potential Energy, Total Energy and their time averages. Damped Oscillations.	**10**
PART-6 **Special Theory of Relativity:** Constancy of speed of light. Postulates of Special Theory of Relativity. Length contraction. Time dilation. Relativistic addition of Velocities.	**10**

Instructional Strategy:

1. Teacher may use various teaching aids like models, charts, graphs and experimental kits etc. for imparting effective instructions in the subject.
2. Students need to be exposed to use of different sets of units and conversion from one unit type to another. Software may be used to solve problems involving conversion of units.
3. The teacher should explain about field applications before teaching the basics of mechanics, work, power and energy, rotational motion, properties of matter etc. to develop proper understanding of the physical phenomenon.
4. Use of demonstration can make the subject interesting and develop scientific temper in the students.

Recommended Books:

1. F.W. Sears, M.W. Zemansky and H.D. Young, 'University Physics', 13th Edn., Addison Wesley, **1986**.
2. Charles Kittel, et. Al., 'Mechanics Berkeley Physics Course', Vol.-1, Tata McGraw Hill, **2007**.

PHYSICS LAB.

Subject Code: BAEE3-213 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

S.N.	Contents	Hrs.
01	Measurements of length (or diameter) using Vernier caliper, screw gauge and	**6**
02	Travelling microscope.	**6**
03	To determine the Height of a Building using a Sextant.	**6**
04	To determine the Moment of Inertia of a Flywheel.	**6**
05	To determine the Young's Modulus of a Wire by Optical Lever Method.	**6**

06	To determine the Modulus of Rigidity of a Wire by Maxwell's needle.	**6**
07	To determine the Elastic Constants of a Wire by Searle's method.	**6**
08	To determine g by Bar Pendulum.	**6**
09	To determine g by Kater's Pendulum.	**6**
10	To determine g and velocity for a freely falling body using Digital Timing technique	**6**

QUALITY MANAGEMENT SYSTEM

Subject Code: BAEE3-214 **L T P C** **Duration: 90 Hrs.**
5 1 0 6

Rationale:
A quality management system (QMS) is a formalized system that documents processes, procedures, and responsibilities for achieving quality policies and objectives. A QMS helps coordinate and direct an organization's activities to meet customer and regulatory requirements and improve its effectiveness and efficiency on a continuous basis. Quality management systems serve many purposes, including:

1. Improving processes
2. Reducing waste
3. Lowering costs
4. Facilitating and identifying training opportunities
5. Engaging staff
6. Setting organization-wide direction

The aim of quality management system is to improve understanding of what customers really want in the way of services the organisation produces and to ensure that it consistently delivers exactly what is expected. For this purpose, AME students in this course are required to teach the quality management system to develop knowledge to maintain consistently the standard of maintenance work carried out with economy.

Learning Outcomes:
After undergoing this course, the students will be able to:

1. Meaning of Quality and quality improvement.
2. Need of quality control in aviation industry.
3. Quality audit, Total quality management, Concept of Zero defect.
4. ISO-9001 quality systems, IAQG, AS-9100 Aerospace standards.
5. DGCA, FAA, EASA and IATA Requirements and Standards Aerospace Quality manuals, aircraft airworthiness, documentation, Safety practices & standards. Quality policy.
6. Auditing techniques, recording findings, communication, assessing compliance action and monitoring compliance.

Contents	Hrs.
Module-I **Introduction** Descriptors/Topics Meaning of Quality and quality improvement, need of automobile & Aviation Quality, Introduction to Statistical methods for quality control, Process Capability for aerospace applications.	**16**

Module-II **Quality Control** Statistical Quality Control, Ishikawa diagram, control charts, Control charts for attributes & variables, Moving average chart for aviation Quality systems.	**14**
Module-III **Production Control** Acceptance Sampling, OC curve, Sampling Plan, Producer's risk, Consumer's risk, Average Quality Level, AOQL, Design of Single & double sampling plan.	**12**
Module-IV **Quality Assurance** Need of Aerospace Quality Assurance, Quality Audit, total quality management, Concept of Zero defects, ISO-9001 quality systems, IAQG, AS-9100 Aerospace Standards.	**12**
Module-V **Aerospace Certification** DGCA, FAA, EASA and IATA Requirements and Standards Aerospace Quality manuals, aircraft airworthiness, documentation, Safety practices & standards. Quality Policy, Objective, Quality Requirements, Quality procedures and evidence retention.	**7**
Module-VI **Regulatory Compliance** Quality Standards / Regulatory Compliance – Compliance Records.	**2**
Module-VII **Audit and Surveillance** Auditing techniques, recording findings, communication, assessing compliance action and monitoring compliance. Statistical analysis and risk assessment. Risk based surveillance.	**12**

Instructional Strategy:

While imparting instructions, teacher should give demonstration of various figures and diagrams concerned to quality management system to the students. Different transparencies and animated projections should be shown to the students for better understanding of the lesson.

Recommended Books:

1. E.L. Grant & R.S. Leavenworth, 'Statistical Quality Control', McGraw Hill Co.
2. M. Mahajan, 'Statistical Quality Control', Dhanpat Rai & Co.
3. Kanishka Bedi, 'Quality Management', Oxford University Press.
4. ISO 9001
5. AS 9100
6. DGCA – Civil Aviation Requirements
7. IATA – IOSA Standards Manual

TUTORIAL	
Contents	**Hrs.**
Develop Typical Quality System for five specific activities of aircraft maintenance industry.	**5**
Carryout audit of five specific activities of aircraft maintenance industry establish regulatory compliance and record recommendation.	**5**

Carryout audit of five specific activities of aircraft maintenance industry record findings, document evidence, communicate findings, verify action taken and root cause assessment and carryout risk assessment.	**5**

AIRCRAFT STRUCTURE AND ASSOCIATED SYSTEMS

Subject Code: BAEE3-315 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale:
As the AME students will involve in maintenance, repair and overhauling of aircraft in future, they must be well versed in identifying the parts of aircraft and understanding their functions. Hence, learning the basic term of aviation, the concepts of aircraft structure and control surfaces are mandatory.

Learning Outcomes:
After undergoing the subject, students will be able to have the adequate knowledge on the following:

1. General terms and terminologies of aviation
2. Major and minor parts of aircraft and their functioning
3. Types of aircraft structure
4. Classification of aircraft structure
5. Fasteners and rivets being used in aircraft
6. Loads acting on aircraft during flight
7. Rigging and symmetry checks
8. Mass balancing and aerodynamic balancing
9. Attachment of wings
10. Aircraft surface protection

Contents	Hrs.
Introduction to General term and vocabulary used in Aeronautical Science ➢ Introduction to aircraft technical literature. ➢ Introduction to ATA system	**4**
Introduction to aircraft, major aircraft components, aircraft systems and their functions, reference lines, station and zone identification systems	**4**
Airframe Structures — General Concepts ➢ Airworthiness requirements for structural strength; Structural classification, primary, secondary and tertiary; Fail safe, safe life, damage, tolerance concepts; Zonal and station identification systems; Stress, strain, bending, compression, shear, torsion, tension, hoop stress, fatigue; Lightning strike protection provision. Drains and ventilation provisions, System installation provisions Aircraft bonding and continuity. ➢ Construction methods of: stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers, struts, ties, beams, floor structures, reinforcement, methods of skinning, anti-corrosive protection, wing, empennage and engine attachments; ➢ Describe current practice in aircraft design related to load transfer, load path continuity and reduction of stress raisers in pressurized fuselages.	**20**
Fasteners used on Aircraft ➢ Fasteners, Screw threads: Screw nomenclature; thread forms, dimensions and tolerances for standard threads used in aircraft; measuring screw threads; ➢ Bolts, studs and screws	**4**

➢ Bolt types: specification, identification and marking of aircraft bolts, international standards; ➢ Nuts: self-locking, anchor, standard types; Machine screws: aircraft specifications; ➢ Studs: types and uses, insertion and removal; Self tapping screws, dowels. ➢ Aircraft rivets: Types of solid and blind rivets: specifications and identification, heat treatment. ➢ Riveting: Riveted joints, rivet spacing and pitch; Tools used for riveting and dimpling; Inspection of riveted joints.	
Structural Assembly ➢ Structural assembly techniques: riveting, bolting, bonding. ➢ Methods of surface protection, such as chromating, anodising, painting, Surface cleaning. ➢ Airframe symmetry: Methods of alignment and symmetry checks. ➢ Complete airframe for symmetry fuselage for twist and bending, vertical stabiliser for alignment wings and horizontal stabilisers for dihedral and incidence.	**4**
Airframe Structures — Aeroplane ➢ Fuselage (ATA 52/53/56): Construction and pressurisation sealing ➢ Wing, stabiliser, pylon and undercarriage attachments ➢ Seat installation and cargo loading system ➢ Doors and emergency exits: construction, mechanisms, operation and safety devices ➢ Windows and windscreen construction and mechanisms	**10**
Wings (ATA 57) ➢ Anhedral, dihedral and incidence angle ➢ Inter-plane struts ➢ Longitudinal dihedral ➢ Rigging position ➢ Stagger ➢ Wash in and Washout ➢ Construction ➢ Fuel storage ➢ Landing gear ➢ Pylon ➢ Control surface ➢ High lift/drag attachments.	**4**
Stabilizers ➢ Construction ➢ Control surface attachment.	**4**
Flight Control Surfaces (ATA 55/57) ➢ Construction and attachment ➢ Balancing -- mass and aerodynamic.	**4**
Nacelles/Pylons (ATA 54) ➢ Construction ➢ Firewalls ➢ Engine mounts	**2**

Instructional Strategy:

1. Teachers should lay special emphasis in making the students conversant with the parts of aircraft and their functions, aviation terms and terminologies, types of aircraft constructions and materials used.
2. Use of audio-visual aids/video films should be made to show specialized operations.

3. Exposure to aircrafts parts
4. Observing the flying of aircraft: operation of control surfaces and high lift/drag devices during landing and take off
5. Demonstration of the functions of aircraft parts and control surfaces.

Reference Books:

1. Aircraft handbook FAA (AC 65-15 A)
2. Aircraft structure Ch. 01 (FAA)
3. Aircraft Construction Repair and Inspection-By Joe Christy
4. Aviation Maintenance Technician Hand book by FAA
5. Aircraft Maintenance and Repair- Delp /Bent/McKinley,
6. AC 43.1B

AIRCRAFT STRUCTURE AND ASSOCIATED SYSTEMS LAB.

Subject Code: BAEE3-316 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

S.N.	Contents	Hrs.
01	Identifying aircraft reference lines, station and zone numbers	4
02	Identification of major structural members of fixed wing aircraft. Loads on major structural members.	4
03	Identification of detail structural members of aircraft and loads acting on these structural members.	4
04	Aircraft structure construction	4
05	Aircraft structural assembly, joints and lightning protection	4
06	Identification of components of flight control surfaces and methods of mass balancing	4
07	Control surface, landing gear and engine attachment	4
08	Identification of type of Fuselage and method of pressure sealing Identification of Pressure bulkheads and unpressurised bulkheads	4
09	Common structural defects, simple inspection technique and recording	8
10	Types of rivets, defects, inspection of riveted joints and structure	8
11	Construction (Modelling) of various types structural joints	8
12	Check aircraft symmetry	4

ELECTRICAL FUNDAMENTALS-II

Subject Code: BAEE3-317 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale:

Electricity & Magnetism is devoted to the utilization of the forces of nature and materials for the benefits of mankind. Harnessing the vast sources of energy and transforming them to the most convenient form (electrical) for the overall benefit of the society for sustenance is prime objective. For this purpose, it is necessary to teach the students basics of electrical science, fundamental laws of electricity and different electrical components. This subjects aims at developing knowledge of electricity and its application used in domestic and aviation Industries.

Learning Outcomes:

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

1. Understand about sources of electrical energy.
2. Understand about construction and working of battery.

3. Understand about construction and working of DC & AC generators.
4. Distinguish between bonding, grounding and shielding.
5. Understand about electrical cable and connectors.
6. Distinguish between wire stripping, crimping & splicing.
7. Understand about electromagnetic interference (EMI).
8. Understand about electrostatic sensitive devices.

Contents	Hrs.
Generation of Electricity Elementary knowledge on generation of electricity by the following methods: light, heat, friction, pressure, chemical action, magnetism and motion.	**04**
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.	**04**
DC Motor/Generator Theory Basic motor and generator theory; Construction and purpose of components in DC generator; Operation of DC generator, factors affecting output & direction of current flow in DC generators; Operation of DC motor and factors affecting output power, torque, speed and direction of rotation of DC motors; series wound, shunt wound and compound motors; Starter Generator construction.	**09**
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 & uses; Permanent Magnet Generators.	**09**
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.	**08**
Power Power, work and energy (kinetic and potential); Dissipation of power by a resistor; power formula; Calculations involving power, work and energy	**08**
Aircraft Electrical Cables and Connectors a) Cable types, construction and characteristics; High tension and co-axial cables; Crimping; Connector types, pins, plugs, sockets, insulators, current and voltage rating, coupling, identification codes. b) Electrical Wiring Interconnection System (EWIS) Continuity, insulation and bonding techniques and Testing; Use of crimp tools: hand and hydraulic operated; testing of crimp joints; Connector pin removal and insertion; Co-axial cables: testing & installation precautions; Identification of wire types, their inspection criteria and damage tolerance, Wiring protection techniques: Cable looming and loom support, cable clamps, and protective sleeving techniques including heat shrink wrapping, shielding. EWIS installations, inspection, repair, maintenance and cleanliness standards.	**08**

Electromagnetic Environment influence of the following phenomena on maintenance practices for electronic system:- Electromagnetic Compatibility EMC; Electromagnetic Interference EMI; High Intensity Radiated Field HIRF; Lightning/lightning protection	**06**
Electro Sensitive Devices Special handling of components sensitive to electrostatic discharges; awareness of risks and possible damage, component and personnel anti-static protection devices.	**04**

Instructional Strategy:
While imparting instructions, teacher must show various images or videos related to Topic by using projector. Students should be asked to collect different electrical Components available in the market. Visits to industry should be planned to demonstrate Electrical power generation, distribution & utilization in the industry.

Recommended Books:
1. B.L. Theraja, 'Electrical Technology'.
2. E.H.J. Pallett, 'Aircraft Electrical System'.
3. Thomas K. Eismin, 'Aircraft Electricity and Electronics'.

ELECTRICAL FUNDAMENTALS-II LAB.

Subject Code: BAEE3-318 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

S.N.	Contents	Hrs.
01	Generation of electricity by light, heat, chemical action, magnetism & motion.	**4**
02	Construct power sources using primary and secondary cells.	**4**
03	Construct a model to study usage of thermo-cell and photo-cell.	**4**
04	Construct a model to generate DC power using different method of coil Arrangements (series and shunt) to understand their Usage.	**4**
05	Construct a model of DC motor using different method of coil arrangements (series and shunt) to understand their Usage.	**4**
06	Construct a model to generate single/poly phase AC power to understand their usage.	**4**
07	Construct a model of AC motor using single/ poly phase arrangements to understand their usage.	**4**
08	Measure amount of power dissipated by various resistors; calculation of power	**4**
09	Using at least two crimping systems, select appropriate cable crimping tools and crimp cables to prepare cable ends or plug / socket terminals.	**4**
10	Check an aircraft electrical circuit for continuity in conjunction with an electrical wiring diagram.	**4**
11	Identify cables and cables values by reference to the maintenance manuals. Identify a range of electrical component symbols.	**4**
12	Inspection of electrical cable looms / bundles and cable trunking.	**4**
13	Select and use appropriate cable stripping tools and solder cables to single and multipin connectors / tag boards.	**4**
14	Prepare, and install a simple loom, using at least two binding methods.	**4**
15	Identification of various fasteners and locking devices used in aircraft.	**4**

GAS TURBINE ENGINE

Subject Code: BAEE3-319 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale:
Lot of development has taken place in the field of gas turbine engine. New engine designs and technology are being developed continuously since its inception. AME students in this course are required to have knowledge of various types of turbine engines and its applications. For this purpose, it is necessary to teach them basics of the construction, systems of gas turbine engines fitted in aircraft. This subject aims at developing knowledge about the basic design and functioning of different turbine engine systems used in the Aircraft industries.

Learning Outcomes:
After undergoing this course, the students will be able to:
1. Understand principle of operation, basic design and construction of gas turbine engines.
2. Classify different types of turbine engines.
3. Know characteristics, properties and identification of engines used in aircraft.
4. Understand about fuel, oil and ignition system components of the engine.
5. Know about starting system, power augmentation system, fire protection system of the engine.
6. Gas turbine engine monitoring, ground operation engine preservation and storage techniques.

Contents	Hrs.
Fundamentals Potential energy, kinetic energy, Newton's laws of motion, Brayton cycle; The relationship between force, work, power, energy, velocity, acceleration; Constructional arrangement and operation of turbojet, turbofan, turbo shaft, turboprop.	**3**
Engine Performance Gross thrust, net thrust, choked nozzle thrust, thrust distribution, resultant thrust, thrust horsepower, equivalent shaft horsepower, specific fuel consumption; Engine efficiencies; By-pass ratio and engine pressure ratio; Pressure, temperature and velocity of the gas flow; Engine ratings, static thrust, influence of speed, altitude and hot climate, flat rating, limitations.	**3**
Inlet Compressor inlet ducts; Effects of various inlet configurations; Ice protection.	**2**
Compressors Axial and centrifugal types; Constructional features and operating principles and applications; Fan balancing; Operation: Causes and effects of compressor stall and surge; Methods of air flow control: bleed valves, variable inlet guide vanes, variable stator vanes, rotating stator blades; Compressor ratio.	**4**
Combustion Section Constructional features and principles of operation.	**2**
Turbine Section Operation and characteristics of different turbine blade types; Blade to disk attachment; Nozzle guide vanes; Causes and effects of turbine blade stress and creep.	**3**
Exhaust Constructional features and principles of operation; Convergent, divergent and variable area nozzles; Engine noise reduction; Thrust reversers.	**2**
Bearings and Seals Constructional features and principles of operation and handling .	**2**

Lubricants and Fuels Properties and specifications; Fuel additives; Safety precautions.	**1**
Lubrication Systems System operation/lay-out and components.	**2**
Fuel Systems Operation of engine control and fuel metering systems including electronic engine control (FADEC); Systems lay-out and components.	**3**
Air Systems Operation of engine air distribution and anti-ice control systems, including internal cooling, sealing and external air services.	**3**
Starting and Ignition Systems Operation of engine start systems and components; Ignition systems and components; Maintenance safety requirements.	**3**
Engine Indication Systems Exhaust Gas Temperature/ Inter-stage Turbine Temperature; Engine Thrust Indication: Engine Pressure Ratio, engine turbine discharge pressure or jet pipe pressure systems; Oil pressure and temperature; Fuel pressure and flow; Engine speed, Propeller Speed; Vibration measurement and indication; Torque; Power.	**4**
Power Augmentation Systems Operation and applications; Water injection, water methanol; Afterburner systems.	**2**
Turbo-prop Engines Gas coupled/free turbine and gear coupled turbines; Reduction gears; Integrated engine and propeller controls; Over-speed safety devices.	**3**
Turbo-shaft Engines Arrangements drive systems, reduction gearing, couplings, control systems.	**3**
Auxiliary Power Units (APUs) Purpose, operation, protective systems.	**3**
Power Plant Installation Configuration of firewalls, cowlings, acoustic panels, engine mounts, anti-vibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables and rods, lifting points and drains.	**3**
Fire Protection Systems Operation of detection and extinguishing systems.	**2**
Engine Monitoring and Ground Operation Procedures for starting and ground run-up; Interpretation of engine power output and parameters; Trend (including oil analysis, vibration and boroscope) monitoring; Inspection of engine and components to criteria, tolerances and data specified by engine manufacturer; Compressor washing/cleaning; Foreign Object Damage.	**4**
Engine Storage and Preservation Preservation and de-preservation for the engine and accessories/ systems.	**3**

Instructional Strategy:

While imparting instructions, teacher should give demonstration of various types of gas turbine engines, its systems and components, to the students. Different mock ups, transparencies and animated videos should be shown to the students for better understanding of the lesson.

Recommended Books:

1. Irwine Treager, 'Aircraft Gas Turbine Technology'.
2. Rolls Royce, 'The Jet Engine'.
3. 'Power Plant Section Text Book', (EA-ITP-P).

4. Dale Crane, 'Aviation Maintenance Technician Series'.
5. Jack V. Casamassa and Ralph D. Bent,' 'Jet Aircraft Power Systems'.
6. Turbomeca, 'Gas Turbine Engines'. Bordes, France.
7. M. Guillon, 'Hydraulic Servo Systems'.
8. John Anderson, 'Introduction to Flight'.
9. 'Civil Aircraft Inspection Procedure (CAP459) Part-II Aircraft'.
10. M.J. Kroes, T.W. Wild, R.D. Bent and J.L. McKinley, 'Aircraft Power Plants'.

GAS TURBINE ENGINE LAB.

Subject Code: BAEE3-320 **L T P C** **Duration: 60 Hrs.**
0 0 4 0

S.N.	Contents	Hrs.
01	Identify engine types, modules and subassemblies and components of turbine engines .	2
02	Identify various parts of thrust management and bypass system of turbine engine.	2
03	Identification and inspection of compressors stages.	2
04	Engine compressor surge and stall management components and control.	2
05	Identification various components of combustion systems and methods of cooling's.	2
06	Identification of exhaust system and methods of noise reduction.	2
07	Identification and inspection of components of thrust reversal system.	2
08	Identify normal & electronic fuel control, monitoring and indication system.	6
09	Familiarization with methods of engine starting and ignition systems.	4
10	Operation check of Engine indicating systems.	4
11	Familiarization of APU starting and shutdown procedure.	4
12	Familiarization with power plant removal & installation.	8
13	Visual Inspection of engines.	4
14	Typical engine control rigging.	6
15	Familiarization with engines and airframe interface.	4
16	Testing of engine fire monitoring and extinguishing operation.	4
17	Study engine storage and preservation.	2

AIRCRAFT SYSTEMS-I

Subject Code: BAEE3-321 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale:
This subject provides the knowledge about handling procedures of aircraft on ground which includes weighing, balancing, taxiing, re-fuelling/defueling procedures and will enable the students to comprehend the theory, concepts and working of pneumatic, Air conditioning and cabin pressurization system. This will help them to troubleshoot the faults in the systems

Learning Outcomes:
Key areas of study include:
1. Aircraft handling and effects of environmental conditions on it and its storage.
2. Emergency equipment requirements, cabin lay-out and cargo handling and retention equipment
3. Airframe systems; including hydraulic, pneumatic, and environmental control systems etc.

Contents	Hrs.
Aircraft Weight and Balance a) Centre of Gravity/Balance limits calculation: use of relevant documents; b) Preparation of aircraft for weighing; Aircraft weighing.	**4**
Aircraft Handling and Storage Aircraft taxiing/towing and associated safety precautions; Aircraft jacking**,** chocking, securing and associated safety precautions; Aircraft storage methods; Refuelling /defueling procedures; De-icing/anti-icing procedures; Electrical, hydraulic and pneumatic ground supplies. Effects of environmental conditions on aircraft handling and operation.	**5**
Pneumatic/Vacuum (ATA 36) System lay-out; Sources: engine/APU, compressors, reservoirs, ground supply; Pressure control; Distribution; Indications and warnings; Interfaces with other systems.	**8**
Air Conditioning and Cabin Pressurization (ATA 21) 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.	**8**
Equipment and Furnishings (ATA 25) Emergency equipment requirements; Seats, harnesses and belts, Electronic emergency equipment requirements Cabin lay-out, cargo retention; Equipment lay-out; Cabin Furnishing Installation; Cabin entertainment equipment; Galley installation; Cargo handling and retention equipment; Air stairs. Lifting system; Emergency flotation systems;	**6**
Flight Controls (ATA 27) Primary controls: aileron, elevator, rudder, spoiler; Trim control; Active load control; High lift devices; Lift dump, speed brakes; System operation: manual, hydraulic, pneumatic, electrical, fly-by-wire; Artificial feel, Yaw damper, Mach trim, rudder limiter, gust locks systems; Balancing and rigging; Stall protection/warning system.	**8**
Fuel Systems (ATA 28) 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.	**8**
Hydraulic Power (ATA 29) System lay-out; Hydraulic fluids; Hydraulic reservoirs and accumulators; Pressure generation: electric, mechanical, pneumatic; Emergency pressure generation; Filters; Pressure Control; Power distribution; Indication and warning systems; Interface with other systems.	**5**
Ice and Rain Protection (ATA 30) Ice formation, classification and detection; Anti-icing systems: electrical, hot air and chemical; De-icing systems: electrical, hot air, pneumatic and chemical; Rain repellant; Probe and drain heating; Wiper systems.	**3**
Landing Gear (ATA 32) Construction, shock absorbing; Extension and retraction systems: normal and emergency; Indications and warning; Wheels, brakes, antiskid and auto-braking; Tyres; Steering; Air-ground sensing; Skids, floats.	**3**
Abnormal Events (ATA 05) a) Inspections following lightning strikes and HIRF penetration.	**2**

b) Inspections following abnormal events such as heavy landings and flight through turbulence.	

Instructional Strategy:
While imparting instructions, teacher should practically demonstrate the aircraft weighing and various procedures related to aircraft system on aircraft by referring aircraft manual. Students should be asked to maintain their log cards/ books.

Recommended Books:
1. 'Airframe and Power Plant Mechanics (AC 65-15A) -Airframe Hand Book FAA'.
2. 'Civil Aircraft Inspection Procedure (CAP 459) Part II Aircraft'.
3. Jeppesen, 'A & P Technician Air Frame Text Book'.
4. Larry Reithmaier, 'Aircraft Repair Manual (FAA-AC-43.13)'.
5. M. Guillon, 'Aviation Maintenance Technician Hand Book', FAA Hydraulic Servo Systems.
6. E.H.J. Pallett, 'Aircraft Instruments'.
7. E.H.J. Pallett, 'Aircraft Electrical System'.

AIRCRAFT SYSTEMS-I LAB.

Subject Code: BAEE3-322 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

S.N.	Contents	Hrs.
01	Jacking and leveling of an aircraft. Record caution, warnings and procedure	6
02	Locate and inspect Bleed components installed on aircraft and use maintenance manual	4
03	Locate and inspect components of air-conditioning system and indications and use maintenance manual.	4
04	Locate and inspect components of aircraft pressurization system and safety devises and use maintenance manual	4
05	Replace passenger seats and Check seat belts for serviceability.	4
06	Identification and inspection of flight control system	4
07	Rigging and operational check flight control systems	8
08	Identification and inspection of landing gear systems. Wheel and Brake removal / installation.	12
09	Identification and inspection of Fuel system	4
10	Quantity Indicating systems functional testing.	4
11	Inspection of aircraft hydraulic system and servicing	6
12	Inspection for lightning strike protection.	2

ELECTRONIC FUNDAMENTALS AND DIGITAL TECHNIQUES-I

Subject Code: BAEE3-423 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale:
This subject comes under the Core Technology group and will enable the students to comprehend the theory, concepts, characteristics and working principles of basic electronic devices and their applications in electronic circuits. The knowledge of various devices acquired by the students will help them to design, test, troubleshoot and repair electronic circuits

Learning Outcomes:

1. After undergoing this course, the students will be able to:
2. Classify various types of Diodes and transistors
3. Characteristics, and properties of Operational Amplifier
4. Acquire knowledge about printed circuit board.
5. Know about principle of operation of resolvers, differential, control and torque.
6. Classification of numbering system
7. To get knowledge about microprocessor

Contents	Hrs.
Semiconductors 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. Materials, electron configuration, electrical properties; P and N type materials: effects of impurities on conduction, majority and minority characters; PN junction in a semiconductor, development of a potential across a PN junction in unbiased, forward biased and reverse biased conditions; Operation and function of diodes in the following circuits: clippers, clampers, full and half wave rectifiers, bridge rectifiers, voltage doublers and triplers; Detailed operation and characteristics of the following devices: silicon controlled rectifier (thyristor), light emitting diode, Shottky diode, photo conductive diode, varactor diode, varistor, rectifier diodes, Zener diode.	**8**
Transistors Transistor symbols; Component description and orientation; Transistor characteristics and properties. Construction and operation of PNP and NPN transistors; Base, collector and emitter configurations; Testing of transistors. Basic appreciation of other transistor types and their uses. Application of transistors: classes of amplifier (A, B, C); Simple circuits including: bias, decoupling, feedback and stabilization; Multistage circuit principles: cascades, push-pull, oscillators, multi-vibrators, flip- flop circuits.	**8**
Integrated Circuits Description and operation of logic circuits and linear circuits/operational amplifiers. Description and operation of logic circuits and linear circuits; Introduction to operation and function of an operational amplifier used as: integrator, differentiator, voltage follower, comparator; Operation and amplifier stages connecting methods: resistive capacitive, inductive (transformer), inductive resistive (IR), direct; Advantages and disadvantages of positive and negative feedback Operation and use of encoders and decoders. , functions of encoders type. Uses of medium, large and very large scale integration.	**8**
Printed Circuit Boards Description and use of printed circuit boards.	**4**
Servomechanisms 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. Understanding of the following terms: Open and closed loop, follow up, servomechanism, analogue, transducer, null, damping, feedback, dead band; Construction operation and use of the following synchro system components: resolvers, differential, control and torque, E	**10**

and I transformers, inductance transmitters, capacitance transmitters, synchronous transmitters; Servomechanism defects, reversal of synchro leads, hunting.	
Numbering Systems Numbering systems: binary, octal and hexadecimal; Demonstration of conversions between the decimal and binary, octal and hexadecimal systems and vice versa.	**3**
Data Conversion Analogue Data, Digital Data; Operation and application of analogue to digital, and digital to analogue converters, inputs and outputs, limitations of various types.	**3**
Data Buses Operation of data buses in aircraft systems, including knowledge of ARINC and other specifications.	**3**
Logic Circuits Identification of common logic gate symbols, tables and equivalent circuits; Applications used for aircraft systems, schematic diagrams. Interpretation of logic diagrams.	**3**
Microprocessors Functions performed and overall operation of a microprocessor; Basic operation of each of the following microprocessor elements: control and processing unit, clock, register, arithmetic logic unit.	**6**
Fiber Optics Advantages and disadvantages of fiber optic data transmission over electrical wire propagation; Fibre optic data bus; Fiber optic related terms; Terminations; Couplers, control terminals, remote terminals; Application of fiber optics in aircraft systems	**4**

Instructional Strategy:
While imparting instructions, teacher should show various types of engineering materials to the students. Students should be asked to collect various electronics components available in the market.

Recommended Books:
1. Bemard Grob, 'Basic Electronics'.
2. Malvino, 'Digital Fundamentals'.
3. V.K. Mehta, 'Leech Principles of Electronics'.

ELECTRONIC FUNDAMENTALS AND DIGITAL TECHNIQUES-I LAB.

Subject Code: BAEE3-424 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

S.N.	Contents	Hrs.
01	Identification of basic electronic components (diodes, transistors), digital Multimeter, Function Generator and Oscilloscope	**4**
02	Practical on I-V Characteristics of (a) p-n junction Diode, and (b) Zener diode.	**4**
03	Study of Clipping and Clamping circuits	**4**
04	Conversion of A C Voltage using (a) Half wave rectifier and (b) Full wave rectifier (FWR).	**4**
05	Uses of basic electronic components (diodes, transistors),digital Multimeter, Function Generator and Oscilloscope	**4**
06	Construct a model to study fixed Bias and Voltage divider bias configuration for CE transistor.	**4**
07	Construct a model to study Single Stage CE amplifier of given gain	**4**
08	Construct a model to study correlation between different numbering systems	**4**

09	Construct a model to study digital to analogue converters	**4**
10	Construct a model to study typical data buses used in aircraft system.	**4**
11	Functions performed and overall operation of a microprocessor;	**4**
12	Demonstrate fiber optic data transmission over electrical wire propagation;	**4**
13	Construct a Universal Gates and test	**4**
14	Construct a flip flop circuit using elementary gates	**4**
15	Construct a seven segment display driver	**4**

AIRCRAFT MATERIALS AND HARDWARE

Subject Code: BAEE3-425 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale :
Lot of development has taken place in the field of materials and hardware. New materials are being developed and it has become possible to change the properties of materials to suit the requirements. AME students in this course are required to make use of different materials hardware for various applications. For this purpose, it is necessary to teach them basics of metal structure, properties, usage various ferrous and non-ferrous, Composite and Non-Metallic materials and various types of Fasteners used in aircraft. This subject aims at developing knowledge about the characteristics and usage of various types of materials aircraft hardware used in the Aircraft industries.

Learning Outcomes:
After undergoing this course, the students will be able to:
1. Distinguish between metals and non-metals and ferrous and non-ferrous materials.
2. Classify various types of metals and non-metals.
3. Characteristics, properties and identification of common alloy steels used in aircraft.
4. Characteristics, properties and identification of common non-ferrous materials used in aircraft;
5. Heat treatment and application of non-ferrous materials;
6. Characteristics, properties and identification of common composite and non-metallic materials, other than wood, used in aircraft.
7. Characteristics, properties and types of fabrics used in aeroplane; Inspections methods for fabric.
8. Thread forms, dimensions and tolerances for standard threads used in aircraft; measuring screw threads

Contents	Hrs.
Aircraft Materials — Ferrous (a) Characteristics, properties and identification of common alloy steels used in aircraft; Heat treatment and application of alloy steels; (b) Testing of ferrous materials for hardness, tensile strength, fatigue strength and impact resistance.	**12**
Aircraft Material — Non-Ferrous (a) Characteristics, properties and identification of common non-ferrous materials used in aircraft; Heat treatment and application of non-ferrous materials; (b) Testing of non-ferrous material for hardness, tensile strength, fatigue strength and impact resistance.	**12**
Aircraft Materials - Composite and Non- Metallic (a) Characteristics, properties and identification of common composite and non-metallic materials, other than wood, used in aircraft; Sealant and bonding agents.	**10**

(b) The detection of defects/deterioration in composite and non-metallic material. Repair of composite and non-metallic material.	
Wooden Structures Construction methods of wooden airframe structures; Characteristics, properties and types of wood and glue used in airplanes; Preservation and maintenance of wooden structure; Types of defects in wood material and wooden structures; The detection of defects in wooden structure; Repair of wooden structure.	**8**
Fabric covering & Non-Metals Characteristics, properties and types of fabrics used in aeroplane; Inspections methods for fabric; Types of defects in fabric; Repair of fabric covering.	**4**
Fasteners Screw threads Screw nomenclature; Thread forms, dimensions and tolerances for standard threads used in aircraft; measuring screw threads**;**	**2**
Bolts, studs and screws Bolt types: specification, identification and marking of aircraft bolts, international standards; Nuts: self-locking, anchor, standard types; Machine screws: aircraft specifications; Studs: types and uses, insertion and removal; Self tapping screws, dowels.	**2**
Locking devices Tab and spring washers, locking plates, split pins, palnuts, wire locking, quick release fasteners, keys, circlips, and cotter pins and techniques.	**2**
Aircraft rivets Types of solid and blind rivets: specifications and identification, heat treatment.	**4**
Riveting Riveted joints, rivet spacing and pitch; Tools used for riveting and dimpling; Inspection of riveted joints.	**4**

Instructional Strategy:

While imparting instructions, teacher should show various types of engineering materials to the students. Students should be asked to collect samples of various materials available in the market. Visits to industry should be planned to demonstrate use of various types of materials or Heat Treatment Processes in the industry.

Means of Assessment:

Assignments and quiz/class tests, mid-term and end-term written tests, model/prototype making

Recommended Books:

1. Aircraft handbook FAA (AC 65-15 A)
2. Civil Aircraft Inspection Procedures (CAIP 459-Part I, Basic)
3. Airframe & Power Plant Mechanics (General Handbook EA-AC 65-9A) FAA
4. Titterton, ‘Aircraft Materials & Processes’.
5. A.C. Parkinson, ‘Machine Drawing’.
6. Cindy Foreman Electricity, ‘Advanced Composites (EA-358)’.
7. CAIP 562

AIRCRAFT MATERIALS AND HARDWARE LAB.

Subject Code: BAEE3-426 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

S.N.	Contents	Hrs.
01	Testing of Non -Ferrous materials for hardness, tensile , Fatigue strength	4
02	Testing of ferrous materials for hardness, tensile , Fatigue strength	4
03	Identification of the characteristics and properties of common composite and non-metallic materials other than wood, used in aircraft.	4
04	Detection of defects/deterioration in composite and non-metallic material	4
05	Identification of the characteristics and properties of common types of wood and glue used in aircraft.	4
06	Identification and detection of defects in wood material and wooden structures	4
07	Simple repair of composite and non-metallic materials and structures	4
08	Inspection and Repair of wooden structures.	4
09	Identification of the characteristics and properties of common fabrics and adhesives used in wooden structure aircraft.	4
10	Identification of defects and Repair of fabric covering.	4
11	Use of basic tools and equipment for: cutting, forming and joining commonly used materials.	4
12	Identification of Aircraft metallic materials	4
13	Identification of aircraft non-materials used on aircraft	4
14	Identification of various rivets and use of any one riveting technique	4
15	Identification of various fasteners and locking devices used in aircraft	4

AIRCRAFT MAINTENANCE PRACTICES

Subject Code: BAEE3-427 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale :
Aircraft Maintenance Engineers are responsible for the maintenance and repair of aircraft for this purpose they must have proper knowledge of aircraft maintenance procedures and tools used for maintenance. Proper handling, care and controls of their personal tools.

Learning Outcomes:
After undergoing this course, the students will be able to:
1. Aspects of safe working practices- Aircraft and workshop.
2. Knowledge on fire and extinguishing agents.
3. Care, control and use common hand tools, Common power tools.
4. Use of precision measuring tools.
5. Lubrication equipment and methods.
6. Engineering Drawings, Diagrams and Standards.
7. Classes of fits
8. Standard methods for checking shafts, bearings and other parts.
9. Causes of corrosion. Types of corrosion and their identification.
10. Welding, Brazing, Soldering and Bonding methods.
11. Disassembly, Inspection, Repair and Assembly Techniques.
12. Maintenance Procedures
13. Power Transmissions
14. Bearings, Control Cables, Pipes and Hoses and springs

Contents	Hrs.
Safety Precautions-Aircraft and Workshop Aspects of safe working practices including precautions to take when working with electricity, gases especially oxygen, oils and chemicals; Instructions on 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.	**4**
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.	**4**
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**
Engineering Drawings, Diagrams and Standards 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.	**4**
Fits and Clearances 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.	**4**
Corrosion a) Chemical fundamentals; Formation by, galvanic action process, microbiological stress; b) Types of corrosion and their identification; Causes of corrosion; Material types, susceptibility to corrosion.	**6**
Welding, Brazing, Soldering and Bonding a) Soldering methods; inspection of soldered joints. b) Welding and brazing methods; Inspection of welded and brazed joints; Bonding methods and inspection of bonded joints.	**5**
Disassembly, Inspection, Repair and Assembly Techniques a) Types of defects and visual inspection techniques. Corrosion removal, assessment and re-protection. b) General repair methods, Structural Repair Manual; Ageing, fatigue and corrosion control programs; c) Non-destructive inspection techniques including, penetrant, radiographic, eddy current, ultrasonic and borescope methods. d) Disassembly and re-assembly techniques. e) Trouble shooting techniques	**9**
Maintenance Procedures 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	**3**

Bearings Purpose of bearings, loads, material, construction; Types of bearings and their application. Testing, cleaning and inspection of bearings; Lubrication requirements of bearings; Defects in bearings and their causes.	**3**
Transmissions Gear types and their application; Gear ratios, reduction and multiplication gear systems, driven and driving gears, idler gears, mesh patterns; Belts and pulleys, chains and sprockets. Inspection of gears, backlash; Inspection of belts and pulleys, chains and sprockets; Inspection of screw jacks, lever devices, push-pull rod systems.	**3**
Control Cables Types of cables; End fittings, turnbuckles and compensation devices; Pulleys and cable system components; Bowden cables; Aircraft flexible control systems. Swaging of end fittings; Inspection and testing of control cables; Bowden cables; aircraft flexible control systems.	**3**
Pipes and Unions (a) Identification of, and types of rigid and flexible pipes and their connectors used in aircraft; (b) Standard unions for aircraft hydraulic, fuel, oil, pneumatic and air system pipes.	**3**
Pipes and Hoses Bending and belling/flaring aircraft pipes; Inspection and testing of aircraft pipes and hoses; Installation and clamping of pipes.	**3**
Springs Types of springs, materials, characteristics and applications. Inspection and testing of springs.	**2**

Instructional Strategy:
While imparting instructions, teacher should show various types of tools used in Aircraft Maintenance to the students. Visits to Aircraft Maintenance workshop should be planned to demonstrate use of various types of tools.

Recommended Books:
1. Airframe and Power Plant Mechanics (AC 65-15A)-Airframe Hand Book FAA
2. Civil Aircraft Inspection Procedure (CAP 459) Part II Aircraft
3. Kroes, Watkin and Delph, 'Aircraft Maintenance and Repair'.
4. Acceptable Methods, Techniques and practices (FAA)-EA-AC 43.13-1 A & 2A.
5. FAA, 'Aviation Maintenance Technician Hand Book'.

AIRCRAFT MAINTENANCE PRACTICES LAB.

Subject Code: BAEE3-428 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

S.N.	Contents	Hrs.
01	Draw different projections of a given object – Three View Diagram simple object, structural member, and joints	**12**
02	Fit and remove thread inserts	**4**

03	Use of precision measuring instruments, selection, handling of instruments and marking	**6**
04	Removal and installation of hydraulic system pressurized / unpressurized components – safety, handling precautions, selection of appropriate tools and manuals. Use zonal numbers to record location. Use parts catalogue & component location manual to locate components. Identify pipes and hoses	**6**
05	Removal and installation of pneumatic system pressurized / unpressurized components – safety, handling precautions, selection of appropriate tools and manuals. Use zonal numbers to record location. Use parts catalogue & component location manual to locate components. Identify pipes and hoses	**6**
06	Removal and installation of oxygen system components – safety, handling precautions, selection of appropriate tools and manuals. Use zonal numbers to record location. Use parts catalogue & component location manual to locate components. Identify pipes and hoses	**4**
07	Visual inspection of various types of surface defects of aircraft structure using simple aids like magnifying glass, light and mirror. Use zonal and station numbers to record defect location	**8**
08	Visual inspection of various types of surface defects of aircraft structure and system components like bearings, gears, chain, pulley, spring and cables using simple aids like magnifying glass, light and mirror and record defects.	**8**
09	Selection and use of lubrication technique of bearings, flight / engine / propeller controls and undercarriages. Identifying lubricants.	**2**

AVIONICS

Subject Code: BAEE3-429 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale :

Maxwell first suggested the existence of electromagnetic waves in 1864. In 1894, Marconi demonstrated the commercial potential of the phenomenon that Maxwell predicted and Hertz actually used in his apparatus. Marconi's system of wireless telegraphy proved to be invaluable for maritime communications. The use of radio equipment & avionics in general has increased markedly for all types of aircraft during the past century. Today the term avionics, which is a combination of the words aviation electronics, encompasses a variety of electronic system. This subjects aims at developing knowledge of avionics system installed in aircraft can include communications (COMM), navigation (NAV) & autopilot.

Learning Outcomes:

After undergoing this syllabus, the students will be able to:

1. Understand about function of aircraft radio communication system.
2. Understand about function of aircraft radio navigation system.
3. Understand about automatic flight control system.
4. Understand about on board maintenance system.
5. Understand about on board information sharing system.
6. Understand about Avionic General Test Equipment.

Contents	Hrs.
Communication (ATA 23) Fundamentals of radio wave propagation, antennas, transmission lines, communication, receiver and transmitter; Working principles of following systems: Very High Frequency	**08**

(VHF) communication; High Frequency (HF) communication; Audio; Emergency Locator Transmitters; Cockpit Voice Recorder; ARINC communication and reporting.	
Navigation (ATA 34) Very High Frequency omnidirectional range (VOR); Automatic Direction Finding (ADF); Instrument Landing System (ILS); Microwave Landing System (MLS); Distance Measuring Equipment (DME); Very Low Frequency and hyperbolic navigation(VLF/Omega); Doppler navigation; Area navigation RNAV systems; Flight Management Systems (FMS); Global Positioning System (GPS), Global Navigation Satellite Systems (GNSS); INS (Inertial Navigation System); Air Traffic Control transponder, secondary surveillance radar; Traffic Alert and Collision Avoidance System(TCAS). Weather Avoidance Radar; Radio altimeter; Inertial reference system (IRS).	**18**
Auto-flight (ATA 22) Fundamentals of automatic flight control including working principles and current terminology; Flight Director System; Command signal processing; Modes of operation - roll, pitch and yaw channels; Yaw dampers; Auto-throttle systems; Automatic Landing Systems - principles & categories, modes of operation: Approach, glide slope, land, go-around; system monitors and failure conditions. Fly by Wire (FBW).	**15**
On board Maintenance Systems (ATA 45) Central maintenance computers; Data loading system; Electronic library system; Printing; Structure monitoring (damage tolerance monitoring). Software management control: Awareness of restrictions, airworthiness requirements and possible catastrophic effects of unapproved changes to software programmes.	**05**
Information Systems (ATA 46) 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 functions 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; Aircraft General Information System; Flight Deck Information System; Maintenance Information System; Passenger Cabin Information System; Miscellaneous Information System.	**10**
Avionic General Test Equipment Operation, function and use of avionic general test equipment. Cabin System; Information system.	**04**

Instructional Strategy:

While imparting instructions ….

1. Instructor must show various images, videos & animation related to the topic with the help of projector (OHP).
2. With the help of Aircraft Flight Simulator demonstrate different aircraft radio system to the students.
3. Arrange visit to different Airline & MROs to demonstrate functioning of different aircraft system and its components installed into actual aircraft engage into operation.

Recommended Books:

1. E.H.J. Pallett, ‘Micro Electronics Aircraft System’.
2. James W. Wasson, ‘Avionics Systems Operation & Maintenance’.
3. Thomas K. Eismin, ‘Aircraft Electricity and Electronics’.

4. Civil Aircraft Inspection Procedure (CAP 459) – Part-II (Aircraft).
5. Millman and Halkias, 'Integrated Electronics'.
6. J. Powell, 'Aircraft Radio System'.
7. George Kennedy, 'Electronic Communication System'.
8. Kayton & Fried, 'Avionics Navigation Systems'.
9. Borje Forssell, 'Radio Navigation System'.

AVIONICS LABS.

Subject Code: BAEE3-430 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

S.N.	Contents	Hrs.
01	VHF / HF Communications LRU replacement and Communication Check.	4
02	Use of various test equipment for avionics system maintenance.	2
03	VHF Navigation LRU replacement and system tests.	4
04	Inspection and testing of ELT.	2
05	CVR - switching and recording.	2
06	Antenna replacement and system testing.	4
07	Radio Standing Wave ratio Measurement Tests.	4
08	Function Testing of ATC / TCAS system components.	4
09	Operation test of Weather Radar system.	2
10	Intercommunication / Passenger Address Component function testing.	2
11	ILS / VOR Systems function testing using appropriate test equipment e.g. Nav 401/402.	4
12	Radio Altimeter system test utilizing appropriate (555) test set.	4
13	DME / VOR Functional Testing utilizing appropriate test set.	4
14	ADF component functions and tests.	4
15	Functional check of inertial navigation system.	4
16	Operational testing of Flight Director System's and auto pilot system.	4
17	Locate Auto throttle systems components and bite test.	2
18	Perform BITE on Central Maintenance system.	4

ELECTRONIC FUNDAMENTALS AND DIGITAL TECHNIQUES-II

Subject Code: BAEE3-531 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale:
This subject comes under the Core Technology group and will enable the students to comprehend the theory, concepts, characteristics and working principles of basic electronic devices and their applications in electronic circuits. The knowledge of various devices acquired by the students will help them to design, test, troubleshoot and repair electronic circuits.

Learning Outcomes:
After undergoing this course, the students will be able to:

1. Understand Computer related terminology and typical memory devices
2. Acquire knowledge of Operation, application and identification in logic diagrams of multiplexers.
3. Understand Principles of operation of common types of displays Functions that may be typically integrated in the Integrated Modular Avionic (IMA).

Contents	Hrs.
Basic Computer Structure Computer terminology (including bit, byte, software, hardware, CPU, IC, and various memory devices such as RAM, ROM, PROM); Computer technology (as applied in aircraft systems). Computer related terminology; Operation, layout and interface of the major components in a microcomputer including their associated bus systems; Information contained in single and multi-address instruction words; Memory associated terms; Operation of typical memory devices; Operation, advantages and disadvantage of the various data storage systems.	**9**
Multiplexing Operation, application and identification in logic diagrams of multiplexers and demultiplexers**.**	**3**
Electronic Displays and Instrument Systems Principles of operation of common types of displays used in modern aircraft, including Cathode Ray Tubes, Light Emitting Diodes and Liquid Crystal Display. Electronic Flight Instrument Systems; Typical systems arrangements and cockpit layout of electronic instrument systems ECAM-Electronic Centralized Aircraft Monitoring; EFIS-Electronic Flight Instrument System; EICAS-Engine Indication and Crew Alerting System Instrument warning systems including master warning systems and centralized warning panels;	**18**
Typical Electronic/Digital Aircraft Systems General arrangement of typical electronic/digital aircraft systems and associated BITE (Built in Test Equipment) testing such as: ACARS-ARINC Communication and Addressing and Reporting System; Integrated modular Avionics;	**10**
Integrated Modular Avionics (ATA 42) Functions that may be typically integrated in the Integrated Modular Avionic (IMA) modules are, among others: Bleed Management, Air Pressure Control, Air Ventilation and Control, Avionics and Cockpit Ventilation Control, Temperature Control, Air Traffic Communication, Avionics Communication Router, Electrical Load Management, Circuit Breaker Monitoring, Electrical System BITE, Fuel Management, Braking Control, Steering Control, Landing Gear Extension and Retraction, Tyre Pressure Indication, Oleo Pressure Indication, Brake Temperature Monitoring, etc.; Core System; Network Components.	**12**
Cabin Systems (ATA 44) 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.	**8**

The Cabin Network Service typically consists on a server, typically interfacing with, among others, the following systems: Data/Radio Communication; In-Flight Entertainment System; The Cabin Network Service may host functions such as: Access to pre-departure/departure reports; E-mail/intranet/Internet access; Passenger database; Cabin Core System; In-flight Entertainment System; External Communication System; Cabin Mass Memory System; Cabin Monitoring System; Miscellaneous Cabin System.	

Instructional Strategy:
While imparting instructions, teacher should show various types of engineering materials to the students. Students should be asked to collect various electronics components available in the market.

Recommended Books:
1. Bemard Grob, 'Basic Electronics'.
2. Malvino and Leech, 'Digital Fundamentals'.
3. V K Mehta, 'Principles of Electronics'.

ELECTRONIC FUNDAMENTALS AND DIGITAL TECHNIQUES-II LAB.

Subject Code: BAEE3-532 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

S.N.	Contents	Hrs.
01	Familiarization with computer architecture and its components	4
02	Identification of components of Display systems	4
03	Operation check of Display system.	4
04	Familiarization with CRT and various components associated with EFIS	4
05	Identification of components in engine display systems	4
06	Bite / self-test of EFIS system.	4
07	BITE on different aircraft systems.	4
08	Familiarization with components of system associated with Integral modular avionics systems such Air Pressure Control, Air Ventilation and Control, Avionics and Cockpit Ventilation Control, Temperature Control, Air Traffic Communication.	4
09	Operation check of ventilation control system.	4
10	Operation check of IFE system.	4
11	Operation check of intercom system.	4
12	Operation check of intercom system.	4
13	Inspection of IFE system, intercom system and other cabin systems.	4
14	Operation of temperature control system	4
15	Identify ECAM system components and carry out test	4

WORKSHOP PRACTICES

Subject Code: BAEE3-533 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale:
AME students are responsible for supervising repair and maintenance of the aircraft. For this purpose, knowledge about various workshop machinery operations and processes are required to be imparted.

Learning Outcomes:
1. After undergoing the subject, students will be able to:
2. Safely handling of workshop machineries.
3. Knowledge of sheet working.
4. Knowledge of various Hand tools for working on bench.
5. Fabricate welding joints using gas welding, arc welding,
6. Inspect various welding joints, castings, forgings.
7. Prepare sand moulds manually.
8. Pipe bending and flaring, pipe inspection.
9. Identification, hose end fittings.

Contents	Hrs.
Safety & Precautions to be taken while working in the Machine shop. Various types of aids to be used while working on machines. Basic Machining	**4**
Material handling - Sheet Metal Marking out and calculation of bend allowance; Sheet metal working, including bending and forming; Inspection of sheet metal work.	**6**
Various types of gears and usage and inspection Various Hand tools for working on bench	**8**
Drills and drilling procedures. Simple Turning and Taper turning. Various types of measuring and layout tools	**6**
Welding Techniques: Preparation of arc welding of butt joints, lap joints and tee joints. Gas welding practice; Metric Measurement	**8**
Various forms of Surface Finish and Surface measurement, Various forms of Heat Treatment & Testing of Materials, Various forms of Taps & Dies	**16**
a) Smithy operations, upsetting, swaging, setting down and bending b) Foundry operations like mould preparation for gear and step cone pulley	**8**
Hoses and Pipes Pneumatic, Hydraulic pipes and end fitting identification, pipe bending and flaring, pipe inspection. Types of hoses, identification, hose end fittings, house routing and inspection.	**4**

Instructional Strategy:
1. Teachers should lay special emphasis in making the students conversant with concepts, principles, procedures and practices related to various workshop operations and processes.
2. Use of audio-visual aids/video films should be made to show specialized operations.

Recommended Books:
1. K.P. Roy, 'Workshop Technology', A.K. Hajra Chowdhary, **2000**.
2. James Anderson, 'Shop Theory'.

WORKSHOP PRACTICES LAB.

Subject Code: BAEE3-534 **L T P C** **Duration: 60 Hrs.**
0 0 4 0

S.N.	Contents	Hrs.
01	Sheet metal marking, cutting, sheet metal structural defects	**4**
02	Practice of 1st model. Butt Joint and inspect	**4**
03	Practice of 2nd model. Lap Joint and inspect	**4**
04	Practice of 3rd model. V-Joint and inspect	**4**
05	Practice of 3rd model. T-Joint and inspect	**4**
06	Demonstration of 1st model - Dovetail 4	**4**
07	Demonstration of 2nd model- Radius Gauge	**4**
08	Inspection of various welded samples with / without defects and record observation	**4**
09	Soldering Exercises, inspection and defects	**4**
10	Cable splicing and swaging	**4**
11	Pipe bending and inspection of pipe assembly	**4**
12	Taps and Dies, thread cutting and inspection	**4**

AIRCRAFT SYSTEMS-II

Subject Code: BAEE3-535 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale:
This subject provides the knowledge about Batteries Installation and Operation of aircraft lights system and will enable the students to comprehend the theory, concepts and working of various instruments and taking readings, system lay-out of oxygen system and Integrated Modular Avionics This will help them to troubleshoot the faults in the systems

Learning Outcomes:
After successful completion of course students should be able to

1. To know about basic principle of flight instruments that how they are useful to pilots for operation of flight.
2. To understand about what types of operating systems are used to conduct successful operation.
3. To understand about how aircrafts are maintained
4. To understand about how controls, operate an aircraft.

Contents	Hrs.
Aircraft Electrical Power System (ATA24) Batteries Installation and Operation; DC power generation; AC power generation; Emergency power generation; Voltage regulation; Power distribution; Inverters, transformers, rectifiers; Circuit protection; External/Ground power;	**8**
Aircraft Lights System (ATA 33) External: navigation, anti-collision, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency Lights.	**4**
Instrument System (ATA34) Direct reading pressure and temperature gauges; Temperature indicating systems; Fuel quantity indicating systems; Gyroscopic principles; Artificial horizons; Attitude director,	**15**

direction indicator, horizontal situation indicator, turn and slip indicators, turn coordinator; Directional gyros; Ground Proximity Warning Systems; Compass systems: direct reading, remote reading; Flight Data Recording systems; Stall warning systems and angle of attack indicating systems; Vibration measurement and indication; Glass cockpit.	
Oxygen System(ATA35) System lay-out: cockpit, cabin; Sources, storage, charging and Distribution; Supply regulation; Indications and warnings;	**8**
Fire Protection (ATA26) a) Fire and smoke detection and warning systems; Fire extinguishing systems; System tests. **b)** Portable fire extinguisher.	**6**
Water/Waste (ATA38) Water system lay-out, supply, distribution, servicing and draining; Toilet system lay-out, flushing and servicing; Corrosion aspects.	**4**
Integrated Modular Avionics (ATA42) Functions that may be typically integrated in the Integrated Modular Avionic (IMA) modules are, among others: Bleed Management, Air Pressure Control, Air Ventilation and Control, Avionics and Cockpit Ventilation Control, Temperature Control, Air Traffic Communication, Avionics Communication Router, Electrical Load Management, Circuit Breaker Monitoring, Electrical System BITE, Fuel Management, Braking Control, Steering Control, Landing Gear Extension and Retraction, Tyre Pressure Indication, Oleo Pressure Indication, Brake Temperature Monitoring, etc.; Core System; Network Components.	**10**
Door and Door Warning Type of Doors. Sensors, Escape Slides, Door warning systems, Inspections techniques.	**5**

Instructional Strategy:
While imparting instructions, teacher should practically demonstrate the aircraft weighing and various procedures related to aircraft system on aircraft by referring aircraft manual. Students should be asked to maintain their log cards/books.

Recommended Books:

1. Keith W. Bose, ‘Aviation Electronics’.
2. E.H.J. Pallett, ‘Aircraft Instruments’.
3. C.A. Williams, ‘Aircraft Instruments’.
4. James W. Wasson, ‘Avionics Systems Operation & Maintenance’.
5. A. Typers & R.B. Miles, ‘Principles of Servo Mechanism’.
6. Bent McKinley and also by Eismin/Bent McKinley, ‘Aircraft Electricity and Electronics’.
7. Civil Aircraft Inspection Procedure (CAP 459) -Part II Aircraft
8. Winston Merkey John Hovorka, ‘The Mechanism of Inertial Position and Heading Indication’.

AIRCRAFT SYSTEMS-II LAB.

Subject Code: BAEE3-536 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

S.N.	Contents	Hrs.
01	Reading and interpretation of electrical schematic and wiring diagrams and Identification of components of electrical power supply system.	**4**
02	Replacement of switches and circuit breakers and system check	**4**

03	Installation and operation check of Batteries in aircraft	**4**
04	Generator power check / voltage adjustment.	**4**
05	Internal lighting, replace bulb and filament.	**4**
06	Operational check of GPWS	**4**
07	Operational check-up of stall warning system and angle of attack indicating system	**4**
08	Operational check of temperature indicating system	**4**
09	Gyroscopic Instrument component replacements and functional tests.	**4**
10	Inspection and operation check of fuel quantity indication	**4**
11	Functional check of RR compass	**4**
12	Removal and Installation of Crew O2 system component	**4**
13	Identification of FDR system components	**4**
14	Check operation of fire / smoke detection and warning system.	**4**
15	Identification of components of door warning system and its operation check	**4**

PISTON ENGINES AND PROPELLERS

Subject Code: BAEE3-537 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale:
Lot of development has taken place in the field of piston engines as well as in propeller used in aircraft. New engine and propeller designs and technology are being developed continuously since its inception. AME students in this course are required to have knowledge of various types of piston engines, propellers and their applications in aircraft. For this purpose, it is necessary to teach them basics of the construction, systems of piston engines and propellers fitted in aircraft. This subject aims at developing knowledge about the basic design and functioning of different piston engines and propellers systems used in the Aircraft industries.

Learning Outcomes:
After undergoing this course, the students will be able to:
1. Understand fundamentals, principle of operation, basic design and construction of piston engines.
2. Classify different types of propellers used on aircraft.
3. Know characteristics, properties and identification of piston engines used in aircraft.
4. Understand about fuel, oil and ignition system components of the engine.
5. Know about starting system, power augmentation system, fire protection system of the engine.
6. Piston engine monitoring, ground operation engine preservation and storage techniques.
7. Propeller pitch control, synchronising, propeller maintenance, preservation of propeller.

Contents	Hrs.
Fundamentals Mechanical, thermal and volumetric efficiencies operating principles — 2 stroke, 4 stroke, Otto and Diesel, Piston displacement and compression ratio; Engine configuration and firing order.	**2**
Engine Performance Power calculation and measurement; Factors affecting engine power; Mixtures/leaning, pre-ignition.	**2**
Engine Construction Crank case, crank shaft, cam shafts, sumps; Accessory gearbox; Cylinder and piston assemblies; Connecting rods, inlet and exhaust manifolds; Valve mechanisms;	**3**

Propeller reduction gearboxes.	
Engine Fuel Systems Carburettor Types, construction and principles of operation; Icing and heating.	**2**
Fuel injection systems Types, construction and principles of operation.	**2**
Electronic engine control Operation of engine control and fuel metering systems including electronic engine control (FADEC); Systems lay-out and components.	**4**
Starting and Ignition Systems Starting systems, pre-heat systems; Magneto types, construction and principles of operation; Ignition harnesses, spark plugs; Low and high tension systems.	**3**
Induction, Exhaust and Cooling Systems Construction and operation of: induction systems including alternate air systems; Exhaust systems, engine cooling systems — air and liquid.	**2**
Supercharging/ Turbo charging Principles and purpose of supercharging and its effects on engine parameters. Construction and operation of supercharging/ turbo-charging systems; System terminology; Control systems; System protection.	**3**
Lubricants and Fuels Properties and specifications; Fuel additives; Safety precautions.	**2**
Lubrication Systems System operation/lay-out and components.	**2**
Engine Indication Systems Engine speed; Cylinder head temperature; Coolant temperature; Oil pressure and temperature; Exhaust Gas Temperature; Fuel pressure and flow; Manifold pressure.	**3**
Power Plant Installation Configuration of firewalls, cowlings, acoustic panels, engine mounts, antivibration mounts, hoses, pipes, feeders, connectors, wiring looms, control cables and rods, lifting points and drains.	**3**
Engine Monitoring and Ground Operation Procedures for starting and ground run-up; Interpretation of engine power output and parameters; Inspection of engine and components: criteria, tolerances, and data specified by engine manufacturer.	**5**
Engine Storage and Preservation Preservation and de-preservation for the engine and accessories/ systems.	**2**
Aircraft Propeller Fundamentals; Blade element theory; High/low blade angle, reverse angle, angle of attack, rotational speed; Propeller slip; Aerodynamic, centrifugal, and thrust forces; Torque; Relative airflow on blade angle of attack; Vibration and resonance.	**4**
Propeller Construction Construction methods and materials used in wooden, composite and metal propellers; Blade station, blade face, blade shank, blade back and hub assembly; fixed pitch, controllable pitch, constant speeding propeller; Propeller/spinner installation.	**3**
Propeller Pitch Control Speed control and pitch change methods, mechanical and electrical/electronic; Feathering and reverse pitch; Over speed protection.	**3**
Propeller Synchronising Synchronising and synchrophasing equipment.	**2**

Propeller Ice Protection Fluid and electrical de-icing equipment.	**2**
Propeller Maintenance Static and dynamic balancing; Blade tracking; Assessment of blade damage, erosion, corrosion, impact damage, delamination; Propeller treatment/repair schemes; Propeller engine running.	**3**
Propeller Storage and Preservation Propeller preservation and de-preservation.	**3**

Instructional Strategy:
While imparting instructions, teacher should give demonstration of various types of piston engines as well as propellers, its systems and components, to the students. Different mock ups, transparencies and animated videos should be shown to the students for better understanding of the lesson.

Recommended Books:
1. Airframe and Power Plant Mechanics (EA-AC 65- 12A) -Power Plant Hand FAA
2. Bent and McKinley, 'Power Plant'.
3. Civil Aircraft Inspection Procedure (CAP 459) Part II Aircraft
4. Frank Delph, 'Aircraft Propeller and Controls'.
5. Power Plant Section Text Book- (EA-ITP-P)
6. Herschel Smith, 'Aircraft Piston Engines'.
7. Dale Crane, 'Aviation Maintenance Technician Series'.

PISTON ENGINES AND PROPELLERS LAB.

Subject Code: BAEE3-538 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

S.N.	Contents	Hrs.
01	Familiarise with constructions and functions of piston engines.	**3**
02	Identification and inspection of various subassemblies of piston engines.	**3**
03	Identification and inspection of cylinder and piston assemblies.	**3**
04	Inspection of accessory gear box valve mechanism.	**3**
05	Identification and inspection of various components of piston engines.	**3**
06	Identification and inspection of engine fuel system and function of carburettor.	**3**
07	Identification and inspection of engine fuel injection system and electronic fuel control.	**3**
08	Function check of magneto.	**3**
09	Various methods of engine starting and ignition systems and Engine indicating systems.	**3**
10	Identification and inspection of components and function of lubrication system.	**3**
11	Engine control system and rigging.	**4**
12	Familiarization with engines and airframe interface.	**3**
13	Testing of engine fire warning and extinguishing operation.	**3**
14	Preparation for engine/ propeller storage and preservation.	**3**
15	Familiarise with propeller construction.	**3**
16	Methods of propeller pitch control and its effect on engine power. Feathering and reverse pitch control. Propeller synchrophasing system.	**4**
17	Check Propeller track.	**3**
18	Engine monitoring and ground operation.	**4**

19	Spark plug cleaning and testing.	**3**

GROUND HANDLING, SAFETY AND SUPPORT SYSTEM

Subject Code: BAEE3-639 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale:
A successful Safety Management System (SMS) reduces the rate and cost of accidents and incidents, improves communication and productivity, and helps your airport meet its legal responsibility to manage safety. This subject enables the students to learn how to implement an efficient SMS at your organization and promote a safety culture within your organization. Understand the relevance of risk management in relation to SMS and learn how to evaluate, prioritize and mitigate risk. Analyze the impact human factors have on safety and develop your skills in detecting, controlling and preventing errors in an airport environment.

Learning Outcomes:
On completion of this course students will be able to:
1. Implement a safety culture throughout their organization
2. Apply the risk management cycle to their organization
3. Integrate safety into aerodrome operations by applying management controls to safety-critical processes
4. Understand how regulatory requirements, State concerns and State Safety Program (SSP) apply to SMS.

Contents	**Hrs.**
Part-I General knowledge of ground handling of Aircraft, Aircraft Safety; Mooring, Jacking, Leveling, hoisting of aircraft, Towing, Mooring of an a/c during adverse conditions. Aircraft cleaning and maintaining. Ground signaling/marshalling of aircraft in day & night time.	**5**
Part-II Brief knowledge of airport and its procedures. Control tower, Dispersal areas, Aprons, Tarmac, Taxi track, Runway and its ends. Approach and clear zone layout. Brief knowledge of the signals given by the control tower. Knowledge of Airfield lighting system, Aircraft Rescue & Fire Fighting.	**10**
Part-III Maintenance and handling of ground equipment's used in maintenance of aircraft. Compressors, Portable hydraulic test stands, Electrical power supply equipment, charging trolley. Air-conditioning and Heating unit, ground support air start unit. Pressure oil unit, Fire extinguishers, jacks, Hoisting cranes/gantry, Ladders, Platforms, Trestles, and Chocks.	**15**
Part-IV Knowledge of safety and fire precautions to be observed during maintenance including re-fueling, defueling & engine start. Maintenance of hydraulic accumulators, reservoirs and filters:	**10**

Part-V Rigging of flight control surfaces and duplicate inspection; Rigging checks-Angular alignment checks and symmetry checks, Knowledge and use of Tensiometers, Protractors etc.	**10**
Part-VI Maintenance of landing gear (L/G), Shock strut charging and bleeding, Maintenance of L/G brakes i.e., Dragging, Grabbing, Fading, Brakes and excessive brake pedal travel. Maintenance on wheels, tires and tubes i.e., dismantling, inspection, assembling, inflating, inspection and installation Storage of Rotables.	**10**

Instructional Strategy:
Learn how to plan, organize, create and deliver performance-based safety training that truly engages students and improves organization's safety practices.

Recommended Books:
1. General handbook AC65-9A
2. Airframe Handbook AC 65-15A

GROUND HANDLING, SAFETY AND SUPPORT SYSTEM LAB.

Subject Code: BAEE3-640 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

S.N.	Contents	Hrs.
01	Hydraulic system bleeding, replenish fluid reservoir and handling precautions	**6**
02	Hydraulic accumulator charging	**6**
03	Use of ground power unit and checks	**4**
04	4 Identification and control of various types of fires, practicing fire extinguishing.	
05	Practical on headset communication during arrival and departure of aircraft & Identification of aircraft hazard zones	**4**
06	Fuel sample check and refuelling	**6**
07	Flight control system lubrication	**6**
08	Landing gear system lubrication	**6**
09	Landing gear oleo charging	**6**
10	Tyre pressure check	**4**
11	Aircraft parking and mooring	**8**

APPROVAL OF MAINTENANCE ORGANIZATION

Subject Code: BAEE3-641 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale:
This Subject establishes the requirements to be met by an organization to qualify for the issue or continuation of an approval for the maintenance of aircraft and components to be installed therein used by air operators and other civil aircrafts registered or operated in India.

Learning Outcomes:
1. After undergoing this subject, the students will be able to:
2. Understand DGCA rules to be followed by Maintenance Organizations.
3. Know procedure to be followed for Approval of Maintenance Organization.
4. Create maintenance work orders, Aircraft Certificate of Release to Service, Component Certificate of Release to Service.

Contents	Hrs.
Scope, Application, Extent Of Approval, Maintenance Organization Manual	5
Maintenance Organization Manual, Personnel Requirements,	5
Certifying staff and airworthiness review staff, Components, Equipment and Tools	7
Maintenance Data, Maintenance Work Orders, Maintenance Standards, Aircraft Certificate of Release to Service, Component Certificate of Release to Service.	7
Maintenance Records and airworthiness review record, Privileges of the Organization.	6
Organizational Review, Changes to the Approved Maintenance Organization, Continued Validity of Approval, Findings.	5
CAR-145 SECTION A TECHNICAL REQUIREMENTS: ACCEPTABLE MEANS OF COMPLIANCE GUIDANCE MATERIAL	25

Instructional Strategy
While teaching this subject teacher need to refer latest revision of CAR-M and CAR-145 available on DGCA website www.dgca.nic.in.

Recommended Books:
1. CAR-M available on DGCA website www.dgca.nic.in.
2. CAR-145 available on DGCA website www.dgca.nic.in.

APPROVAL OF MAINTENANCE ORGANIZATION LAB.

Subject Code: BAEE3-642 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

S.N.	Contents	Hrs.
01	Scope, Application, Extent Of Approval, Maintenance Organization Manual	
02	Maintenance Organization Manual, Personnel Requirements,	
03	Certifying staff and airworthiness review staff, Components, Equipment and Tools	
04	Maintenance Data, Maintenance Work Orders, Maintenance Standards, Aircraft Certificate of Release to Service, Component Certificate of Release to Service.	
05	Maintenance Records and airworthiness review record, Privileges of the Organization.	
06	Organizational Review, Changes to the Approved Maintenance Organization, Continued Validity of Approval, Findings.	
07	**CAR-145 SECTION A TECHNICAL REQUIREMENTS:** ACCEPTABLE MEANS OF COMPLIANCE GUIDANCE MATERIAL	

TYPICAL AIRCRAFT MAINTENANCE - FIXED WING HEAVY/COMPLEX AIRCRAFT

Subject Code: BAEE3-643 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale:
This Subject has been prepared for a specific fixed wing Heavy/Complex Aircrafts. It contains information necessary to enable the students to service, troubleshoot, functionally test, and repair systems and equipment in the particular aircraft. It also includes information

necessary for the students to perform maintenance or make minor repair to units in the aircraft normally requiring such action on the flight line or in the maintenance hangar. It covers the aircraft configuration as described in the AMM.

Learning Outcomes:

After undergoing this subject, the students will be able to:

1. Read the Maintenance Manual, Illustrated Parts Catalogue, Wiring Diagrams and other literature available with the aircraft.
2. Understand the various systems fitted to the specific aircraft.
3. Troubleshoot the Landing Gear system.
4. Carryout towing, Leveling, Weighing and Pre-flight operations.

Contents	Hrs.
Dimensions and Areas, Lifting and Shoring, Levelling and Weighing.	
Towing and Taxiing, Placards and Markings, Servicing.	
Air Conditioning, Auto flight.	
Electrical Power, Equipment and Furnishings.	
Fire Protection, Flight Controls.	
Fuel, Hydraulic Power, Ice and Rain Protection.	
Landing Gear, Lights, Oxygen system, Pneumatic system, Vacuum system, Instruments and Panels, Lights.	
Doors, Fuselage, Stabilizer, Windows, Wings,	
Power Plant, Engine Fuel and Control, Ignition, Engine Controls, Engine Indicating, Oil, Starting	

Instructional Strategy:

While teaching this subject teacher need to refer the Aircraft Maintenance Manual and other publications of the fixed wing Heavy/Complex aircraft available with the Institute. To make the subject more interesting artificial snags can be developed in aircraft systems and troubleshooting procedures should be followed for rectification as per the Maintenance Manual.

Recommended Books:

1. Specific “Aircraft Maintenance Manual” for heavy/complex aircraft available with the Institute.
2. Specific “Aircraft Flight Manual” for heavy/complex aircraft available with the Institute.

TYPICAL AIRCRAFT MAINTENANCE - FIXED WING HEAVY/COMPLEX AIRCRAFT LAB.

Subject Code: BAEE3-644 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

S.N.	Contents	Hrs.
01	GENERAL VISUAL INSPECTION.	
02	PHASE Al 300 HOUR INSPECTION/CHECKS	
03	PHASE A2 300 HOUR INSPECTIONICHECKS	
04	PHASE A3 300 HOUR INSPECTIONICHECKS	
05	PHASE A4 300 HOUR INSPECTIONICHECKS	
06	PHASE A5 300 HOUR INSPECTIONICHECKS	
07	PHASE A6 300 HOUR INSPECTIONICHECKS	

TYPICAL AIRCRAFT MAINTENANCE - FIXED WING LIGHT/COMPOSITE AIRCRAFT

Subject Code: BAEE3-645 **L T P C** **Duration: 60 Hrs.**
3 1 0 4

Rationale:
This Subject has been prepared for specific Fixed Wing Light / Composite Aircrafts. It contains information necessary to enable the students to service, troubleshoot, functionally test, and repair systems and equipment in the particular aircraft. It also includes information necessary for the students to perform maintenance or make minor repair to units in the aircraft normally requiring such action on the flight line or in the maintenance hangar. It covers the aircraft configuration as delivered to the customer.

Learning Outcomes:
After undergoing this subject, the students will be able to:
1. Read the Maintenance Manual, Illustrated Parts Catalogue, Wiring Diagrams and other literature available with the aircraft.
2. Understand the various systems fitted to the specific aircraft.
3. Troubleshoot the Landing Gear system.
4. Carryout towing, Levelling, Weighing and Pre-flight operations.

S.N.	Contents	Hrs.
01	General Description of Light Aircraft as per AMM	
02	Ground Handling, Servicing, Cleaning, Lubrication and Inspection.	
03	Fuselage, Wing And Empennage, Aileron Control System, Wing Flap Control System, Elevator Control System, Elevator Trim Tab Control System, Rudder Control System, Landing Gear And Brakes.	
04	Engine, Propeller, Fuel System.	
05	Instruments & Instrument Systems.	
06	Electrical System, Lighting And Lightning Protection	
07	Wiring Diagrams.	
08	Avionics.	
09	Inspection Following an Incident, List Of Fuels, Oils, Lubricants, Greases And Their Periodicity Of Usage.	

Instructional Strategy:
While teaching this subject teacher need to refer the Aircraft Maintenance Manual and other publications of the fixed wing Light/Composite aircraft available with the Institute. To make the subject more interesting artificial snags can be developed in systems and troubleshooting procedures should be followed for rectification as per Aircraft Maintenance Manual.

Recommended Books:
1. Specific “Aircraft Maintenance Manual” for Light/composite aircraft available with the Institute.
2. Specific “Aircraft Flight Manual” for Light/composite aircraft available with the Institute.

TYPICAL AIRCRAFT MAINTENANCE - FIXED WING LIGHT/COMPOSITE AIRCRAFT LAB.

Subject Code: BAEE3-646 **L T P C** **Duration: 60 Hrs.**
0 0 4 2

S.N.	Contents	Hrs.
01	General Description of Light Aircraft as per AMM	
02	Ground Handling, Servicing, Cleaning, Lubrication and Inspection.	
03	Fuselage, Wing And Empennage, Aileron Control System, Wing Flap Control System, Elevator Control System, Elevator Trim Tab Control System, Rudder Control System, Landing Gear And Brakes.	
04	Engine, Propeller, Fuel System.	
05	Instruments & Instrument Systems.	
06	Electrical System, Lighting And Lightning Protection	
07	Wiring Diagrams.	
08	Avionics.	
09	Inspection Following an Incident, List Of Fuels, Oils, Lubricants, Greases and their Periodicity of Usage.	