CURRICULUM FOR THREE YEAR

DIPLOMA COURSE IN

AIRCRAFT MAINTENANCE ENGINEERING (AVIONICS)

Effective from Session

Semester System

UNDER DEVELOPMENT

Prepared By

Curriculum Development Cell

INSTITUTE OF RESEARCH,DEVELOPMENT & TRAINING, U.P., KANPUR

APPROVED BY

BOARD OF TECHNICAL EDUCATION

U.P. LUCKNOW,on dated 1-.06.2015

Corrected and Approved By B.T.E. Meeting On Dated 10.06.2015

STUDY AND EVALUATION SCHEME FOR
THREE YEAR(SIX SEMESTER) DIPLOMA COURSE IN AIR CRAFT MAINTENANCE ENGINEERING (AVIONICS)
(To Be Effective From)

(To Be Effective From)

I Semester

Curriculum							Scheme of Examination								
Periods Per Week						S U B J E C T	Theory				Practical				Grand Total
Lec.	Tutorial	Draw	Lab	Work Shop	Total		Examination		Sess. Marks	Total Marks	Examination		Sess. Marks	Total Marks	
							Dur.	Marks			Dur.	Marks			
4	2	-	-	-	6	1.1 Mathematics-I	2.5	50	20	70	-	-	-	-	70
4	2	-	-	-	6	1.2 Physics-I	2.5	50	20	70	-	-	-	-	70
6	-	-	2	-	8	1.3 General Engineering And Ground Supports	2.5	50	20	70	3	60	30	90	160
-	-	-	8	-	8	1.4 Engineering Drawing	4.0	50	20	70	-	-	-	-	70
8	-	-	-	-	8	1.5 Air Law, C.A.R. & Human Factors & Limitation-I	2.5	50	20	70	-	-	-	-	70
4	-	-	8	-	12	1.6 Workshop Practice	2.5	50	20	70	6	100	50	150	220
26	4	-	18	-	48	<---------TOTAL---------->	--	300	120	420		160	80	240	660
Games/NCC/Social and Cultural Activity+Community Development+ Discipline(10+20+10)															40
Aggregate															700

II Semester

4	2	-	-	-	6	2.1 Mathematics-II	2.5	50	20	70	-	-	-	-	70
4	2	-	-	-	6	2.2 Physics-II	2.5	50	20	70	-	-	-	-	70
4	2	-	-	-	6	2.3 Mechanics	2.5	50	20	70	-	-	-	-	70
7	2	-	3	-	12	2.4 Basic Electricity And Electronics Engineering	2.5	50	20	70	3	60	30	90	160
5	-	-	3	-	8	2.5 AirCraft Materials & Material Science	2.5	50	20	70	-	-	-	-	70
10	-	-	-	-	10	2.6 Air Law, C.A.R. & Human Factors & Limitation-II	2.5	50	20	70	-	-	-	-	70
34	8	-	6	-	48	<---------TOTAL---------->	--	300	120	420		60	30	90	510
Games/NCC/Social and Cultural Activity+Community Development+ Discipline(10+20+10)															40
Aggregate															550

NOTE:- (1) Each period will be 50 minutes duration.
(2) Each session will be of 16 weeks.
(3) Effective teaching will be at least 14 weeks.
(4) Remaining periods will be utilized for revision etc.
(5) A good number of guest lectures by person from industries and institutions of higher education be arranged own topics such as Environmental Pollution, Safety Concerns in Industry and Entrepreneur Develop Development for general awareness
(6) For Community Development Work See Annexure-I
(7) Objective questions in theory examinations will be of 60 questions of 1/2 marks each with reasoning and other 04 questions will be of 5 marks each.

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STUDY AND EVALUATION SCHEME FOR
THREE YEAR(SIX SEMESTER) DIPLOMA COURSE IN AIR CRAFT MAINTENANCE ENGINEERING (AVIONICS)
(To Be Effective From)

III SEMESTER

Curriculum							Scheme of Examination							
Periods Per Week						S U B J E C T	Theory			Practical			Grand Total
Lec.	Tutorial	Draw	Lab	Work Shop	Total		Examination Dur.	Examination Marks	Sess. Marks	Total Marks	Examination Dur.	Examination Marks	Sess. Marks	Total Marks	
7	2	-|	5	-	14	3.1 Airframe & Systems	2.5	50	20	70	3	100	50	150	220
4	-	-|	6	-	10	3.2 General Aero Engine	2.5	50	20	70	3	50	25	75	145
5	-	-|	7	-	12	3.3Aircraft Electrical System-I	2.5	50	20	70	3	50	25	75	145
6	1	-|	5	-	6	3.4 Aircraft Electronics System	2.5	50	20	70	3	50	25	75	145
22	3	-|	23	-	48	<---------TOTAL----------->	--	200	80	280		250	125	375	655
						Games/NCC/Social and Cultural Activity+Community Development+ Discipline(10+20+10)									40
													Aggregate		695

IV SEMESTER

9	3	-| -	-	12	4.1 Theory of Flight	2.5	50	20	70	--	--	--	--	70
6	2	-|4	-	12	4.2 Aircraft Instrumentation-I	2.5	50	20	70	3	50	25	75	145
6	2	-|4	-	12	4.3 Auto Flight & Servo Mechanism	2.5	50	20	70	3	50	25	75	145
6	2	-|4	-	12	4.4 Aircraft Communication System	2.5	50	20	70	3	50	25	75	145
27	9	-|12	-	48	<---------TOTAL----------->	--	200	80	280		150	75	225	505
					Games/NCC/Social and Cultural Activity+Community Development+ Discipline(10+20+10)									40
													Aggregate		545

NOTE:- (1) Each period will be 50 minutes duration.
(2) Each session will be of 16 weeks.
(3) Effective teaching will be at least 14 weeks.
(4) Remaining periods will be utilised for revision etc.
(5) For Community Development Work See Annexure-I
(6) After IV SEM EXAM, the students well go for 4 weeks industrial training structured and supervised by institute staff. They well prepare a report of their work and observations in industry which will be evaluated by external examiner for project for 60 marks (30 for Viva-Voce, 10 for Documentary work and 20 for sessional). See Annexure-II
(7) A good number of guest lectures by person from industries and institutions of higher education be arranged own topics such as Environmental Pollution, Safety Concerns in Industry and Entreprenure Develop Development for general awareness
(8) Objective questions in theory examinations will be of 60 questions of 1/2 marks each with reasoning and other 04 questions will be of 5 marks each.

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(To Be Effective From)

V SEMESTER

Curriculum							Scheme of Examination							
Periods Per Week						S U B J E C T	Theory			Practical			Grand Total
Lec.	Tutorial	Draw	Lab	Work Shop	Total		Examination Dur.	Sess. Marks	Total Marks	Examination Dur.	Sess. Marks	Total Marks	
8	-	-	8	-	16	5.1 Computer Theory	2.5	50	20	70	3	60	30	90	160
8	-	-	8	-	16	5.2 Aircraft Electrical System-II	2.5	50	20	70	3	60	30	90	160
8	-	-	8	-	16	5.3 Aircraft Instrumentation-II	2.5	50	20	70	3	60	30	90	160
24	-	-	24	-	48	<---------TOTAL---------->	--	150	60	210		180	90	270	480
						Games/NCC/Social and Cultural Activity+Community Development+ Discipline(10+20+10)									40
													Aggregate		520

VI SEMESTER

4	-	-	-	-	4	6.1 Environmental Education* and Disaster Management	2.5	50	--	--	-	--	--	--	--
8	-	-	-	-	8	6.2 Propulsion	2.5	50	20	70	-	--	--	--	70
8	-	-	8	-	16	6.3 Aircraft Radio Navigation System	2.5	50	20	70	6	100	50	150	220
3	-	-	11	-	14	6.4 Avionics System of Bonanza A-36	2.5	50	20	70	6	100	50	150	220
-	-	-	-	-	6	6.5 Project	-	--	--	--	-	100	50	150	150
-	-	-	-	-	-	6.6 Industrial Training	-	--	--	--	-	40	20	60	60
23	-	-	19	6	48	<---------TOTAL---------->	--	150	60	210	--	340	170	510	720
						Games/NCC/Social and Cultural Activity+Community				Games+ Discipline(20+20)					40
													Aggregate		760
													30% Carry Over of I & II		375
													70% Carry Over of III & IV		868
													100% Carry Over of V & VI		1240
															2483

NOTE:-
(1) Each period will of be 50 minutes duration.
(2) Each session will be of 16 weeks.
(3) Effective teaching will be at least 14 weeks.
(4) Remaining periods will be utilised for revision etc.
(5) For Community Development Work See Annexure-I
(6) A good number of guest lectures by person from industries and institutions of higher education be arranged on topics such as Environmental Pollution, Safety Concerns in Industry and Entreprenure Develop Development for general awareness
(7) (*) It is compulsory to appear & to pass in examination, But marks will not be included for division and percentage of obtained marks.
(8) Objective questions in theory examinations will be of 60 questions of 1/2 marks each with reasoning and other 04 questions will be of 5 marks each.

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MAIN FEATURES OF THE CURRICULUM

TITLE OF THE COURSE	: Diploma in Air Craft Maintenance Engineering (Avionics)
DURATION	: Three Years(Six Semester)
PATTERN OF THE COURSE	: Semester System
INTAKE	: 30
TYPE OF COURSE	: Full Time Institutional
ENTRY QUALIFICATION	: 10 + 2 with (Physics, Chemistry and Mathematics) or Equivalent and 50% agregate in Physics, Chemistry and Math
MODE OF ADMISSION	: Through Joint Entrance Examination

LIST OF EXPERTS

The List of experts who participated in the workshop for semester system of curriculum in Aircraft Maintenance Engineering Diploma course held at Aeronautical Training Institute, U. P., Lucknow Airport, Lucknow on 21.04.2015

1.	Dr. G. M. Rahanuma	Principal Lecturer Aeronautical Training Institute, U.P., Lucknow Airport, Lucknow.
2.	Sri B. K. Verma	Cheief Lecturer, Aeronautical Training Institute, U.P., Lucknow Airport, Lucknow.
3.	Sri J. K. Saroj	Lecturer, Mechanical Aeronautical Training Institute, U.P., Lucknow Airport, Lucknow.
4.	Sri M. S. Mehata	Lecturer, Avionics Aeronautical Training Institute, U.P., Lucknow Airport, Lucknow.
5.	Km. Sneha Gupta	Lecturer, Aeronotics Aeronautical Training Institute, U.P., Lucknow Airport, Lucknow.
6.	Sri Brajesh	Lecturer, Mechanical Aeronautical Training Institute, U.P., Lucknow Airport, Lucknow.
7.	Sri Mohd Ahamad Siddiqui	Lecturer, Electrical Aeronautical Training Institute, U.P., Lucknow Airport, Lucknow.
8.	Sri Arivnd Kumar	Instructor Workshop Aeronautical Training Institute, U.P., Lucknow Airport, Lucknow.
9.	Km. Vandana Bhatt	Instructor (Aero) Aeronautical Training Institute, U.P., Lucknow Airport, Lucknow.
10	Sri Santosh Kumar Singh	Instructor (Avionocies) Aeronautical Training Institute, U.P., Lucknow Airport, Lucknow.
11.	Sri Dinesh Sharma	Lecturer (Electrical) I.R.D.T.,U.P., Kanpur

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I Semester

1.1 MATHEMATICS-I

L	T	P
4	2	-

Rationale :

Mathematics is the back bone of engineering education. It is indispensable for understanding quantitatively the concepts of engineering and technology.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time L	T	P
1.	Algebra	15	8	-
2.	Trignometry	15	8	-
3.	Differential Calculus	26	10	-
	Total	56	28	-

DETAILED CONTENTS

1. ALGEBRA:

(i) Theory of Eqution and symmetric functions of roots.

(ii) Bionomial, Logarithmic and Exponmential Series, General exponential and logarithmic series (Rivision).

(iii) Complex numbers and their applications to engineering problems.

(iv) Vectors and their graphic representation Mathematical operations of vectors.

(v) Matrices and Determinants (Elementary Idea).

2. TRIGNOMETRY :

(i) Inverse Circular Functions.

(ii) De Movier's Theorem and its application.

3. DIFFERENTIAL CALCULUS :

(i) Method of finding derivatives of differential coefficient of a function.

(ii) Differentiation of function of function.

(iii) Logarithmic differentiation.

(iv) Successive differentiation.

(v) Partial differentiation.

(vi) Application of findings Tangents and Normal.

(vii) Maxima and Minima.

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1.2 PHYSICS-I

L	T	P
2	1	-

Rationale :

Knowledge and teaching of physics is a foundation course of engineering students, its purpose is to develop proper understanding of physical phenomena and the scientific concepts.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time L	T	P
1.	Topics No. 1	14	7	-
2.	Topics No. 2	14	7	-
3.	Topics No. 3	14	7	-
4.	Topics No. 4	14	7	-
	Total	56	28	-

DETAILED CONTENTS

1.A. THERMOMETRY :

(i) Concept of heat and temperature. Units of heat. Basic principles of measurement of temperature.

(ii) Different types of thermometers, their merits and demerits with special reference to constant volume Hydrogen Gas Thermometer, Platinum Resistance Thermometer, Thermocouple Thermometers.

(iii) Relation between Fahrenheit, Celcius, Kelvin and Rankine's, Scales of temperature.

B. CALORIMETRY :

(i) Concept of thermal capacity and specific heat, Effect of temperature on specific heat, Specific heat of solid/liquid by Bunsen's ice calorimeter.

(ii) Latents heat of fusion and vaporisation, thermal energy and heat of combustions.

(iii) Specific heat of gases, Specific heat at constant pressure and constant volume (Cp & Cv) and relationship between them. Ratio of two specific heats, specific heat of gas at low temperature, difference between vapour and gas. .

2. NATURE OF HEAT :

(i) Concept of mechanical equivalent of heat and its determination by Joule's method.

(ii) Concept of ideal and real gases. Laws governing the behaviour of gases viz. Boyle's Law, Charle's Law. Compression and expansion processes of gases - such as adiavatic, sothermal processes. Work done during these processes, Internal energy of gas.

(iii) Concept of heat transfer by conduction, convection and radiation, Coefficient of thermal conductivity and its determination by Searle's and Lee's methods. Simple numericals related to above

3. THERMODYNAICS :

First and second law of thermodynamics, Concept of heat engine, heat pump and refrigerator, Carnot cycle, Auto cycle and Diesel cycle and their thermal efficienies and related numericals.

4. OPTICS :

Nature of light, Speeds of light, Loss of refraction and reflection at a plane surface by Spherical Mirror and Lenses and Critical angle, Total internal reflection. Principle of Fibre optics, Optical fibre and their applications.

1.3 GENERAL ENGINEERING AND GROUND SUPPORT

L	T	P
6	-	2

Rationale :

The paper intends to provide aquaintance with the components common to various machines and equipments and processes generally used in aircraft.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time L	T	P
1.	Topics No. 1	9	-	-
2.	Topics No. 2	9	-	-
3.	Topics No. 3	9	-	-
4.	Topics No. 4	12	-	-
5.	Topics No. 5	12	-	-
6.	Topics No. 6	12	-	-
7.	Topics No. 7	12		
8.	Topics No. 8	9		
	Total	84	-	28

DETAILED CONTENTS

1. INTRODUCTION TO HAZARDOUS LIQUID/GASES:

Safety precautions when working with hazardous/non-hazardous gases, Oils and chemicals. Remedial action in the event of fire/accident.

2. AIRCRAFT FASTENING DEVICES:

Types, identification and symbols of- Bolts, Nuts Washers, Screws, Threads, Rivits, Pins, Keys nd Key Ways.

3. PURPOSE, USE AND LUBRICATION OF BEARINGS :

Plane, split step, ball and roller bearing, Journal bearing, thrust bearing, collar bearing and special types of bearing and their application such as oil lite bearing, elastomer bear and air bearing.

4. TRASMISSION :

Different types of gear, gear trains and their use for transmission of motion, spur gear, single and double helical gear, bevel gears, worm gear, rack and penion. Concept of pitch, pitch circle and module, planetary gear system. Belt, pully chain and sprockets, lever devices, push pull rod

system.

5. CABLES :

Introduction of aircraft cables, Material uses and types of cables. Cable fittings, swaging and splicing. Procedure of aircraft cables, Proof testing of aircraft cable, fair lead and turnbuckles.

6. FLUID LINES AND FITTINGS :

Rigid fluid lines, material, identification, sizes, febrication of metal tubes.

Flexible hose, Materials of flexible holes - low, medium and high pressure hose, identification, flexible hose inspection, testing size designation and hose fittings

7. FIRE PROTECTION :

Classification of fire, Fire extinguishers identification, inspection and operating procedure. Safety and fire precaution to be observed during fuelling and defuelling of aircraft. Fire extinguishers agents

8. NONDESTRUCTIVE TESTING :

Crack detection by various method such as visual inspection, hot oil and chalk method. Dye penetrant method. Meganetic particle inspection, X-ray, Ultrasonic and Eddy current inspection, Fluro particle inspection test. NDT of composite materials.

LIST OF PRACTICALS

Material Testing

1. Riveting practice e.g butt joint, lap joint.
2. Inspection of cable system.
3. Familiarization with tube and flexible hose inspection and testing.
4. Familiarization with spliting and swaging operation.
5. Bending and flaring or tube.
6. Familiarization with various kind of union used in fuel, oil and hydraulic system.
7. Familiarization with dye penetrant method.
8. Familiarization with meganetic particles inspections.
9. Familiarization with Eddy current inspections.
10. Familiarization with cable tension adjustment.

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1.4 ENGINEERING DRAWING

L	T	P
-	-	8

Rationale :

Whether it is production, design or maintenance engineer, Knowledge of engineering drawing is a must to him. From production to assembly and dismantling for maintenance knowledge of engineering drawing is essential.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time L	T	P
1.	Topics No. 1	-	-	-
2.	Topics No. 2	-	-	-
3.	Topics No. 3	-	-	-
4.	Topics No. 4	-	-	-
5.	Topics No. 5	-	-	-
6.	Topics No. 6	-	-	-
7.	Topics No. 7	-	-	-
8.	Topics No. 8	-	-	-
	Total	-	-	112

DETAILED CONTENTS

1. INTRODUCTION :

1.1 General Introduction to Engineering Drawing and its meaning.

1.2 Introduction of various drawing materials, instruments and equipment.

1.3 Use of Draughtman Instruments, Mini drafter and Set of instruments, French curves, their correct use and care.

1.4 Sizes of Drawings sheets and their lay out.

2A. LETTERING TECHNIQUES :

Printing of vertical and inclined, Normal single stroke capital letters and numbers.

B. INTRODUCTION TO SCALES :

Necessity and use, R.F. types used in general engineering drawing, Plane, Diagonal and Chord sxales.

3. CONVENTIONAL REPRESENTATIONS :

3.1 Methods of showing centre lines, hidden lines, reference lines section lines and dimensional lines and dimensioning.

3.2 Standard material symbols.

3.3 Conventional method of representing threads, nuts, joints and welded parts. Exercises to illustrats the above.

4. Dimensioning Techniques.

5. PRINCIPLE OF PROJECTIONS :

Principle of projections and essential views, orthographic projection and exercises.

5.1 Plan, Elevation, Side views in first angle and third angle projections, simple exercises.

6. ISOMETRIC PROJECTION :

6.1 Isometric Scales.

6.2 Isometric Views.

7. DEVELOPMENT OF SURFACES :

7.1 Parallel line and radial line methods developments, Development of simple and truncated surfaces (Cubes, Prisms, Pyramids, Cylinders & Cones).

8. DRAWING OF TYPICAL AIRCRAFT PARTS :

Study of machine drawing and blue prints.

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1.5 AIR LAW, C.A.R AND HUMAN FACTORS AND LIMITATION-I

L	T	P
8	-	-

Rationale :

The objective and quality and related responsibility in the work of aircraft maintenance at any level requires some legislation. The paper deals with such things imperative for the knowledge of aircraft maintenance engineer and these are changable to time to time as DGCA, New Delhi requirements

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time L	T	P
1.	Topics No. 1	18	-	-
2.	Topics No. 2	18	-	-
3.	Topics No. 3	18	-	-
4.	Topics No. 4	18	-	-
5.	Topics No. 5	18	-	-
6.	Topics No. 6	10	-	-
7.	Topics No. 7	12	-	-
	Total	112	-	-

DETAILED CONTENTS

1. I. A. R. :

Knowledge of Aricraft manuals, Aircraft Rules. Air worthiness advisory circular, Aeronautical informationcirculars.

2. COCKPIT CHICK LIST, MEL, CDL AND DEFECTS :

Minimum equipment list, preparation and use of concept and emergency check list. Defect recording, reporting, investigation, rectification adn analysis. Maintenance control by retiability method.

3. AIRCRAFT MAINTENANCE PROGRAMMES AND THEIR APPLOVAL:

Reliability programme, AMP, On condition maintenance, TBO-revision programme, Maintenance of fuel and oil consumption records, Fixing routine maintenance periods and component TBO,s initial and revision.

4. APPLOVAL OF ORGANISATIONS

Approval of organisation in CAR 145, CAR-M, CAR-21, Approval of organisation in Cat.E and Cat.G.

5. AIRWORTHINESS AND CONTINUED AIRWORTHINESS :

Registration of aircraft, certificate of airworthiness, Rebuilding of aircraft, Special flight perprits, Airworthiness of ageing aircraft, Inspection of wooden aircraft, Airworthiness requirement for gliders, Microlight aircraft and hot air balloons. Flight manuals, pooling of aircraft, construction certification and operation of experimental/amature built aircraft, Age of aircraft, Import/Export of aircraft, Space, Item of equipments, Load and trim sheet.

6. FUELING, REFUELLING AND CALIBRATION OF FUELS :

Requirments for fueling, refueling, calibration of fuel, storage, handling quality control and unusable fuel.

7. HUMAN PERFORMANCE :

7.1 General : The Need to take human factors into account incident attributable to human factors/human error; Murphy's law.

7.2 Human Performance and Limitations : Vision, Hearing, Information Processing, Attention and perception, Memory, Claustrophobia and physical access.

7.3 Social Psychology : Responsibility- Individual and group, Motivation and de-motivation, Peer pressure, Culature issues, Team working, Management, supervision adn leadership.

7.4 Factors Affecting Performance : Fitness, Health, Stress - Domestic and work relatied, Time pressure and deadlines, Workload - Overload and underload, Sleep and fatigue, Shift work, Alcohal, medication, srug abuse.

1.6 WORKSHOP PRACTICES

L	T	P
4	-	8

Preamble :

There are basically 4 shops to workshop practice i.e. Carpentary shop, Fitting shop, Machine shop and Welding shop. The purpose is to familarization of various machines used in aircraft repair and maintenance.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time L	T	P
1.	Topics No. 1	6	-	-
2.	Topics No. 2	6	-	-
3.	Topics No. 3	6	-	-
4.	Topics No. 4	6	-	-
5.	Topics No. 5	6	-	-
6.	Topics No. 6	13	-	-
7.	Topics No. 7	13	-	-
	Total	56	-	112

DETAILED CONTENTS

1. Safety rules and Precautions in workshop- Instructions in the remedial action to be taken in the event of accidients/ human or machines

2. GENERAL WORKSHOP TOOLS :

A. Marking and Measuring tools - Steel scale, Surface gauge, Protector, Try square, Scriber, Different types of Punches, Divider, Callipers, surface Plate, Gauges, Vernier Callipers, Micrometer, Combinition set, Marking gauges, Bevel square.

B. Cutting Tools - Different types of File, Hacksaw, Chisels Tap and Die, Different types of Drill, Reamer, Different types of saw, Different types of Plainer, Different types of Power tools- lathe, Grinding Machine, Power Hacksaw, Milling Machine, Drilling Machine

C. Holding and Supporting Tools - Different types of vice, Bench hook, Bar clamp, Tongs, Pliers, Jigs adn fixtures.

D. Striking Tools - Different types of Hammer.

E. Miscellaneous Tools - Screw Driver, Pincer, Different types of wrench, Keys, File Card, Spanner & drift.

3. Handling and uses of different type of precision measuring tools.

4. Limits fits and allowances. Concept of interchangeability.

5. Working knowledge of Tools used on the follwong machine tools - Power Hacksaw, Drilling Machine, Lathe (Centre, Capston and Turret). Grinding Machines

6. Welding

A. Safety precautions observed before and during welding.

B. Different types of welding - Gas welding, Electric arc welding, Seam welding, Spot welding, TIG & MIG, Types of fluxes and its advantages.

   (a) Gas welding - Types of gas welding, identificaiton of cylinders pressure regulator (single and double), welding torch and equipment, type of flame and blow pipe.

   (b) Electric Arc Welding - Types of arc welding - metallic arc, gas shield arc welding (TIG & MIG), plasma arc welding.

   (c) Pressure Welding - Seam, Butt and spot welding.

   (e) Types of welded joints and defect analysis

7. Brazing - Al brazing, Cu brazing, Silver brazing and Stainless steel brazing.

LIST OF PRACTICAL

GENERAL

1. Safety preautions to be observed in workshop

2. Familiarisation with various tools and equipments in use in the workshop.

3. Workshop, Work materials and Tool materials.

EXERCISE :

FITTING SHOP :

1. Hacksawing procedure, Precautions and Techniques in Hacksawing, Different number of Teeth in Blade, Utility.

2. (a) Making a straight cut with Hacksaw.

   (b) Cutting a Solid block.

   (c) Cutting a Channel.

   (d) Cutting a corner

   (e) Cutting a Conduit.

3. Cutting a square piec of 2" sides with Hacksaw.

4. Practice in the use of different files, precautions in the use of different filling rechique and methods.

5. Exercise 3 to be filed approximate size to side 2".

6. Filling the above exercise top surface to flat.

7. Filling the sides of above job to make right angle.

8. Making of "T" fitting.

9. Making Male and Female as per diagram given.

10. Making circular hole by drilling and finishing with file.

11. Making a square hole in a sheet.

12. Making a Diagononal fitting.

13. Practice in riveting and making a riveted joints.

MACHINE SHOP :

1. Familiarisation with the Machines in the Machine shop with -

   (a) Lathe

(b) Drilling Machine.

(c) Sharppening of Tool Bits.

EXERCISE :

1. Practice of Plain Turning, Facing of a M. S. Rod.

2. Step turning of Rod.

3. Thread Cutting Exernal

4. Taper turning.

5. Internal Turning Procedure.

6. Cutting Threads Internally by tape.

7. Knurling Practice.

AECR CARPENTRY :

1. Familiarisation with Tools and Equipments and Safety procedure in Carpentry.

2. Measuring and Making tools.

3. Cutting Tools, Saw, Planes, Chisels etc.,

4. Drilling and Boring Tools : Carpenters Brace Augarbit, Rosebit, Rosebit and Bradwal.

EXERCISE :

1. Procedure of use Saws and setting of the teeth.

2. Practice in Sharpening of Saws Teeth.

3. Practice in use of different types of chisels and shrpening

4. Practice in Grinding and Sharpening of various types of Chisels.

5. Practice of plaining.

6. Procedure of marking different types of cut.

7. Making a Half Lap joints and 'T' joints and Sawing practices as per drawing.

WELDING SHOP :

Familiarisation with Tools, equipments used in the welding shop and precautions.

1. Oxygen and Acetyline Cylinders.

2. Acetyline regulator for Low Pressure.

3. Gas Cutting Equipment and Welding tips.

4. Pressure Regulators, Hose and Hose fitting, Welding Torch, Goggles, Spark, Filler Rod Wire Brush, welding table with fire, Brick to.

EXERCISE :

1. Practice of lighting the Gases.

2. Oxidising, Neutral and Reducing Flames.

3. Practice in making Head welding.

4. Practice a Line Brazing.

5. Practicing a Seam Soldering

6. Practicing a Butt Welding.

II Semester

2.1 MATHEMATICS-II

L	T	P
4	2	-

Rationale :

Mathematics is the back bone of engineering education. It is indispensable for understanding quantitatively the concepts of engineering and technology.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time L	T	P
1.	Integral Calculus	28	14	-
2.	Co-Ordinate Geometry	28	14	-
	Total	56	28	-

DETAILED CONTENTS

1. INTEGRAL CALCULUS:

(i) Methods of indefinite integration.
(ii) Integration by Substitution.
(iii) Integration by parts.
(iv) Application of integration in calculation of Surface, Area and Volumes of cylinder, Cone and Sphere.

2. CO-ORDINATE GEOMETRY :

(i) Cartesian and Polar co-ordinates and their relationship through the system of representation of point in space and in a plane. Inter-relationship between Polar and Cartisian co-ordinates. Polar and Cartesian equation of standard curves.
(ii) Straight lines, Planes and Sphere in space, distance between two points of space. Findings equations of a straight line and shortest distance between two lines.
(iii) Standard form of curves of parabola, hyperbola, ellipse and tangents and normals.
(iv) Study of general equations of Second Degree for representing of various curve such as a pair of straight line, circle, parabola and ellipse.

2.2 PHYSICS-II

L	T	P
2	1	-

Rationale :

Knowledge and teaching of physics is a foundation course of engineering students, its purpose is to develop proper understanding of physical phenomena and the scientific concepts.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time L	T	P
1.	Topics No. 1	14	7	-
2.	Topics No. 2	14	7	-
3.	Topics No. 3	14	7	-
4.	Topics No. 4	14	7	-
	Total	56	28	-

DETAILED CONTENTS

1. WAVE MOTION AND SOUND :

Mechanical waves, Sinusoidal wave, Interfrence phenomena and Standing waves. Speed of sound, Production of sounds, Intensity of sound waves, Pitch and quality. Doplar's effects and Ultrosonic waves.

2. KINEMATICS :

(i) Angular valocity, Angular accelaration, Angular monmentum.

(ii) Relation between Angular and linear valocity.

(iii)Centrifugal force.

(iv) Motion in a vertical circle.

(v) K.E. of rotation.

(vi)Simple theory of vibrations and harmonic resonancres

(vii) Numericals based on above topics.

3. PROJECTILE :

Parabolic motions, Projectile thrown horizontally and at an angle, Problems on time of flight, horigontale range and maximum horizontal range.

4. MOTION OF SETELLITES - ESCAPE VALOCITY :

(i) Orbital speed of setellite.

(ii) Period of revolution of setellite.

(iii) Artificial setellite.

(iv) Weightlessness in setellite.

(v) Binding energy of setellite.

(vi) Max height attained and valocity of setellite.

(vii)Geo-stationery satelites

(viii)Jet propulsion theory.

2.3 MECHANICS

L	T	P
4	2	-

Rationale :

This subject deals with fundamental concepts of mechanics which are useful for the AME students for further understanding the second and final year subject/topic like engine, braking system and in general.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time L	T	P
1.	Topics No. 1	6	3	-
2.	Topics No. 2	6	3	-
3.	Topics No. 3	6	3	-
4.	Topics No. 4	6	3	-
5.	Topics No. 5	6	3	-
6.	Topics No. 6	6	3	-
7.	Topics No. 7	6	3	-
8.	Topics No. 8	6	3	-
9.	Topics No. 9	6	3	-
10.	Topics No. 10	2	1	-
	Total	56	28	-

DETAILED CONTENTS

1. VECTORS AND FORCE ANALYSIS :

Concept of Scalers and Vectors quantities, Graphical representation of vactors, Composition and Resolution of force vactors, Law of Parallelogram of forces and Law of Triangle of forces. Lami's theorem, Conditions for equilibrium of a particle under the action of number of forces, Concept of moment of a force, Resultant of forces and their equilibrant. Condition of equilibrium of a rigid body acted upon by number of forces. Related numericals, Concept of free body diagram.

2. FRICTION :

Static and dynamic friction, Limiting friction. Laws of friction, Angle of friction. Cofficient of friction. Numerical problems.

Application of friction in Aircraft/Aviation and its effect in terms of wear, tear and life.

3. WORK, POWER AND ENERGY :

Torque and force, Work done by a force and torque. Kinetic and potential energies. H.P. of an engine and its efficiency. Motion in a straight line subjected to a force.

4. SIMPLE MACHINES :

Introduction, types of pulleys.Mechanical advantage and velocity ratios, Simple wheel and axle, Weston's differential pulley block and their use. Screw Jacks. Numerical problems.

5. MOMENT OF INERTIA :

Moment of inertia of plane areas, Radius of gyration, General theorems on moment of inertia

(i) Theorem of parralel axis.

(ii) Theorem of perpendicular axis.

6. MECHANISMS:

Definition of link, Frame and mechanism, Difference between machine and mechanism, Kinematic pairs, Lower and higher pairs. Introduction to four bar mechanisms, Slider crank mechanism, Introduction to cams and its use.

7. STRENGTH OF MATERIALS :

Stress, Strain and Elasticity, Tensile and compressive stress, Hookes law, different types of elasticity, Poission ratio, Relation between moduli. Determination of Young's modulous, for a material, numericals.

8. BEAMS AND TRUSSES :

Definitions of the terms. Concept of tie and struts, Types of supports. Calculation of reaction and supports of beams trusses and cantilevers. Concept of shear force and bending moment at a section of a beam under various kinds of load. Shear force and bending moment diagram.

9. FLUID MECHANICS:

Introduction to fluid mechanics, viscocity, Surface Tension, Importance of their knowledge in engineering field, Various kinds of fluid flows (Open and closed channels) Laminar and turbulent flows, Bernaullis equation and its application in general and in aeronautics. Introduction to Reynonds numbers.

10. Application of mechanics in Aeronautics (Brief Idea).

Corrected and Approved By B.T.E. Meeting On Dated 10.06.2015

2.4 BASIC ELECTRICITY & ELECTRONICS

L	T	P
7	2	3

Rationale

An A.M.E. diploma holder is involved in various jobs ranging from preventive maintenance of aircraft to fault location in circuits, commission of new component , selection of suitable component for improvement.In order to carry out these and similar jobs effectively on any equipment circuitry or machinery, specialised knowledge of concerned field is essential.

However, for acquiring knowldge in any specialised field of electrical engineering, a group of certain common fundamental concepts, principles and laws involved and mastering of some manual skills are the pre-requisites to be covered in the subject of basic electiricity.

Sl.N.	Units	Coverage Time L	T	P
1.	Basic terminology and their concept	5	1	-
2.	D.C. circuits	12	4	-
3.	Introduction To Semiconductor Devices	15	4	-
4.	Capacitors	12	4	-
5.	Electromagnetism	12	3	-
6.	Electromagnetic induction	15	4	-
7.	A.C. circuits	15	4	-
8.	Polyphase circuits	12	4	-
		98	28	42

DETAILED CONTENTS

1. Basic Terminology and their concepts

1.1 Current, EMF, potential difference (Voltage), resistance, resistivity, their units, conductors & insulators.

1.2 Effect of temperature on the resistance of conductors, semiconductors (C, Si, Ge) and insulators physical explanation, temperature coeffient of resistacne.

1.3 Electrical power, energy and their units (SI).

1.4 Relationship between electrical, mechanical and thermal SI units of work, power and energy.

2. D.C. Circuits

2.1 Kirchoff's laws.

2.2 Simple numerical problems based on Kirchoff's laws.

2.3 Introduction to Thevenin and Superposition theorem.

2.4 Operation of photo cells, Construction, Material and operation of thermo-couples.

3. Introduction To Semiconductor Devices

Introduction of semiconductor and their application in avaiation. Types of semiconductor. Band theory of solids.

4. Capacitors

4.1 Concept of capacitor, capacity of parallel plate capacitor, and effect of physical parameters.

4.1 Energy stored in a capacitor, dielectric and its influence on capaitance of a capacitor, dielectric constant dielectric breakdown and dielectric strength. Dielectric loss.

4.3 Series and parallel combination of capacitors.

4.4 Variable capacitors.

4.5 Charging and discharging of capacitors.

4.6 Simple broblems on capacitors.

5. Electromagnetism

5.1 Theory of magnetism, Magnetic material, Magnetism and demagnetism, Electro magnetic waves.

5.2 Concept of magnetic flux, flux density, magnetic field intensity ,permeability and their units.

5.3 Maganetic circuits, concept of reluctance and mmf and simple problems.

5.4 Analogy between electric and magnetic circuits.

5.5 B-H curve and magnetic hysteresis (No mathematiccal derivation).

5.6 Elementry ideas about hysteresis loss.

6. Electromagnetic Induction

6.1 Faraday's laws of electromagnetic induction. Lenz's law, simple problem. Dynamically induced emf.

6.2 Self induced emf, inductance, its role in electrical circuits. Simple problems.

6.3 Mutually induced emf, mutual inductance,its role in electrical circuits. Simple problems.

6.4 Energy stored in magnetic circuit.

6.5 Rise and decay of current in inductors.

6.6 Force on a current carrying conductor placed in a magnetic field and its applications.

6.7 Elementry idea about eddy current loss.

7. A.C.Circuits

7.1 Recapitulation of terminology, instantaeous value, maximum (peak) value, cyle, frequency,alternate current and voltage. Difference between AC and DC, Static electricity and conduction.

7.2 Equation of an alternating voltage and current and wave shape varying sinusoidally.

7.3 Average and RMS value of alternating voltage and current. Importance of RMS value. Simple problems.

7.4 Concept of phase, phase difference and phasor representation of alternating voltage and current.

7.5. A.C. through pure resistance, inductance,capacitance, phasor diagram and power absorbed.

7.6 R-L series circuit, idea of impedance and calculations.

7.7 Apparent power, reactive power and active power,power factor, its importance and simple problems.

7.8 R-C series circuit , simple problems.

7.9 R-L-C series circuit , simple problems.

7.10 Solution of simple parallel A-C ciruits by

(a) Phasor diagram method,

(b) Admittance method.

7.11 Solution of AC circuits series/ parallel by j method. (simple problems).

7.12 Resonance (Series and parallel) and practical application, simple problems.

8. Polyphase System

8.1 Introduction to polyphase system. Advantage of three phase system over single phase system.

8.2 Star and Delta connections. Relationship between phase and line value of currents and voltage.Power in polyphase circuits. Simple problems of balanced circuits only.

BASIC ELECTRICITY & ELECTRONICS LAB

i) To show the variation of resistance of a lamp with temperature by plotting a V-I curve for 100W filament lamps.

ii) To study the colour coded resistance and to verify the same by multimeter.

iii) To measure the total or equilivant resistance of colour coded resistors connected in series and parallel and to verify the same by multimeter.

iv) To verify the Kirchoff's laws.

v) To measure the total or equilivant capacitance of capictors connected in series and parallel and to verify the same by multimeter.

vi) To find the relationship between voltage and current for R-L series circuit for variable resistances & variable inductance.

vii) To measure the power factor in a single phase AC circuit by using voltmeter, ammeter & wattmeter.

viii) To study the B-H curve for a ferro-magnetic core.

IX) To study the phenomenon of electro magnetic induction.

x) Verification of voltage and current relations in Star and delta connected systems.

xi) Testing of diodes and transistors.

xii) Soldering Practices.

Corrected and Approved By B.T.E. Meeting On Dated 10.06.2015

2.5 AIRCRAFT MATERIALS AND MATERIAL SCIENCE

L	T	P
5	-	3

Preamble:

The aim of Aircraft Maintenance Engineering is to familarise with the material of various parts of Aircraft and to make best use of material available in single form or in combination. For this purpose knowledge is Material Science is essential.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time L	T	P
1.	Topics No. 1	8	-	-
2.	Topics No. 2	6	-	-
3.	Topics No. 3	8	-	-
4.	Topics No. 4	6	-	-
5.	Topics No. 5	6	-	-
6.	Topics No. 6	6	-	-
7.	Topics No. 7	8	-	-
8.	Topics No. 8	8	-	-
9.	Topics No. 9	8	-	-
10.	Topics No. 10	6	-	-
	Total	70	-	42

DETAILED CONTENTS

1. INTRODUCTION TO AIRCRAFT MATERIALS (Non Metals) :

A. Air craft woods and their uses, their structure, strength of wood, Types of glues

B. Introduction to Plywood, its construction and use.

C. Types of aircraft Fabric, their specifications and testing.

D. Reinforcing tapes, threads and their specification and requirement.

E. Introduction to popes and thinner, classification and types, Tauetening and non tauetenin dopes.

2. Rubber- Natural synthetic rubber, Types of synthetic rubber, Buna-s Buna-N, Neopren Butyl and thickol and their uses and storage and service life.

3. Introduction to plastic - Classification, inspection, thermo plastic and thermo setting plastic.

4. Aircraft adhesives and seallent used and storage

5. INTRODUCTION TO FERROUS MATERIALS :

A. Physical terms like- hardness, brittlenste, malleability Ductility, elasticity, density, fusibility, conductivity, contraction and expansion.

B. Heat teratment Terms - Critical range, Annealing, Narmalizing, Heat treatment, Hardening Quenching, Tempering carburizing, case harding

C. Physical Test Terms - Strain, stress, tensile strength, elastic limit, proportional limit, proof stress, yield strength, yield point elongation, reduction of area, modulus of elasticity.

D. Hardness testing- Rockwell, Brinnel and universal testing machine.

6. STEEL AND ITS ALLOY :

A. Plain carbon steel, effect of indiviual elements. SAE numbering system, Air craft steel and corrosion resistent steel.

B. Heat treatment of steel- Critical range, structure of steel, theory of heat treatment.

C. Introduction to various methods of heat treatment. Hardening, Tempering, Annealing, Normalising, Carburising, Case hardening and their Different processes. Heat treatment of carbon steels, Critical points in iron-carbon diagram. Refining process and their temperature. Temperature colour guide.

7. INTRODUCTION TO NON FERROUS METALS :

A. Introduction to Ni and its alloy, Cu and its alloy- Properties and types. Identification of those materials in various heat treated states and forms.

B. Introduction to Air Craft Aluminium alloys, Nomenclature, classification, heat treatment of Al alloy.

C. Mg and its alloys, Ti and its alloys, inconel monel and their uses

8. SHAPING OF METALS :

Forging, Drawing, Casting, Rolling, Bending, Extruding, Shearing, Forming and Piercing.

9. COMPOSITE MATERIAL :

A. Composite, advantages & uses of compositite material.

B. Reinforcing fibres, type & uses.

C. Terms : warp, weft, unidirectional, bidirectional, mats, fabric weaves, satin weaves, hybrids, intraply hybrid, interply hybrid.

D. Matrix material, thermosets, thermoplastic, epoxy resin, working with resin & catelysists, adhesive pre-inpregnated materials, fillers, metal matrix composites.

E. Core material, honey-comb, foams-styrofoam, urethane, PVC, strux.

F. Different types of manufacturing techniques, manufacturing methods, compression, moulding, vaccuum bagging, filament winding, wet lay-up, lightining protection & painting of composite part.

G. Safaty precautions in the use of composite material.

H. Curing method of composite material in brief- autoclave, heating blankets.

I. Machinery of cured composite.

J. Detection of defects/deterioration in composite

10. CORROSION AND ITS PREVENTION :

Corrosion and their type, Detection of corrossion, prevention of corrossion, method of preventing corrossion, special coating, chemical films, special paints like Abrassive Resistant Paint, Heat and corrossive resistive paints and electroplating.

2.6 AIR LAW, C.A.R AND HUMAN FACTORS AND LIMITATION-II

L	T	P
10	-	-

Rationale :

The objective and quality and related responsibility in the work of aircraft maintenance at any level requires some legislation. The paper deals with such things imperative for the knowledge of aircraft maintenance engineer and these are changable to time to time as DGCA, New Delhi requirements

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time L	T	P
1.	Topics No. 1	20	-	-
2.	Topics No. 2	20	-	-
3.	Topics No. 3	20	-	-
4.	Topics No. 4	20	-	-
5.	Topics No. 5	20	-	-
6.	Topics No. 6	40	-	-
	Total	140	-	-

DETAILED CONTENTS

1. AIRCRAFT INSTRUMENTS, EQUIPMENTS AND ACCESSORIES :

Overhaul and periodical inspection of aircraft instrument, maintenance of test equipment, Airworthiness precedure for aircraft system/ accessories shop, FDR, CVR, GPWS, ACAS.

2. LICENSING OF AIRCRAFT MAINTENACE ENGINEERS (CAR-66):

Issue of AME licences, its classification and experiments requirements, procedure of examination for issue/extension of BASIC and AME licences. Classification and certification responsibilities fo AME licence for Helicopters, Endorsement, renewal and certification privileges of AME licence, Grant fo open AME licence. Issue of BAMEC and authorisation to AME/Approved person. Grant of apporval to persons engaged in overhaul, Major repairs of component/aircraft engine. Approval of FEE, CFE, GET. Student flight engineer/Flight Engineers licence. Validation of foreign AME licence, Mandatory modification and inspection.

3. OPERATIONAL REQUIREMENTS OF AIRCRAFT :

Operation of commercial Air Transport Aeroplanes. General aviation Aeorplanes, Commerical air transport and general aviation Helicopters. Powered hang gliders, Exit low seating. Airworthiness, mainteance and operational requirements for extended range operation with twin engine

aeroplane for commerical air transport operation. Requirements for operation manual; Implementation of RVSM, Performance based navigation. Requirements for evaluation, certification and maintenance of aircraft flight simulators and synthetic flight training device. Airworthiness requirements for CAT II and CAT III A operation.

4. Airborne communication, navigation, radar and flight testing of aircraft.

5. MISCELLANEUS REQUIREMENTS :

Weight and balance control, storage of aircraft parts, Loncessions, Aircraft log books, provision of medical supplies in aircraft. Document to be carried on boald by Indian registered aircraft and procedure of tissue of taxy permit.

6. HUMAN PERFORMANCE :

6.1 Physical Environment : Noise and fumes, Illumination, Climate and temperature, Motion and cibration, Working environment.

6.2 Tasks : Physical work, Repetitive tasks, Visual inspection, Comples system.

6.3 Communication : Within and between teams, Work logging and recording, Keeping upto date, currency, Dissemination of information.

6.4 Human Error : Error models and theories, Types of error in maintenance tasks, Implications of errors (i.e accidents), Avording and managing erroes.

6.5 Hazards in the Workplace : Recognising and avoiding hazards, Dealing with emergencies.

III Semester

3.1 AIRFRAME & SYSTEMS

L	T	P
7	2	5

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time		
		L	T	P
1	Topics No. 1	20	8	-
2	Topics No. 2	12	4	-
3	Topics No. 3	11	3	-
4	Topics No. 4	9	3	-
5	Topics No. 5	9	2	-
6	Topics No. 6	9	2	-
7	Topics No. 7	6	2	-
8	Topics No. 8	6	2	-
9	Topics No. 9	6	2	-
	Total	98	28	70

DETAILED CONTENTS

1. General Structural Concepts

- Airworthiness requirements for structural strength & classification as primary, secondary and tertiary and structural strength.
- Fail safe, safe life and damage tolerances.
- Zonal and stations identification system.
- Stress, strain, bending, compression, shear, torsion, tension and fatigue conceptions.
- General construction, composite construction, metal construction, monocoque, semi monocoque and stressed skin construction.
- Steel tubular structure, light metal construction, fabric, plywood and metal coverage.
- Construction methods of stressed skin fuselage, formers, stringers, longerons, bulkheads, frames, doublers struts, ties, beams, floor structure, reinforcements, method of coverage fuselage and wing etc., anti corrosive, treatment.
- Structure assembly methods riveting, bolting and bonding.
- Methods of surface clearing and protection.
- Airframe symmetry, method of alignment and symmetry checks.
- Under carriage types, fixed and retractable, tyres, shock absorbers and brake systems.

- Fabrics, surface tapes, reinforcing tape lacing cord, stringing cord, dope and doping procedures.
- Doors construction, mechanism, operation and safety devices, seeking and pressurization construction & pressurization sealing wing, stabilizer, pylon & undercarriage attachment.
- Windows and windscreen construction.
- Cockpit, instruments panel construction.
- Seat installation and safety.
  Fuel storage system.
- Firewall, engine mounts.
- Drains and ventilation provisions.
- Lightening strike and protections.
- Aircraft Bonding
- Knowledge of general terms such as damage, tolerances, aging of aircraft and SSID etc.
- Flight control, surface construction and balancing etc.

2. Hydraulic System

- System layout, fundamental of hydraulic systems and terminology, advantages and disadvantages of hydraulic system.
- Hydraulic fluids.
- Hydraulic rubber seals and packing washers.
- Hydraulic system component : Reservoir, hand pumps, power driven pumps, filters, pressure regulator valve, accumulator, selector valves, pressure relief valves, actuating cylinders, check valves, orifice check valve, restrictor valves, hydraulic fuse, fine disconnect or quick disconnect valve, Emergency pressure generation
- Flexible hydraulic hoses.
- Inspection and pressure testing.
- Indication & warning system

3. LandinG Gear System

- Construction, shock absorbing.
- Extension & retraction system normal & emergency
- Indication & warning
- Anti-skid system & auto braking.

4. Pneumatic System

- Introduction, System Layout advantages and disadvantages of pneumatic system.
- High pressure, medium pressure and low pressure system.
- Pneumatic system components, engine driven compressor, relief valves, control valve, filters, oil separators, air bottle, pressure reducing valves, check valves, restrictors.

- Indication & warning system

5. De-icing And Anti-icing System

- Ice prevention: Heating, surfaces using hot air heating by electrical system, breaking of ice formation and alcohol spraying.
- Pneumatic de-icing systems & maintenance.
- Thermal anti-icing control systems.
- Wind shield icing control systems.
- Servicing and maintenance of de-icing system.

6. Aicraft Environment System

- Outflow valves and safety valves.
- Instruments allied to pressurization systems.
- Gas vapour cycle air-conditioning system
- Air cycle air-conditioning system

7. Aircraft Oxygen Systems

- Introduction, systems layout cockpit, cabin sources supply regulation.
- Charging and purging of oxygen system, oxygen system servicing.
- General precautions for oxygen system, Indications & warning.

8. Fuel Systems

- System layout, fuel tanks, supply systems, dumping, venting and draining.
- Cross feed and transfer, indications and warnings, refueling and defueling, longitudinal balance of fuel system.

9. Fire Protection System

- Fire and smoke detection and warning system.
- Fire extinguishing system.
- Systems tests

AIRFRAME & SYSTEMS PRACTICAL

1. Familiarization and inspection of, Wing and fuselage construction, including primary and secondary structures. Forged, extruded, cast and sheet materials used

2. Familiarization and inspection of Main joints: methods of riveting, spot welding, and adhesive bonding.

3. Familiarization and inspection of Doors and cut-outs, positions of inspection panels, removal of fairings, and methods of gaining access to all parts of structure.

5. Familiarization and inspection of interconnections of autopilot to control systems; examination (by visiting airline, if necessary) of power-operated control systems.

6. Preflight inspection of aircraft, starting and running of engine; observation of instrument reading; functional check of electrical components ,stopping of engines

7. Use of grounding equipment for moving lifting or servicing aircraft

8. Familiarization with Identification and operation of hydraulic system trainer.

9. Familiarization with Identification and operation of pneumatic system trainer.

10. Familiarization with Identification and operation of landing gear system.

11. Familiarization with Identification and operation of de-icing and anti-icing system.

12. Familiarization with Identification and operation of Pressurization system.

13. Familiarization with aircraft air-conditioning system

14. Familiarization with Identification and operation of Aircraft oxygen systems.

15. Familiarization with Identification and operation of Fuel systems:

16. Familiarization with Identification and operation of Fire protection:

Corrected and Approved By B.T.E. Meeting On Dated 10.06.2015

3.2 GENERAL AERO ENGINE

L	T	P
4	-	6

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time		
		L	T	P
1	Topics No. 1A,1B & 1C	10	-	-
2	Topics No. 1D 1E & 1F	10	-	-
3	Topics No. 1G,1H & 1I	10	-	-
4	Topics No. 1J & 1K	10	-	-
5	Topics No. 2A,2B & 2C	5	-	-
	Topics No. 2D, 2E & 2F	5		
6	Topics No. 2G,2H& 2I	6	-	-
	Total	56	-	84

DETAILED CONTENTS

1. FUNDAMENTALS

1A Potential energy, kinetic energy, Newton's laws of motion Brayton cycle

1B The relationship between force, work, power, energy, velocity, acceleration.

1C General knowledge of different thermodynamics Laws, Process, pressure, volume diagram, gas equation and work done during the process.

1D General knowledge of thermo-dynamic laws related to internal combustion engines.

1E Knowledge of internal and external combustion heat engines.

1F General knowledge of otto cycle and the relationship between volume, temperature and pressure.

1G A general knowledge of terms used in theory of piston engine such as piston displacement and compression ratio, calculation of parameters from given data.

1H Knowledge of various efficiencies involved in internal combustion engines. (Mechanical, thermal and volumetric)

1I Operating principle and difference between two stroke & four stroke engines,otto and diesel engine merits and demerits.

1J Introduction, Principle & performances: Introduction to jet engine, working cycle, comparison between PE and JE. Engine performance, thrust calculation, gross thrust, net thrust, choked nozzle, thrust distribution, thrust horse power, ESHP, specific fuel consumption, factors effecting engine performance.

1K Constructional arrangement and operation of turbojet turbofan, turbo shaft, turboprop.

2. ENGINE PERFORMANCE

2A Knowledge of various factors, affecting the engine performance.

2B Classification of I.C. engines, on the basis of cylinder arrangement, cooling systems & no. of strokes per cycle.

2C. Identification & designation of reciprocating engines.

2D Power calculation and measurement, factors affecting engine power, mixture/leaning, preignition.

2E Gross thrust, net thrust, choked nozzle thrust, thrust distribution

2F Resultant thrust, thrust horsepower, equivalent shaft horsepower, specific fuel consumption.

2G. Engine efficiencies

2H By-pass ratio and engine pressure ratio.

2I Engine ratings, static thrust, influence of speed, altitude and hot climate, flat rating, limitations.

GENERAL AERO ENGINE PRACTICAL

1. Identification of various engine parts.
2. Familiarization with the valve operating mechanism.
3. Familiarization with working principle of four stroke engine.
4. Inspection and assembly of intake & exhaust valve
5. Familiarization with Rigging and propeller control, Compressor washing procedure.
6. Familiarization with internal inspection by endoscope/boroscope.
7. Familiarization with inspection of accessories gear system.
8. Familiarization with constructional arrangement of turbojet / turbofan / turbo shaft / turboprop,
9. Familiarization with various inlet configurations; engine inlet, Axial and centrifugal types of compressor).
10. Engine indicating system, Engine monitoring and ground operation.

3.3 AIRCRAFT ELECTRICAL SYSTEM-I

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L	T	P
5	-	7

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time		
		L	T	P
1	Topics No. A	10		-
2	Topics No. B	10		-
3	Topics No. C	10		-
4	Topics No. D	8		-
5	Topics No. E	10		-
6	Topics No. F	8		-
7	Topics No. G	7		-
8	Topics No. H	7		-
	Total	70		98

DETAILED CONTENTS

A- 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

B- General description of electrical measuring instruments

.-Requirement of indicating instruments.

.Construction & working of moving coil type, moving iron type and dynamometer type instruments-Ammeter, voltmeter, Ohm meter, watt meter, frequency meter, Megger.

conversion of ammeter to voltmeter and vice versa.

.Knowledge of various AC and DC measuring instruments
.Application of multiplier and shunt.

C- Electrical Cables and Connectors

. Cable types, construction and characteristics
· 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 and installation precautions

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· Wiring protection techniques: Cable looming and loom support, cable clamps, protective sleeving techniques including heat shrink wrapping, shielding.

D- Protective devices

Fuses, relays, circuit breakers over voltage, under voltage,
reverse current relays current limiter, switch, solenoids.

E- Static electricity in aircraftP-static, causes and prevention, corona threshold, bonding, shielding static discharge wicks and null field discharger, Electrostatic laws of attraction and repulsion, units of charge.

F- TEST EQUIPMENTS

- Knowledge of the construction, principle of operation, use and precautions to be observed for aircraft test equipments.

G- BONDING AND SCREENING- Knowledge of purpose of bonding and shielding and difference between the two, precaution, methods employed; minimum acceptable standards for insulation and bonding; and testing.

- Detail knowledge of aircraft wiring system; procedure of laying of electrical cables and precautions to be taken thereof..

H- Rectifiers:-

1. Type of rectifier.
2. Construction of copper oxide
3. Selenium rectifier
4. Half and full wave rectifier

AIRCRAFT ELECTRICAL SYSTEM-I PRACTICAL

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1. **LEAD ACID BATTERIES**

Checking of battery condition, adjustment of specific gravity of electrolyte, battery charging practice; capacity, discharge and insulation test; others

2. **NICKEL CADMIUM BATTERIES**

A. Checking of battery condition: determining state of charge, cell balancing, charging, etc.

B- Checking of electrolyte level and insulation tests, Safety precautions, Deep cycling of nickel cadmium units.

3. **WIRING, CABLING AND SOLDERING TECHNIQUES**

Practice in stripping insulation; splicing; wiring to lugs; terminals and tube sockets; and dismantling, soldering and reassembly of connectors.Cables: lacing of wires to form a cable, termination and soldering of cable ends, and serving of coaxial cables. Soldering: practice with different sizes of soldering irons, different grades of solder, fluxes and types of connectors

4. Familiarization with different types of elect. Measuring Instruments.

5. To measure the insulation resistance of a cable with the help of megger.

6. Practice of A.C. and D.C. parallel and series circuit.

7 Familiarization with Circuit breaker-function and testing

8. **Bonding, continuity and insulation testing**

a-Bonding checks: use of bonding tester.

b-Continuity and insulation tests on aircraft circuit; use of Megger testers.

c- Millivolt drop checks at cable joints and terminal ends.

9- familiarization with cut-outs and relays,reverse current relays, solenoid,thermal

10- familiarasation with various parts of wheatstone bridge and other balancing devices, sensing elements

3.4 AIRCRFT ELECTRONICS SYSTEM

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L	T	P
6	1	5

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time		
		L	T	P
1	Topics No. A	15	2	-
2	Topics No. B	12	2	-
3	Topics No. C	9	2	-
4	Topics No. D	9	2	-
5	Topics No. E	12	2	-
6	Topics No. F	9	2	-
7	Topics No. G	9	1	-
8	Topics No. H	9	1	
	Total	84	14	70

DETAILED CONTENTS

A. Solid State Devices

1. Semi conductor theory - Conventional and electron flow, voltage and current sources. Diode theory with elementary circuit ideal. Special purpose diodes (zener), schottky, varactor etc.

2. Bipolar transistors biasing and classification of Amplifiers

3. Concept of FET & Thyristor family devices.

4. knowledge of Medium, large and very large scale integrated circuits.

5. Microprocessors & Memories

- Functions performed and overall operation of a microprocessor.
- Basic operation of each of the following microprocessors, elements-control and processing unit, clock register, arithmetic logic unit. -Memory associated terms
- Operation of typical memory devices.
- Operation, advantages and disadvantages of various data storage system.

B. Electrostatic Sensitive Devices

- Special handling of components sensitive to electrostatic discharge.

- Awareness of risk and possible damage, component and personnel, anti-static protection devices

C. Operational amplifiers, oscillators and multi-vibrators

D. knowledge of the terms used, basic operation, interfacing of the major component of a computer

E. Multiplexing.

- Operation, application, and identification, in logic diagrams of multiplexers and de multiplexers.
- Operation and use of encoders and decoders.
- Function of encoders types.

F. On Board Maintenace system (ATA 45)

Central maintenance computer, printing, structure monitoring, data loading system , Electronics library system

G. Avionics General Test Equipment

- Operation, function and use of avionics general test equipment.
- periodic calibration of test equipment

H. Electronic Displays

Principles of operation of common types of displays used in modern aircraft including cathode ray tubes, light emitting diodes and liquid crystal display.

AIRCRAFT ELECTRONICS PRACTICAL

1. Recognition and reading the value of passive devices with colour codes.
2. Recognition and testing of active devices.
3. Familiarise with Uses of medium, large and very large scale integration.
4. Familiarise with identification, operation and classification of logic gates
5. Familiarise with operation and classification of operational amplifiers
6. Familiarise with operation and classification of oscillators and multi-vibrators
7. Familiarise with Functions and operation of microprocessor.
8. Familiarise with Operation and use of encoders, decoders, multiplexer and demultiplexer

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IV Semester

4.1THEORY OF FLIGHT

L	T	P
9	3	-

TOPIC WISE DISTRIBUTION OF PERIODS

Sl. No.	Topics	Coverage Time L	T	P
1	Topics No. 1	22	8	-
2	Topics No. 2	25	8	-
3	Topics No. 3	12	2	-
4	Topics No. 4	25	8	-
5	Topics No. 5	22	8	-
6	Topics No. 6	22	8	-
	Total	128	42	-

Detailed Contents

1-Basic aerodynamics

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, upwash and downwash, vortices, stagnation

–The terms: camber, chord, mean aerodynamic chord, profile (parasite) drag, induced drag, centre of pressure, angle of attack, wash in and wash out,
fineness ratio, wing shape and aspect ratio

–Thrust, Weight, Aerodynamic Resultant

-Generation of Lift and Drag: Angle of Attack, Lift coefficient, Drag coefficient, polar curve, stall

-Aerofoil contamination including ice, snow, frost.

-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.

3-Flight Stability and Dynamics

– Longitudinal, lateral and directional stability (active and passive).

4-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;
-Drag inducing devices: spoilers, lift dumpers, speed brakes
-Operation and effect of trim tabs, servo tabs, control surface bias.

5-High Speed Aerodynamics

- Concept of supersonic pattern
- Difference between Subsonic and Supersonic flow
- Formation of shock wave.

6-Concept of Fly By Wire And Its Application

- A brief knowledge of rotor craft
- Helicopter Aerodynamics

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4.2 AIRCRAFT INSTRUMENTATION-I

L	T	P
6	2	4

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time		
		L	T	P
1	Topics No. 1A & 1B	9	3	-
2	Topics No. 1C & 1D	12	4	-
3	Topics No. 1E & 1F	9	3	-
4	Topics No. 1G & 1H	9	3	-
5	Topics No. 1I,1J & 1K	9	3	-
6	Topics No. 1L & 1M	9	3	-
7	Topics No. 2A& 2B	9	3	-
8	Topics No. 2C & 2D	9	3	-
9	Topics No. 2E & 2F	9	3	-
	Total	75	28	56

DETAILED CONTENTS

1. **INSTRUMENT**

1A. General introduction to aircraft instrument: various instruments and their classification.

1B. Altimeter, principle, constructional details, types of setting, position error, leak test and periodical inspection.

1C. Airspeed indicator-Pitot and static tube, construction and principle, position error & periodical inspection, leak test.

1D. Vertical speed indicator, constructional features checks and installation procedure, periodical inspection.

1E. Pressure gauges, principles of operation types of gauges, periodical inspection.

1F. Temperature gauge, principle of thermocouple and different type used in aviation, cylinder head temperature gauge, maintenance and periodical inspection.

1G. R.P.M. indicator, constructional details types of indicators, maintenance

and periodical inspection.

1H. Gyro instruments, principle of gyro wheel & different types of gyros, constructional details of each i.e. turn & bank, artificial horizon and directional gyro, maintenance and periodical inspection, suction gauges etc.

1I. Electrically operated instruments.

1J. Fuel quantity measuring system.

1K. Fuel flow gauge

1L. Manifold pressure gauge.

1M. Detailed knowledge of the procedures of replacement and insitu operational tests of all instruments (except where the use of special test instrument/equipment is required

2. COMPASS

2A. Knowledge of general principles of magnetism, magnetic materials and permanent magnets, polarity and strength of bar magnets, the earth as magnet; the magnetism and its relationship to the geographic meridian.

2B. Knowledge of general principles of construction for typical aircraft direct reading compasses, including the magnet system, damping liquid, verge ring and markings, lubber line, grid wires, shock absorbing suspension and corrector box, the inspection necessary for the detection of common defects that may arise during use.

2C. Knowledge of the procedure and points to be observed during installation of the compass in aircraft.

2D. Knowledge of the precautions to be observed in the choice of site for swinging and preparation of a "swinging base", checking the base by means of a landing compass.

2E. Knowledge of the compensation of compasses in the aircraft including the observation of deviations, the calculations and adjustments. Necessary for corrections for co-efficient A, B and C, the procedure to be followed after, then corrections are made and the preparation of deviation cards and graphs.

2F. Knowledge of the use of landing compass for checking the compasses in aircraft.

AIRCRAFT INSTRUMENTATION-I PRACTICAL

1. familiarization and system lay out and maintenance check of altimeter
2. familiarization and system lay out and maintenance check of Airspeed indicator
3. familiarization and system lay out and maintenance check of mach meter
4. familiarization and system lay out and maintenance check of rate of climb indicator
5. familiarization and system lay out and maintenance check of direct reading pressure and tempreture gauge
6. familiarisation and system lay out and maintenance check of fuel quantity indicating system and fuel flow meter
7. familiarisation and system lay out and maintenance check of artificial horizon
8. familiarisation and system lay out and maintenance check of slip indicator
9. familiarization with mechanically operated gauges and their function
10. familiarization with pressure transducers, electrically operated transmitters and their function
11. familiarization with electrically operated gauges their function
12. Swinging & compensation of compass by synthetic aids.
13. Magnetic compasses: friction and damping tests, practice compass swing, and compensation
14. Remote compass: examination and demonstration.
15. Familiarisation with P-type compass & B type compass.
16. Familiarisation with Pivot friction test & Damping test.

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4.3 AUTOFLIGHT & SERVO MECHANISM

L	T	P
6	2	4

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time		
		L	T	P
1	Topics No. A	20	8	-
2	Topics No. B	20	8	-
3	Topics No. C	12	2	-
4	Topics No. D	12	2	-
5	Topics No. E	20	8	-
	Total	84	28	56

DETAILED CONTENTS

A. AUTO FLIGHT

Fundamental automatic flight control , working principle and current termilogy- Command signal processing- Modes of operation roll , pitch and yaw channels- Yaw dampers- Stability augmentation system- Automatic trim control- Autopilots navigation aids interface- Auto throttle- Automatic landing system- Mode of operation, approach, glide slope , land , go around- System monitors and failure condition.

B. AUTOPILOT SYSTEM

Knowledge of function and operation of components in a typical Autopilot system, responses of the system in flight and during functional checks on ground

C. SIGNAL

purpose of pullup and feedback signals, causes of hunting and methods of damping, troubleshooting of servo- mechanisms.

D. SOFTWARE MANAGEMENT CONTROL

Awareness of restriction, airworthiness requirement and possible catastrophic effect of unapproved changes to software program.

E. SERVO MECHANISM

Understanding of following terms: open and close loop, follow up, feed back, analogue transducers- Principle of operation and use of a following synchro system, transducer, transformer inductance & capacitance, transmitter component /features, resolver, differential- Construction operation and use of a following

synchro system , transducer, transformer, inductance & capacitance, transmitter component/features,resolver,differential- Knowledge of construction, principle and operation of servomotors and rate generators; system response to displacement (position) and rate (velocity) command signals; purpose of pullup and rate feedback signals; causes of hunting and methods of damping; troubleshooting of servomechanism.

AUTOFLIGHT & SERVO MECHANISM PRACTICAL

1. Familiarise with the automatic flight control system componentand lay-out and demonstrate functional test
2. Familiarise with Modes of operation: roll, pitch and yaw channels;Yaw dampers;Stability Augmentation System in helicopters;
3. Familiarise with Automatic trim control;
4. Familiarise with Autopilot navigation aids interface;
5. Familiarise with Autothrottle systems.
6.. Familiarise with the Automatic Landing Systems component and lay-out and demonstrate functional check of modes of operation, approach, glide slope, land, go-around, system monitors and failure conditions.
7. Elementary working principle of simple auto pilot system.
8. Different types of auto pilots.

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4.4 AIRCRAFT COMMUNICATION SYSTEM

L	T	P
6	2	4

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time		
		L	T	P
1	Topics No. A	48	16	-
2	Topics No. B	18	6	-
3	Topics No. C	18	6	-
	Total	75	28	56

DETAILED CONTENTS

A. GENERAL

- Knowledge of the theory of operation, performance level and specifications of an Audio Integration System.
- Knowledge of classification , use and wave propagation characteristics of the radio frequencies and their spectrum.
- Knowledge of terms connected with, construction and identification for various types of antennas; the voltage and current distribution along antenna of various length.
- Detailed knowledge of radio frequency transmission lines, coaxial cables, current and voltage distribution, impedance of lines, standing waves, standing wave ratio, matching, tuning stubs, waveguides, attenuation in waveguides, resonant cavities
- Filter- low pass, high pass, band pass and band stop
- Knowledge of modulation and demodulation, amplitude, frequency and phase modulation, AM and FM receivers, transmitter, superhatrodyne principle;balanced modulator.
- Emergency locater transmitter
- Cockpit voice recorder
- Cabin Entertainment equipment

B. FIBER OPTICS

Advantages and disadvantage of fiber optic data transmission over electrical wire propagation

Fiber optic data bus

Fiber optic related terms

Termination

Coupler, control terminals, remote terminals

Application of Fiber optics in aircraft system

C. SATELLITE COMMUNICATION

-Elementary principle of satellite Communication and its application to aircraft.

-Knowledge of construction and principles of operation of saturable reactors and magnetic amplifiers; bias; phase sensitive half wave and inputs and outputs, polarity sensitive inputs and outputs, pushpull outputs and effects of stage gains and cascading on time response.

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AIRCRAFT COMUNICATION SYSTEM PRACTICAL

A-FUNDAMENTAL TECHNIQUES

1. Familiarise with safety precautions associated with radio equipment hazards: high voltages, radio frequency (RF) emissions and microwave emissions, electrostatic discharge, etc.
2. Wiring and cabling: demonstration and practice in wiring and soldering radio circuits.
3. Multimeters, Megger and bonding testers / milliohmmeter: demonstrations and practice.
4. Identification and inspection of antenna: external wire aerials, blade, rod aerials, D/F loops, and suppressed aerials; viewing on aircraft, and inspection for physical condition.
5. Aerial masts, static dischargers, etc.: inspection and servicing.
6. Familiarise with the following system elements;
   TRF receiver
   Intermediate frequency amplifier
   Frequency converter
   Superheterodyne receiver
   Buffer-doubler amplifier
   RF amplifier
   Modulation
   Transmission lines

B-DEMONSTRATION OF TEST PROCEDURES ON AIRBORNE EQUIPMENT

Identification: identity and location of principal types of airborne communication and navigation equipment: racking systems, power supplies, antennae and other interconnections.

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V Semester

5.1COMPUTER THEORY

L	T	P
8	-	8

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time		
		L	T	P
1	Topics No. 1	15	-	
2	Topics No. 2	20	-	
3	Topics No. 3	15	-	
4	Topics No. 4	17	-	
5	Topics No. 5	15	-	
6	Topics No. 6	15	-	
7	Topics No. 7	15	-	
	Total	112	-	112

DETAILED CONTENTS

1-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).
· Operation, layout and interface of the major components in a micro computer including their associated bussystems
· Information contained in single and multi address instruction words
· Memory associated terms,Operation of typical memory devices
· Operation, advantages and disadvantages of the various data storage systems.

2-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. **4-Data Buses**
· Operation of data buses in aircraft systems, including knowledge of ARINC and other specifications.

5-Logic Circuits

· Identification of common logic gate symbols, tables and equivalent circuits;

· Applications used for aircraft systems, schematic diagrams.
· Interpretation of logic diagrams.

6-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.

7-Printed Circuit Boards
· Description and use of printed circuit boards.

COMPUTER PRACTICAL

1. Creating, Editing, Modifying database file, Label, Report, Format and Query,
2. Use all commands of DOS.
3. Use all the features and utilizes of MS Word.
4. Use all the features and utilizes of MS Excel.
5. Use all the features and utilizes of MS PowerPoint.
6. Selection of command using windows.
7. Practices on E-mail and websites.
8. Inventory & preventive maintenance package. Written specially for aircraft maintenance organizations.
9. System analysis and design, programming and working

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5.2 AIRCRAFT ELECTRICAL SYSTEM-II

L	T	P
8	-	8

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time		
		L	T	P
1	Topics No. 1	12	-	
2	Topics No. 2	12	-	
3	Topics No. 3	12	-	
4	Topics No. 4	12	-	
5	Topics No. 5	12	-	
6	Topics No. 6	12	-	
7	Topics No. 7	8	-	
8	Topics No. 8	12	-	
9	Topics No. 9	8	-	
10	Topics No. 10	12	-	
	Total	112	-	112

Detailed Contents

1- Aircraft power Generation and Distribution

- Batteries installation and operation
- DC Power generation
- AC Power generation
- Emergency Power generation
- Voltage regulation
- Power distribution
- Circuit Protection
- External/Ground Power

2-Generator:- Characteristics of generator, armature reaction, methods to overcome it, voltage regulator, vibrating type, carbon pile type, three unit control panel, paralleling of generator, repair and maintenance.

3-D.C. Generator:-

. construction and purpose of components in DC generator
· Operation of, and factors affecting output power, torque, speed and direction of rotation of DC Generator

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· Series wound, shunt wound and compound Generator
. starter generator construction

4-<u>AC Generators</u>

· Rotation of loop in a magnetic field and waveform produced
· Operation and construction of revolving armature and revolving field type AC generators
· Single phase, two phase and three phase alternators
· Three phase star and delta connections advantages and uses·
Permanent Magnet Generators

5- Motor

· Basic motor theory

6. Dc Motor

· Operation of, and factors affecting output power, torque, speed and direction of rotation of DC motors
· Series wound, shunt wound and compound motors

7-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.

8-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

9-<u>Invertors and Convertors</u>

-Knowledge of the operation and construction of static inverters, rotary inverters and transformer rectifier units

<u>10-AIRCRAFT SYSTEM</u>

- Knowledge of principle of operation, inspection and trouble shooting of aircraft galley equipments, aircraft lights, and electrical components and indicating circuits for Landing Gear, Flap System and Airconditioning system etc.
- Knowledge of operation and inspection of Aircraft Fire and Smoke Detection and Protection System.

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AIRCRAFT ELECTRICAL SYSTEM-II PRACTICAL

1- Familiarisation with DC power generation
2- Familiarisation with AC power generation and emergency power generation
3- Familiarisation with Voltage regulation,power distribution
4- Familiarisation with component and lay-out and perform functional check of external light: navigation, landing,taxiing,ice
5- Familiarisation with component and lay-out and perform functional check of Internal light: cabin, cockpit, cargo and instrument lights
6- Familiarisation with component and lay-out and perform functional check of Emergency light
7- Familiarisation with various parts of Voltage regulators
8- Familiarisation with various parts of battery cut outs and reverses current relays
9- familiarisation with various parts of thermal circuit breakers and function
10- Familiarisation with various parts of generators
11- Familiarisation with various parts Motors
12- Maintenance practices of motors and generators

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5.3AIRCRAFT INSTRUMENTATION SYSTEM-II

L	T	P
8	-	8

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time L	T	P
1	Topics No. A	52	-	
2	Topics No. B	15	-	
3	Topics No. C	15	-	
4	Topics No. D	15	-	
5	Topics No. E	15	-	
	Total	112	-	112

DETAILED CONTENTS

A. INSTRUMENT SYSTEM

- Temperature indicating syste
- Tachometer
- Air data computer
- Stall warning system and angle of attack indicating system
- Vibration measurement and indication
- RR compass system
- Electronic flight instrument system (ADI , HSI,CDI,RMI and EFIS)
- Ground proximity warning system
- Warning system including master warning , Centralize warning system, annunciators and EICAS
- Altitude reporting /alerting system

- Engine thrust indication – EPR , or Jet pipe pressure system

- Exhaust gas temperature/interstage turbine temperature

B. Software Management Control

- Awareness of restrictions, airworthiness requirements and possible catastrophic effects of unapproved changes to software programmes

C. Electromagnetic Environment

- Influence of the following phenomena on maintenance practices for electronic system:
- EMC-Electromagnetic Compatibility EMIElectromagnetic Interference HIRF-High Intensity Radiated Field Lightning/lightning protection

D. ELECTRONICS INSTRUMENT SYSTEM

- Typical system arrangement of glass Cockpit

- Knowledge of the types and operation of displays (LED, Liquid Crystal etc.), CRTs and its application.

F. Flight data Recorder

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AIRCRAFT INSTRUMENT SYSTEM-II PRACTICAL

1-Familiarisation and system lay out and maintenance check of ground proximity warning Systems

2-Familiarisation and system lay out and maintenance check of flight data recording Systems

3-Familiarisation and system lay out and maintenance check of electronic flight instrument systems

4-Familiarisation and system lay out and maintenance check of instrument warning system including master warning system

5-Familiarisation and system lay out and maintenance check of stall warning and angle of attack indicating systems

6-Familiarisation and system lay out and maintenance check of vibration measurement and indication

7- Familiarisation and system lay out and maintenance check of Altitude reporting/alerting systems,air data computer.

8-Familiarisation with tacho-generator/Indicator (DC and AC types)

9- Engine speed synchronizing gear: examination and demonstration and principles

10-Engine temperature thermocouples: demonstration of cylinder head, Jet-pipe temperature and other types

11-Familiarisation with Ratio-meter temperature gauges

12-Familiarisation with various kinds of temperature sensing units (e.g. fire and overheating detectors, cabin air-duct stats, and inching controls for cooler shutters)

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VI Semester

6.1 ENVIRONMENTAL EDUCATION & DISASTER MANAGEMENT

L	T	P
4	-	-

RATIONALE:

A diplima student must have the knowledge of different types of pollution caused due to industrialisation and construction activities, so as he may help in balancing of eco-system and control pollution by providing controlling measures. They should be also aware of the environmental laws for effectively controlling the pollution of environment. The topics are to be taught in light of legislation Para-3.

TOPIC WISE DISTRIBUTION OF PERIODS:

SL. NO.	TOPIC	L	T	P
1.	Introduction	6		
2.	Pollution	4		
2.1	Water Pollution	8		
2.2	Air Pollution	8		
2.3	Noise Pollution	4		
2.4	Radio Active Pollution	6		
2.5	Solid Waste Management	6		
3.	Legislations	4		
4.	Environmental Impact Assessment	4		
5.	Disaster Management	6		
	TOTAL	56	-	-

DETAILED CONTENTS

1. INTRODUCTION :

- Basics of ecology, Ecosystem, Biodiversity Human activities and its effect on ecology and eco system, different development i.e. irrigration, urbanization, road development and other engineering activities and their effects on ecology and eco system, Mining and deforestation and their effects.

- Lowering of water level , Urbanization.

- Biodegradation and Biodegradibility, composting, bio remediation, Microbes .Use of biopesticidies and biofungicides.

- Global warning concerns, Ozone layer depletion, Green house effect, Acid rain,etc.

2. POLLUTION :

Sources of pollution, natural and man made, their effects on living environments and related legislation.

2.1 WATER POLLUTION :

- Factors contributing water pollution and their effect.

- Domestic waste water and industrial waste water. Heavy metals, microbes and leaching metal.

- Physical, Chemical and Biological Characteristics of waste water.

- Indian Standards for qulity of drinking water.

- Indian Standards for quality of treated waste water.

- Treatment methods of effluent (domestic waste water and industrial/ mining waste water), its reuse/safe disposal.

2.2 AIR POLLUTION :

Definition of Air pollution, types of air pollutants i.e. SPM, NOX, SOX, GO, CO2, NH3, F, CL, causes and its effects on the environment.

- Monitoring and control of air pollutants, Control measures techniques. Introductory Idea of control equipment in industries i.e.

A. Settling chambers
B. Cyclones
C. Scrubbers (Dry and Wet)
D. Multi Clones
E. Electro Static Precipitations
F. Bog Fillers.

- Ambient air qulaity measurement and their standards.

- Process and domestic emission control

- Vehicular Pollution and Its control with special emphasis of Euro-I, Euro-II, Euro-III and Euro IV.

2.3 NOISE POLLUTION :

Sources of noise pollution, its effect and control.

2.4 RADISACTIVE POLLUTION :

Sources and its effect on human, animal, plant and material, means to control and preventive measures.

2.5 SOLID WASTE MANAGEMENT :

Municipal solid waste, Biomedical waste, Industrial and

Hazardous waste, Plastic waste and its management.

3. LEGISLATION :

Preliminary knowledge of the following Acts and rules made thereunder-

- The Water (Prevention and Control of Pollution) Act - 1974.

- The Air (Prevention and Control of Pollution) Act - 1981.

- The Environmental Protection (Prevention and Control of Pollution) Act -1986. Rules notified under EP Act - 1986 Viz.

  # The Manufacture, Storage and Import of Hazardous Chemical (Amendment) Rules, 2000

  # The Hazardous Wastes (Management and Handling) Amendment Rules, 2003.

  # Bio-Medical Waste (Management and Handling) (Amendment) Rules, 2003.

  # The Noise Pollution (Regulation and Control) (Amendment) Rules, 2002.

  # Municipal Solid Wastes (Management and Handling) Rules, 2000.

  # The Recycled Plastics Manufacture and Usage (Amendment) rules, 2003.

4. ENVIRONMENTAL IMPACT ASSESSMENT (EIA) :

- Basic concepts, objective and methodology of EIA.

- Objectives and requirement of Environmental Management System (ISO-14000) (An Introduction).

5. DISASTER MANAGEMENT :

Definition of disaster - Natural and Manmade, Type of disaster management, How disaster forms, Destructive power, Causes and Hazards, Case study of Tsunami Disaster, National policy- Its objective and main features, National Environment Policy, Need for central intervention, State Disaster Authority- Duties and powers, Case studies of various Disaster in the country, Meaning and benifit of vulnerability reduction, Factor promoting vulnerability reduction and mitigation, Emergency support function plan.

Main feature and function of National Disaster Management Frame Work, Disaster mitigation and prevention, Legal Policy Frame Work, Early warning system, Human Resource Development and Function, Information dissemination and communication.

6.2 PROPULSION

L	T	P
8	-	-

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time		
		L	T	P
1	Topics No. 1	15	-	-
2	Topics No. 2	15	-	-
3	Topics No. 3	15	-	-
4	Topics No. 4	35	-	-
5	Topics No. 5	32	-	-
	Total	112	-	-

DETAILED CONTENTS

1. Turbine Engines

Constructional arrangement and operation of turbojet, turbofan, turbo shaft and turbo propeller engines.

2. Electronic Engine control and fuel metering system (FADEC)

3. Fire detection and extinguishing system

4. Engine Indicating Systems

Exhaust gas temperature/Inter state turbine temperature
Power Indicating System
Engine speed;
Engine Thrust Indication : Engine Pressure Ratio, Engine turbine discharge pressure or jet pipe pressure systems;

Oil pressure and temperature;

5. Fuel pressure, temperature and flow;

Manifold pressure;
Engine torque; Propeller speed

6.3 AIRCRAFT RADIO NAVIGATION SYSTEM

L	T	P
8	-	8

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time		
		L	T	P
1	Topics No. 1	16	-	-
2	Topics No. 2	16	-	-
3	Topics No. 3	16	-	-
4	Topics No. 4	16	-	-
5	Topics No. 5	12	-	-
6	Topics No. 6	12	-	-
7	Topics No. 7	12		
8	Topics No. 8	12		
	Total	112	-	112

DETAILED CONTENTS

1. Knowledge of terms used, principle, operation, characteristics, installation and maintenance:

Automatic Direction Finder (ADF) Systems.
Very High Frequency (VHF) Omni Directional Range System

2. Instrument Landing Systems

Localizer, glideslope and marker system
Microwave landing system

3. Long range navigation system

Very Low Frequency (VLF)/omega Navigation Systems

LORAN/DECCA/DOPPLER Navigation Systems

4. Area navigation/RNAV system

Inertial navigation system
Global positioning system
Flight management system

5. Radar Equipment

Review of microwave theory

Primary and secondary radar

weather radar

Distance measuring equipment.

Air Traffic Control (ATC) Transponder System/SSR
Radio Altimeter System
ACAS/TCAS

6. TERRAIN Avoidance and warning system

7. stormscope

8. Digital a/c system

- EFIS – Electronic Flight Instrument System

- EICAS – Engine Indication and Crew Alerting System
- FBW – Fly By Wire
- IRS – Inertial Reference System

AIRCRAFT RADIO NAVIGATION PRACTICAL

1. Familiarise with component and demonstrate functional check of Automatic Direction Finder (ADF) Systems.
2. Familiarise with component and demonstrate functional check of Very High Frequency (VHF) Omni Directional Range System
3. Familiarise with component and demonstrate functional check of Instrument Landing Systems
4. Familiarise with component and demonstrate functional check of Weather Radar Systems.
5. Familiarise with component and demonstrate functional check of Air Traffic Control (ATC) Transponder System.
6. Familiarise with component and demonstrate functional check of Radio Altimeter Systems
7. Familiarise with component and demonstrate functional check of Distance Measuring Equipment
8. Familiarise with component and demonstrate functional check of Flight director system
9. Familiarise with component and demonstrate functional check of Global positioning system
10. Familiarise with component and demonstrate functional check of Traffic alert and collision avoidance system

6.4 AVIONICS SYSTEM OF BONANZA A-36 AIRCRAFT

L	T	P
3	-	11

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time L	T	P
1	Topics No.1	5	-	
2	Topics No.2	5	-	
3	Topics No.3	5	-	
4	Topics No.4	5	-	
5	Topics No.5	5	-	
6	Topics No.6	5	-	
7	Topics No.7	5	-	
8	Topics No.8	5	-	
9	Topics No.9	2		
	Total	42	-	154

DETAILED CONTENTS

1. Knowledge of terms used, principle, operation, characteristics, installation and maintenance of operation of very high frequency communication equipments
2. Knowledge of terms used, principle, operation, characteristics, installation and maintenance of operation VOR/ILS equipments
3. Knowledge of terms used, principle, operation, characteristics, installation and maintenance of operation of Automatic Direction Finder
4. Knowledge of terms used, principle, operation, characteristics, installation and maintenance of operation of Global Positioning System
5. Knowledge of terms used, principle, operation, characteristics, installation and maintenance of operation of Transponder
6. Knowledge of terms used, principle, operation, characteristics, installation and maintenance of operation of Emergency Locator transmitter
7. Knowledge of terms used, principle, operation, characteristics, installation and maintenance of operation of Distance Measuring Equipment

8. Knowledge of terms used, principle, operation, characteristics, installation and maintenance of operation of Audio Amplifier
9. Knowledge of terms used, principle, operation, characteristics, installation and maintenance of Autopilot

AVIONICS SYSTEM OF BONANZA A-36 AIRCRAFT PRACTICAL

1. Familiarise with component and lay-out and demonstrate functional check of very high frequency communication equipments
2. Familiarise with component and lay-out and demonstrate functional check of operation of VOR/ILS equipments
3. Familiarise with component and lay-out and demonstrate functional check of Automatic Direction Finder
4. Familiarise with component and lay-out and demonstrate functional check of Global Positioning System
5. Familiarise with component and lay-out and demonstrate functional check of Transponder
6. Familiarise with component and lay-out and demonstrate functional check of Emergency Locator transmitter
7. Familiarise with component and lay-out and demonstrate functional check of Distance Measuring Equipment
8. Familiarise with component and lay-out and demonstrate functional check of Audio Amplifier
9. Familiarise with component and lay-out and demonstrate functional check of Autopilot

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6.5 PROJECT

Student in groups/individually the given maintenance work of major/minor assembly, subassembly of aircraft. They will prepare a reprot of their work which should contain : Its objective, Identification of work elements, their sequencing, Time schedule, Work procedure facilities/resources wanted. Inspection of parts decision making whether recondition of replace - Manpower wanted, estimated expenditure. Testing after maintenance.

Two periods per week are alloted for this work. The project contains 150 marks, the breakup is as follows

Viva-Voce - 80 Marks

Documentation - 20 Marks

Sessional Marks - 50 Marks

STAFF STRUCTURE

Chief Instructor (Principal lecturer) : 01 Post

(a) BAMEL in a stream related to the scope of the approval or degree in engineering or equivalent qualification in the field of Aeronautical / Mechanical / Electrical / Electronics / Instrument engineering. He should also have passed Paper I (Regulations) of AME licence examination.

(b) For BAMEL holders, ten years practical experience in aviation industry out of which a minimum two years in the field of instruction. For engineering graduates, two years practical experience in aviation industry out of which a minimum of one year in the field of instruction.

(c) Knowledge of Hindi.

Dy. Chief Instructor (Chief lecturer): 01 Post

(a) BAMEL in a stream related to the scope of the approval or degree in engineering or equivalent qualification in the field of Aeronautical / Mechanical / Electrical / Electronics / Instrument engineering. He should also have passed Paper I (Regulations) of AME licence examination.

(b) For BAMEL holders, five years practical experience in aviation industry out of which a minimum two years in the field of instruction. For engineering graduates, two years practical experience in aviation industry out of which a minimum of one year in the field of instruction.

(c) Knowledge of Hindi.

Lecturers

1. Lecturer (Aero.) : 02 Posts

(1) BAMEL in any category (LA,PE,HA & JE) OR. Degree in Engineering in Aeronautical/Mechanical/Electrical/Electronics/ Instrumentation Engineering OR.Diploma in any of the above disciplines OR Bachelor of Science with Physics, Chemistry and Maths/Bachelor of Science (Electronics).

(2) One year Practical/Instructional experience for holders of Engineering degree OR BAMEL and three years practical/Instructional experience in aviation industry for others.

(3) Instructors assigned to teach paper-I (Air Law, airworthiness Requirements and Human Performance) should have passed paper-I of AME Licence Examination.

(4) Instructors teaching Paper-III subject should have passed paper-III of the relevant

category OR have adequate maintenance experience in the relevant category.

(5) Knowledge of Hindi.

2. <u>Lecturer (Avionics)</u> : 02 Posts

(1) BAMEL in any category (ES,IS & RN) OR. Degree in Engineering in Aeronautical/Mechanical/Electrical/Electronics/Instrumentation engineering OR.Diploma in any of the above disciplines OR Bachelor of Science with Physics, Chemistry and Maths/Bachelor of Science (Electronics).

(2) One year Practical/Instructional experience for holders of Engineering degree OR BAMEL and three years practical/Instructional experience in aviation industry for others.

(3) Instructors assigned to teach paper-I (Air Law, airworthiness Requirements and Human Performance) should have passed paper-I of AME Licence Examination.

(4) Instructors teaching Paper-III subject should have passed paper-III of the relevant category OR have adequate maintenance experience in the relevant category.

(5) Knowledge of Hindi.

3. <u>Lecturer (Mechanical)</u> : 02 Posts

(1) Degree in Mechanical or Automobile Engineering or its equivalent with at least 55% marks.

(2) Five years practical/instructional experience in appropriate field.

(3) Knowledge of Hindi

.4. <u>Lecturer (Electrical)</u> : 01 Post

(1) Degree in Electrical or Electronics Engineering or equivalent with at least 55% marks

(2) Five years practical/instructional experience in appropriate field.

(3) Knowledge of Hindi.

5. <u>Lecturer (Science)</u> : 01 Post

(1) At least second class Master degree in Physics or Chemistry or Maths with at least 55% marks. Weightage will be given to B.Ed. or its equivalent degree holder

(2) Five years practical/instructional experience in appropriate field.

(3) Knowledge of Hindi

(Instructors)

1. Instructor (Aero.) : 01 Post

(1) Diploma/AME course in Aircraft Maintenance Engineering Mechanical stream (Aeroplane & Powerplants) issued by any Director General of Civil Aviation, Government of India recognized institute.

(2) Three years practical/instructional experience in appropriate field

(3) Knowledge of Hindi.

OR

(1) BAMEL in any category in mechanical stream (Aeroplane & Powerplants)

(2) Two years practical/instructional experience in appropriate field

(3) Knowledge of Hindi.

2. Instructor (Avionics) : 01 Post

(1) Diploma/AME course in Aircraft Maintenance Engineering in Avionics Stream, issued by any Director General of Civil Aviation, Government of India recognized institute.

(2) Three years practical/instructional experience in appropriate field

(3) Knowledge of Hindi.

OR

(1) BAMEL in any category in Avionics stream (ES,IS & RN)

(2) Two years practical/instructional experience in appropriate field

(3) Knowledge of Hindi

3. Instructor (Workshop) : 02 Post

(1) Diploma in Mechanical./Aircraft Maintenance Engineering issued by State board of Technical Education.

(2) Three years practical/instructional experience in appropriate field

(3) Knowledge of Hindi.

Technician

1. Electrician : : 01 Post

(1) High School Passed

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(2) Two years certificate in electrician trade from Industrial Training Institute (I.T.I.).

2. <u>Welder :</u> : 01 Post

(1) High School passed.
(2) One Year certificate in welding trade from Industrial Training Institute (I.T.I.)

3. <u>Machinist/Fitter/Carpenter</u> : 01 each

(1) High School passed.
(2) One Year certificate in welding trade from Industrial Training Institute (I.T.I.)

Note- Atleast two guest lecturers be arranged every month from the person in the respective field

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SPACE REQUIREMENT

S.No	Room requirements	Qty.	Area (Sq. m.)
	A. Administrative Block		
1.	Chief Instructor/Principal Room	1	30
2.	Dy.Chief Instructor/|Chief lecturer Room	1	20
3.	Lecturer Room	1	70
4.	Office Room	1	60
	B. Teaching Staff		
1.	Class room	6	33each
2.	Drawing hall	1	60
3.	Conference A.V Aids room	1	120
4.	Library cum Computer lab	1	120
	C. Work Shop Block		
1.	General fitting shop	1	50
2.	Carpentry shop	1	40
3.	Machine shop	1	120
4.	Welding shop	1	40
5.	Engine shop	1	40
6.	Airframe shop	1	40
7.	Instrument shop	1	40
8.	Electrical shop	1	50
9.	Battery charging shop	1	50
10.	Radio shop	1	60
11.	Composite shop	1	40
12.	Small hanger for parking of aircrafts	1	200
	D. Store for miscellaneous items	1	30

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List of Tools & Equipments

S.No. A.	General fitting shop	Qty.
1.	Fitter/ carpentry Bench Vices	36
2.	Hacksaw with frame	11
3.	Power hacksaw	01
4.	Ball peen Hammers	06
5.	Cross peen Hammers	06
6.	Straight peen Hammer	06
7.	Soft head Hammer	06
8.	Files set	06
9.	Steel rule	06 sets
10.	Fitter squares	12
11.	Punches (set)	06
12.	Calipers (set containing internal external & hermaphrodite)	06
13.	Scribing block	06
14.	Vee block	06 pairs
15.	Surface plates (cast iron)	04
16.	Surface plates (granite)	01
17.	Hand drill machines	06
18.	Power drill machines (bench)	01
19.	Drill bits	15 sets
20.	Reamers	10 sets
21.	Taps	02 sets
22.	Dies	03 sets
23.	Micrometer English (external)	06
24.	Micrometer English (internal)	02
25.	Micrometer Metric (external)	03
26.	Micrometer Metric (internal)	02
27.	Vernier Calipers	08
28.	Screw thread gauge	05 sets
29.	Bench grinder	02
30.	Screw driver sets	06 sets
31.	Sheet cutter	06
32.	Pliers	06
33.	Electric drill machine	05
34.	Hammer drill machine	01
35.	Cordless drill machine	01
B.	**Carpentry Shop :**	
1.	Carpenter's saw	06
2.	Jack planes wooden	06
3.	Jack planes metal	06
4.	Chisels firmer	08
5	Chisels mortise	08
6	Auger bit	08
7	Measuring & marking tools	06
8	Circular saw machine	01
9	Carpenter's bench vice	07
10	Wood turning lathe	01

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C.	**Machine Shop**	
1.	Lathe machine (3 ft. bed)	01
2.	SS & SC lathe	02
3.	All geared lathe	02
4.	Capstan lathe	01
5.	Sheet metal guillotine	06
6.	Arbor press	01
7.	Combination set	01
8.	Milling machine	02
9.	Brinell hardness tester	01
10.	Rockwell hardness tester	01
11.	Large surface table	01
12.	Power Hacksaw	01
13.	Power Grinding and buffing machine	01
14.	Power drill machines (bench)	01
D.	**Welding Shop :**	
1.	Gas welding set	02
2.	Electric resistance welder for Spot welding	01
3.	Arc Welding Machine (Transformer type)	02
4.	TIG Welding Machine	01
5.	Goggles, gloves (Gas welding)	06
6.	Spark lighter	02
7.	Wire brush	06
8.	Eye shield for electric arc welding	06
9.	Solder iron	06
10.	Blow lamp	02
E.	**Engine Shop :**	
1.	Mock up of fuel system	01
2.	Mock up of ignition system	01
3.	Exploded view of engine	01
4.	Continental A-65 engine	01
5.	Continental 0-450 engine for imparting training &	
6.	associated tools for carrying out job	01
7.	Turbine engine	01
8.	Spanners set (ring)	01
9.	Spanners set (open)	01
10.	Deep socket (3/8" square head)	01 set
11.	Socket (1/4" square head)	01 set
12.	Extensions	01 set
13.	T-handle	01
14.	Ratchet handle	01
15.	Cylinder mercer gauge	01
16.	Pin hole gauge	04 set
17.	Telescopic gauge	04 set
18.	Depth gauge (vernier)	03
19.	Height gauge (vernier)	04
	Depth gauge micrometer type	01

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20.	Dial test indicator	02
21.	Compressor	01
22.	Feeler gauge (in thou.)	06
23.	Bomb tester	01
24.	Megger	01
25.	Torque spanner (dial type)	01
26.	Torque spanner ratchet type	01
27.	Piston spanner ratchet type	01
28.	Mallet	01
F.	**Airframe Shop** :	
1.	Mock up of pneumatic system	01
2.	Mock up of hydraulic system	01
3.	Working model of hydraulic brake	01
4.	One complete aircraft	01
5.	Circlip pliers (internal)	02 sets
6.	Circlip pliers (external)	02 sets
7.	Grease gun	01
8.	Portable magna flux equipment	01
9.	De-magnetisation rig	01
10.	Fluorescent inspection equipment	01
11.	Cherry rivet gun	03
12.	Cleco fasteners pliers	02 sets
13.	Tyre pressure gauge	02
14.	Pneumatic riveting gun	02
15.	Snap and dolly	06 sets
16.	Ezy out extractor	02
17.	Mouly tester	02
18.	Cable tensiometer	02
19.	Fabric stitching needles	05 sets
20.	Straight edge	02
21.	Spirit level	02
22.	Plumb bob	02
23.	Avary scales (consisting of 3 scales)	01 set
24.	Trammel	02
25	Allen key set	02
26	Adjustable spanner	04
27	"C" spanner	02
28	Grip pliers	02
29	Universal testing machine	01
30	Working model of flap operating system	01
31	Air Conditioning machine with cooling effect	01
G.	Composite shop	01
1	Laying up tables	01 each
2	brushes and spatulas	01 each
3	Scissors and Cutter	

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4.	Epoxy resin, Hardener, activator	01each
5.	Measuring cup, Pot and Tray	01each
6.	Video CDs of composite repair	03
7.	Sanders	01
8.	Fibers	01
9.	Many examples of composite materials	01each
10.	Heat Lamp and hot Blower	01each
11.	Digital thermometer	01
H.	**Electrical Shop**	
1	Length of Aircraft cabling with typical plugs, sockets, Bulkhead sealing bungs, grommet	01set each
2	Junction Boxes, switches, fuses, thermal circuit breakers, wire connecting device	01 set each
3	AC Generators (constant speed drives) test bench	01 set
4	DC Generators (constant speed drives) test bench	01 set
5	Voltage regulators, generator control units	01seteach
6	Current limiting devices vibrator type	01 set
7	Current limiting devices variable resistance type	01 set
8	DC motor 28 V	01 No
9	AC motor 28 V	01 No
10	Continuously rated motors	01 No
11	Engine starter	01 No
12	Rotary actuator	01 No
13	Linear actuator	01 No
14	Static invertor & specimens of other types of current conversion devices such as transformer current rectifier units	03 set
15	Rotary invertors	01 No.
16	Electrical heating device thermal de-icing shoes etc.	01 No
17	Electrical heating device pitot heads.	01 set
18	Fluorescent lamps, Navigation lights ,Landing lamp	01 set
19	Electrical machine unit for testing motor & Generator	01 set
20	Voltmeter	01 No
21	Ammeter	01 No
22	Ohmmeter	01 No
23	Wheatstone bridge	02 No
24	Thermocouple	01 No
25	Ratio meter	01 No
26	Servos and synchros	01 No
27	Generator	01 No
28	Electrical Landing Light	01No
29	CRT	01 No
30	Multimeter	03 No
31	Mockup of Smoke detector	01 set
32	Mockup of Cabin lighting system	01 set

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33	Mockup of Thermocouple principle	01 set
34	Electrical Test Panel	01 set
35	Electrical 5mm point temperature controlled soldering Iron	01 No
36	One wire stripper for removing insulation A selection of small screw drivers(including a phillips) One adjustable hook wrench(18 to 50mm) one set of Allen keys	01 set
37	Display Board	01 set
38	Cabin Lighting System Mockup	01 set
I.	**<u>Instrument Shop</u>**	
1.	Pitot Static Head	01 No
2.	Jet Pipe thermocouple	01 No
3.	Magnetic Compass	01 No
4.	Fuel content Gauge (Capacitance type)	01 No
5.	Fuel content Gauge (Float Operated type)	01 No
6.	Cylinder Head thermocouple	01 No
7.	Oil thermometer (Electrical type)	01 No
8.	Oil thermometer (Physical type)	01 No
9.	Engine Speed Indicator (AC type)	01 No
10.	Engine Speed Indicator (DC type)	01 No
11	Simple type Autopilot	01 set
12	Engine Oil Pressure Gauge (Bourdon tube type)	
13	Engine Oil Pressure Gauge (Electrical type)	01 No
14	Cabin Temperature Controller	
15	Mockups of Altimeter Test Chamber	01 No
16	Mockup of Airspeed indicator for Leak test	
17	Gyroscopic Instrument Test table	01 No
18.	Mockup for compass swinging practice	
19.	Mockup for RPM indicator	01 No
20.	One set of watch screw drivers	
	One set of miniature spanners	01 No
	One set of Allen keys(aooropriate sized)	
	One set of Bristol spine keys	01 No
	One electric temperature controlled soldering iron with fine point.	
21	Bonding tester(lead battery operated)	01 No
22	Dead Weight Tester	
		01 No
		01 set each

		01 No
		01 No

J.	**Radio Shop**	
1.	Variable stabilized power supply unit Variable suppy 0-28V	01 N0
2.	Signal generator (High Grade) RF	01 N0
3.	Signal generator for bench work (20-2000 Hz)AF	01 N0
4.	Signal generator (VHF)	01 N0
5.	Audio frequency oscillators	01 N0
6.	Frequency meter 0-1999.99 Hz	01 N0
7.	Cathode ray oscilloscopes	01 N0
8.	Moving coil Volt-Ohm-milliam meter multi meter (0-1000m V/O-2000m V/O-500m V/O-500µA)	01 N0
9.	Variac 5 Amp.	01 N0
10.	Spectrum analyzer - 1090 MHz	01 N0
11.	Digital Battery analyzer	01 N0
12.	IC/Microprocessor	01 N0
13.	Digital Volt meter/Ohm-O-2000 OHM meter/Ammeter	01 N0
14.	Search radar/Weather Radar	01 N0
15	Electronics Amplifiers (e.g. Capacitance type fuel content gage, Cabin temperature controllers automatic pilots)	01 No
16	Logic probe	01 No
17	RLC Bridge	01 No
18	Voltage standing Wave meter 0-50W	01 No
19	Absorption and thermocouple watt meter	01 No
20	Distance measuring equipment system	01 No
21	Air traffic control transponder system	01 No
22	Distance measuring Mockup	01 set
23	Automatic pilots Mockup	01 set
24	VHF Transmitter and Receiver RT 241A	01 No
25	HF Transmitter and Receiver DX10-DA	01 No
26	HF Transceiver	01 No
27	VOR ILS receiver Type 51RV-1	01 No
28	Marker Receiver KMA-20	01 No

29	Altimeter RX TX KRA-10A	01 No
30	ADF Receiver KR-85	01 No
31.	Horizontal Situation Indicator HIS-651	01 No
32.	(RMI) ADF Indicator Type KI-225	01 No
33.	RMI Radio Magnetic Indicator	01 No
34.	Radio Altitude Indicator IND-021	01 No
35.	Course Selector Indicator KI-211C	01 No
36.	Cage (screen Room)	01 No
37.	Glide Path receiver	01 No

K. <u>Battery Charging Shop:</u>

1.	Battery Discharging unit for each type	01 No
2.	Battery charging plant (series type suitable for charging several batteries at different rates)	01 No
3.	Constant current charger for charging the Ni-cd batteries	03 No
4.	Battery analyzer	01 No
5.	Lead acid battery (Commercial)	02 No each
6.	Lead acid battery (Aircraft battery)	01 No
7.	Ni-cd battery (Aircraft battery serviceable)	01 No
8.	Charger for lead acid battery	01 No
9.	Hydrometer	03 No

AVIONICS (REFERENCE BOOKS)

SL.NO	NAME OF BOOK/DVD	AUTHOR/PUB	BOOK/DVD NO.
1.	A COURSE IN CONTROL ENGG.	RAO D. TANDON	318
2.	A T/B OF ELECT. ENGG. MATH.	KK SALHOTRA	195
3.	A T/B OF LABO. COURSE IN ELECT. ENGG.	SG TARANKAR	201
4.	A/C BATTERIES	JEPPESEN	292
5.	A/C ELECT. & ELECTRONICS	B. MCKINLEY	5
6.	A/C ELECT. & ELECTRONICS	B. MCKINLEY	6
7.	A/C ELECT. & ELECTRONICS	B. MCKINLEY	307
8.	A/C ELECT. & ELECTRONICS	EISMIN	481
9.	A/C ELECTRICAL SYSTEM	B.MCKINLEY	147
10.	A/C ELECTRICAL SYSTEM	EHJ PALLETT	373
11.	A/C ELECTRICAL SYSTEM	EHJ PALLETT	9-C
12.	A/C ELECTRICAL SYSTEM	EHJ PALLETT	9-D
13.	AIRCRAFT ELECTRICAL SYSTEMS	E.H.J. PALLETT	727
14.	AIRCRAFT ELECTRICAL SYSTEMS	E.H.J. PALLETT	728
15.	AIRCRAFT ELECTRICAL SYSTEMS	E.H.J. PALLETT	729
16.	A/C IGNITION ELECT. POWER SYSTEM	JEPPESEN	289
17.	A/C INSTRUMENTS	EHJ PALLETT	125
18.	AIRCRAFT INSTRUMENTS	E.H.J.PALLETT	747
19.	AIRCRAFT INSTRUMENTS	E.H.J.PALLETT	748
20.	AIRCRAFT INSTRUMENTS	E.H.J.PALLETT	749
21.	AIRCRAFT INSTRUMENTS	E.H.J.PALLETT	750
22.	AIRCRAFT INSTRUMENTS	E.H.J.PALLETT	751
23.	AIRCRAFT INSTRUMENTS	WILLIAM	11-C
24.	AIRCRAFT INSTRUMENTS	WILLIAM	11-E
25.	AIRCRAFT INSTRUMENTS	WILLIAM	11-F
26.	AIRCRAFT INSTRUMENTS	SLOLEY	15-B
27.	AIRCRAFT INSTRUMENTS	SLOLEY	15-C
28.	AIRCRAFT INSTRUMENTS	SLOLEY	15-D
29.	AIRCRAFT INSTRUMENTS & AVIONICS	MAX F HENDERSON	452
30.	AIRCRAFT INSTRUMENTS & AVIONICS	MAX F HENDERSON	539
31.	A/C RADIO SYSTEMS	JAMES POWELL	8-A
32.	A/C RADIO SYSTEMS	JAMES POWELL	8-B
33.	A/C RADIO SYSTEMS	JAMES POWELL	8-C

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34.	A/C RADIO SYSTEMS	JAMES POWELL	609
35.	A/C RADIO SYSTEMS	JAMES POWELL	610
36.	A/C RADIO SYSTEMS	JAMES POWELL	611
37.	ADVANCED ELECT. TECHNOLOGY	H. COTTON	322
38.	AME AVIO. COMPASS COMPEN.7 B.	ATC	275
39.	AME AVIO. SERVO MECHANISMS.6. B.	ATC	269
40.	AME AVIO. A/P SYSTEMS PRINCIPLES	ATC	286
41.	AUTO CAD 2002	FREY	487
42.	AUTOMATIC CONTROL SYSTEM	BENJAMIN	189
43.	AVIATION ELECTRONICS	KW BOSE	371
44.	AVIATION ELECTRONICS	JOHN. M. FERARRA	379
45.	AVIATION ELECTRONICS	KW BOSE	407
46.	BASIC ELECT. FOR A &P MACHS.	DALE CRANE	415
47.	BASIC ELECT. FOR A &P MACHS.	DALE CRANE	416
48.	BASIC ELECTRICITY	JB GUPTA	331
49.	Basic Electronics	Bemard Grob	353
50.	Basic Electronics	Bemard Grob	477
51.	GROB'S BASIC ELECTRONICS	MITCHEL E. SCHULT Z.	645
52.	GROB'S BASIC ELECTRONICS	MITCHEL E. SCHULT Z.	646
53.	GROB'S BASIC ELECTRONICS	MITCHEL E. SCHULT Z.	647
54.	CAD/CAM	MIKELL P GROVER	442
55.	COMPUTER AIDED DESIGN	RADHAKRISHAN	560
56.	COMPUTER AIDED DESIGN	CS KRISNAMOORTI	466
57.	COMPUTER AIDED DESIGN	KR NAMIBIAR	464
58.	COMPUTERS FOR BEGINNERS	R. THIGARAJAN	103
59.	COMPUTERS FOR BEGINNERS	R. THIGARAJAN	104
60.	COMPUTERS FOR BEGINNERS	R. THIGARAJAN	105
61.	COMPUTERS FOR BEGINNERS	R. THIGARAJAN	106
62.	COMPUTER SYSTEM ARCHITECTURE	M. MORRIS MANO.	338
63.	CONTROL OF ELECT. MECHS.	SK BHATTACHARYA	557
64.	D.C. CIRCUITS	S. ROSEN	361
65.	DIGITAL ELECTRONICS	TOKHEIN	341
66.	DIGITAL PRINCIPLES & APPLICATIONS	AP MALVINO	339
67.	DIGITAL PRINCIPLES & APPLICATIONS	AP MALVINO	538
68.	DIGITAL PRINCIPLES & APPLICATIONS	LEACH & MALVINO	636

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69.	DIGITAL PRINCIPLES & APPLICATIONS	LEACH & MALVINO	637
70.	DIGITAL PRINCIPLES & APPLICATIONS	LEACH & MALVINO	638
71.	ELECT. MEASU. & MEASURINGQ	GOLDING & WIDDS	193
72.	ELECTRICAL ENGG. DRAWING	SK BHATTACHARYA	530
73.	ELECTRICAL MEASUREMENTS	REISSLAND	522
74.	ELECTRICAL TECHNOLOGY	B. L. THERAJA	323
75.	ELECTRICAL TECHNOLOGY	B. L. THERAJA	324
76.	ELECTRICAL TECHNOLOGY	B. L. THERAJA	413
77.	ELECTRICAL TECHNOLOGY	B. L. THERAJA	414
78.	ELECTRICAL ENGINEERING	B.L.THEREJA	694
79.	ELECTRICAL ENGINEERING	B.L.THEREJA	695
80.	ELECTRICAL ENGINEERING	B.L.THEREJA	696
81.	ELECTRONIC CIRCUIT DEVICES	FRANK DELP	363
82.	ELECTRONICS COMMUNI. SYSTEM	G.KENNEDY	342
83.	ELECTRONICS FUND. & APPLICATION	D. CHATTOPADHYAY	559
84.	ELECTRONICS FUND. & APPLICATION	D. CHATTOPADHYAY	531
85.	ELEMENTARY COMPUTING	ANU DHAWAN	99
86.	ELEMENTARY COMPUTING	ANU DHAWAN	100
87.	ELEMENTARY COMPUTING	ANU DHAWAN	101
88.	ELEMENTARY COMPUTING	ANU DHAWAN	102
89.	ENGG. DRAWING & COMP. GRAPH	K. VENUGOPAL	555
90.	ENGG. DRAWING & COMP. GRAPH	K. VENUGOPAL	515
91.	EXP. IN BASIC ELECT. ENGG.	SK BHATTACHARYA	534
92.	EXP. IN BASIC ELECT. ENGG.	SK BHATTACHARYA	565
93.	FUNDAMENTAL OF ELETRIC MACHINES	BR GUPTA	523
94.	HARDWARE & SOFTWARE OF PC	SK BOSE	558
95.	HIGH VOLTAGE ENGG.	CL. WADHWA	535
96.	HOW TO USE INTERNET	G. JONES	510
97.	INTEGRATED ELECTRONICS	J MILAN	343
98.	INTERNET & JAVA PROGRAMMING	R. KRISNAMOORTI	561
99.	INTRODUCTION TO COMPUTERS	ROBERT SHEPHARE	520
100.	INTRODUCTION TO WORD STAR	A. NARIMAN	335
101.	LEARING C+++	ERIC NEGLER	516
102.	LINEAR PROGRAMMING METHODS	GVS SHENOG	550
103.	LOTUS 1-2-3	HOSSEIN BIDGOH	333

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104.	MANUAL OF AVIONICS	BRIAN KENDAL	7
105.	MANUAL OF AVIONICS	BRIAN KENDAL	8
106.	MANUAL OF AVIONICS	BRIAN KENDAL	9
107.	MANUAL OF AVIONICS	BRIAN KENDAL	406
108.	MANUFACTURING TECHNOLOGY	M. ADITHAN	527
109.	MASTERING AUTO CAD RELEASE	JEORGE OMURA	336
110.	MICRO ELECTRIC DEVICES & CIRCUIT	BP SINGH	529
111.	MICROPROCESSORS INTEGRATING TECH.	--------	194
112.	MICROSOFT MS DOS USER'S GUIDE & REF.	--------	236
113.	OBJECTIVE Q. ELECT. ELECTS.,TELECOM	GK MITTAL	417
114.	PROD.AUTO. SYSTEMS	P. GROVER	441
115.	PROGRAMMING FOR BASIC	N SUBRAMANYM	190
116.	PROGRAMMING FOR BASIC	N SUBRAMANYM	191
117.	THE ILLUSTRATED D BASE III PLUS WORK	RUSSEL STULZ	337
118.	THE SPIRIT OF 'C'	MUKLISH COPRER	518
119.	UNDERSTANDING & USING D BASE III PLUS	STEVAN C ROSE	332
120.	USE OF COMPU. IN MAKING MECH. ENGG.	I.R.D.T.	392
121.	USING UNIX	ROBERT MARTIN	514
122.	WINDOWS-95	SCRAWFORD	340
123.	WORLD TRANS. DIODES & IC'S COMP.VOL.-	BPB PUB.	476
124.	WORLD TRANS. DIODES & IC'S VOL.-1	BPB PUB.	475
125.	WORLD TRANS. VOL.-1	BPB PUB.	473
126.	WORLD TRANS. VOL.-1	BPB PUB.	474
127.	AUTOMATIC FLIGHT CONTROL	EHJ PALLETT	16
128.	AUTOMATIC FLIGHT CONTROL	EHJ PALLETT	17
128.	AUTOMATIC FLIGHT CONTROL	EHJ PALLETT	306
129.	AUTOMATIC FLIGHT CONTROL	EHJ PALLETT	626
130.	AUTOMATIC FLIGHT CONTROL	EHJ PALLETT	627
131.	AUTOMATIC FLIGHT CONTROL	EHJ PALLETT	628
132.	OPERATING SYSTEM PRINCIPLES	HANSON	334
133.	ELECTRICS JAA ATPL TRAINING VOL. 6	JEPPESEN	639
134.	ELECTRICS JAA ATPL TRAINING VOL. 6	JEPPESEN	640
135.	ELECTRICS JAA ATPL TRAINING VOL. 6	JEPPESEN	641
136.	MODERN AVIATION ELECTRONICS	ALBERT D. HELFRICK	670
137.	MODERN AVIATION ELECTRONICS	ALBERT D. HELFRICK	671

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138.	MODERN AVIATION ELECTRONICS	ALBERT D. HELFRICK	672
139.	AME AVIONICS GYROSCOPE	ATC	270
140.	AIRCRAFT COMMUNICATION & NAVIGATION SYSTEM : PRINCIPLES, MAINTENANCE & OPERATION	WYATT	800
141.	AIRCRAFT ENGINEERS HANDBOOK NO. 4 INSTRUMENT	R.W. SLOLEY & W.H. COULTHARD	819
142.	AIRCRAFT ENGINEERS HANDBOOK NO. 4 INSTRUMENT	R.W. SLOLEY & W.H. COULTHARD	820
143.	AIRCRAFT ENGINEERS HANDBOOK NO. 4 INSTRUMENT	R.W. SLOLEY & W.H. COULTHARD	821
144.	AIRCRAFT INSTRUMENTS	C.A. WILLIAMS	824
145.	AIRCRAFT INSTRUMENTS	C.A. WILLIAMS	825
146.	AIRCRAFT INSTRUMENTS	C.A. WILLIAMS	826
147.	AVIATION ELECTRONICS	KEITH W. BOSE	833
148.	AVIATION ELECTRONICS	KEITH W. BOSE	834
149.	AVIONICS FUNDAMENTALS	JEPPESEN	835
150.	AVIONICS VOL. 1 : AVIATION ELECTRONICS	JOHN M. FERRARA	836
151.	AVIONICS VOL. 1 : AVIATION ELECTRONICS	JOHN M. FERRARA	837
152.	AVIONICS VOL. 1 : AVIATION ELECTRONICS	JOHN M. FERRARA	838
153.	BASIC SYNCHROS & SERVOMECHANISM PART -1 & 2	VALKENBERG	846
154.	BASIC SYNCHROS & SERVOMECHANISM PART -1 & 2	VALKENBERG	847
155.	BASIC SYNCHROS. & SERVOMECHANISM PART -1 & 2	VALKENBERG	848
156.	ELECTRONIC COMMUNICATION SYSTEM 5/ED	GEORGE KENNEDY	859
157.	ELECTRONIC COMMUNICATION SYSTEM 5/ED	GEORGE KENNEDY	860
158.	ELECTRONIC COMMUNICATION SYSTEM 5/ED	GEORGE KENNEDY	861
159.	INTEGRATED ELECTRONICS ANALOG & DIGITAL CIRCUIT & SYSTEM	MILLMAN & HALKIAS	868
160A.	INTEGRATED ELECTRONICS ANALOG & DIGITAL CIRCUIT & SYSTEM	MILLMAN & HALKIAS	869
160B.	INTEGRATED ELECTRONICS ANALOG & DIGITAL CIRCUIT & SYSTEM	MILLMAN & HALKIAS	870
161.	MANUAL OF AVIONICS	BRIAN KENDA	888
162.	MANUAL OF AVIONICS	BRIAN KENDA	889
163.	C# 2008 & 2005 THREADED PROGRAMMING BEGINNER`S GUIDE	HILLAR	849
164.	C# 3.0 COOK BOOK	HILYARD	850
165.	CICS HOW TO FOR COBOL PROGRAMMING & OPERATIONS	KIRK	853
166.	COMPLETE CL DEFINITIVE CONTROL LANGUAGE PROGRAMMING GUIDE	HOLT	855
167.	COMPUTER SYSTEM & DATA ANALYSIS	D K BASU	856

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168.	DB2 9 FOR LINUX, UNIX & WINDOWS DATABASE ADMINISTRATION CERTIFICATION STUDY GUIDE	SANDERS	857
169.	INTRODUCTION TO COMPUTERS	N. PETER	871
170.	PRACTICAL UNIX & INTERNAL SECURITY	GARFINKEL	879
171.	TCP/IP COMPANION – A GUIDE FOR THE COMMON USER	ARICK	883
172.	DATABASE IN DEPTH: THE RELATIONAL MODEL FOR PRACTITIONERS	C.J. DATE	886
173.	OPERATING SYSTEMS	SUMITRADEVI	890
174.	PRACTICAL C^{++} PROGRAMMING	OUALINE	891
175.	PRINCIPLES OF COMPUTER INTEGRATED MANUFACTURING	S K VAJPAYEE	892
176.	COMPUTER FUNDAMENTALS & INFORMATION TECHNOLOGY	RAMESH BANGIA	893

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ANNEXURE-I QUESTIONNAIRE

INSTITUTE OF RESEARCH,DEVELOPMENT AND TRAINING U.P.KANPUR -208024

SUBJECT: Questionnaire for ascertaining the functional requirements of Three Year(Six Semester Diploma holders in Aircraft Maintenance Engineering(Avionics) and inputs to improve the existing curriculum accordingly employment opportinities awaiting them.

PURPOSE: Revision of curriculum for Three Year Diploma in Aircraft Maintenance Engineering(Avionics).

NOTE: 1.Please answer the questions to the points given in the questionnaire.
2.Any other point or suggestion not covered in this questionnaire may be written on a separate paper and enclosed with the questionnaire.

1.Name of the organisation:_____
_____

2.Name & Designation of the officer _____
filling the questionnaire _____

3.Name of the department/section/ _____
shop _____

4.Important functions of the _____
department/section/shop _____

5.Number of diploma holder employees
under your charge in the area of _____
Air Craft Maintenance Engineering
(Avionics)and number existing vaccancies.

6.Please give names of modern equipments/machines handled by a diploma holder in Air Craft Maintenance Engineering (Avionics)

1. 2. 3.

4. 5. 6.

7.What proficiencies are expected from a diploma holder in Air Craft Maintenance Engineering(Avionics).

1. 2. 3.

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4. 5. 6.

8.Mention the approximate percentage of the following desired in Diploma teaching.

1. Theoretical knowledge ----------%
2. Practical knowledge ----------%
3. Skill Development ----------%

9.Do you think " on the job training" / Industrial training should form a part of curriculum. (Yes/ No)
if yes then
(a) Duration of training ----------
(b) Mode of training 1. Spread over different semesters

2. After completion of course

3. Any other mode

10.What mode of recruitment is followed by your organisation.

1. Academic merit
2. Written test
3. Group discussion
4. Interview
5. On the job test.

11. Mention the capabilities/ Qualities looked for while recruiting diploma holder in Air Craft Maintenance Engineering(Avionics).

(a) Technical knowledge ----------
(b) Practical skill ----------
(c) Etiquettes and behaviour ----------
(d) Aptitude ----------
(e) Health habit and social background ----------
(f) Institution where trained ----------

12. Which type of assignment do you suggest for an entrepreneur in Air Craft Maintenance Engineering(Avionics).

13. In which types of organisations can a diploma holder in Air Craft Maintenance Engineering(Avionics) can work or serve.

1 2 3

4 5 6

14. Job prospects for the diploma holder in Air Craft Maintenance Engineering(Avionics) the next ten years in the state/country.

15. In your opinion what should be the subjects to be taught to

a diploma student in Air Craft Maintenance Engineering(Avionics).

Theory Practical

16. Kindly mention particulars regarding topics/areas which should be given more emphasisin the curriculum .

Theory Practical

17. Kindly state whether your organisation can contribute towards improvement of curriculum in above field. If yes : Please give names of experts in your organisation willing todo something in this respect — Yes/ No

18. Kindly give your valuable suggestions for being considered at the time of finilisation of curriculum.

19. What changes in technologies are to be incorporated in the development of curriculum in Air Craft Maintenance Engineering(Avionics).

(Signature)

Kindly mail the above questionnaire duly filled to:-

Dinesh Sharma
Lecturer (Electrical)
Institute of Research,Development & Training,U.P.
Govt. Polytechnic Campus
Kanpur-208024

(Please note that all information in this survey is confidential for the use of curriculum revision only)