

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

INTERNAL AUDIT REPORT

Institute Name:	INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY & MANAGEMENT				
Address of the Institute: Tel / Fax: E-mail : Web Site:	Sy. No. 158 & 160, Kompally 'X' Roads, Kompally, Secunderabad, 500014 9393660097, 9347253325 iiastm@yahoo.com www.civilaviationindia.com				
Existing scope of approval	ELECTRICAL SYSTEMS (ES) INSTRUMENT SYSTEMS (IS) RADIO NAVIGATION (RN)				
Name & Designation of Auditing Team	Mr. K.P. Setty Instructor (I/C Team) Mr. S. Adinarayana Instructor Mr. N.K. Misra Instructor				
INTERNAL AUDIT REPORT					Date : 07.05.2012
S.No		Ref Para (E-VIII)	Compliance as per Revision - 3	Evidence/Sat	Remarks By DGCA Team
1.	1	REQUIREMENTS FOR APPROVAL	4		
2.		The institute shall comply with the following requirements for continuation of the approval. Part approval in Mechanical or Avionics stream or semester wise approval or provisional approval shall not be continued.	4.1	Avionics Stream (ES,IS,RN)	Chapter 2, 2.1 in approved Training Manual Refer Annexure : A-1
3.	2	A para-wise compliance report of this CAR along with necessary evidences as Annexure shall be submitted by the institutes to the local airworthiness office. On receipt of the report, the institute's CAR compliance status will be assessed by representatives of DGCA.	4.2	Para Wise compliance submitted to Local Airworthiness Office	Refer Annexure : A-2
4.		Personnel Requirements	4.3		
5.		Accountable Manager: The organisation shall nominate an accountable manager who has corporate authority for ensuring that all infrastructure and training requirements are financed and carried out to the standards required by this CAR. The accountable manager shall:	4.3.1	Sri G. Satyanarayana nominated and approved by DGCA Head Quarters as Accountable Manager	Chapter 4, 4.1 in approved Training Manual Refer Annexure : A-3

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	<p>(i) ensure that all necessary resources are made available for providing training in accordance with this CAR to support the institute's continued approval; and</p> <p>(ii) demonstrate a basic understanding of this CAR.</p>				
6.	In case of absence of Accountable Manager for more than 60 days, the DGCA approval to the Institute is deemed to be suspended till another suitably qualified person nominated by institute is accepted by Regional Director of Airworthiness.	4.3.1.1	Suitable name will be nominated by the organization in case the Accountable Manger is absent for more than 60 days (Chapter 4.1.2 (f) in Approved Training Manual)	Refer Annexure : A-4	
7.	<p>Qualifications and experience The Chief Instructor/ Deputy Chief Instructor shall have the following minimum qualification and experience:</p> <p>(a) Basic licence (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.</p> <p>(b) For Basic licence 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.</p>	4.3.2	<p>Chief Instructor Mr. D.V.R. Rao</p> <p>Dy. Chief Instructor Mr. P. Satish Kumar</p>	<p>Refer Annexure : A-5</p> <p>Refer Annexure : A-6</p>	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

8.	<p>Chief Instructor and Deputy Chief Instructor(s) should together cover the entire scope of approval. Note: - Experienced persons already functioning as Chief Instructor/ Dy. Chief Instructor/Instructor may continue to exercise the privileges of their approval.</p> <p style="text-align: center;">Dy. Chief Instructor</p>	4.3.2.2.1	<p>Chief Instructor Mr. D.V. R. Rao Category 'A' 1. HS 748. 2. Boeing 737-200 3. Airbus A-300 B2/B4 Category 'C' 1. RR Dart 531/533-2 2. P & W JT8D-9A/17/15. GE CF6-50C/C2 Also valid for I & C of DR compasses Licence No. : 2382</p> <p>Dy. Chief Instructor Mr. P. Satish Kumar BAMEL No. : 10438 ES,IS,RN</p>		
9.	In case of absence of Chief Instructor for more than 30 days, the DGCA approval to the Institute is deemed to be suspended till another suitably qualified person nominated by institute is approved by Regional Director of Airworthiness. During such absence, the accountable manger shall nominate a suitable person to act as C.I.	4.3.2.3	Suitable name will be nominated by the organization for the CI for the period under review (Chapter 4.2, 4.2.4 in Approved Training Manual)	Refer Annexure : A-7	
10.	In case Chief Instructor wants to leave the institute, a notice of 45 days has to be given to the institute and a copy to be submitted to the Regional and local Airworthiness office.	4.3.2.4	Will be actioned accordingly as per norms (Chapter 4.2, 4.2.5 in Approved Training Manual)	Refer Annexure : A-7	
11.	Instructors: - The institute will employ adequate number of qualified and experienced Instructors for imparting both theoretical and practical training to the students. The instructors will be approved by Chief Instructor. In addition to the required compliment of regular instructors, part time instructors may also be employed for imparting training on Engineering Drawing, Computers and Human Factors subjects.	4.3.3	Adequate number of qualified and experienced Instructors Available and approved by Chief Instructor Chapter 4, 4.3, 4.3.1 in approved Training Manual.	Refer Annexure : A-8 & A-9	
12.	Qualifications and experience The Instructors should be knowledgeable and duly qualified to	4.3.3.1	Adequate number of qualified and experienced Instructors Available and	Refer Annexure : A-8	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	<p>undertake the instruction in the assigned subjects. The institute should have balanced staff of persons suitably qualified in all subjects listed in the syllabi. The instructors should have an aptitude for teaching and should be patient, enthusiastic and be able to keep discipline.</p> <p>The instructors should have the following minimum qualifications in the relevant discipline:</p> <p>(a) Basic license (BAMEL) in any category, or Degree in Engineering in Aeronautical/ Mechanical/ Electrical/ Electronics/ Instruments engineering, or Diploma in any of the above disciplines, or Bachelor of Science with Physics, Chemistry and Maths/ Bachelor of Science (Electronics)</p> <p>(b) One year practical/instructional experience for holders of Engineering degree or BAMEL, and three years practical/instructional experience in aviation industry for others.</p> <p>(c) Instructors assigned to teach paper I (Air Law, Airworthiness Requirements & Human Performance) should have passed paper I of AME licence examination.</p> <p>(d) Instructors teaching Paper-III subjects should have passed paper-III of the relevant category or have adequate maintenance experience in the relevant category.</p>		<p>approved by Chief Instructor Chapter 4, 4.3, 4.3.2 in approved Training Manual.</p> <p style="text-align: center;">Chapter 4, 4.3, 4.3.3 in approved Training Manual.</p>		
13.	<p>The overall ratio of whole-time instructors to students shall not be more than 1:30 per subject class. An instructor may teach maximum of two subjects. In general, a training school requires at least two instructors for each range of subjects to ensure continuity of program in the event one instructor being absent. When circumstances permit the program can be made more interesting by having additional guest lecturers.</p> <p>Institutes seeking or having approval in any stream shall satisfy the DGCA that the number of instructors available is adequate to smoothly conduct the training programme for the enrolled batches.</p>	4.4	<p>The ratio of instructors maintained as per norms</p> <p>(Chapter 4.6, 4.6.1 in approved training Manual</p>	Refer Annexure : A-10	
14.	Duties and Responsibilities of Chief Instructor	4.5	Chapter 4, 4.4 in Approved Training Manual	Refer Annexure : A-11	
15.	The Chief Instructor shall be responsible for the conduct of training	4.5.1	Chapter 4, 4.4.1 in Approved Training	Refer Annexure : A-11	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	in accordance with the approved Training Manual and shall ensure that all the conditions of approval are complied with.		Manual		
16.	He shall ensure that appropriately qualified instructors are available in adequate number to cover specific subjects.	4.5.2	Chapter 4, 4.4.2 in Approved Training Manual	Refer Annexure : A-11	
17.	He shall ensure that each student admitted for the course possesses minimum qualifications and fulfils the criteria for admission as stipulated in the CAR and the approved training manual. The medical standards of the students as required for an AME shall be ensured.	4.5.3	Chapter 4, 4.4.3 in Approved Training Manual	Refer Annexure : A-11	
18.	He shall ensure that the aircraft, engines, items of equipment, mock-ups and other training aids are kept in clean and serviceable condition for demonstration and practical training.	4.5.4	Chapter 4, 4.4.4 in Approved Training Manual	Refer Annexure : A-11	
19.	He shall ensure that adequate quantity of reference books are available in the institute library. In addition, he shall ensure that each student is in possession of Aircraft Manual (India), Civil Aviation Requirements and other instructions and amendments thereof, issued by DGCA from time to time. The Chief Instructor shall also ensure that lesson plans and class room notes are prepared and issued to all students on various subjects. He shall also ensure that each student maintains his log book and shall certify the same.	4.5.5	Chapter 4, 4.4.5 & 4.5.6 in Approved Training Manual	Refer Annexure : A-11a, b & c	
20.	He shall ensure that a high standard of instruction is maintained.	4.5.6	Chapter 4, 4.4.7 in Approved Training Manual	Refer Annexure : A-11	
21.	He shall be responsible for setting up question papers, conducting examinations, checking of papers, etc. and to conduct examinations of various semesters in a time bound and fair manner.	4.5.7	Chapter 4, 4.4.8 in Approved Training Manual	Refer Annexure : A-11	
22.	He shall ensure that records of proper attendance of each student are maintained.	4.5.8	Chapter 4, 4.4.9 in Approved Training Manual	Refer Annexure : A-11	
23.	He shall ensure that permanent record of all students admitted to the course and their progression through the various semesters of the course is maintained.	4.5.9	Chapter 4, 4.4.10 in Approved Training Manual	Refer Annexure : A-11	
24.	He shall be responsible for submitting reports on intakes and results of semester examinations to the local airworthiness office by 15th of August of every year and after each semester examination respectively.	4.5.10	Chapter 4, 4.4.11 in Approved Training Manual	Refer Annexure : A-11	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

25.	He shall forward the applications of all eligible candidates to the CEO for appearing in the AME licence examinations conducted by DGCA. Where required, he shall also issue photo identity card to all candidates issued with the computer number by CEO.	4.5.11	Chapter 4, 4.4.12 in Approved Training Manual	Refer Annexure : A-11	
26.	He shall maintain record of each candidate's results of DGCA licence examinations and submit reports to the local Airworthiness office after each session.	4.5.12	Chapter 4, 4.4.13 in Approved Training Manual	Refer Annexure : A-11	
27.	He shall make arrangements for on the job training (OJT) for students and monitor the performance of students during their OJT. He shall ensure that the students maintain daily logbooks during this period.	4.5.13	Chapter 4, 4.4.14 in Approved Training Manual	Refer Annexure : A-11	
28.	He shall issue the course completion certificate after successful completion of the course including the mandatory OJT.	4.5.14	Chapter 4, 4.4.15 in Approved Training Manual	Refer Annexure : A-11	
29.	He shall ensure that security clearance of foreign students is duly obtained through DGCA before admitting them for the course.	4.5.15	Chapter 4, 4.4.16 in Approved Training Manual	Refer Annexure : A-11	
30.	He shall ensure that due facilities are provided to DGCA officers for inspection of the institute.	4.5.16	Chapter 4, 4.4.17 in Approved Training Manual	Refer Annexure : A-11	
31.	Requirements:	4.6			
32.	Facilities and Equipment Requirements: (a) The institute should preferably have its own premises, or premises taken on long term lease (five years). The institute shall not be established in residential areas. They should be established in areas permitted by the local administrative authorities. For this purpose, an NOC from local also acceptable. The existing AME	4.6.1	Chapter No. 5, 5.3. in approved Training Manual		

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	<p>institutes shall shift their location from residential areas by 31st July 2010. A Quarterly progress made in this regard is to be submitted to DGCA Hqrs.</p> <p>(b) Adequate number of class rooms for theoretical classes shall be available. For initial approval, at least three class rooms, each properly equipped with training aids must be available.</p> <p>(c) The class rooms shall be properly lighted, well ventilated, furnished and free from noise. The size of the rooms shall be appropriate to accommodate 30 number of students at a time. As a guideline, each room should be at least of 33 sq. mts area.</p> <p>(d) The institute should have hangar/adequate covered area to park the Aircraft/Helicopter for demonstration and for performing practical exercises on the aircraft.</p> <p>(e) The institute shall have well equipped facilities for the training of students in General Engineering practices (basic electrical work, sheet metal work) and aircraft maintenance practices. In addition separate facilities shall be established or arranged on contract for demonstrating welding, heat treatment, NDT, composite material shop etc. (Appendix II)</p> <p>(f) The institute shall have well equipped facilities in Mechanical and Avionics fields, commensurate with the scope of approval sought. (Appendix II)</p> <p>(g) Each facility shall be equipped with tools / equipment, used for General Engineering and for specific jobs.</p> <p>(h) Facility requirements specified in paragraph '4.6.1 to 4.17.3 and Appendix II to V' shall be suitable for imparting subject knowledge and development of aircraft maintenance skill required for an aircraft maintenance personnel to work on 'airframe and engine' and / or 'electrical, instrument and radio' systems, components and equipment during line and base maintenance and familiarize the trainees with relevant technology and process. The facility required for familiarizing / demonstration / functional check of inspection or functional checks of aircraft systems and component shall confine to 'as installed on the aircraft' unless specifically mentioned.</p> <p>Note: Facilities available with another organisation may be utilised for training purpose through a legally valid; viable contract (from logistic and instructional point), when specifically mentioned in this CAR</p>		<p>As per the 4.6.9 of Checklist –I the Institute had made legally valid and viable contract with a DGCA approved aircraft organizations maintaining aircraft / engine / systems covered by the scope of approval of the training institute and refer Annexure XXII and also Chapter 2, (page no 8-16) , 4.10 to 4.13.5 approved training manuals (para 4.6.1 a, b, c, d, e, f, g& h)</p>	<p>Refer Annexure : A-12</p>	
33.	<p>In the interest of maintaining high instructional standards and for establishing proper rapport between the students and the teacher, the number of students in a batch or class shall not exceed 30.</p>	4.6.2	<p>The strength of the class room is restricted to 30 students only (Chapter 4, 4.6.2 in approved Training Manual)</p>	<p>Refer Annexure : A-13</p>	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

34.	In one academic year, induction of only two batches per stream is permitted. Each batch shall not have more than 30 students.	4.6.3	The strength of the class room is restricted to 30 students only (Chapter 4, 4.6.2 in approved Training Manual)	Refer Annexure : A-13	
35.	Institutes seeking approval in Mechanical stream (Aeroplane and Power plant) should have an appropriate aeroplane commensurate with the scope of approval (pressurized aeroplane fuselage) with landing gear and most of the primary instruments and systems functioning. Alternately, the institute should have at least one light all metal/composite aeroplane complete with engine in running condition, instruments, landing gear etc. functioning and detailed mock-ups of all the aircraft systems, replicating the actual aircraft systems. The aeroplane need not have C of A but should have systems in operating condition for imparting practical training.	4.6.4	Not Applicable (Mechanical Stream)	Not Applicable (Mechanical Stream)	
36.	Institutes seeking approval in Mechanical stream (Helicopter and Power plant), should have at least one helicopter with landing gear and most of the primary instruments and systems functioning. Alternately, the institute should have at least one light Helicopter with engine in The Helicopter need not have C of A but should have systems in operating condition for imparting practical training.	4.6.5	Not Applicable (Mechanical Stream)	Not Applicable (Mechanical Stream)	
37.	Intentionally Left Blank	4.6.6			
38.	In case an institute seeks approval in Avionics stream, it must possess one pressurized aeroplane or an IFR certified helicopter adequately fitted with avionics, complete with engines running, landing gear and instruments and systems functioning. Alternately, have a detailed mockup of all the aircraft avionics systems, replicating the Aircraft avionics systems, for example actual working of auto pilot and interfacing of the associated instruments/systems, simulation of instruments reading etc.	4.6.7	Cessna 172 with IFR rating Refer 5.3.2.6 in approved Training Manual	Refer Annexure : A-12(a)	
39.	Providing OJT to the students in the relevant stream is the responsibility of the organization and a proper system should exist and detailed in the training manual. The details of system wise aircraft maintenance tasks to be performed by the students during the OJT should be documented in the training manual. Arrangements for OJT of all the fifth semester students should be completed two months prior to the examination.	4.6.8	MOU is signed on Rs. 100/- Non – Judicial Stamp Papers available (Chapter 5, 5.7.19 in approved Training Manual)	Refer Annexure : A-14(a) Dated 04.10.2007 A-14(b) Dated 23.12.2009 A-14(c) Dated 04.01.2010 A-14(d) Dated 11.05.2012 A-14(e) Dated 15.05.2012 A-14(e) Dated 15.05.2012	
40.	The institutes who do not have pressurized aeroplane or Helicopter complete with engine(s) running and intend to provide OJT to the students shall make legally valid and viable contract with a aircraft maintenance organisations having DGCA approval to maintain	4.6.9	OJT is provided to AME students at an DGCA approved organizations with Log Book entries signed by QCM of the approved organization	Refer Annexure : A-15 Refer Annexure : A-15(a, b , c & d)	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	aircraft and engine covered by the scope of approval of the training institute for providing actual aircraft maintenance experience. The practical training experience should also cover the activities listed in Appendix “V” of this CAR.		Emails copies attached (As an MOU) Chapter No. 5, 5.7.21.3.1 in approved Training Manual		
41.	Institutes having their own aeroplane as required in Para 4.6.4/5/7 (without alternate arrangements) and the Aircraft/Helicopter engine(s) are in running condition may provide OJT as per the scope of approval on the aeroplane owned by them provided the facilities available are suitable for performing Aircraft maintenance task in accordance with the manufacturer’s recommended safety guidelines. The students should be able to carry out the maintenance tasks and other checks listed in the training manual. The institutes shall have trained person(s) who should be able to ground run and demonstrate the systems of the aeroplane to the students. These person(s) may not be licensed AMEs or factory trained, but should be fully aware of the ground run up, maintenance and repair procedures to be followed on the aeroplane. The practical training experience (OJT) should be as specified in Appendix “V” of this CAR.	4.6.9.1	OJT is provided to AME students at an DGCA approved organizations with Log Book entries signed by QCM of the approved organization Emails copies attached (As an MOU) Chapter No. 5, 5.7.21.3.1 in approved Training Manual	Refer Annexure : A-15	
42.	Existing Institutes who have their own pressurized aircraft as required in Para 4.6.4/5/7 but the engine(s) are not running should have an external power supply to demonstrate the various systems checks on the Aircraft, like fire warning, fuel quantity indications, generator on line, landing Gear extension and retraction, battery charging, warnings etc. These systems checks should be the same as those required before and during ground run procedure. These institutes are not allowed to provide OJT to their students in their premises on Jet engine and unserviceable aircraft system. These institutes should have legally valid and viable contract made with DGCA approved maintenance organizations for imparting OJT on the Jet Engine and relevant aircraft system to all the students enrolled by the institute. Note: Institutes shall have necessary contract with approved aircraft maintenance organisations to perform OJT on Jet engine and systems that are not serviceable in the aircraft held by them.	4.6.10	OJT is provided to AME students at an DGCA approved organizations with Log Book entries signed by QCM of the approved organization Emails copies attached (As an MOU) Chapter No. 5, 5.7.21.3.1 in approved Training Manual	Refer Annexure : A-15	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

43.	<p>The institute shall have a library having a stock of books commensurate with the number of students. One set of books per 10 students should be procured by the institute for issue to the students as course text books.</p> <p>Adequate number of suggested reference books should also be made available in the library. The list of books recommended for the training institute is given in Appendix VIII. The library shall also have manufacturer's technical literature in respect of the aircraft / engine / aircraft system used for training purpose within its premises to carry out removal / installation and other maintenance activities. The Library should be equipped with photocopier and sufficient numbers of computers with access to internet facility for students.</p>	4.6.11	Chapter No. 5, 5.4 in approved Training Manual	Refer Annexure : A-16	
44.	The institute should have OHP and / or LCD projectors in each class room, for use by the trainees and instructors.	4.6.12	Chapter No. 2, 2.4.9, 4.6.12 in approved Training Manual	Refer Annexure : A-17(a)	
45.	Sufficient training aids, demonstration equipment and study material should be available to facilitate complete comprehension of the instruction given.	4.6.13	Chapter 2, 2.4.8 4.6.13 in approved Training Manual	Refer Annexure : A-17(b)	
46.	<p>Contractual arrangement made by the training institute for familiarization, demonstration, operation and providing OJT should be legally valid and viable from logistic point for imparting the training. The validity of the contract should cover the entire training period of all batches of students pursuing the training at the institute. Contracted facilities shall not have any accessibility limitation to the instructors and the trainees.</p> <p>Note: Audio visuals may be used as a supplementary means of practically familiarizing the trainee on subject matter. It may be used as primary teaching aid in respect of subject matter having only academic interest or technology no longer in use. Training institutes imparting practical lessons with the use of audio visuals while the students are at the institute shall detail the additional practical exercises to be demonstrated and / or performed during or at end of the semester and person responsible to monitor the training in the legally valid contract signed with the organizations.</p>	4.6.14	<p>OJT is provided to AME students at an DGCA approved organizations with Log Book entries signed by QCM of the approved organization</p> <p>Emails copies attached (As an MOU)</p> <p>Chapter No. 5, 5.7.21.3.1 in approved Training Manual</p> <p>Chapter 2, 2.4.8 4.6.8 in approved Training Manual</p>	Refer Annexure : A-15	
47.	Institutes desirous of seeking approval in any of the Mechanical stream shall have the following facilities for airframe maintenance skill development.	4.7	Not Applicable (Mechanical Stream)	Not Applicable (Mechanical Stream)	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

48.	BASIC WORKSHOP AND MAINTENANCE PRACTICES – Fixed wing / Rotary wing.	4.7.1		
49.	<p>Introduction</p> <p>a) Training in workshop practice should begin with exercises in the use of hand tools to make a series of simple shapes to specified dimensions from various metals. Each shape should be progressively more complicated with more precise tolerances. From the start, instructors should ensure that students develop the habit of handling basic hand or machine tools in the correct manner, and action should be taken to correct any bad or potentially dangerous practices before they become habitual. At all times, and particularly during the early stages of training, the importance of producing accurate and careful work must be stressed.</p> <p>These exercises can be used to develop the trainees' inspection ability, i.e., the necessary judgment and sense of responsibility required to assess the accuracy of their own work and that of others.</p> <p>b) The students should have the opportunity to remove and replace system components. Practice in inspection functions during simulated maintenance activities is considered an important training element in this phase.</p>	4.7.1.1	Refer Annexure – I & II (Sample of procedure sheet attached) Pic No. 17-47	
50.	<p>Bench fitting</p> <p>Cutting and filing: exercises in cutting metal with hacksaws; filing; Drilling; drill grinding; thread cutting with taps and dies; and scraping.</p> <p>Measurements: use of steel rule, dividers, callipers, micrometres, Vernier, combination set, surface plate, and dial test indicator.</p>	4.7.1.2	Refer Annexure – I & II (Sample of procedure sheet attached) Pic No. 17-47	
51.	<p>Forging, Heat Treatment, Soldering and welding.</p> <p>Forging and hand forging, simple specimens such as chisels, punches and others Hardening and tempering carbon steel by using forge Soldering and use of proper flux Welding: oxyacetylene and metallic arc welding of different materials Inspection of welded joints for flaws.</p> <p>Note: - Forging, heat treatment and welding familiarisation can be out sourced.</p>	4.7.1.3	Refer Annexure – I & II (MOU attached) Pic No. 17-47	
52.	<p>Sheet metal work Sheet aluminium alloy: cutting, marking out, drilling, forming, bending, bending allowances, Familiarise shrinking and flashing. Forming sheet metal by pressing and rolling.</p> <p>Riveting: types of rivets, riveting with hand tools, rivet spacing, countersinking and dimpling, use of pneumatic riveting hammer, blind riveting, inspection of rivets, removal of rivets and use of oversized rivet.</p>	4.7.1.4	Refer Annexure – I & II (Sample of procedure sheet attached) Pic No. 17-47	


INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	Exercises in sheet metal patching and repair work. Note: - Heat treatment of aluminium alloy and alloy rivets: use of salt baths and furnaces; annealing and solution treatment can be out sourced.			
53.	Machine shop Drilling: using machine drills and drill holes in various materials; reaming Holes Grinding: use of grinding wheels for tools sharpening	4.7.1.5	Refer Annexure – I & II (Sample of procedure sheet attached) Pic No. 17-47	
54.	Wire and cable work Inspection of aircraft cables for defects, Tension adjustment on control cables.	4.7.1.6	Refer Annexure – I & II (Sample of procedure sheet attached) Pic No. 17-47	
55.	Tube work Tube bending, without heat treatment; Tube flaring. Fitting of different kinds of unions used in fuel, oil and hydraulic systems. Inspection and testing of tubes and flexible hoses	4.7.1.7	Refer Annexure – I & II (Sample of procedure sheet attached) Pic No. 17-47	
56.	Airframe/Helicopter familiarization Airframe/helicopter structures: Familiarisation and inspection of, Wing and fuselage construction, including primary and secondary structures. Forged, extruded, cast and sheet materials used. Main joints: methods of riveting, spot welding, and adhesive bonding. Doors and cut-outs, positions of inspection panels, removal of fairings, and methods of gaining access to all parts of structure. Landing gear component, system lay-out and function: examination of system Flight Control Systems: examination of control system; checking of Control surface movements and cable tensions; interconnections of autopilot to control systems; examination (by visiting airline, if necessary) of power-operated control systems.	4.7.1.8	Refer Annexure –II to XII (Sample of procedure sheet attached) Pic No. 50- 222)	
57.	Ground handling of aircraft/helicopter Pre-flight inspection of aircraft/helicopter. Starting and running of engines; observation of instrument readings; function check(s) of electrical components; stopping of engines	4.7.1.9	Refer Annexure –II to XII (Sample of procedure sheet attached) Pic No. 50- 222)	
58.	Use of ground equipment for moving, lifting or servicing aircraft	4.7.1.10	Refer Annexure –II to XII (Sample of procedure sheet attached) Pic No. 50- 222)	
59.	Installation and testing of equipment Removal, replacement, in situ inspection, and function testing - Errors and electrical faults of electrical equipment.	4.7.1.11	Refer Annexure –II to XII (Sample of procedure sheet attached) (Pic No. 50- 222) MOU Available	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

60.	<p>Installation and testing of equipment Removal, replacement, in situ inspection, and function testing - Errors and electrical faults of electrical equipment.</p>	4.7.1.11	<p>Annexure A-14 MOU Available</p>	
61.	<p>Light Aircraft / helicopter Removal, control surfaces, landing gear, wings/rotor blades, tail plane/tail rotor blades and fin, and seats Note: - Removal and installation of Engine should be demonstrated to all students at-least once during the curriculum. Inspection: inspection of condition of fuselage alignment checks, freedom from distortion, and symmetry Checking of wings and other airframe components for condition, and freedom from distortion Installation of wings/rotor blades, empennage, control surfaces, and engine; check rigging angles of wings and tail plane; adjust flying controls and check control surface movements; replace landing gear and check alignment track</p>	4.7.1.12	<p>Refer Annexure –II to XII (Sample of procedure sheet attached) (Pic No. 50- 222)</p>	
62.	<p>Wheels and tyres Wheel and brake - removal, inspection, installation and function check. Tyre inspection, identification of defects Brake units: inspection Inspection of anti-skid devices</p>	4.7.1.13	<p>Refer Annexure –II to XII (Sample of procedure sheet attached) (Pic No. 50- 222)</p>	
63.	<p>Control surfaces Inspection - metal-skinned ailerons, elevators and/or rotor blades. Hinges and actuating mechanisms: inspection Correction of mass balance after repair of controls surfaces/rotor blades. Adjustment of balance tabs, and servo-tabs on aircraft (to correct for hinge moments and flying faults).</p>	4.7.1.14	<p>Refer Annexure –II to XII (Sample of procedure sheet attached) (Pic No. 50- 222)</p>	
64.	<p>Multi-engine aircraft/helicopter Simulated airline check: Familiarization with maintenance schedule Performance of sample periodic inspection by the students, including signing of check sheets for each job done and recording of and, if possible, rectification of all defects. Functional checks after replacement of representative cross-section of aircraft systems components, including ground testing of hydraulic system with retraction of landing gear and function testing of electrical system; ground running of engines. weighing of the aircraft and calculation of centre of gravity.</p>	4.7.1.15	<p>MOU Available</p>	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

65.	<p>BASIC MAINTENANCE PRACTICES: REPAIR, MAINTENANCE AND FUNCTION TESTING OF AIRCRAFT/ HELICOPTER SYSTEMS / COMPONENT</p> <p>Note: Aircraft system denoted by ‘*’ may be outsourced</p>	4.7.2		
66.	<p>Hydraulic systems Familiarise with Hydraulic fluids & system component and lay-out and perform servicing, minor maintenance and functional check of Hydraulic reservoirs and accumulators; Hydraulic pressure generation: electric, mechanical, *pneumatic; Emergency hydraulic pressure generation; Hydraulic pressure Control; Hydraulic power distribution; Indication and warning systems; Interface with other systems.</p>	4.7.2.1	Annexure A-14 MOU Available	
67.	<p>Pneumatic systems Familiarise with 'Pneumatic / vacuum Systems' components and functioning of Sources: engine / *APU,; Pressure control; Distribution; Indications and warnings; Interfaces with other systems.</p>	4.7.2.2	Annexure A-14 MOU Available	
68.	<p>Environmental control systems Air supply Familiarise with sources of air supply including engine bleed, *APU and ground cart; Air Conditioning Familiarise with the ‘Air Conditioning System’ components, layout (Air cycle and vapour cycle machines, Distribution systems; Flow, temperature and humidity control system) and demonstrate system functional check. Pressurisation Familiarise with ‘Pressurisation System’ components and layout (Control and indication including control and safety valves; Cabin pressure controllers) Safety and warning devices Familiarise with the components pressurisation system protection and warning devices and system layout.</p>	4.7.2.3	 <p style="text-align: center;">Annexure A-14 MOU Available</p> <p style="text-align: center;">Refer Annexure –II to XII (Sample of procedure sheet attached) Pic No. 50- 222)</p>	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

69.	Fire Control systems Familiarise with the component, system layout and demonstrate functional check of fire and *smoke detection, warning systems; fire extinguishing systems and system tests.	4.7.2.4	Annexure A-14 MOU Available	
70.	De-icing systems Familiarise with components, system and control of *de-icing systems: electrical, hot air, pneumatic and chemical;	4.7.2.5	Annexure A-14 MOU Available	
71.	Miscellaneous systems *Familiarise with 'Water system' components and lay-out - supply, distribution, servicing and draining; Dumping*, *Familiarise with toilet system lay-out, flushing and servicing; Familiarise with oxygen system components, layout, supply, distribution and indication system Familiarise with fuel system component and lay-out and perform servicing, minor maintenance Fuel tanks; Fuel supply systems; venting and draining; Cross-feed and transfer; Indications and warnings; And fuel system functional check Refuelling Familiarise with emergency equipment, seats, harnesses and belts	4.7.2.6	<div style="display: flex; align-items: center;"> <div style="font-size: 2em; margin-right: 10px;">}</div> <div>Annexure A-14 MOU Available</div> </div> <div style="display: flex; align-items: center; margin-top: 20px;"> <div style="font-size: 2em; margin-right: 10px;">}</div> <div>Refer Annexure –II to XII (Sample of procedure sheet attached) Pic No. 50- 222)</div> </div>	
72.	JOB/TASK DOCUMENTATION AND CONTROL PRACTICES	4.7.3		
73.	General servicing and maintenance practices of aircraft systems. (Applicable standard maintenance practices like wire locking, tightening torque for fasteners, pipe unions, electrical connectors etc.), minor fault diagnosis; perform representative systems component removal, fitment, inspection, adjustment, servicing and operational check.	4.7.3.1	Refer Annexure –II to XII (Sample of procedure sheet attached) (Pic No. 50- 222)	
74.	Reserved	4.7.3.2	Reserved	
75.	Reserved	4.8	Reserved	
76.	Institutes desirous to seek approval in any of the Mechanical stream shall have the following facilities for ENGINE (Piston & Turbine engine) maintenance skill development.	4.8	NA	
77.	BASIC MAINTENANCE PRACTICES: ENGINE AND PROPELLER	4.8.1	NA	
78.	Reserved	4.8.1.3	Reserved	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

79.	Reserved	4.8.1.4	Reserved	
80.	Reserved	4.8.1.5	Reserved	
81.	Reserved	4.8.1.6	Reserved	
82.	Reserved	4.8.1.7	Reserved	
83.	Reserved	4.8.1.8	Reserved	
84.	Reserved	4.8.1.9	Reserved	
85.	Reserved	4.8.1.10	Reserved	
86.	Reserved	4.8.1.11	Reserved	
87.	Reserved	4.8.1.12	Reserved	
88.	<p>GAS TURBINE ENGINE Familiarise with constructional arrangement of turbojet / turbofan / turbo shaft / turboprop, various inlet configurations; engine inlet, Axial and centrifugal types of compressor and constructional features, constructional features of combustion section, different types of turbine blade; blade to disk attachment; nozzle guide vanes, exhaust and various types of bearings Familiarise with component and systems layout and perform operation of Engine lubrication system, fuel system including, fuel metering systems, air distribution and anti-ice control, sealing and external air services, start and ignition systems, fire detection and extinguishing systems, Indication Systems -Exhaust Gas Temperature/ Interstate Turbine Temperature, Engine Pressure Ratio, engine turbine discharge pressure or jet pipe pressure systems; Oil pressure and temperature; Fuel pressure and flow; Engine speed; Power indication system Familiarise with gas coupled/free turbine; Reduction gears; Integrated engine and propeller controls; Over speed safety devices of turbo-prop engine and its operation.</p> <p>* Familiarise with arrangements, drive systems, reduction gearing, couplings, control systems of turbo-shaft engines and its operation. Demonstrate power plant removal and installation. Applicable standard practices, minor fault diagnosis, perform representative engine systems component removal, fitment, inspection, adjustment, servicing and operational check. Demonstrate engine starting and ground run-up Note: * As applicable to the airframe / Engine covered by the scope of approval.</p>	4.8.1.13	NOT APPLICABLE	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

89.	<p>Familiarise with various piston engine construction - Crank case, Crank shaft, Cam shafts, Sumps; Accessory gearbox; Cylinder and Piston assemblies; Connecting rods, Inlet and exhaust manifolds; Valve mechanisms; Propeller reduction gearboxes. Various types of carburettors, Icing and heating system,</p> <p>Familiarise with components and systems layout of piston engine fuel injection system components and operation, engine control and fuel metering systems, starting system, pre-heat system; magneto types,</p> <p>Ignition harnesses, spark plugs; low and high tension systems, induction systems including alternate air systems; exhaust systems and engine cooling systems, supercharging / turbo-charging systems, lubrication system, Indication Systems,</p> <p>Demonstrate power plant removal and installation.</p> <p>Perform representative engine systems component removal, fitment,</p> <p>inspection, adjustment, servicing and operational check.</p> <p>Applicable standard practices, minor fault diagnosis, differential pressure test and rectification</p> <p>Demonstrate engine starting and ground run-up</p>	4.8.1.14	NOT APPLICABLE	
90.	<p>PROPELLER</p> <p>Facility to familiarise high/low blade angle, reverse angle, angle of attack, blade station, blade face, blade shank, blade back and hub assembly; fixed pitch, controllable pitch, constant speeding propeller and propeller/spinner attachment.</p> <p>Familiarise with system layout and components of mechanical and electrical/electronic propeller speed control and pitch change mechanism, feathering and reverse pitch; over speed protection.</p> <p>Demonstrate propeller removal and installation.</p> <p>Perform representative propeller systems component removal, fitment,</p> <p>inspection, adjustment, servicing and operational check.</p> <p>Facility to demonstrate propeller engine running</p>	4.8.1.15	NOT APPLICABLE	
91.	Reserved	4.8.2	Reserved	
92.	Reserved	4.8.2.1	Reserved	
93.	Reserved	4.8.2.2	Reserved	
94.	JOB/TASK DOCUMENTATION AND CONTROL PRACTICES	4.8.3	NOT APPLICABLE	
95.	General servicing, maintenance practices of engine and propeller systems and minor fault diagnosis	4.8.3.1	NOT APPLICABLE	
96.	Reserved	4.8.3.2	Reserved	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

97.	The recommended facilities, tools and equipment required to accomplish the maintenance skills as described in Para 4.8 are given in appendix "III"	4.9	MOU Available	
98.	Institutes desirous to seek approval in Avionics stream shall have the following facilities for AVIONICS (ELECTRICAL, INSTRUMENT, RADIO) maintenance skill development.	4.10		
99.	ELECTRICAL Lead acid batteries Check battery condition, specific gravity of electrolyte, battery charging practice; capacity, carry out discharge and insulation test; Safety precautions	4.10.1	Refer Annexure : XIX – XXIII Pic 427 to No 461 & Pic No. 4 to 16	
100.	Nickel cadmium batteries Checking of battery condition: determining state of charge, charging, etc. Checking of electrolyte level and insulation tests. Safety Precautions. Deep cycling of nickel cadmium units.	4.10.2	Refer Annexure : XIX – XXIII Pic 427 to No 461 & Pic No. 4 to 16	
101.	Wire and cable work Making up of wire lengths and specimen cable looms: soldering and crimping ends, identification of cables, and fitting plugs and sockets. Cable tracing practice: continuity and insulation checks on cable runs. Practice in aircraft wiring	4.10.3	Refer Annexure : XIX – XXIII Pic 427 to No 461 & Pic No. 4 to 16	
102.	Bonding, Continuity and Insulation Testing Bonding checks: use of bonding tester or millimicro ohmmeter Continuity and insulation tests on aircraft circuit; use of Megger testers.	4.10.4	Refer Annexure : XIX – XXIII Pic 427 to No 461 & Pic No. 4 to 16	
103.	Generators and Electric Motors Familiarise with various parts of generators and electric motors and function	4.10.5	Refer Annexure : XIX – XXIII Pic 427 to No 461 & Pic No. 4 to 16	
104.	Voltage regulators, cut-outs and relays Familiarise with various types of voltage regulators, battery cut-outs, reverse current relays, solenoids and relays from various circuits, thermal circuit breakers and function.	4.10.6	Refer Annexure : XIX – XXIII Pic 427 to No 461 & Pic No. 4 to 16	
105.	Alternators Familiarise with various parts of alternators and function Electromagnetic relays: inspection	4.10.7	Refer Annexure : XIX – XXIII Pic 427 to No 461 & Pic No. 4 to 16	
106.	Electric motors Familiarise with aircraft various types of motors components and	4.10.8	Refer Annexure : XIX – XXIII Pic 427 to No 461 & Pic No. 4 to 16	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	function (starters motors for piston and turbine aero engines, motors for fuel line pumps, hydraulics, propeller feathering, and windscreen wipers Linear and rotary actuators)			
107.	Inverters and converters Familiarise with static invertors components and function.	4.10.9	Refer Annexure : XIX – XXIII Pic 427 to No 461 & Pic No. 4 to 16	
108.	Reserved	4.10.10	Reserved	
109.	Electrical circuit equipment Demonstration of the function of wide range of miscellaneous electrical components such as transducers, rectifiers, transformers, Wheatstone bridge and other balancing devices, and sensing elements	4.10.11	Refer Annexure : XIX – XXIII Pic 427 to No 461 & Pic No. 4 to 16	
110.	Electrical Power Facility to familiarize with the ‘Aircraft Electrical Power System’ component, lay-out and perform functional check of Batteries; DC power generation; AC power generation; Emergency power generation; Voltage regulation; Power distribution; Inverters, transformers and rectifiers, circuit protection and External / Ground power;	4.10.12	Refer Annexure : XIX – XXIII Pic 427 to No 461 & Pic No. 4 to 16	
111.	Lights Facility to familiarise with component and lay-out and perform functional check of External lights: navigation, landing, taxiing, ice; Internal lights: cabin, cockpit, cargo; Emergency lights.	4.10.13	Refer Annexure : XIX – XXIII Pic 427 to No 461 & Pic No. 4 to 16	
112.	INSTRUMENTS Note: Aircraft instrument systems denoted by ‘*’ may be outsourced alternately familiarisation of the systems may be carried out during field visit / OJT	4.11		
113.	Pressure indication Familiarise with mechanically operated gauges and their function (e.g. Bourdon tube Familiarise with pressure transducers, electrically-operated transmitters and their function Familiarise with Electrically-operated gauges and their function	4.11.1	Refer Annexure : XVI-XIX Pic No. 360 to 380	
114.	Instruments Familiarise with the following instruments, system lay-out their function and maintenance check of Pitot static system Altimeter Airspeed indicator Machmeter Rate of climb indicator	4.11.2	Refer Annexure : XVI-XIX Pic No. 360 to 380	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	<p>Altitude reporting/alerting systems; Air data computers; Instrument pneumatic systems; Direct reading pressure and temperature gauges; Temperature indicating systems; Fuel quantity indicating systems; Artificial horizons; Slip indicators; Directional gyros; * Ground Proximity Warning Systems; * Flight Data Recording systems; * Electronic Flight Instrument Systems; * Instrument warning systems including master warning systems and * Centralised warning panels; * Stall warning systems and angle of attack indicating systems; * Vibration measurement and indication.</p>		<p>Refer Annexure : XVI-XIX Pic No. 360 to 380</p> <p style="text-align: center;">} Annexure A-14 MOU Available</p>	
115.	Reserved	4.11.3	Reserved	
116.	<p>Engine speed indication (ESI) Familiarise with *ESI generators (DC and AC types) and their function: Familiarise with ESI system and their function Familiarise with Generators and gauges and their function</p>	4.11.4	<p>Field Visit/OJT Refer Annexure : A-15 Refer Annexure : A-15(a, b , c & d)</p>	
117.	<p>Thermometers and temperature indication Engine temperature thermocouples: Familiarisation of cylinder head, jetpipe temperature system. Familiarise with ratiometer temperature gauges and their function Familiarise with various kinds of temperature sensing units (e.g. fire and overheating detectors, cabin air-duct).</p>	4.11.5	<p>Refer Annexure : XVI-XIX Pic No. 360 to 380</p>	
118.	<p>Fuel contents indication Familiarise with Float-operated desynn contents gauges and their function : demonstration of operation Familiarise with Capacitance type contents gauges and their function: demonstration of operation Familiarise with Flowmeters and their function</p>	4.11.6	<p>Refer Annexure : XVI-XIX Pic No. 360 to 380</p>	
119.	<p>Compass systems Familiarise with Magnetic compasses and their function: Familiarise with Remote compass and their function: Swing of compass with the available aircraft or mock-up: compensation practice.</p>	4.11.7	<p>Refer Annexure : XVI-XIX Pic No. 360 to 380</p>	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

120.	Reserved	4.11.8	Reserved	
121.	AUTO FLIGHT	4.12		
122.	Facility to familiarise with the automatic flight control system component and lay-out and demonstrate functional test Modes of operation: roll, pitch and yaw channels; Yaw dampers; Stability Augmentation System in helicopters; Automatic trim control; Autopilot navigation aids interface; Autothrottle systems. Facility to familiarise with the Automatic Landing Systems component and lay-out and demonstrate functional check of modes of operation, approach, glideslope, land, go-around, system monitors and failure conditions. Note: Partial autoflight system familiarisation and demonstration exercises may be outsourced.	4.12.1	Field Visit/OJT Refer Annexure : A-15 Refer Annexure : A-15(a, b , c & d)	
123.	Reserved	4.12.2	Reserved	
124.	RADIO	4.13		
125.	Radio workshop: Fundamental techniques Familiarise with safety precautions associated with radio equipment hazards: high voltages, radio frequency (RF) emissions and microwave emissions, electrostatic discharge, etc. Wiring and cabling: demonstration and practice in wiring and soldering radio circuits. Multimeters, Megger and bonding testers / milliohmmeter: demonstrations and practice. 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. Aerial masts, static dischargers, etc.: inspection and servicing. Familiarise with the following system elements; TRF receiver Intermediate frequency amplifier Frequency converter Superheterodyne alignment Buffer-doubler amplifier RF amplifier Modulation Transmission lines	4.13.1	Refer Annexure : XII-XVI Pic No. 223 to 342	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

126.	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.	4.13.2	Refer Annexure : XII-XVI Pic No. 223 to 342	
127.	Wiring, cabling and soldering techniques Wiring: 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. Handling of electrostatic sensitive devices.	4.13.3	Refer Annexure : XII-XVI Pic No. 223 to 342	
128.	Instrumentation Multimeter: practice in measuring and calculating series and parallel resistance; voltage and current measurements on various circuits; others. Megger: continuity and insulation tests on aircraft cable assemblies structure; practice with circuit boards; Frequency metres: practice in frequency measurement. Practice in measuring L, R, C and Q values Signal generators: demonstration of cathode ray oscilloscope; demonstration of use of examine wave-forms, wave envelopes, and DC measurements.	4.13.4	Refer Annexure : XII-XVI Pic No. 223 to 342	
129.	Reserved	4.13.5	Reserved	
130.	Communication/Navigation Note: Functional check of radio system may be outsourced Facility to familiarise with component and lay-out and demonstrate functional check of the following system Very High Frequency (VHF) communication; High Frequency (HF) communication; Audio; Emergency Locator Transmitters; Cockpit Voice Recorder; Very High Frequency omnidirectional range (VOR); Automatic Direction Finding (ADF); Instrument Landing System (ILS); Flight Director systems; Distance Measuring Equipment (DME); Global Positioning System (GPS), Air Traffic Control transponder, Traffic Alert and Collision Avoidance System(TCAS); Weather avoidance	4.13.6	Refer Annexure : XII-XVI Pic No. 223 to 342 Field Visit/OJT Refer Annexure : A-15 Refer Annexure : A-15(a, b , c & d)	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	<p>radar; Radio altimeter; Note: * Demonstration of functional check requiring radio transmission may be carried out during field visit or OJT. Radio communication may be performed adopting an equivalent means.</p>			
131.	<p>REPAIR, MAINTENANCE AND FUNCTION TESTING OF AIRCRAFT SYSTEMS/COMPONENT: AVIONICS</p>	4.14		
132.	<p>Airborne and test equipment practice Demonstrate use of representative airborne radio and radar equipment and practice in servicing, and installation on the aircraft. Removal and replacement of equipment from aircraft racks, checks on power supplies, and remote controls. Routine maintenance inspections of equipment in situ. Operational checks. Understanding and use of remote specialist communications, navigation and radio test equipment for ramp Understanding and use of system built-in test equipment (BITE), Practicing wiring, fault tracing . Note: * Demonstration of functional check requiring radio transmission may be carried out during field visit or OJT</p>	4.14.1	<p>Field Visit/OJT Refer Annexure : A-15 Refer Annexure : A-15(a, b , c & d)</p>	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

133.	JOB/TASK DOCUMENTATION AND CONTROL PRACTICES	4.15		
134.	Applicable standard practices, minor fault diagnosis, perform representative electrical, instrument and radio systems component removal, fitment, inspection, adjustment, servicing and operational check.	4.15.1	Chapter 2, 2.4.12. 4.15 in approved Training Manual Sample of Procedure sheet attached	Refer Annexure : A-18(a,b &c)
135.	Reserved	4.15.2	Reserved	
136.	Additional recommended facilities, tools and equipment required to accomplish the maintenance skills are given in Appendix II, III & IV.	4.16	Annexure : I – II Pic No. 17- 47 (Workshop Lab) Annexure : II - XII Pic No. 50- 222 (Airframe & Engine Lab) Annexure : XII - XVI Pic No. 223- 342 (Radio Lab) Annexure : XVI - XIX Pic No. 360 - 380 (Instrument Lab) Annexure : XIX - XXIII Pic No. 427 – 461, 4 to 16 (Electrical Lab)	
137.	On-Job Practical Training	4.17		
138.	For completion of the course, six months On the Job Training (OJT) shall be mandatory. These six months OJT may be given in a continuous period or may be divided into two segments of three months each. For imparting practical training on aircraft maintenance to the trainees, facilities acceptable to DGCA and as specified in Appendix V must exist.	4.17.1	Chapter 2, 2.4.8 4.6.9 in approved Training Manual MOU attached	Refer Annexure: A-19(a &b) & A-14 already attached
139.	The institutes shall make suitable arrangements with DGCA approved maintenance organisations having an airworthy and operating aircraft / engine/ relevant system engaged in major maintenance for practical on the job training at the end of the course. The trainees shall be deputed to approve aircraft maintenance organisation maintaining the aircraft and engine covered by the scope of approval of the training institute.	4.17.2	The OJT is provided to the students from DGCA approved organization MOU attached	Refer Annexure: A-19(a &b) & A-14 already attached
140.	Institutes (new/existing) having their own aircraft as required in Para 4.5.5/6/7 (without alternate arrangements) may give OJT, on the aeroplane/helicopter owned by them. The students should be able to carry out the maintenance schedules and other checks as called for in the AMM. The institutes shall have trained person(s) who should be able to ground run and demonstrate the systems of the aircraft to the students. These person(s) may not be licenced AMEs or factory trained, but should be fully aware of the ground run up, maintenance and repair procedures to be followed on the type of aircraft possessed by the institute. The institutes shall ensure that all safety precautions and standard maintenance	4.17.3	The OJT is provided to the students from DGCA approved organization MOU attached	Refer Annexure: A-19(a &b) & A-14 already attached

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	practices are followed and requirements spelt out in Appendix V are fulfilled in toto.				
141.	Preparation of Training Manual The institute shall prepare a Training Manual detailing the training policy and procedures which will be approved by DGCA. The Training Manual may be prepared containing the information given in Appendix VII for reference. Necessary supplementary procedure manual shall be prepared and approved by the accountable manager. The Training / procedure manual contents in no case shall override the CAR/Aircraft Rules and instructions issued by DGCA from time to time.	5	Training Manual had been approved by the DGCA and submitted	Refer Annexure : B	Already 3 copies Training Manual submitted
142.	QUALIFICATIONS FOR ADMISSION	6			
143.	For AME training course, the candidates shall have passed minimum 10+2 class with Mathematics, Physics and Chemistry from a recognized board or university or its equivalent;	6.1	Chapter 5., 5.7.2.1 in approved training Manual	Refer Annexure : C-1(a, b, c)	
144.	The trainees shall be subjected to a medical examination before they are admitted to the training institute by a doctor possessing at least an MBBS degree. Candidates shall not have any physical disabilities or colour blindness, which may interfere in discharging the duties as an AME.	6.2	Chapter 5., 5.7.2.2 in approved training Manual	Refer Annexure : C-1(d)	
145.	PERIOD OF TRAINING	7			
146.	The period of training in the approved institute will be counted for the purpose of computing total aeronautical maintenance experience required for becoming eligible for appearing in the AME licence written examination.	7.1	5.7.6 & 5.7.7 in approved Training Manual	Refer Annexure: A-19(b) Attached already	
147.	The minimum duration of the training for various streams shall be as follows: (a) (LA, PE, HA & JE) Mechanical stream – Aeroplane and Powerplant Three years including six months OJT (b) (RA, JE & PE) Mechanical stream – Helicopter and Powerplant Three years including six months OJT (c) (ES, IS & RN) Avionics stream- Three years including six months OJT	7.2	5.7.6 in approved Training Manual	Refer Annexure: A-19(b) Attached already	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

148.	Institutes may at their discretion increase the duration of the course before commencement of the batch, in order to cover the prescribed syllabus with additional thoroughness. This procedure shall be documented in the training manual approved by DGCA.	7.2.1	Chapter No. 6 Page No. 67 in approved g Training Manual	Refer Annexure : D-1	
149.	In case a student wants to migrate from one institution to another a formal approval has to be sought from DAW(Trg.) Hdqrs.	7.2.2	Chapter No. 5 5.7.4 in approved Training Manual (No student is migrated)	Refer Annexure : D-2	
150.	All semesters in training institute shall contain both theoretical and practical classes in equal proportion. The period assigned for OJT shall be exclusively devoted to familiarisation / demonstration / performance of actual aircraft maintenance tasks.	7.3	Chapter No. 5 5.7.6 & 5.7.7.3 in approved Training Manual (No student is migrated)	Refer Annexure : D-3	
151.	During the entire period of training, each student shall maintain records of training / log book indicating the practical training he has undergone. The records of training / log book shall be signed by an instructor of the institute or the QCM of the organisation where he has undergone the practical training.	7.4	Chapter No. 5 5.7.7.6 in approved Training Manual	Refer Annexure : D-4a,b,c	
152.	The courses shall start in the month of July each year to ensure that the students are eligible for the October examination session of the following year. The list of admitted students in a batch should be forwarded to CEO, latest by first week of September, for allotment of Computer number to the students.	7.5	Chapter No. 5, 5.7.5 in approved Training Manual	Refer Annexure : D-5 a,b &c	
153.	The number of students in each batch shall be in commensurate with the infrastructure available and shall not exceed 30. However, no institute shall have more than two batches in each stream, in an academic year.	7.6	Chapter No. 5, 5.7.7.1 in approved Training Manual	Refer Annexure : D-5 a,b &c	
154.	During any semester the practical training shall not be normally less than 50% of total training time. Any variation in period or scope of training will have prior approval of DGCA.	7.7	Chapter No. 5, 5.7.7.1 in approved Training Manual	Refer Annexure : D-3	
155.	Reserved	7.8	Reserved		
156.	SEMESTER EXAMINATIONS	8			
157.	After completing each semester the candidate shall be subjected to an examination. Before a candidate is allowed to appear for the examination, he should have been present for at least 80% of the training period of the subject. The examination shall be conducted semester-wise every six months.	8.1	Chapter No. 5, 5.7.8 in approved Training Manual	Refer Annexure : E – 1 a, b, c	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

158.	Examination papers shall be set, invigilated and checked by competent examiners designated by the Chief Instructor. Examinations shall be held at the end of each semester.	8.2	Chapter No. 5, 5.7.12.7 in approved Training Manual	Refer Annexure : E – 2 a, b	
159.	The examination papers shall be combination of quiz-type and essay-type questions.	8.3	Chapter No. 5, 5.7.12.3 in approved Training Manual	Refer Annexure : E – 2 a, b	
160.	Candidates who are successful in the semester examination shall be issued with a mark sheet by the institute giving details of the marks obtained in each subject. After successful completion of the course and verification of completion of specified aircraft maintenance tasks to be performed during the OJT, the institute shall award a serially numbered certificate, the format of which will be approved by DGCA. The record of certificate and students detail shall be maintained by the training institutes. Course completion certificate issued to the trainee should indicate the type of aircraft and powerplant or the aircraft system on which the maintenance experience was gained during the OJT.	8.4	Chapter No. 5, 5.7.15.1 in approved Training Manual	Refer Annexure : E – 3 a,b,c	
161.	DGCA representatives may at their discretion associate with the examination to ensure that the standard of questions and fair examination practices are followed.	8.5	Chapter No. 5, 5.7.12.3 in approved Training Manual	Refer Annexure : E – 2 a, b	
162.	To be declared successful in the course, the candidates must obtain a minimum 70% in each paper of semester examinations conducted by the institute.	8.6	Chapter No. 5, 5.7.14.1 in approved Training Manual	Refer Annexure : E – 4 a, b	
163.	Candidates may be promoted to the next semester after completion of previous semester(s). Candidates who are not successful in passing some subjects of a semester may be re-examined for those subject(s) until they pass the complete semester. For such students the application must be forwarded for DGCA AME licence examination only after he has successfully passed the required semester examinations.	8.7	Chapter No. 5, 5.7.14.1 in approved Training Manual	Refer Annexure : E – 5 a, b, c,d	
164.	The syllabus for various semesters of the Basic licence course shall be drafted to cover various modules of DGCA licensing system as given in Appendix V.	8.8	Chapter No.6 , Appendix 1 Semester wise syllabus in approved Training Manual	Refer Annexure : B	
165.	AME licence examination conducted by DGCA	9			
166.	AME licence examinations are conducted by DGCA three times in a calendar year i.e., in the months of February, June and October. The eligibility criteria for appearing in DGCA AME licence examinations shall be as given below (i) The students who have completed one year of approved training curriculum and successfully passed 1st and 2nd semester of the	9.1	Chapter No. 5, 5.7.16 in approved Training Manual	Refer Annexure : E – 5 a, b, c,d & (Already attached para 8.7)	

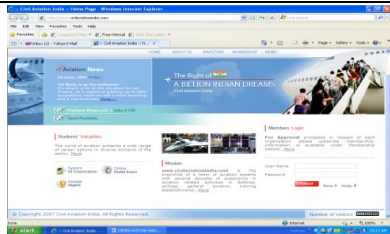
INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	<p>institute examination shall be allowed to appear in Paper I (Air Law, Airworthiness Requirements & Human Performance) or equivalent modules of AME/basic license examination.</p> <p>(ii) The students who have completed two years of approved training curriculum and successfully passed 3rd and 4th semester of the institute examination shall be allowed to appear in Paper II (Aircraft Engineering) or equivalent modules of AME/basic license examination.</p> <p>(iii) The students who have completed two and a half years of the approved training curriculum and successfully passed 5th semester of the institute examination will be allowed to appear in Paper III or equivalent modules of AME/ basic license examination. A student will be allowed to appear for a maximum of two categories or equivalent modules of AME/ basic license examination in a session.</p> <p>(iv) The students may appear in the remaining categories of relevant stream after successfully undergoing OJT.</p>		<p>Chapter No. 5, 5.7.16 in approved Training Manual</p> <p>Still to appear</p>	<p>Refer Annexure : F-1a, b, c & d</p> <p>Still to appear</p>	
167.	Training Records	10			
168.	<p>Student Record</p> <p>The Chief Instructor shall ensure that a file is maintained for each student, wherein the following records shall be preserved on permanent basis:</p> <p>(a) The name and address and photograph of the student.</p> <p>(b) The batch and the stream in which the student is admitted.</p> <p>(c) The commencement and conclusion dates of the course.</p> <p>(d) Copies of certificates of the education qualifications – and medical record.</p> <p>(e) Attendance records of students.</p> <p>(f) Record of all practical tests/skill tests.</p> <p>(g) Computer number of the students allotted by CEO.</p> <p>(h) Semester wise performance and examination records.</p> <p>(i) A photocopy of the identity card issued to the students by the institute.</p> <p>(j) The duration and details of experience and OJT since induction.</p> <p>(k) A copy of final certificate issued by the institute</p> <p>(l) The security clearance of the student, if applicable.</p>	10.1	Chapter No. 5, 5.7.18.1(a-1) in approved Training Manual	Refer Annexure : G-1	
169.	<p>Institute Records</p> <p>The following records shall be maintained for a period of five years after the completion of course.</p> <p>(a) The records of the employment of the instructor subject wise.</p>	10.2			
			Chapter No. 5, 5.7.18.2 9(a-f) in approved Training Manual	Refer Annexure G-2 (i)	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	(b) Question papers and answer sheets of each student semester wise.		Chapter No. 5, 5.7.18.2 9(a-f) in approved Training Manual	Refer Annexure G-2 (ii to xiii)	
	(c) List of the computer numbers allotted to the students by CEO batch wise.		Chapter No. 5, 5.7.18.2 9(a-f) in approved Training Manual	Refer Annexure G-2 (xiv)	
	(d) List of DGCA approved organizations having tie up with the institute to provide OJT.		MOU attached	Refer Annexure : A-14(a) Dated 04.10.2007 A-14(b) Dated 23.12.2009 A-14(c) Dated 04.01.2010 A-14(d) Dated 11.05.2012 A-14(e) Dated 15.05.2012 A-14(e) Dated 15.05.2012	
	(e) List of organizations having tie up with the institute to provide some elements of practical training as permitted by CAR.		MOU attached	Refer Annexure : A-14(a) Dated 04.10.2007 A-14(b) Dated 23.12.2009 A-14(c) Dated 04.01.2010 A-14(d) Dated 11.05.2012 A-14(e) Dated 15.05.2012 A-14(e) Dated 15.05.2012	
	(f) Paper-wise performance of the students in DGCA licence examination.		Chapter No. 5, 5.7.18.2 9(a-f) in approved Training Manual	Refer Annexure : F-1 (a,b,c,d)	
170.	GRANT OF APPROVAL	11.			
171.	Upon satisfactory compliance with the requirements given in this CAR and any other instructions issued by DGCA from time to time, a Certificate of Approval is issued to the institute. Normally the validity of approval granted to the institute will be for one calendar year. The certificate should be displayed at prominent place and a copy kept in the training manual.	11.1	Chapter 2, 2.6 in approved Training Manual	Refer Annexure : H -1	
172.	The approval granted to an institute shall be deemed to be suspended if, at any time, it is found that the institute does not meet the requirements stipulated in this CAR. In such case, the institute should immediately intimate the local airworthiness office and submit an action plan to ensure compliance with the requirements. In such case the total period/duration of the course will be extended by the period the approval remain suspended.	11.2	The withdrawal of approval granted to Institution can be actioned with a suitable notice stating the reasons for withdrawal of the scope of approval if deemed to be appropriate for the action.	No evidence can be submitted at this stage	
173.	The certificate shall be surrendered when the institute is no longer approved.	11.3	The certificate of approval will be returned if the suspension of the approval is justified at both the ends,	No evidence can be submitted at this stage	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

174.	Reserved	11.4			
175.	<p>The institute shall have a dedicated website in which it will publish information about the scope of DGCA approval, admission policy, infrastructure available, chargeable fees, course duration, OJT and various other terms and conditions. The website shall be kept updated to provide correct information to the student at all times.</p> <p>Note: Approval granted by DGCA to conduct the training programme does not absolve the institute from complying with other regulatory requirements separately and possess requisite licence / approvals.</p>	11.5	 <p>Refer website: www.civilaviationindia.com</p>	Refer annexure : H-2	
176.	CONTINUANCE OF APPROVAL	12.			
177.	Facilities, human resources, training and examination standards shall be maintained at standards not lower than those originally approved.	12.1	The organization will maintain all the stipulated rules, regulations and policies which are governed under the CAR will be maintained on the high standards for which the scope of approval granted.		
178.	The institute shall carry out an internal audit of their facilities with respect to this CAR, approved training and procedure manual, take appropriate corrective and preventive action and submit a report to local airworthiness office at least two months before the expiry of the approval. The local airworthiness office shall also conduct an inspection of the facilities of the institute to ensure compliance with this CAR before effecting renewal of the approval.	12.2	Chapter 6, Appendix 'xv' in approved training manual	Refer annexure : I-1	
179.	Prior written permission shall be obtained from the Director General of Civil Aviation in respect of any material changes in the organisation	12.3	Till date there are no such changes effected for seeking permission from the DGCA in the organization setup.		
180.	Facilities shall be offered to the representatives of DGCA to inspect the institute or attend any course for the purpose of monitoring the standard of training. A minimum of two months prior information shall be given to the Director General of Civil Aviation whenever new courses are started or existing approved courses are modified. DGCA may require any amendment to the content or duration of course.	12.4	At all times facilities are extended to DGCA and representatives for inspection within stipulated period as per the DGCA norms.	Refer annexure : I-2	
181.	The institutes which consistently show results less than the national average in terms of number of candidates passing in the DGCA licence examination, in consecutive three sessions, shall not be allowed to intake fresh batches of students until the percentage of their candidates passing the DGCA licence examination improves.	12.5	The marginal standards have been lay down for affecting the result of DGCA Examination to their standards for effective pass percentage in DGCA Examination.		

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	The results of such training schools shall be made public and placed on DGCA.				
182.	The aircraft maintenance related tasks and practical exercises are performed in a safe manner, following the manufacturer's recommendation and in its absence by adopting standard practices.	12.6	All the tasks and practical exercise are performed in accordance with the procedures lay down in the maintenance manual for adopting higher standard of practices		
183.	The training programme is conducted in accordance with the Aircraft Rules, 1937, this CAR and in a manner approved by the DGCA.	12.7	The training schedule programs are conducted in accordance with the Aircraft Rules 1937, as per the CAR guidance		

AS PER CAR SECTION II, SERIES 'E' PART VIII REVISION- 3

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

APPENDIX 'I'

FORM CA-182 (Training institutes)
OFFICE OF THE DIRECTOR GENERAL OF CIVIL AVIATION TECHNICAL CENTRE,
OPPOSITE SAFDARJUNG AIRPORT, NEW DELHI
(Application for approval of training institute)

- 1 Name and Address of the Institute :
 - 2 Category(s) for which Approval is required : "G" :
 - 3 Brief Details of the nature of training for which approval is sought :
 - 4 Location of the institute :
 - 5 Number of employees (inclusive of instructors and inspection staff) :
 - 6 Name and qualifications of Chief Instructor and instructors :
 - 7 List of Inspection equipment (including special equipment available) :
 - 8 Existing DGCA authority, if any :
 - 9 Para-wise compliance report signed by accountable Manager :
 10. Whether a Training Manual of the institute is attached: (write Yes or No):
 11. Details of Fees remitted
- Date:
(Signature of the applicant)

Note: Extra sheets may be attached to furnish additional information, if any.

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

APPENDIX – ‘II’

PRACTICAL MAINTANCE SKILLS: AIRFRAME---FACILITIES, TOOLS AND EQUIPMENT

This appendix provides guidance for the kind of facilities, tools and equipment that are likely to be needed to meet the Training Objective of Para 4.6 and 4.7

Note: Items denoted by ‘*’ are not applicable for institutes approved to impart training in Avionics Stream.

	METALWORK AND SHEET METAL WORK WITH HAND TOOLS	1		
	For basic skills training, the training workshop should be equipped with sturdy benches mounted with vices at approximately 2-m intervals, one vice per student. Other items required include: a) Powered grinding wheel for tool sharpening b) Powered drilling machine c) Large surface table for precision marking–off d) Compressor air supply suitable for use with pneumatic hand tools e) Powered hacksaw for cutting stock material f) Sheet metal guillotine g) Chalkboard / whiteboard for workshop instruction and work schedule	1.1	Annexure : II - XII Pic No. 50- 222 (Airframe & Engine Lab)	
	For airframe/helicopter skills training, the facility should ideally include the following: a) A complete pressurized aircraft of all-metal construction with retractable landing gear, complete with engines in running order, and suitable for practicing repair and inspection duties b)* Hydraulic lifting jacks, fuselage cradles, lifting slings, cables and steering bars, dihedral and incidence boards, and work and tools suitable for aircraft types provided c) Desk for manuals and notices d) Display board for inspection worksheets e) Ground electrical power trolley f) Apron–type fire extinguisher trolley g) Hangar access equipment such as benches, trestles, ladders, chocks. h)* Mobile lifting equipment, i.e. small crane or overhead gantry i)* Spray guns for aircraft paint and dope j)* Oil and fuel replenishing facility k)* Reserved l)* Mobile hydraulic power source m)* Retraction jacks n) Reserved	1.2	Annexure : II - XII Pic No. 50- 222 (Airframe & Engine Lab)	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	<p>o) Reserved p) Reserved q) Reserved r) Reserved s) Reserved t) Seat and safety equipment</p>			
	<p>Personal tool kit. Students should have their own tools and a toolbox. This may be issued on a shop basis, i.e. a kit issued in the basic metalwork shop and be retained by the shop when the students' progress to the next phase, or students may be issued, and retain on a permanent basis, a personal basic kit which is their own property until completion of their training. The following items are suggested for basic metalwork.</p> <p>a) Measuring and marking-off tools - 30-cm steel rule graduated in fractions of inches and millimeters - Outside and inside calipers - Try square - Set of feeler gauges - 15-cm dividers - Scriber</p> <p>b) Fitter's tools - Round-nose and side-cutter pliers - 15-cm long screwdriver - Hacksaw - Selection of files of different sections, lengths and cuts - Hand drill and a set of small diameter drills - Set of centre and pin punches - Ball-pen and cross pane hammers - 20-cm flat chisel and a set of small chisels (including flat , cross cut and round nose) - plastic or hide- faced hammer sheet metal snips - various sizes and types of screw drivers - set of double – ended , open ended and ring spanners of appropriate range in sizes and appropriate type (American, BSF, Unified , or Metric) to suit available airframes - set of sockets wrenches with handles and accessories to suit available airframes</p>	1.3	Annexure : I – II Pic No. 17- 47 (Workshop Lab)	
	METALWORK WITH MACHINE TOOLS	2		
	Workshop equipment: It is not important for AMEs to acquire a high degree of skill as machine tool craftsman. A small machine shop can be incorporated in the basic metal workshop or can be housed separately, according to the premises available. It is suggested that machine tools provided should generally be the simple, robust types suitable for training	2.1	Annexure : I – II Pic No. 17- 47 (Workshop Lab)	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	<p>and might include the following.</p> <ul style="list-style-type: none"> a) Drill machines b)* Surface grinding machine# c)* Buffing machine # Facility may be contracted 		<p>Annexure A-14 MOU</p>	
	<p>Trainees will not normally need any specific personal tool kit. Other items may be included to suit local needs.</p>	<p>2.2</p>		
	<p>AIRFRAME/HELICOPTER FAMILIARISATION FACILITY Facilities for developing aircraft maintenance skill is determined according to the requirements of the technicians undergoing training. In general, it is desirable that the AME students should have the opportunity to remove and replace major components and perform standard aircraft maintenance practices. Practice in inspection functions during simulated repair or maintenance activities is considered an important training element in this phase. The requirements for the training of AME on aircraft system are as follows:</p> <ul style="list-style-type: none"> a) Ideally, a complete aircraft of all metal construction with retractable landing gear, complete with engine in running order. b) Alternately an all metal fuselage, wings and control surfaces of stressed skin type suitable for practicing repairs and inspection duties. c) Hydraulic lifting jacks, trestles, fuselage cradles, lifting slings, cables and steering bars, dihedral and incidence boards and tools suitable for aircraft types provided. d) Desks for manuals and notices. e) Display boards for inspection worksheets. f) Ground electrical power trolley. g) Fire extinguisher trolley. h) Hangar access equipment such as benches, trestles, ladders, chocks etc. i) Mobile lifting equipment i.e., small crane or overhaul gantry. j) Spray gun for aircraft paint and dope. k) Oil and fuel replenishing facility l) Reserved m) Mobile hydraulic pressure source n) <input type="checkbox"/> Test boards designed to represent sections of typical aircraft cables, air and fluid systems. These should be complete with rigging instructions so that student's errors are known upon completion of training. o) Manufacturer's recommended tools or locally fabricated tools to perform the defined maintenance tasks <p><input type="checkbox"/> Not applicable for Institutes having serviceable aircraft complete in all respect.</p>	<p>3*</p>	<p>Annexure A-14 MOU</p>	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	SPECIALIST ACTIVITIES: WOOD AND FABRIC, WELDING, AND COMPOSITES	4*		
	Introduction Equipment in the training areas for these specialist activities depends on the training requirements	4.1		
	Wood work and fabric workshop Reserved	4.2		
	# WELDING	4.3		
	The purpose of a short course on welding is to impart enough knowledge of welding techniques to enable students to assess the airworthiness of welded joints and structures. It is not intended to produce skilled welders. The welding shop must be chosen and equipped to comply with the safety regulations for oxyacetylene and other types of welding. Metal-screened working bays with metal work benches should be built according to the number of work stations required	4.3.1	Annexure A-14 MOU	
	Welding equipment might include the following a) Set of oxyacetylene welding equipment b) Electric or arc welder c) Electric TIG or MIG welder d) Eye face shield, goggles, leather gloves and aprons e) Electrodes, welding rods and welding fluxes f) Electric resistance welder for spot welding (may be stored in sheet metal shop)	4.3.2	Annexure A-14 MOU	
	# Fibreglass and reinforced plastic workshop	5.4*		
	Many aircraft are fitted with secondary structures constructed from fibre or glass materials. (Indeed, some aircraft even have their primary structure made of fibre or glass material). From the training point of view, only secondary structure should be of concern.	5.4.1	Annexure A-14 MOU	
	As far as space, a dust free, humidity controlled atmosphere, lighting and doors are concerned the workshop should follow the general pattern of the fabric shop. Fire proof storage facilities for highly inflammable and corrosive resins and activators are also required. The correct type of extinguishers must be available. The following tools should be provided for the fibreglass and reinforced plastic workshop a) Laying up tables b) Brushes and spatulas c) Scissors and cutters d) Sanders e) Measuring Cup f) Heat lamp g) Pots and trays # Facilities may be owned or arranged on contract.	5.4.2	Annexure A-14 MOU	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

APPENDIX – ‘III’

PRACTICAL MAINTENANCE SKILLS: ENGINE AND PROPELLER – FACILITIES, TOOLS AND EQUIPMENT

	<p>INTRODUCTION This appendix provides guidance for the kind of facilities Tools and equipment that are likely to be needed to meet the Training Objectives of Para 4.8.</p>	1		
	<p>For engine skill training, the facility should ideally have the following:</p> <ul style="list-style-type: none"> a) Sectioned / Dismantled engines (piston or turbine), according to the scope of approval b) Reserved c) Mobile lifting gantry for hoisting engines and heavy equipment. d) Engine slings and work stands e) Manufacturer’s recommended tools or locally fabricated tools to perform the defined maintenance tasks. f) Reserved g) Reserved h) Reserved i) Propeller manufacturer’s recommended tools or locally fabricated tools to perform the defined maintenance tasks j) Example of contemporary propeller controllers. k) Example of various types of magnetos. l) Example of various high-energy and other types of gas turbine igniter. m) Example of various types of carburetor and petrol Injection equipment n) Example of turbocharger. 	2	Not Applicable	
	<p>ENGINE FAMILIARIZATION FACILITY</p>	3		
	<p>In general it is desirable that students should have the opportunity to remove and replace major components. Practise in inspection functions during simulated repair or maintenance activities is considered an important training element in this phase. The facility to develop maintenance skill of students on engines shall have the following items</p> <ul style="list-style-type: none"> a) A complete piston engine and a turbine engine. b) Reserved c) Mobile lifting equipment (i.e., a small crane or over-head gantry lifting slings) and tools suitable for engine types provided. d) Desk for manuals and notices. e) Display board for inspection work sheets. f) Access and storage equipment such as benches, trestles, shelves, etc. g) Oil and fuel replenishing facility h) Test board designed to represent sections of typical aircraft/engine cable, air and fluid system. These should be complete with rigging instructions so that student errors are detected immediately*. <p>*Not applicable for Institutes having serviceable aircraft complete in all respect and engine with indication system in operating condition.</p>	3.1	Not Applicable	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

APPENDIX – ‘IV’

PRACTICAL MAINTENANCE SKILLS: AVIONICS — ELECTRICAL, INSTRUMENTS, AUTOFLIGHT AND RADIO – FACILITIES, TOOLS AND EQUIPMENT

	<p>Introduction General Facilities for all avionics training school are as given in Appendix-II. In addition specific facilities are required relevant to Avionics stream. This appendix provides guidance for the kind of facilities, tools and equipment that are needed to meet the training objectives for institutes seeking approval in Avionics stream.</p>	1		
	<p>Aircraft with necessary systems in a functional condition as required in paragraph 4.6.7 and to perform the exercises listed from 4.10.1 to 4.13.6</p>	1.1		
	<p>Avionics Facility: Electrical</p>	2		
	<p>Shop equipment: - The electrical shop should be equipped with demonstration mock ups representing typical aircraft circuits. If made realistically, these can be of value for practicing adjustments and troubleshooting as well as for demonstration safety precautions with fire warnings and extinguishing provisions. Benches should be smooth topped and have sufficient vices and power points (for soldering irons) to suit the class size planned. The following equipment items should also be available: a) Reserved b) Reserved c) Battery charging plant, preferably housed in a separate, well ventilated charging room. For lead acid batteries, the charging plant should be of the series type suitable for charging several batteries at different rates Note- For charging lead acid and nickel cadmium batteries, a separate and totally isolated charging rooms and equipment will be required for each type. For nickel cadmium batteries, a constant current charger and battery analyzer must be specified</p>	2.1	<p>Annexure : XIX - XXIII Pic No. 427 – 461, 4 to 16 (Electrical Lab)</p>	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	<p>Personal tool kit Students should have their own tools and tool box. This may be issued on a shop basis i.e., a kit in the electrical shop may contain only tools required for training in this shop and be retained by the shop when the students progress to the next phase, or students may be issued, and retain on permanent basis, a personal basic kit which is their own property until the completion of their training.. The following items are required for basic electrical work:</p> <p>a) One electric 5-mm point temperature controlled soldering iron (soldering copper) b) One wire stripper for removing insulation c) A selection of small screw drivers (including a Phillips) d) One adjustable hook wrench (18 to 50 mm) e) One set of Allen Keys</p>	2.2	Annexure : XIX - XXIII Pic No. 427 – 461, 4 to 16 (Electrical Lab)	
	<p>The following types of components should be available and used as appropriate according to the potential need of the trainees:</p> <p>a) Lengths of the aircraft cabling with typical plugs , sockets , bulk head sealing bungs, grommets etc., for practicing wire work and making up looms b) A selection of switches, fuses, thermal circuit breakers, wire connecting devices, junction boxes and other electrical system elements c) Specimens of airborne batteries (both lead acid and nickel cadmium): sectioned, serviceable and chargeable. d) DC generators and AC alternators e) Voltage regulators, and other types of current limiting devices (i e., vibrator types and variable resistance types) f) Various types of DC and AC motors, including engine starters, continuously rated motors, rotary and linear actuators. g) Static inverters and specimens of other types of current conversion devices, such as transformer current rectifier units (TRUs) h) Reserved i) Specimens of aircraft electrical heating devices, such as pitot heads, thermal de-icing shoes etc. j) Specimens of aircraft lighting appliances, such as cabin fluorescent lamps, landing lamps, navigation lights etc.</p>	2.3*	Annexure A-14 MOU	
	AVIONICS Facility : INSTRUMENT	3		
	The shop should be housed in a separate room with ventilation Benches should be topped with smooth hard wood or covered with a Formica top	3.1		
	The instrument shop should be equipped with demonstration mock-ups representing typical aircraft circuits. If made realistically, these can be of value for practicing adjustments and troubleshooting as well as for demonstration. Benches should be smooth topped and have	3.2	Annexure : XVI - XIX Pic No. 360 - 380 (Instrument Lab)	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	<p>sufficient vices and power points (for soldering irons) to suit the class size planned. The following major equipment items should also be available:</p> <ul style="list-style-type: none"> a) Reserved b) Reserved c) Mock-up air speed indicator (ASI) system for leak test practice d) Reserved e) Mock up for compass swinging practice (i.e. an old aircraft or a specially made trolley which can be used on an outdoor site selected as compass base f) Megger for insulation testing of electrical items. 			
	<p>The personal basic tool kits of students should be supplemented by the following items</p> <ul style="list-style-type: none"> a) One set of watch makers screw drivers b) One set of miniature spanners c) One set of Allen keys (appropriate sized) d) One set of Bristol spline keys e) One electric temperature controlled soldering iron with fine point (similar to that issued in electrical shop) 	3.3	<p>Annexure : XVI - XIX Pic No. 360 - 380 (Instrument Lab)</p>	
	<p>The following types of components should be available and used as appropriate according to the potential need of the trainees:</p> <ul style="list-style-type: none"> a) Boost or manifold pressure gauge b) Hydraulic pressure gauge c) Engine oil pressure gauge (Bourdon tube type) d) Engine oil pressure gauge (electrical type) e) ASI f) Pitot static head g) Altimeter h) Rate of climb indicator i) Turn and slip indicator j) Directional gyroscope k) Artificial horizon l) Engine speed indicator (DC and AC types) m) Oil thermometer (physical and electrical type) n) Cylinder head and jet pipe thermocouple o) Fuel content gauge (float operated and capacitance type) p) Magnetic compass q) Simple type Autopilot r) Instrument systems with electronic amplifiers (e.g. Capacitance type fuel content gauges, cabin temperature controllers, and auto pilot) s) Specimens of various types of airborne electrical instruments, including instruments embodying principles of the voltmeter, ammeter, ohmmeter, Wheatstone bridge, thermocouple, ratio meter, servos and synchros etc. 	3.4*	<p>Annexure : XVI - XIX Pic No. 360 - 380 (Instrument Lab)</p>	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	AVIONICS Facility:, NAVIGATION AND RADIO	4		
	The shop should be housed in a separate room with necessary ventilation. Benches should be topped with smooth hard wood or covered with a Formica top.	4.1		
	The following test equipment items should also be available: a) Variable stabilized power supply unit b) Signal generator c) Reserved d) Signal generator (UHF/VHF) e) Audio frequency oscillators f) Reserved g) Cathode ray oscilloscope h) Frequency meters i) Moving coil, volt-ohm-milliammeter and multi meters j) Variac k) Reserved l) IC/Microprocessors m) Digital voltmeter/ ohmmeter/ammeter n) Logic probe o) RLC bridge p) Voltage standing wave meters q) Reserved	4.2	Annexure : XII - XVI Pic No. 223- 342 (Radio Lab)	
	The facility should be equipped with demonstration mock-ups representing typical aircraft circuits. The following equipment may be of value for practicing adjustments and troubleshooting as well as for demonstration. a) High frequency transmitter receiver (HF) b) Very High frequency transmitter receiver (VHF) c) Automatic direction finder system d) Very High frequency omnidirectional radio range / instrument landing system (VOR/ILS) system (including glide scope and marker receivers) e) Distance measuring equipment system f) Air traffic control transponder system (including altitude reporting mode) g) Radio altimeter h) Weather radar i) Reserved j) Navigation indicators capable of presenting combined navigation information, typically a radio magnetic indicator (RMI) and horizontal situation indicator (HSI) wired for both compass and various radio navigation inputs. k) Reserved	4.3*	Annexure : XII - XVI Pic No. 223- 342 (Radio Lab)	

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

	Note: * (2.3, 3.4 & 4.3) Separate units are not required if the institute is having corresponding serviceable aircraft system and necessary test equipment to carry out operational check of the system on ground. Facilities for transmitting radio frequencies may be outsourced			
	Necessary power supply for operating the aircraft component and replica of aircraft system meant for familiarisation, demonstration, and performing functional check as part of the practical training.	4.4	Annexure : XII - XVI Pic No. 223- 342 (Radio Lab)	
	The personal basic tool kits of students should be same as specified for instrument facility but may be supplemented to suit local needs.	4.5	Annexure : XII - XVI Pic No. 223- 342 (Radio Lab)	
	Reserved	4.6		

INDIAN INSTITUTE OF AEROSPACE TECHNOLOGY AND MANAGEMENT

APPENDIX – ‘V’

Applied on the Job practical training: Experience (OJT)

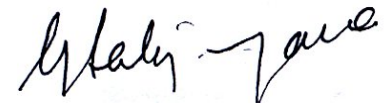
<p>Introduction: Experience of this course takes the form of a series of supervised abilities by applying the knowledge, skill and attitude learned so far. The exercises should consist of simulated (or real , if fully supervised) maintenance tasks based on actual sample maintenance programme extracts as well as on compliance with regulations , approved maintenance organisation (AMO) procedures and amendments. This phase of the training can be on the job at an AMO, in such case the details of maintenance tasks to be performed by the trainee shall be provided to the contracted maintenance organisation by the training institute. Instead it can be given at the organisation where the trainees can receive the required practical training under the guidance and supervision of an Aircraft Maintenance Engineer (AME) instructor. In the later case, however it will expedite the trainee’s training if, in addition to “real” maintenance exercises, hypothetical situations are set up as practical exercises when time allows</p>	1	The OJT held at approved Organizations only as per the requirements	
<p>The simulated or assumed operating conditions for each exercise must be clearly specified by the instructor. The exercises should be made as realistic as possible. Past maintenance records etc. can be used (e.g. case studies) and answers arrived at by the trainees should be compared to what actually took place. A group discussion after each exercise will be beneficial in eliminating possible misconceptions</p>	2	The training imparted has been accorded and recorded in their respective logbooks as per the schedule orientation programme	
<p>The OJT should be divided into Line and Base modules</p>	3		
<p>TRAINING OBJECTIVES Conditions: The trainee will be provided with appropriate hangar and facilities; tools (both hand and machine); materials; an aircraft or components as applicable; aircraft maintenance manuals; AMO tasks or job cards and procedure documents. Performance : The trainee will practice removal , replacement , dismantling, inspection , decision making regarding repair or replacement, re assembly and function testing of fault finding equipment , using both engineering drawings as well as manufacturers’ maintenance , and tests(real or simulated)</p>	4	The training conducted in the approved organizations as per the schedules	

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	<p>Standard of accomplishment: During this experience phase of training, the standard is a function of the variety of exercises completed and the time spent in work shop training. The trainee / students may work individually or in team on the exercises so that they have “ownership “of the standard. If necessary, they should practice and repeat increasingly complex exercises to develop greater skills within their respective area of competence. Finally, they should function test on the aircraft</p>			
	<p>APPLIED PRACTICAL LINE MAINTENANCE OPERATION: AIRFRAME/ENGINE / AVIONICS The required materials and publications include the following: a) Extract from the approved maintenance programme b) Appropriate aircraft, engine or part there of c) Aircraft maintenance manual (AMM) d) Operators’ minimum equipment list (MEL) e) Operators maintenance control manual f) AMO tasks or job cards g) Operator’s technical log h) Associated technical tools or test equipment Operating conditions defined by the instructor should include not to be limited to the following: a) Simulated aircraft departure time b) Simulated aircraft maintenance state and age c) Availability of spare parts d) Availability of role play flight crew for questioning e) Statement if a defect is found, trainee must make decision to repair, replace or defer f) Recording of work in accordance with AMO and operator manuals and with DGCA regulations g) Simulated conditions of the maintenance facility Exercises should be designed to give trainees practices in the following a) Manual and diagnostic skills b) Compilation of necessary additional work or job cards c) Understanding of flight crew entries in the technical logs d) Verbal briefing and de-briefing of flight crew e) Correct use of manuals such as the AMM or MEL f) Making of accurate and complete entries in the technical logs, work or job cards.</p>	5	The training is imparted in AMOs as per the norms of DGCA	
	<p>APPLIED PRACTICAL BASE MAINTENANCE OPERATION: AIRFRAME/ ENGINE / AVIONICS Operating conditions defined by the instructor should include but not be limited to the following: a) Simulated stage of aircraft check completion b) Simulated aircraft maintenance state and age</p>	6	The stipulated programme will be conducted on OJT in the DGCA Approved Organizations	

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<p>c) Availability of spare parts and materials d) Availability of role play maintenance personnel for questioning e) Statement if a defect is found, trainee must make decision to repair, replace or defer f) Recording of work in accordance with AMO and operator manuals and with DGCA regulations g) Simulated conditions of the maintenance facility</p> <p>Exercises should be designed to give trainees practices in the following</p> <p>a) Manual and inspection skills covering representative cross section of maintenance tasks on aircraft b) Assessment of damage, corrosion etc. c) Determination of appropriate repair /rectification action d) Compilation of necessary additional work or job cards e) Verbal briefing and de briefing of maintenance personnel f) Correct use of manuals such as AMM or structural repair manuals (SRM) g) Making of accurate and complete entries in the work or job cards</p>			
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