

CONTACT DETAILS OF THE BODY SUBMITTING THE QUALIFICATION FILE

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Groundcrew Examining Board (GEB)
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List of documents submitted in support of the Qualifications File

1. Curriculum and training contents for Joint Basic Phase Training (JBPT) (Annexure-I)
2. Curriculum and training contents for Trade Phase Training Term – I (Annexure-II)
3. Curriculum and training contents for Trade Phase Training Term – II (Annexure-III)
4. Curriculum and training contents for Trade Phase Training Term – III (Annexure-IV)
5. Curriculum and training contents for Trade Phase Training Term – IV (Annexure-V)
6. Air Force Order (AFO) 57/15 specifying the role of Workshop Fitter (Machinist) (Annexure-VI)

SUMMARY

1. Qualification Title	AC/LAC : Work Shop Fitter (Machinist)
2. Qualification Code	IAF/WKS(M)/210
3. NCO Code and Occupation	3115.9900 Mechanical Engineering Technician; 3115.0103, Maintenance Technician Assistant Mechanical. 5414.011, Security Supervisor; 5411.9900, Fire fighter others;
4. Nature and purpose of the qualification	A trade and rank certificate to the personnel with adequate knowledge and skill to perform the duties of Aircraftsman/Leading Aircraftsman in the Station Workshop/ General Engineering Section.
5. Body/bodies which will award the qualification	Workshop Training Institute (WTI) and Regional Examining Board (Training) REB (T)
6. Body which will accredit providers to offer courses leading to the qualification	Directorate of Training (D Trg), Air HQ
7. Whether accreditation/affiliation norms are already in place or not (if yes, attach a copy)	N/A as specific to Defence Forces
8. Occupation(s) to which the qualification gives access	Aircraftsman /Leading Aircraftsman of Work shop Fitter (Machinist)
9. Job Description of the Occupation	Undertakes minor repair, servicing and maintenance on various types of Lathe, Jig Boring, CNC Lathe, Drilling machine. Carries out major repair & replacement on aero engine components aero engine components/ Ground equipments and MT vehicles by operating Lathe. Details placed at Annexure- VI
10. Licensing requirements	N/A
11. Statutory and regulatory requirements of the relevant sector (documentary evidence to be provided)	Air Force Act, Air Force Regulations, Air Force Order,
12. Level of the qualification in the NSQF	4
13. Anticipated volume of	4140 Hours comprising of

training/learning required to complete the qualification	(a) 1050 Hours of JBPT (b) 2640 Hours of following four terms (i) TPT Term - I : 660 hours (ii) TPT Term - II : 660 hours (iii) TPT Term - III : 660 hours (iv) TPT Term - IV : 660 hours (c) On Job Training (OJT) of 450 Hours at field unit
14. Indicative list of training tools required to deliver this qualification	Classroom with modern audio visual aids. Charts with properties of common machine working raw materials. Charts with various sections of Indian Standard raw materials available. Instructional videos on basics of machining, machinability of materials and various machine tools. Workshop with conventional lathe, milling, jig boring machines and other equipment. Other associated machine tools like saw, planer, shaper, grinders etc. for imparting basic working, familiarisation to the ab-initio trainees.
15. Entry requirements and/or recommendations	<p>Education Qualification: Passed Intermediate / 10+2 / equivalent examination in science stream / subjects approved by Central / State Education Boards with minimum 60% marks in aggregate and 50% marks in English. OR Passed two year vocational course affiliated / recognized by CBSE / State Education Boards/ Councils duly recognized at par with 10+2 by AIU with minimum 60% marks in aggregate, and 50% marks in English in Vocational Course or in Intermediate / Matriculation if English is not a subject in Vocational Course.</p> <p>Age : 17 Yrs -21 Yrs</p> <p>Prerequisite for TPT: Tradesmen should have successfully completed Joint Basic Phase Training</p>
16. Progression from the qualification	Job Progression AC→LAC→Cpl*→Sgt*→JWO*→WO→MWO *Subject to clearing promotion exam for Corporal (Cpl), Sergeant (Sgt) and Junior Warrant Officer (JWO) called as Corporal Promotion Exam (CPE), Sergeant Promotion Exam (SPE) and Junior Warrant Promotion Exam (JPE)
17. Planned arrangements for the Recognition of Prior learning (RPL)	N/A
18. International comparability where known	Not Known
19. Date of planned review of the qualification.	Every 5 yrs/earlier in case of change in training syllabus pattern.

20. Formal structure of the qualification			
Title of component and identification code.	Mandatory/Optional	Estimated size (learning hours)	Level
1. Workshop technology and Engineering Drawing IAF/WKS(M)/210/01	M	500	4
2. Lathe Machine, Capstan and Turret lathe Machine. IAF/WKS(M)/210/02	M	400	4
3. Boring, Jig Boring Machine, Broaching Machine, Press Form and Rubber Technology IAF/WKS(M)/210/03	M	500	4
4. Milling Machine and Reciprocating Machine IAF/WKS(M)/210/01/04	M	600	4
5. Machine tools maintenance IAF/WKS(M)/210/05	M	300	4
6. Drilling Machine IAF/WKS(M)/210/06	M	300	4
7. Carpentry IAF/WKS(M)/210/07	M	400	4
8. CNC Lathe Machine, CNC Milling, CAD/ CAM & CIM IAF/WKS(M)/210/08	M	400	4
9. Logistic procedure (IMMOLS) IAF/WKS(M)/210/09	M	440	4
10. Aerospace /Maintenance Safety IAF/WKS(M)/210/10	M	300	4
TOTAL	M	4140	

Syllabus of JBPT is Annexed as Annexure-I

SECTION 1
ASSESSMENT

21. Body/Bodies which will carry out assessment:

There are two bodies, which carry out the assessment:

1. Trade Phase Training (TPT) is completed through three/four terms respectively for Non Tech/Tech tradesmen. The formative and Summative Assessment during and at the end of the training is carried out by Unit Examining Board (UEB) of E&ITI respectively.
2. Regional Exam Board (Training) [REB (T)] is responsible for conducting the End Term Exam for gauging the knowledge acquired by the Personnel. The final certification and mustering into the trained trade is done by REB (T).

22. How will RPL assessment be managed and who will carry it out?

N/A.

23. Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, reliable and fair and show that these are in line with the requirements of the NSQF.

(a) Assessment is carried out by both UEB and independent REB (T). Both the boards have all necessary infrastructure and pool of qualified Instructors, Examiners and Assessors to carry out detailed assessments. REB (T) uses all the modern trends like Online Testing and Evaluation System (OTES) for conducting the exams, evaluation and in-depth analysis of the result. The exams are conducted in the following manner:

- (i). Written Exams are conducted by both boards for the theory part of curriculum consisting of questions divided into three categories (factual, comprehension, application) for testing the knowledge of Air Warrior in his trade:
 - (aa) Objective: MCQ, T&F, Fill in the blanks
 - (ab) Subjective :VSA, SA, LA
- (ii). Practical Exam to test the :
 - (aa) Professional Skill
 - (ab) Core Skill of the Personnel
- (iii). Viva Voce to gauge the overall knowledge, and its application in resolving an issue.

ASSESSMENT EVIDENCE

Complete a grid for each component as listed in “Formal structure of the qualification” in the Summary.

NOTE: This grid can be replaced by any part of the qualification documentation which shows the same information – ie Learning Outcomes to be assessed, assessment criteria and the means of assessment.

24. Assessment Evidences

Title of Component:

Outcomes to be assessed	Assessment criteria for the outcome
1. Knowledge of Workshop technology and Engineering Drawing	Elementary Knowledge and ability of Air warrior to know the following: (a) Identification & nomenclature of common tools as per engineering terms and machines used at workshop. (b) Care maintenance and servicing schedule of different ground equipment. (c) To know about the identification, classification, properties and strength of metals and its alloys.
2. Knowledge of Lathe Machine, Capstan and Turret lathe Machine.	Air warrior must be able to tell about the following: (a) Various Lathe operations such as Plain Turning, Facing, Drilling, Boring, Taper turning, Thread cutting-external and internal, Eccentric turning. (b) Types of taper turning, various types of threads and their uses. (c) Main parts and classification of capstan and turret lathe machines. (d) Different types of operations carried out on capstan and turret lathe machines.
3. Knowledge of Boring, Jig Boring Machine, Broaching Machine, Press Form and Rubber Technology	(a) Individual should know the Construction, Classification, Operation, uses test for truth and simple adjustment of automatic Boring, Jig Boring Machine, Broaching Machine (b) Should know the process of making dies. (c) Should know various types of rubber technology.
4. Knowledge of Milling Machine and Reciprocating Machine	Air warrior is tested for his knowledge by conducting a practical exam on the following: (a) The assembly, adjustment, testing, operation and servicing procedure of Milling Machine. (b) Classification and selection of milling cutters. (c) Various types of attachments used on Milling Machine
5. Machine tools maintenance	Should know the servicing schedule of Machines. Perform Serviceable stat as pe servicing schedule of Machine.
6. Knowledge of Drilling Machine	Air warrior must be able to tell about the following: (a) Main parts and classification of Drilling Machine. (b) Various operations carried out on drilling Machine.

7. Carpentry	(a) Should know about the various types of woods, seasoning of wood and various types of joint in carpentry.
8. CNC Lathe Machine, CNC Milling, CAD/ CAM & CIM	Construction, operation, classification, uses, tests for truth and simple adjustment of CNC machines. Method of setting tools and machines for mass production, calculations, methods of setting up work for machining, Milling cutter grinding clearances. Properties and uses of lubricants used on CNC machines.
9. Logistic procedure(IMMOLS)	To be aware about the procedure of demand/issue/returns of material through IMMOLS , searching of material from Global Index Gallery (GIG)
10. Aerospace /Maintenance Safety	To be aware of the actions to be taken to ensure flight safety and maintenance safety in workshop.

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Means of assessment 1

There are two types of Assessments viz. Formative and Summative.

- (a) The Formative Assessment is carried out continuously during the conduct of course Exam & is conducted by UEB.
- (b) Summative Assessment is carried out at the end of the course. **Exam is conducted by REB (T)**

Details are mentioned under 'Means of Assessment-2'. Written test, Practical examination/ Skill test & Viva voce.

Means of assessment 2

1. Means of Formative Assessment (Total marks allotted- 250) conducted by UEB

- (a) Assignments for each module of Theory component 100 Marks
- (b) Assignments for each module of Trade Skills component 25 Marks
- (c) Job practical 75 Marks
- (d) Viva-voce 50 marks

2. Means of Summative Assessment (Total marks allotted- 250) conducted by REB (T)

- (a) Written test for Theory component 100Marks
- (b) Written test for Trade Skills component 25 Marks
- (c) Job practical 75 Marks
- (d) Viva voce 50 Marks

Component wise distribution of marks is given in the Annexure-II.

Pass/Fail

The minimum qualifying standard is 50% marks in each part and 50% in aggregate of all parts of Course End Knowledge Test (CEKT) Exam conducted by REB (T). Those who score 70% in each part, directly mustered as Leading Aircraftsman (LAC).

Pass within two attempts.

SECTION 2**25. EVIDENCE OF LEVEL****OPTION A**

Title/Name of qualification/component: Aircraftsman/Leading Aircraftsman of Workshop Fitter (M)			Level: 4
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
Process	<ol style="list-style-type: none"> 1. Air Warrior carry out the duties as Workshop Fitter (M) in General Engineering Section at AF Base Repair Depot/ Station Workshop at Field Units. 2. Air Warrior is expected to have the knowledge and display skills in the field of work like machining processes on various machines. 3. Manufacturing and modification of Jigs and Fixtures. 	<ol style="list-style-type: none"> 1. Air Warriors are able to carry out the duties of the Workshop Fitter (M) in the General Engineering Section at AF Base Repair Depot(BRD) /Station Workshop at Field Unit. 2. Able to carry out routine servicing and simple repair on the workshop tools/ machines. 3. Undertake skilled task of different type of turning, milling, grinding and drilling operations 	4
Professional knowledge	<p>Air warrior is expected to have the knowledge in the following :-</p> <ol style="list-style-type: none"> 1. Engineering drawing 2. Various tools and Machines used in the General Engineering Section. 3. Various metal used on workshop and their properties. 4. To identify and use tipped tools, cutters and grinding wheels. 5. To identify the source of problem and take action to resolve the issue 6. Safety issues 	<p>Air Warriors are able to acquire basic knowledge on different tools, sheet metals, machines used in workshop with their uses. They are able to identify different hand tools, measuring tools and their applications. They are also able to acquire the knowledge to handle the cause of the problem and undertake basic troubleshooting.</p>	4

Title/Name of qualification/component: Aircraftsman/Leading Aircraftsman of Workshop Fitter (M)			Level: 4
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
Professional skill	Air Warriors are able to recognise the problem and undertake it troubleshooting by undertaking the following: 1. Machining, Milling and Grinding.	1. Air Warriors are able to recognise the problem area and undertake repair by taking necessary course of action (Machining, Milling and Grinding, etc)	4
Core skill	1. Air Warriors are able to communicate within Air Force and outside agencies 2. Air Warriors are able to read the instruction manuals, job card in English 3. Air Warriors are able to have basic computer knowledge.	Air Warriors have communication skill, arithmetic skills, computer skill and basic understanding of social and natural environment	4
Responsibility	Air Warriors are able to shoulder responsibility for fault diagnosis and repair without supervision.	Capable of working independently and is responsible for his work.	4

SECTION 3
EVIDENCE OF NEED

26. What evidence is there that the qualification is needed?

(a) Keeping pace with the technological advancements, IAF has also upgraded and inducted new systems in its inventory. These new as well as old equipment in the IAF inventory have to be maintained in serviceable condition so as to be effectively utilised during peace, natural calamity and actual combat. For this workshop is required to undertake regular maintenance and servicing to keep them combat worthy round the clock.

(b) The Workshop Fitter (M) is entrusted with the task of maintaining the tools, dies and machines used in the workshop for meeting the repair requirements of the IAF inventory equipment. These tradesmen go through rigorous training at Workshop Training Institute and acquire the required acumen.

(c) The huge number of new and upgraded equipment acquired by IAF from India and abroad calls for a huge pool of trained technicians at various levels to maintain the IAF inventory. Thus qualification is relevant to fulfil the demand of IAF.

What is the estimated uptake of this qualification and what is the basis of this estimate?

Is based on the cadre and actual figures cannot be revealed

27. Recommendation from concerned Line Ministry of Govt/Regulatory Body. To be supported by documentary Evidences

The trade has been cleared by MoD and notification to the same effect is confidential in nature.

28. What steps were taken to ensure that the qualification(s) does (do) not duplicate already existing or planned qualifications in the NSQF?

This qualification is especially tailor made to suit the specific organisational requirements of IAF. In some parts it does have some similarity with civil agency as regards to some portion of the syllabus for which the NOS have been equated.

29. What arrangements are in place to monitor and review the qualification(s)? What data will be used and at what point will the qualification(s) be revised or updated?

IAF has well defined Directorates responsible for monitoring both the training and testing aspects. **Directorate of Training** is responsible for ensuring that right training is imparted to the recruits. The syllabus is based on various studies and feedback received from field units/ REB(T).

Directorate of Education is responsible for Trade Testing and evaluation of the knowledge and skill level of the personnel passing out from the training institute and their performance in field units.

This qualification will be reviewed and revised at an interval of five years or earlier, in case of change in syllabus based on the feedback from field Units/REB(T/Z).

SECTION 4
EVIDENCE OF PROGRESSION

30. What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector?

On completion of the course, an Aircraftsman will be posted to Technical Type Training School (TETTRA) school, where he will undergo training on one of the specific system related to ground equipment or aircraft and after successful completion he will be detailed to work in one of the section of the Air Force unit after suitable OJT is imparted to him. With another five months of skill training under supervision he will be promoted to LAC. After three months of skill refinement he will be in a position to appear for Corporal Promotion Examination (CPE). On successful completion of CPE he will be promoted to Cpl after five years from date of enrolment. He will further keep climbing the promotion ladder by appearing for Sergeant Promotion Examination (SPE) for Sgt and Junior Promotion Examination (JPE) for JWO ranks. As per new policy in vogue, ACRs have been linked to skill levels. So, he will be motivated to enhance his skill levels and get them tested by appearing for SGT .

The progression flow is given below.

AC→LAC→Cpl*→Sgt*→JWO*→WO→MWO

*Subject to clearing promotion exam for Cpl, Sgt and JWO called as CPE, SPE and JPE

31. INSTRUCTOR PREREQUISITES: For posting as an instructor following prerequisites are to be fulfilled:-

(a) **Personal attributes:-**

- (i) Should be energetic, motivating, innovative and good at communication.
- (ii) Should be able to establish rapport with the trainees and employ innovative methods to impart instructions.

(b) **Qualification:-**

- (i) Should have attained rank of Sgt and above (at least 13 yrs of service).
- (ii) Should have been assessed 'Superior' and above during preceding 5 yrs.

(c) **QRs:-**

- (i) Should have in depth knowledge and be highly skilled in his trade.
- (ii) Should be recommended for instructional duties by GEB/REB on attaining stipulated standards during assessment.
- (iii) Should have undergone Methods of Instruction Course conducted by Ground Training Instructors School.

Annexure-I
Curriculum and training contents
for Joint Basic Phase Training (JBPT)

SCHEDULE OF TRAINING - JBPTC

Sl No.	Syllabus Index	Subject	Total Periods
TRAINING ACTIVITIES DURING WORKING HOURS: SIX DAYS PER WEEK EXCEPT SECOND SATURDAYS			
1.	JBPTC / GST / 1 to 12	General Service Training (including Field Craft Training camp)	590
2.	JBPTC / Eng / 1 to 4	English	350
3.	JBPTC / GSK / 1 to 11	General Service Knowledge	165
4.	JBPTC / Comp / 1 to 08	Basic Computer Training	50
5.	JBPTC/MAC/1 to 07	Mentoring & Counselling	45
TOTAL (SL NO 1 TO 5)		1200	
TRAINING ACTIVITIES BEYOND WORKING HOURS – 200 PERIODS			
6.	JBPTC / Hindi / 1 to 6	Hindi Training	36
7.	JBPTC / WTC / 1	Weak Trainees Classes / Night Classes	64
8.	JBPTC / GSD / 1	General Service Duties & Stn Duties	100
TOTAL (SL NO 6 to 8)		200 periods	
GRAND TOTAL (SL NO 1 TO 8)		1400 periods	
TOTAL EFFECTIVE TRAINING PERIODS		1400 periods=1400x45/60=1050 hour (Since per period is 45 minutes)	

Annexure-II
Curriculum and training
contents for Trade Phase
Training Term – I

COMPUTATION OF EFFECTIVE PERIODS: WORK SHOP FITTER (M)

1. **Total Duration of Term-I**

(a)	Duration of Term - I	:	16 Weeks
(b)	Non Training days considered	:	04 Weeks with second Saturday and 04 days Close Holidays per Term
(C)	Periods available per Term	:	{(12 weeks X 06 days X 10 periods) + (04 weeks X 5 days X 10 periods) – (04 days CH X 10 periods)} = 880 Periods

2. **Common Activities**

(a)	Out Door Training (Health Run/PT/OTW)	:	166 Periods
(b)	General Service Training (GST)	:	48 Periods
(c)	General Service Duty (GSD) (Mentoring, Counselling and other allied activities like Guest Lectures, etc for Personality Development)	:	28 Periods
(d)	Mid Term Examination (MTT)	:	04 Periods (1/2 Day)
(e)	End Term Examination (ETT)	:	32 Periods (04 Days)
	TOTAL	:	278 Periods

3. **Common Non-Technical Subjects**

(a)	English	:	100 Periods
(b)	Computer & IW Fundamentals	:	30 Periods
	TOTAL	:	130 Periods

4. **Common Technical Subjects**

(a)	Fundamental of Flight	:	12 Periods
(b)	Basic Electronics and Electricals	:	30 Periods
	TOTAL	:	42 Periods

5.	<u>Trade Specific Subject</u>	:	430 Periods
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6. **SUMMARY: TERM – I**

Common Activities	Common Non-Technical Subjects	Common Technical Subjects	Trade Specific Subject	Total
278	130	42	430	880

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(Annexure-III)
Curriculum and training
contents for Trade Phase
Training Term – II

COMPUTATION OF EFFECTIVE PERIODS: WORK SHOP FITTER (M)

1. **Total Duration of Term-II**

(a)	Duration of Term - II	:	16 Weeks
(b)	Non Training days considered	:	04 Weeks with second Saturday and 04 days Close Holidays per Term
(c)	Periods available per Term	:	{(12 weeks X 06 days X 10 periods) + (04 weeks X 5 days X 10 periods) – (04 days CH X 10 periods)} = 880 Periods

2. **Common Activities**

(a)	Out Door Training (Health Run/PT/OTW)	:	148 Periods
(b)	General Service Training (GST)	:	48 Periods
(c)	General Service Duty (GSD) (Mentoring, Counselling and other allied activities like Guest Lectures, etc for Personality Development)	:	28 Periods
(d)	Mid Term Examination (MTT)	:	04 Periods (1/2 Day)
(e)	Pre REB (T) Examination	:	16 Periods (02 Days)
(f)	REB (T) Examination		88 Periods (11 Days)
	TOTAL	:	332 Periods

3. **Common Non-Technical Subjects**

Computer & IW Fundamentals	37 Periods
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4. **Common Technical Subjects**

(a)	Aerospace Safety-I	:	28 Periods
(b)	IMMOLS (Integrated Material Management Online system)		20 Periods
	TOTAL	:	48 Periods

5.	<u>Trade Specific Subject</u>	:	463 Periods
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6. **SUMMARY: TERM – II**

Common Activities	Common Non-Technical Subjects	Common Technical Subjects	Trade Specific Subject	Total
332	37	48	463	880

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(Annexure-IV)
Curriculum and training
contents for Trade Phase
Training Term – III

COMPUTATION OF EFFECTIVE PERIODS: WORK SHOP FITTTER (S)

1. **Total Duration of Term**

(a)	Duration of Term - I	:	16 Weeks
(b)	Non Training days considered	:	04 Weeks with second Saturday and 04 days Close Holidays per Term
(C)	Periods available per Term	:	{(12 weeks X 06 days X 10 periods) + (04 weeks X 5 days X 10 periods) – (04 days CH X 10 periods)} = 880 Periods

2. **Common Activities**

(a)	Out Door Training (Health Run/PT/OTW)	:	166 Periods
(b)	General Service Training (GST)	:	48 Periods
(c)	General Service Duty (GSD) (Mentoring, Counselling and other allied activities like Guest Lectures, etc for Personality Development)	:	30 Periods
(d)	Mid Term Examination (MTT)	:	04 Periods (1/2 Day)
(e)	End Term Examination (ETT)	:	32 Periods (04 Days)
	TOTAL	:	280 Periods

3.	<u>Common Non-Technical Subjects</u>		Nil
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4. **Common Technical Subjects**

4.	Aerospace safety --II	:	08 Periods
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5.	<u>Trade Specific Subject</u>	:	592 Periods
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6. **SUMMARY: TERM – III**

Common Activities	Common Non-Technical Subjects	Common Technical Subjects	Trade Specific Subject	Total
280	00	08	592	880

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(Annexure-V)
Curriculum and training
contents for Trade Phase
Training Term – IV

COMPUTATION OF EFFECTIVE PERIODS: WORK SHOP FITTER (M)

1. **Total Duration of Term-IV**

(a)	Duration of Term - I	:	16 Weeks
(b)	Non Training days considered	:	04 Weeks with second Saturday and 04 days Close Holidays per Term
(C)	Periods available per Term	:	{(12 weeks X 06 days X 10 periods) + (04 weeks X 5 days X 10 periods) – (04 days CH X 10 periods)} = 880 Periods

2. **Common Activities**

(a)	Out Door Training (Health Run/PT/OTW)	:	144 Periods
(b)	General Service Training (GST)	:	48 Periods
(c)	General Service Duty (GSD) (Mentoring, Counselling and other allied activities like Guest Lectures, etc for Personality Development)	:	33 Periods
(d)	Mid Term Examination (MTT)	:	04 Periods (1/2 Day)
(e)	Pre REB (T) Examination	:	16 Periods (02 Days)
(f)	REB (T) Examination		88 Period (11 Days)
(g)	Passing Out Parade (POP)		08 Period
(h)	Clearance and Departure		08 Period
	TOTAL		349 Periods

3.	<u>Common Non-Technical Subjects</u>	:	Nil
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4.	<u>Common Technical Subjects</u>	:	Nil
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5.	<u>Trade Specific Subject</u>	:	531 Periods
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6. **SUMMARY: TERM – IV**

Common Activities	Common Non-Technical Subjects	Common Technical Subjects	Trade Specific Subject	Total
349	00	00	531	880

Note: Total training hours for TPT Term-I, Term-II, Term-III and Term-IV is **(880 X 4 X 45/60 = 2640 Hours)** (Specific to trade is 971.15 hours and other activities like examination, practical training etc is 1668.45. Total is **971.15 + 1668.45 = 2640 hours**).

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Annexure-VI
Air Force Order (AFO)
57/15 specifying the role
of Workshop Fitter
(Machinist)

WORKSHOP FITTER (MACHINIST): GROUP 'X'

AIRCRAFTMAN	
<p>1. Undertakes any such tasks on the range of equipment specified for Leading Aircraftman of Machinist trade and in addition should be able to carry out the following independently:-</p> <p style="padding-left: 40px;">(a) Setting up of machining operations shaping, slotting, planting or milling machine.</p> <p style="padding-left: 40px;">(b) Setting up and operating automatic lathes including common types of grinding machines used in the IAF for repetition jobs</p>	<p>1. Should have thorough knowledge of the subjects of Leading Aircraftman of Machinist Trade and in addition have knowledge of the following:-</p> <p style="padding-left: 40px;">(a) Heat and Mechanics, care, maintenance, use of tools and precession instruments; construction, operation, classification, uses, tests for truth and adjustments of shaping, slotting, planning and milling machines used in the service; methods of setting up work on these machines and use of their attachments and accessories; calculations for change wheel to suit lead and spiral angles, construction and use of swivel table and dividing heads; method of direct and simple indexing, simple calculations for train of gears; speeds and feeds for milling operations, uses of milling operations, uses of milling cutters and setting up of group of cutters, use of gear to the vernier, knowledge of quick return actions; properties and use of cutting lubricants; causes of chatter and overheating whilst machining.</p> <p style="padding-left: 40px;">(b) Construction, operation, classification, uses test for truth and simple adjustment of automatic lathes, grinding machines used in the IAF; method of setting of tools and machines for mass production and uni-production job use of gauges, calculations of pulley speed and diameters; methods of setting up work for grinding abrasives; constructions and method of manufacture of grinding wheels, selection and training of wheels; milling cutter grinding clearances,</p>

<p>(c) Carrying out simple surface grinding operations on a machine „set“ for him, taking all precautions to avoid injury.</p> <p>(d) Minor servicing of machine tools.</p> <p>(e) More advanced machine tool work, procure complex machined assemblies involving high precision turning milling and grinding operations, carries out difficult indexing and helical milling operations, checks gear trains for proper meshing and clearances; adjusts, repairs and replaces machine tools parts and devices</p> <p>(f) Handling and operating of first aid fix appliances.</p>	<p>setting up and use of steadies; properties and use of lubricants; principles of conventional workshop drawing given either in fraction or decimal systems, ability to recognize conventional methods of representations on it and interpret it in terms of machining operations.</p> <p>(c) Various making out tools and their use. Standard limit systems, various types of gauges and their uses.</p> <p>(d) Daily and periodical servicing procedure applicable to machine tools and their documentations.</p> <p>(e) Principles, construction, care; use and methods of testing for accuracy and gauges used in machine shop and tool room; methods and instruments used when marking out; testing components for ovality taper, alignment concentricity, and relationship of surfaces. Features of construction and operation of universal milling machines, classification types and selection of milling cutters; methods of compound and differential indexing; terms and formulate used in gear constructional, calculating and determining peripheral cutting speeds and settings for turning special threads. Manufacturer’s classification, and method of marking of types and shapes of grinding wheels; factors covering selection of wheels for various operations and materials; temperature control; factors affecting cutting speeds.</p> <p>(f) Knowledge of first aid fire appliances, fire fighting procedure and fire organisation.</p>
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