

Curriculum For Level-V Certificate Course

ENGINE TESTING

SYLLABUS FOR

ONE YEAR – FULL TIME

LEVEL-V CERTIFICATE COURSE IN ENGINE TESTING

Effective From

Under Development

Prepared By

Curriculum Development Cell

Institute of Research, Development & Training, U.P.,

Kanpur

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TEACHING AND EXAMINATION SCHEME																			
COURSE NAME : ENGINE TESTING (SECTOR AUTOMOBILE)																			
COURSE CODE : ET-LEVEL V																			
DURATION OF COURSE : ONE YEAR																			
WITH EFFECT FROM																			
Sr. No.	Subject	ST. Code	Teaching Scheme						Examination Scheme										
			T h.	TU	Pr./ WS	D R G	Total	Hrs	Theory			Th. Total		PR. Total				Grand Total	
									Max	Min	Sl Test	Max	Min	Hrs.	Marks	Sl. Test	Total marks		
1	Engine Repair & Rebuilding	ET 5.1	6	-	3		9	2.5	50	17	20	70	24	03	20	10	30	100	
2	Engine Performance	ET 5.2	5	-	3		8	2.5	50	17	20	70	24	03	20	10	30	100	
3	Power Train	ET 5.3	5	-	2		7	2.5	50	17	20	70	24	03	20	10	30	100	
4	Vehicle Wheel & Tyre	ET 5.4	6	-	2		8	2.5	50	17	20	70	24	03	20	10	30	100	
5	EMPLOYABLE SKILLS	GEN 5.5	4	-	4		8	2.5	50	17	20	70	24	03	20	10	30	100	
							40												500

Student Centered Activities+Disciplines(0+20) 20

OBREVIATIONS : TH-THEORY, TU-TUTORIAL, SL-SESSIONAL, PR-PRACTICALS, WS-WORKSHOP, DRG-DRAWING

NOTE:

1. Each period will be 50 minutes duration.
2. Each session will be 32 weeks.
3. Effective teaching will be at least 25 weeks.
4. Remaining periods will be utilized for revision etc.
5. SI system of units shall be used in each subject
6. Student centered activities will comprise of various co-curricular activities like seminar, extension lectures, field visits, NCC, NSS, Hobby, clubs, Games and cultural activities

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II- MAIN FEATURES OF THE CURRICULUM

Title of the course : **Level V Certificate Course in Engine Testing**

Duration : One Year

Pattern of the course : Annual System

Intake : 100

Type of course : Full Time

III-LIST OF EXPERTS

S.No.	Name & Designation	Name Of Organization/Institution	Date	Workshop Place
1	Sri Rituraj Mishra DGM	Tata Motors Ltd , Lucknow	26/09/18	G.P.Lucknow
2	Sri Sanjay srivastava	Tata Motors Ltd , Lucknow	26/09/18	G.P.Lucknow
3	Sri Prakash Chandra	Tata Motors Ltd , Lucknow	26/09/18	G.P.Lucknow
4	Sri Rajesh Kumar Sharma	Tata Motors Ltd , Lucknow	26/09/18	G.P.Lucknow
5	Smt Meenu Drivedi	Lecturer, Mechanical G.P.Lucknow	26/09/18	G.P.Lucknow
6	Sri Tushar Kiran	Lecturer, Mechanical G.P.Lucknow	26/09/18	G.P.Lucknow
7	Sri Himanshu Bhaskar	Lecturer, Mechanical G.P.Lucknow	26/09/18	G.P.Lucknow
8	Smt Deepshikha	Lecturer, English G.G.P.Lucknow	26/09/18	G.P.Lucknow
9	Sri Janbeag Loni	Principal, G.P.Lucknow	26/09/18	G.P.Lucknow
10	Sri Sanjeev Kumar Singh	Secretary, Board Of Technical Education, U.P	26/09/18	G.P.Lucknow
11	Sri Ashok Kushwaha	Text Book Officer, IRDT Kanpur	26/09/18	G.P.Lucknow

5.1 ENGINE REPAIR AND REBUILDING

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6 - 3

1. **Theory of Engine : (40 Hours)**

Operation, introduction, major engine components, operating principle, behavior of liquids & gases. Engine operation, classification, vibration, displacement, crank shaft rotation. Engine measurement *other engine design.

2. **Engine Repair and Rebuilding : (30 Hours)**

Industry Introduction, Full service repair facilities, Repair, replacement & remanufacturing facilities.

3. **Engine Operating System : (20 Hours)**

Introduction, The starting system, Lubrication & fuel system.

4. **Factor Affecting Engine Performance : (30 Hours)**

Introduction, Spark plug, combustion chamber sealing, fuel & combustion. Engine noise.

5. **Mechanism : (30 Hours)**

Timing Mechanism. Valve timing, gear drive, chain drive, belt drive system.

List of Practical's

1. Identification of special tools and fixture of Engine. (10 Hours)
2. Timing setting of engine and FIP. (10 Hours)
3. Dismantling & Assembly of engine. (20 Hours)
4. Physical inspection of engine parts. (10 Hours)
5. Application of engine testing equipment. (10 Hours)

5.2 ENGINE PERFORMANCE

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1. **Fundamental Engine Operating : (30 Hours)**

Principle, Torque, power, energy, volume ,Liquid, gases & combustion.

2. **Basic Engine Testing : (30 Hours)**

Compression testing. Cylinder leakage testing & vacuum gauges.

3. **Support System Diagnosis: (20 Hours)**

Battery, starter system, cooling system diagnosis.

4. **Engine Diagnosis and Repair : (30 Hours)**

Engine leak, smoke, misfire, no start diagnosis.

5. **Engine Related Systems : (20 Hours)**

Air conditioning system.

6. **Diagnostic Equipment : (20 Hours)**

Digital millimeter, Ohm meter, connectors & terminal. Sewing pins, test lamp, laptop.

List of Practical's

1. Identification of diagnosis equipments. (10 Hours)
2. Identification of support systems. (10 Hours)
3. Engine repairing kit & Recognition. (10 Hours)
4. Engine Testing parameters. (10 Hours)
5. Analysis of engine failure. (10 Hours)
6. Analysis of Engine failure Parts. (10 Hours)

6.3 POWER TRAIN & TRANSMISSION SYSTEM

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5 - 2

1. **Clutch: (20 Hours)**
Function and different type of clutch assy
2. **Gear Box: (30 Hours)**
Assy and different type of gear box
3. **Propeller Shaft and Universal Joint : (30 Hours)**
Propeller Shaft and universal joint
4. **Clutch Trouble Shooting : (20 Hours)**
Clutch trouble shooting
5. **Differential: (30 Hours)**
Function & trouble shooting
6. **Transfer Case/Gear Box Trouble Shooting: (20 Hours)**
Transfer case / gear box troubleshooting

List of Practical's

1. Dismantling & Assy and Adjustment of main shaft. (10 hours)
2. Dismantling & Assy and Adjustment of Clutch. (05 hours)
3. Measurement of shim selection of gear box. (10 hours)
4. Dismantling & Assy and Adjustment of Center Bearing. (05 hours)
5. Dismantling and Assy + Adjustment Crown wheel. (05 hours)
6. Dismantling and Assy + Adjustment as per chapter 06. (05 hours)

6.4 VEHICLE WHEEL AND TYRE

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1. **Automobile Wheels : (20 Hours)**
Wheels and Rims
2. **Types Construction : (30 Hours)**
Construction of tyre, Material of tyre
3. **Automobile Tyre : (20 Hours)**
Selections of tyre according to load & vehicle.
4. **Types of Tyre: (20 Hours)**
Types of tyre ,tube & tubeless
5. **Wheel Drum Assy, Break Shoe Assy : (20 Hours)**
Wheel drum assy, Brake Shoe Assy
6. **Suspension System: (20 Hours)**
Different type of Suspension system and shock absorber
7. **Defects in Tyre and Trouble Shooting : (20 Hours)**
Defects in tyre & trouble shooting

List of Practical's

1. Wheel Balancing of tyre. (10 Hours)
2. Wheel Alignment of Vehicle. (05 Hours)
3. Caster Angle, camber Angle, Toe in , Toe out. (05 Hours)
4. Tyre Replacement procedure. (05 Hours)
5. Dismantling and Assy of break drum and break shoe. (05 Hours)
6. Dismantling and Assy of leaf spring. (05 Hours)
7. Dismantling and Assy of hub. (05 Hours)

5.5 EMPLOYABLE SKILLS

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RATIONALE

Diploma holders are required to not only possess subject related knowledge but also soft skills to get good jobs and to rise steadily at their workplace. This subject is included to develop employability skills amongst the students.

DETAILED CONTENTS

1-Industrial Scenario Engineering Education and Expectations of competences from an engineer by employer .

2- Personality types characteristics and features for a successful engineer.

3-Professional Engineer desirable values and ethics and their development. Relation between engineering profession society and environment.

4- Managing project

- Leadership
- Motivation
- Time management
- Computer Software
- Interpersonal Relationship
- Engineer economics and fundamentals

5- Effective communication

- Listening
- Speaking
- Writing
- Presentation Technique/ Seminar
- Group discussion

6-Preparing for Employment

- Searching for job/job hunting
- Resume writing

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- Interview technique in personal interview telephonic interview, panel interview, group interview. Video conference.

7- Managing Self

- Managers body, mind motion & spirit
- Stress management
- Conflict resolution

8- Continuing professional development

- Organizing learning and knowledge
- Use of computer for organizing knowledge resources

9- Creativity, Innovation and Intellectual property right.

- Concept and need in present time for an engineer

10- Basic rules, laws and norms to be adhered by engineers during their working

List of Equipments

1.	Crancking tools, Cranck lifting brackets	1
2.	Timing setting tools	1
3.	Different size of sockets and spanners,nut runner	1
4.	Measuring tools	1
5.	Setup of dynamometer	1
6.	Dynamometer or testing on vehicle	1
7.	Engine Repairing Kit	1
8.	Different Testing equipment Tool & Gauges	1
9.	Checking Equipment Tools	1
10.	Clutch Holding Device	1
11.	Special tool kit for gear box dismantling	1
12.	Different size of sockets and spanner, nut runner	1
13.	Wheel balancing machine	1
14.	Wheel alignment machine	1
15.	Lever and extension	1
16.	Require size of spanner and tyre lever	1

Kindly mail the suggestion and comments for improvement of syllabus

Ashok Kushwaha

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Test Book Officer

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