

GANPAT UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

Programme	Diploma Engineering	Branch	Automobile Engineering						
Semester	VI	Version	1.0.0.0						
Effective from Academic Year	2020-21	Effective for the batch Admitted in	July 2018						
Subject code	1AU2602	Subject Name	AUTO TRANSMISSION MECHANISM DIAGNOSIS AND TESTING						
Teaching scheme			Examination scheme (Marks)						
(Per week)	Lecture(DT)	Practical(Lab.)	Total	CE	SEE	Total			
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	30	20	50

Pre-requisites:

No Pre-Requisites are required for understanding the subject.

Course Learning Outcomes:

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain so that they can demonstrate the following course outcomes.

CO1. Identify probable faults/troubles and their causes in automobile transmission systems.

CO2. Use suitable instruments, tools and service manuals for diagnosis and testing of automobile transmission systems.

CO 3. Remove automobile units by using proper tools and procedures: gear box, brakes, suspension, final drive, etc.

CO 4. Disassemble, inspect, and repair various automobile units by using proper tools and procedures: gear box, differential, brakes, suspension, steering, etc.

CO 5. Follow safety rules for repair and maintenance of various transmission systems of automobile vehicle.

Course Content

Name of UNIT	Unit Content	Unit Learning Outcomes	Marks	Hrs
Unit – I Trouble Shooting of Clutch	1.1 Troubles in clutch units, its causes and rectification 1.2 Inspection procedure and rectification 1.3 Reconditioning of clutch components 1.4 Clutch adjustment 1.5 Lubrication of clutch units and linkages 1.6 Troubles in fluid coupling, its causes a	1a. Identify various troubles in clutch unit and fluid coupling, 1b. Analyse and Rectify various troubles in clutch unit 1c. Explain overhauling of Clutch	8	8
Unit – II Inspection, Testing and Overhauling of Gear Box.	2.1 Troubles in gear box unit, their causes and remedies 2.2 Inspection of components of gear box 2.3 Rectification of various troubles in components 2.4 Overhauling of gearbox	2a. Identify various troubles in gear box 2b. Analyse and Rectify various troubles in gear box 2c. Explain overhauling of Gear box	8	8

<p align="center">Unit– III Inspection and Troubleshooting of Propeller Shaft -Universal Joint Rear Axle Assembly</p>	<p>3.1. Troubles in propeller shaft assembly 3.2. Inspection procedure 3.3. Rectification of various troubles 3.4. Alignment of propeller shaft 3.5. Troubleshooting of Constant Velocity Joint 3.6. Troubles in rear axle assembly and their probable causes 3.7. Inspection procedure for rear axle assembly 3.8. rectification of troubles in rear axle assembly 3.9. Procedure for road testing for proper performance of rear axle assembly</p>	<p>3a) Identify various troubles in propeller shaft, 3b) Analyse and Rectify various troubles in propeller shaft 3c) Explain Inspection procedure of propeller shaft 3d) Identify various troubles in rear axle assembly, 3e) Analyse and Rectify various troubles in rear axle assembly 3f) Explain Inspection procedure of rear axle assembly</p>	<p align="center">12</p>	<p align="center">11</p>
<p align="center">Unit– IV Trouble Shooting of Front Axle and Steering System</p>	<p>4.1 Troubles in front axle and steering system, and their probable causes 4.2 Inspection procedure for front axle 4.3 Rectification of various troubles 4.4 Procedure of testing for proper performance 4.5 Wheel alignment procedure 4.6 Troubles, its causes and remedies in power steering system (Hydraulic and Electronics) 4.7 Troubleshooting of various steering gear box</p>	<p>4a. Identify various troubles in front axle and steering system 4b. Analyse and Rectify various troubles in front axle and steering system 4c. Explain Inspection procedure of front axle 4d. Describe the procedure of Wheel alignment</p>	<p align="center">10</p>	<p align="center">10</p>
<p align="center">Unit– V Trouble shooting of Braking System & Service of Wheels and Tyres</p>	<p>5.1 Troubles in Mechanical, Hydraulic and Air braking system and their causes 5.2 External checks of braking system 5.3 Internal checks of system 5.4 Rectification of various troubles 5.5 Brake performance test 5.6 Trouble shooting of sub assemblies of various brake systems like Master Cylinder, Vacuum Booster and Unloaded Valve. 5.7 Trouble shooting of Antilock Braking System. 5.8 Different troubles and probable causes in Wheels and Tyres 5.9 Inspection of rim and tyres 5.10 Remedial Operation</p>	<p>5a. Identify various troubles in different braking system, 5b. Analyse and Rectify various troubles in brake 5c. Explain brake performance test 5d. Identify various troubles in wheels, 5e. Analyse and Rectify various troubles 5f. Describe the procedure of tyre rotation and Wheel balancing 5g. Explain the procedure of tyre retreading</p>	<p align="center">12</p>	<p align="center">11</p>

	5.11 Rotation of tyre 5.12 Tyre Retreading procedure 5.13 Various troubles, causes and remedies in alloy wheels 5.14 Wheel balancing procedure			
Unit– VI Inspection, Servicing and Repair of Suspension System & Chassis Frame.	6.1 Various troubles and their probable causes in suspension system 6.2 Inspection procedure 6.3 Remedial operation 6.4 Lubrication of coil spring and leaf spring 6.5 Various troubles and causes in chassis frame 6.6 Inspection procedure 6.7 Remedial operation 6.8 Repairs and alignment of frame 6.9 Schedule for chassis lubrication 6.10 Types of instrument used	6a. Identify various troubles in suspension system 6b. Analyse and Rectify various troubles in suspension system 6c. Identify various troubles in chassis frame, 6d. Analyze and Rectify various troubles in chassis and frame 6e. Explain repair and alignment procedure of frame	10	12
		Total	60	60

List of Practical		
Sr. No.	Practical Exercises (Any Seven)	Hours
I	Perform servicing of clutch	4
II	Perform servicing of gear box	4
III	Perform servicing of gear shifting mechanism	4
IV	Perform servicing of final drive	4
V	Perform servicing of steering system	4
VI	Perform servicing of braking system	4
VII	Perform bleeding of hydraulic braking system and pedal adjustment	4
VIII	Perform servicing of air brake system	4
IX	Perform wheel alignment and balancing	4
X	Wash and service the car	4

List of Reference Books			
No	Title of Reference Books	Authors	Publication
1	Automobile Engineering	R. B. Gupta	Satya Prakashan, New Delhi
2	Automotive Mechanics	W.H.Crouse & D.L. Anglin	Tata Mc-Graw Hill Publishing Co. Ltd.
3	Maintenance Engineering And Management	R.C. Mishra, K. Pathak	PHI Learning Pvt. Ltd., 2004
4	Automobile Engineering	C.P. Nakra	Dhanpat Rai Publication Co. (P) Ltd.
5	Automotive Technology	N.K.Giri	Khanna Publication Co. (P) Ltd.

Link of Learning Web Resource	
1	http://youtu.be/J-vrjgKqqSQ
2	http://youtu.be/vJVrFjzNj3w

3	http://youtu.be/JRDN6hwCljs
4	https://www.youtube.com/playlist?list=PLPvqVA0h0J6gqQc2XkNjYzaCwbimt4aaA

List of Software/Learning Websites

Sr. No	Topic / Video Title	URL Address
1	Connecting brake lines with a compression fitting	http://youtu.be/rF9p0KoYU4E?list=PLPvqVA0h0J6ib8WNSsv1ITOQKOMAQVHNz
2	Checking a pressed in lower ball joint for wear	http://youtu.be/RWZq9WapzrM?list=PLPvqVA0h0J6ib8WNSsv1ITTOQKOMAQVHNz
3	Changing a vehicle brake line	http://youtu.be/1tBpXORbhU?list=PLPvqVA0h0J6ib8WNSsv1ITOQKOMAQVHNz
4	Car O Liner Mark 6 Frame Alignment Bench	http://youtu.be/w-j6T_Yj18g?list=PLPvqVA0h0J6ib8WNSsv1ITTOQKOMAQVHNz
5	Bench bleeding a brake master cylinder	http://youtu.be/KglpDbSI2F8?list=PLPvqVA0h0J6ib8WNSsv1ITOQKOMAQVHNz
6	ABS Brakes & More How to Troubleshoot ABS Disc Brakes	http://youtu.be/CqXmrex-DD4?list=PLPvqVA0h0J6ib8WNSsv1ITTOQKOMAQVHNz
7	1998 Ford Ranger Rear Differential Reassembly	http://youtu.be/tQQ6OorGI4E?list=PLPvqVA0h0J6ib8WNSsv1ITTOQKOMAQVHNz
8	1998 Ford Ranger Rear Differential Disassembly	http://youtu.be/ISqhuAh8Eus?list=PLPvqVA0h0J6ib8WNSsv1ITOQKOMAQVHNz
9	3D Wheel Alignment Manatec FOX 3D	http://youtu.be/iA327NEjwYw?list=PLPvqVA0h0J6ib8WNSsv1ITTOQKOMAQVHNz
10	Wheel balancing	http://youtu.be/yRoXUI3UR0k?list=PLPvqVA0h0J6ib8WNSsv1ITTOQKOMAQVHNz
11	Wheel balancer	http://youtu.be/Hl6Oy6jViEs?list=PLPvqVA0h0J6ib8WNSsv1ITOQKOMAQVHNz
12	Wheel Alignment Why cars need four wheel alignment	http://youtu.be/59aj3YERo_I?list=PLPvqVA0h0J6ib8WNSsv1ITOQKOMAQVHNz
13	Symptoms of unbalanced tires	http://youtu.be/m9f63m31bVs?list=PLPvqVA0h0J6ib8WNSsv1ITTOQKOMAQVHNz
14	Symptoms of a worn wheel bearing while driving the vehicle	http://youtu.be/3ly_QReFOg0?list=PLPvqVA0h0J6ib8WNSsv1ITOQKOMAQVHNz
15	Symptoms of a warped brake rotor	http://youtu.be/F5Epq1wZ5Do?list=PLPvqVA0h0J6ib8WNSsv1ITTOQKOMAQVHNz
16	MGB Differential Repair Part 2	http://youtu.be/xA6kaA09XTIY?list=PLPvqVA0h0J6ib8WNSsv1ITOQKOMAQVHNz
17	How To Test, Troubleshoot, Remove & Replace a Power Steering Gear Box	http://youtu.be/QsbNTjqSjpk?list=PLPvqVA0h0J6ib8WNSsv1ITOQKOMAQVHNz
18	How to Perform an Alignment on Your Car at Home	http://youtu.be/C8lnafFxtE4?list=PLPvqVA0h0J6ib8WNSsv1ITTOQKOMAQVHNz
19	How To Diagnose A Clutch Problem	http://youtu.be/eqrFtnSZIMU?list=PLPvqVA0h0J6ib8WNSsv1ITOQKOMAQVHNz
20	How to connect brake lines with new fittings & a union	http://youtu.be/kBwQPoHWmyE?list=PLPvqVA0h0J6ib8WNSsv1ITTOQKOMAQVHNz
22	How to bend brake lines with a pulley	http://youtu.be/T7pxl2RtpQ?list=PLPvqVA0h0J6ib8WNSsv1ITTOQKOMAQVHNz
23	Troubleshooting brake chamber	http://youtu.be/9r1b1_9T7L4?list=PLPvqVA0h0J6ib8WNSsv1ITOQKOMAQVHNz