

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme		Diploma Engineering				Branch	AUTOMOBILE ENGINEERING		
Semester		III				Version	1.0.0.0		
Effective from Academic Year			2019-20			Effective for the batch Admitted in			July 2018
Subject code		1AU2302	Subject Name			AUTOMOTIBILE TRANSMISSION AND MECHANISM			
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:
Students must have basic knowledge of different type of clutch and transmission used in vehicles. Students must aware about use of transmission and trouble shooting of it.

Course Learning Outcomes:
The course content should be taught and implemented with an aim to develop different skills leading to the achievement of the following competencies and course learning outcomes: T1. Install and test automobile power transmission, brakes, steering and suspension system during manufacturing T2. Maintain automobile power transmission, brakes, steering and suspension system during service T3. The practical should be carried out in such a manner that students are able to acquire different learning out comes in cognitive, psychomotor and affective domain to demonstrate course learning outcomes.

Course Content				
Name of UNIT	Unit Content	Unit Learning Outcomes	Marks	Hrs
UNIT – 1 Introduction to Automobile Transmission System	1.1 Flow of power transmitted in front wheel drive, rear wheel drive and four wheel drive. 1.2 Different layout of chassis. 1.3 Lubrication of chassis. 1.4 Different types of frame. 1.5 Frame less chassis	1a. Describe power transmission systems. 1b. Draw different layout of chassis. 1c. Explain construction of frames.	7	5
UNIT – 2 Clutch & Gear box	2.1 Necessity Types of clutches. 2.2 Construction and functions of different types of clutches, clutch actuating mechanism. 2.3 Construction and functions of fluid coupling. 2.4 Necessity Types of gearboxes. 2.5 Construction and functions of Sliding mesh, Constant mesh, Synchromesh, Epicyclical train & automatic transmission. 2.6 Gear shifting mechanism, 2.7 Torque converter and overdrive-construction & working.	2a. List different types of clutches. 2b. Explain operation of Clutch, Clutch actuating Mechanism. 2c. Describe Construction and working of fluid coupling. 2d. Describe different types of gears and gear boxes. 2e. Describe operation of Gear shifting mechanisms with line diagram of motion flow. 2f. Explain construction & working of overdrive & torque convertor.	10	8

UNIT – 3 Propeller shaft & universal joint	3.1 Need of propeller shaft, universal joint and slip joint. 3.2 Construction & functions of various types of propeller shafts. 3.3 Construction & functions of various types of universal joints.	3a. Explain need & construction of various types of propeller shafts. 3b. Explain construction & functions of various types of universal joints.	8	5
UNIT – 4 Axle assembly	4.1 Necessity of final drive, Types of final drive. 4.2 Construction & functions of final drive. 4.3 Necessity of differential, Construction & functions of differential, differential locks. 4.4 Types of axle housing Function of axle housing and different types of axle mounting.	4a. Identify components of final drive assembly. 4b. Describe construction and operation of differential and different types of rear axles. 4c. Describe construction and operation of different types of axle housings.	8	7
UNIT – 5 steering mechanism	5.1 Necessity of steering geometry. 5.2 Kingpin inclination, camber, caster, Toe-in Toe-out and other terminology. 5.3 Types of front axle. 5.4 Types of steering linkages and Types of steering gears. 5.5 Effect of under steer and over steering. 5.6 Steering lock and turning circle radius. 5.7 Power steering systems- hydraulic, electronics controlled electrical.	5a. Explain steering geometry. 5b. Describe various steering mechanisms with is need and importance. 5c. Identify various linkages of steering mechanisms, steering gears. 5d. Explain power steering system	10	8
Unit– 6 Wheels and tyres and brakes	6.1 Various types of wheels. 6.2 Salient features of wheels. 6.3 Salient features of different types of rims. 6.4 Types of tyres. 6.5 Constructional details of tube and tubeless tyres. 6.6 Hot & cold tyre retarding procedure. 6.7 Rating of tyre. 6.8 Factors affecting life of tyre. 6.9 Tyre rotation and Tyre specification. 6.10 Necessity & Types of brake. 6.11 Construction and functions of braking system, Braking Mechanism, Brake setting. 6.12 Anti lock brake systems- purpose, arrangement and function of different parts.	6a. Describe construction of various types of wheels and tyres. 6b. Factors affecting life of tyre, & Tyre rotation. 6c. Describe tyre rating & specifications. 6d. Explain Hot & cold tyre retreading procedures. 6e. List types of brakes. 6f. Explain construction and operation of various braking mechanisms. 6g. Explain need, construction & working of Anti lock brakes	10	8
Unit– 7 Suspension system	7.1 Necessity of suspension system. 7.2 Types of front & rear suspension systems. 7.3 Types of springs. 7.4 Construction and functions of various types of suspension system. 7.5 Necessity of shock absorber. 7.6 Construction and functions of shock absorber	7a. Explain importance of suspension system. 7b. Describe construction and working of front & rear suspension systems and shock absorbers. 7c. Differentiate functions of springs and shock absorbers.	7	4

List of Practical (Any seven)		
No.	Unit	Name of Practical
1	2	Demonstrate construction and working of different types of clutch.
2	2	Demonstrate construction and working of different types of gear boxes.
3	2	Study working principal of overdrive mechanism
4	3	Demonstrate functions of propeller shaft and universal joint
5	3	Demonstrate working of differential
6	5	Demonstrate construction and operation of steering mechanism
7	5	Demonstrate construction and operation of power steering
8	6	Study of different types of wheels and tyres
9	6	Demonstrate operation of brake mechanisms and brakes (Hydraulic, Mechanical, Air brake).
10	7	Demonstrate of different types of suspension systems and shock absorbers

List of Reference Books			
No	Title of Reference Books	Authors	Publication
1	Automobile Engineering	R. B. Gupta	SatyaPrakashan, New Delhi
2	Automobile Engineering vol-II	Anil Chhikara	SatyaPrakashan, New Delhi
3	Automobile Engineering	K. M. Gupta	Umesh Publication
4	Automobile Engineering	Jain K.K., Asthana R.B.	Tata Mc-Graw Hill Publishing Co. Ltd.
5	Automobile Engineering	G. B. S. Narang	Khanna Publishers
6	Transmission and power Train	W.H.Crouse & D.L. Anglin	Tata Mc-Graw Hill Publishing Co. Ltd.
7	Automobile Engineering: (Vol-II)	Singh Kirpal	Standard Publishers Distributors

Link of Learning Web Resource	
1	https://www.youtube.com/watch?v=u_y1S8C0Hmc
2	https://nptel.ac.in/courses/116102012/101
3	https://www.objectivebooks.com/2015/06/online-automobile-engineering-quiz.html
4	https://play.howstuffworks.com/quiz/transmission-quiz
5	https://www.prep.youth4work.com/Practice-Tests/Mechanical-Engineering-Test/Automobile-Engineering-Test

CO'S AND PO'S MAPPING

Name of PO	Description	CO 1	CO 2	CO 3
PO -1	An ability to apply knowledge of mathematics and engineering science.	SLI	SLI	SLI
PO -2	An ability to demonstrate, develop and conduct experiments, as well as to analyze and interpret data.	SUB	SLI	SLI
PO -3	An ability to design a system component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability.	MED	MED	SUB
PO -4	An ability to perform with multidisciplinary teams.	MED	MED	SUB
PO -5	Use of appropriate modern tool and application software that pertain to Automobile engineering technology systems.	NONE	SUB	MED.
PO -6	An ability to identify, formulates, execute and solve engineering problems.	SLI.	SUB	MED.
PO -7	An ability to communicate and present effectively in both verbal and written forms.	SLI	MED.	SUB
PO -8	The broad education necessary to understand the impact of engineering solutions in global, economic, environmental and societal context.	MED.	SUB.	SUB.
PO -9	Recognition of need for self-improvement, and an ability to engage in life-long learning.	SLI	NONE	NONE
PO -10	Ability to aware about the contemporary issues.	SLI	SLI	SLI
PO -11	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	MED.	MED.	MED.
PO -12	Demonstrate to analyse and apply unconventional processes, automation, robotics Nanotechnology, Computer-Aided-Design & Manufacturing and knowledge in Automobile Engineering, Thermodynamics, Refrigeration & Air Conditioning and Jet Propulsion & Rocket Engineering to analyse and solve complex problems and to work professionally in such systems and plants.	SLI	MED.	MED.