



Engineering Program

Specialization	Automotive Maintenance
Course Number	20211131
Course Title	Automotive power drive line units (Theoretical part of the course)
Credit Hours	3
Theoretical Hours	1
Practical Hours	6



Brief Course Description:

Fundamentals of clutch system, manual transmission, automatic transmission, propeller shaft and universal joints, final drive, differential and axles.

Course Objectives:

Upon the completion of this course, the student will be able to:

1. Identify the different types and describe the construction of power drive line units.
2. Outline the principle operation of power drive line units.
3. Outline the hydraulic and electrical control circuits of automatic transmission.



Detailed Course Outline:

Unit Number	Unit Title	Unit Content	Time Needed (hr)
1.	Clutch system	<ul style="list-style-type: none"> Clutch system components and operation. Clutch system types. Mechanical clutch system. Hydraulic clutch system. 	2
2.	Manual transmission	<ul style="list-style-type: none"> Driving force requirements for transmission. Types of manual gearboxes. Types of synchromesh units. Four wheel drive and transfer case. Gear shifting mechanism. 	4
3.	Automatic transmission	<ul style="list-style-type: none"> Types of automatic transmission. Main components in the automatic transmission. Torque converter. Planetary gear unit. Three speed and reverse automatic transmission. Overdrive planetary gear unit. Manual linkage. Transmission with hydraulic control. Transmission with electro hydraulic control. 	5
4.	Propeller shaft and universal joints	<ul style="list-style-type: none"> Propeller shaft function and construction. The Hochkiss drive. Alternative types of drive line arrangement. Front wheel driving axle arrangement. Types of constant velocity joints. 	2



5.	Final drive, differential and axles	<ul style="list-style-type: none">Final drive construction and operation.Differential construction and operation.Axles and axle shafts.Advantages and disadvantages of 4W drive.	3
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Evaluation Strategies:

Exams		Percentage	Date
Exams	First Exam	20%	
	Second Exam	20%	
	Final Exam	50%	
Homework and Projects Discussions and lecture Presentations		10%	

Teaching Methodology:

- ❖ Lectures and presentations.

Text Book

1- William H. Crouce and Donald Anglin, Automotive Mechanics, Hill school publishing company, USA.

References

1. William H. Crouce and Donald Anglin, Automotive Mechanics, Hill school publishing company, USA.
2. Automotive engineering – Leeming D , Pittman, UK

