



## Module (Course Syllabus) Catalogue 2022-2023

<b>College</b>	<b>Erbil Technology College</b>	
<b>Department</b>	<b>Engineering Automotive Technology</b>	
<b>Module Name</b>	<b>Manual Transmission</b>	
<b>Module Code</b>	<b>MAT302</b>	
<b>Degree</b>	<b>Technical Diploma</b>	
<b>Semester</b>	<b>3<sup>rd</sup></b>	
<b>Qualification</b>	<b>Master</b>	
<b>Scientific Title</b>	<b>Assistant Lecturer</b>	
<b>ECTS (Credits)</b>	<b>6</b>	
<b>Module type</b>	<b>Core</b>	
<b>Weekly hours</b>	<b>4 hrs.</b>	
<b>Weekly hours (Theory)</b>	<b>(2) h Class</b>	<b>(81) h Workload</b>
<b>Weekly hours (Practical)</b>	<b>(2) hrs. Class</b>	<b>(81) h Workload</b>
<b>Number of Weeks</b>	<b>12</b>	
<b>Lecturer (Theory)</b>	<b>Mr. Kareem Ibrahim Kareem</b>	
<b>Lecturers (Practical)</b>	<b>E-Mail</b>	<b>Mobile No.</b>
<b>1. Mr. Kareem Ibrahim Kareem</b>	<a href="mailto:kareem.kareem@epu.edu.iq">kareem.kareem@epu.edu.iq</a>	<b>07501114579</b>
<b>2. Nawzad Nazm Abdullrahman</b>	-	<b>07504048894</b>
<b>3. Farshad Rashed</b>	-	<b>07504022722</b>
<b>Websites / Kareem</b>	<a href="https://moodle.epu.edu.iq/my/">https://moodle.epu.edu.iq/my/</a>	

# Course Book

<b>Course Description</b>	Human all over the world currently are used automobiles with different types. Automobiles and vehicles have several main components including drive train (transmission system). This course focus to demonstrate specific information about main components which are clutch, transmission (gear box), drive shaft assembly, final drive assembly, transaxles and components of four wheel drive.																				
<b>Course Objectives</b>	<ol style="list-style-type: none"> <li>1. To recognize main components of drive train (transmission system).</li> <li>2. To know working principals of drive train parts.</li> <li>3. To diagnose (identify) noise and vibration of drive train components.</li> <li>4. To inspect different parts of drive train.</li> <li>5. To repair different parts of drive train.</li> <li>6. To replace different parts of drive train.</li> <li>7. Adjust components which are required.</li> </ol>																				
<b>Student's Obligation</b>	<ol style="list-style-type: none"> <li>1. Students have to attend theoretical and practical lectures to obtain primary information.</li> <li>2. Students must done quiz weekly in practice lectures.</li> <li>3. Students must to complete homework, reports and seminars on time.</li> <li>4. Obtained information of theory and practice lectures is student's duty through several different sources such as (notes during lectures, books, internet and journals.</li> <li>5. Students should deal with institute and university <b>rules</b> and <b>reminds</b> which are relating to teaching staff, administrative staff, exam and students.</li> <li>6. Students have to protect and keep equipment and devices in lab and study halls.</li> </ol>																				
<b>Required Learning Materials</b>	<ol style="list-style-type: none"> <li>1. Theory lectures will be tough by data show in PPT form.</li> <li>2. Practice lectures will be tough by data show in PPT form, laboratory works, scientific movies and scientific visiting.</li> <li>3. Group working during practice lectures, in labs.</li> </ol>																				
<b>Assessment Scheme</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #f4a460;"><b>Homework</b></td> <td style="text-align: right;"><b>5</b></td> </tr> <tr> <td style="background-color: #f4a460;"><b>Class Activity</b></td> <td style="text-align: right;"><b>2</b></td> </tr> <tr> <td style="background-color: #f4a460;"><b>Report and Seminar</b></td> <td style="text-align: right;"><b>10</b></td> </tr> <tr> <td style="background-color: #f4a460;"><b>Lab Report and Activates (Practice)</b></td> <td style="text-align: right;"><b>10</b></td> </tr> <tr> <td style="background-color: #f4a460;"><b>Quiz ( Theory + Practice )</b></td> <td style="text-align: right;"><b>8</b></td> </tr> <tr> <td style="background-color: #f4a460;"><b>Mid Term Exam (Practice)</b></td> <td style="text-align: right;"><b>15</b></td> </tr> <tr> <td style="background-color: #f4a460;"><b>Mid Term Exam (Theory)</b></td> <td style="text-align: right;"><b>10</b></td> </tr> <tr> <td style="background-color: #f4a460;"><b>Final (Practice)</b></td> <td style="text-align: right;"><b>20</b></td> </tr> <tr> <td style="background-color: #f4a460;"><b>Final (Theory)</b></td> <td style="text-align: right;"><b>20</b></td> </tr> <tr> <td style="background-color: #f4a460;"><b>Total Grade or Mark</b></td> <td style="text-align: right;"><b>100</b></td> </tr> </table>	<b>Homework</b>	<b>5</b>	<b>Class Activity</b>	<b>2</b>	<b>Report and Seminar</b>	<b>10</b>	<b>Lab Report and Activates (Practice)</b>	<b>10</b>	<b>Quiz ( Theory + Practice )</b>	<b>8</b>	<b>Mid Term Exam (Practice)</b>	<b>15</b>	<b>Mid Term Exam (Theory)</b>	<b>10</b>	<b>Final (Practice)</b>	<b>20</b>	<b>Final (Theory)</b>	<b>20</b>	<b>Total Grade or Mark</b>	<b>100</b>
<b>Homework</b>	<b>5</b>																				
<b>Class Activity</b>	<b>2</b>																				
<b>Report and Seminar</b>	<b>10</b>																				
<b>Lab Report and Activates (Practice)</b>	<b>10</b>																				
<b>Quiz ( Theory + Practice )</b>	<b>8</b>																				
<b>Mid Term Exam (Practice)</b>	<b>15</b>																				
<b>Mid Term Exam (Theory)</b>	<b>10</b>																				
<b>Final (Practice)</b>	<b>20</b>																				
<b>Final (Theory)</b>	<b>20</b>																				
<b>Total Grade or Mark</b>	<b>100</b>																				

<b>Specific Learning Outcome</b>	<ol style="list-style-type: none"> <li>1. Student has to obtained property knowledge about main components of drive train (transmission system).</li> <li>2. Student ought to know working principals of drive train parts.</li> <li>3. Student must diagnose (identify) noise and vibration of drive train components.</li> <li>4. Student should be having knowledge to inspect different parts of drive train.</li> <li>5. Student should be able to repair different parts of drive train.</li> <li>6. Student has to replace different parts of drive train.</li> <li>7. Student must adjust components which are required.</li> </ol>
<b>Course References</b>	<ol style="list-style-type: none"> <li>1. Chris Johanson and James E. Duffy. Manual drive trains and axles. Third Edition. USA. The Goodheart-Willcox Company, Inc.</li> <li>2. Chris Johanson. Shop Manual Drive Trains and Axles. Third Edition. USA. The Goodheart-Willcox Company, Inc.</li> </ol>

<b>Weeks</b>	<b>Course topics/ Theory</b>	<b>Learning Outcome</b>
1.	Introduction to Drive Trains	1 and 2
2.	Gears, Chains, and Bearings	1 and 2
3.	Clutch Construction and Operation	1 and 2
4.	Clutch Problems, Troubleshooting, and Service	2, 3, 4, 5, 6 and 7
5.	Manual Transmission Construction and Operation	1 and 2
6.	Manual Transmission Problems, Troubleshooting, and Service	2, 3, 4, 5, 6 and 7
7.	Manual Transaxle Problems, Troubleshooting, and Service	2, 3, 4, 5, 6 and 7
8.	Drive Shaft Assembly Problems, Troubleshooting, and Service	2, 3, 4, 5, 6 and 7
9.	Rear Axle Assembly Construction and Operation	1 and 2
10.	Rear Axle Assembly Problems, Troubleshooting, and Service	2, 3, 4, 5, 6 and 7
11.	Four-Wheel Drive Component Construction and Operation	1 and 2
12.	Four-Wheel Drive Problems, Troubleshooting, and Service	2, 3, 4, 5, 6 and 7
<b>Weeks</b>	<b>Practical Topics</b>	<b>Learning Outcome</b>
1.	introduction and types of drive train	1 and 2
2.	Job 6—Diagnose Drive Train Component Leakage + Job 7—Check and Correct Drive Shaft Run out	2, 3, 4, 5, 6 and 7

3.	Job 11—Remove, Inspect, and Reinstall a Drive Shaft, U-Joints, and a Centre Support	2, 3, 4, 5, 6 and 7
4.	Job 16—Diagnose Clutch Problems + Job 17—Adjust Clutch Pedal Free Play	2, 3, 4, 5, 6 and 7
5.	Job 18—Bleed a Hydraulic Clutch System	2, 3, 4, 5, 6 and 7
6.	Job 19—Remove a Clutch + Job 20—Inspect and Repair a Clutch + Job 21—Install a Clutch	2, 3, 4, 5, 6 and 7
7.	Job 24—Disassemble and Inspect a Manual Transaxle + Job 25—Reassemble a Manual Transaxle	2, 3, 4, 5, 6 and 7
8.	Job 28—Remove, Service, and Install a Retainer-Type Axle + Job 29—Remove, Service, and Install a C-Lock Axle	2, 3, 4, 5, 6 and 7
9.	Job 32—Remove a Rear Axle Assembly + Job 33—Disassemble and Inspect a Differential + Job 34—Reassemble and Adjust a Differential + Job 35—Install a Rear Axle Assembly	2, 3, 4, 5, 6 and 7
10.	Job 36—Inspect, Remove, and Replace a Transfer Case + Job 37—Overhaul a Transfer Case	2, 3, 4, 5, 6 and 7
11.	Job 38—Service Transfer Case Shift Controls, Locking Hubs, and Wheel Bearings	2, 3, 4, 5, 6 and 7
12.	Job 39—Inspect Power Train Mounts + Job 40—Replace and Align Power Train Mounts	2, 3, 4, 5, 6 and 7

## Questions Example Design

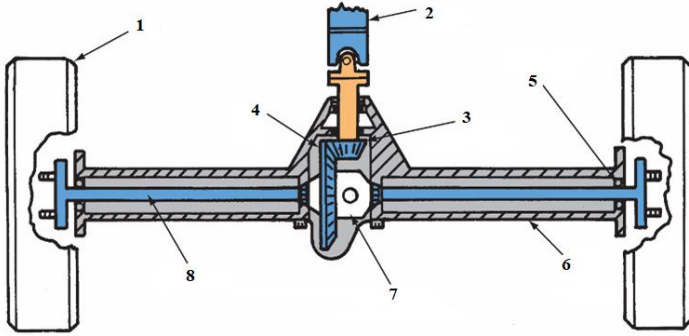
### A. Questions

- Define following Phrases?  
Transmission
- Choose true or false and correct false if appear?  
A. A transaxle is used in a drive train system where the engine is placed directly over the drive axles.  
B. To operate, every vehicle must have a ring and pinion.
- List main parts of drive trains (Transmission System)?
- Match keywords in column A to answers in column B.

A	B
1. Clutch	A. Change power direction 90 degrees
2. Ring and pinion	B. Transmit power to rear axles
3. Drive shaft	C. Engages and disengages power to the transmission

- The differential gears allow the vehicle to do which of the following?  
A. Accelerate faster  
B. Use the engine for braking  
C. Turn corners  
D. Back up
- The path for engine power to the rear wheels is sometimes called the power \_\_\_\_.

7. Write name and highlighted parts of equipment which is given in figure format.



**B. Answers**

1. It can be described as a system to transmit engine power to the road, reverse direction of power ( power flow) and stop power flow.
2. A. True.  
B. False. Some front-wheel drive vehicles do not have a ring and pinion.
3. Clutches, Transmissions, Drive shaft assemblies, Rear axle assemblies, Transaxles and Four-wheel drive components

4. .

	A	B
1.		C
2.		A
3.		B

5. C. Turn corners
6. Flow.
7. Tire, Drive Shaft, Drive Pinion Gear, Ring Gear, Rear axle bearing, Rear axle Housing, Differential case Assembly and Drive axle

**Extra notes:**

**External Evaluator:**