

**Name of Institute: Institute of Technology
and Engineering**

Name of Faculty: Prof. Swapnil Solanki

Course code: ME0653

Course name: Automobile Systems (PE-3)

Pre-requisites: Elements of Mechanical Engineering, Internal
Combustion Engine,

Credit points: 3

Offered Semester: 6th

Course coordinator (weeks 12)

Full name: Prof. Swapnil Solanki

Department with sitting location: 1st floor staff room,
Bhanwar building

Email: swapnilsolanki.me@indusuni.ac.in

Consultation times: 14:00
to 17:00 (Monday to Friday)

Students will be contacted throughout the session via mail with important
information relating to this course.

Course Objectives

By participating in and understanding all facets of this course a student will:

- 1) The purpose of this course is to impart adequate knowledge in both ways
practically as well as theoretically.
- 2) Imparting knowledge of various types of power-driven vehicles.
- 3) To familiarize the students with the fundamentals of Automotive Engine
System, Chassis suspension system, braking and transmission system.
- 4) The students are acquainted with the location and importance of operation,
maintenance and Repair of all components of the various transportation
vehicles.

Course Outcomes (CO)

- 1) Identify the various parts of the automobile
- 2) Explain the working of various parts like engine, transmission,
clutch, brakes.
- 3) Describe how the steering and the suspension systems operate.
- 4) Develop a strong base for understanding future developments in
the automobile industry

Course Outline

This course contains an Automobile parts like brakes, axles, clutches, gear boxes, Steering System, Suspension System, Transmission System etc.

Student will learn working of brakes, axles, clutches, gear boxes, Steering System, Suspension System, Transmission System etc.

Method of delivery

Face to face lectures, self-study material, Active Learning Techniques

Study time

Three lectures each of one hours

CO-PO Mapping (PO: Program Outcomes)

- PO1 Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO2 Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO3 Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4 Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5 Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
- PO6 The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO7 Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO8 Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9 Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11 Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12 Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

1-LightlyMapped 2-ModeratelyMapped 3- HighlyMapped

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2
CO1	3	1	1	-	-	-	-	-	-	-	-	1
CO2	3	2	3	1	3	-	-	-	-	-	-	-
CO3	3	2	2	2	3	-	-	-	-	-	-	-
CO4	2	2	1	-	-	-	-	-	-	-	-	1

Blooms Taxonomy and Knowledge retention

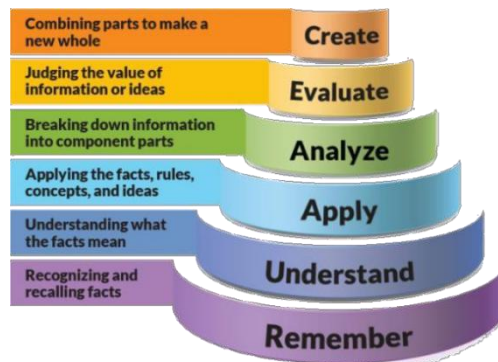


Figure 1: Blooms Taxonomy

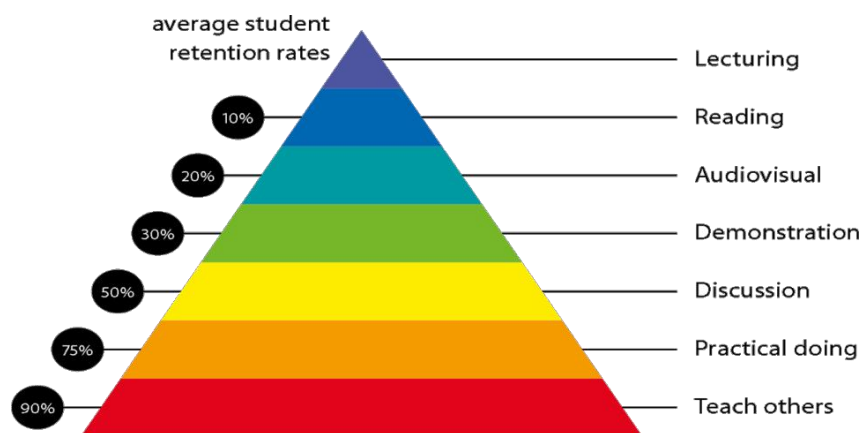


Figure 2: Knowledge retention

Graduate Qualities and Capabilities covered

General Graduate Qualities	Specific Department of Mechanical Graduate Capabilities
<p>Informed Have a sound knowledge of vibration system study and management, need to study or profession and understand its current issues, locally and internationally. Understand how to apply this knowledge to ground level. Understand how an vibrational system has developed and how it relates to other areas.</p>	<p>1 Professional knowledge, grounding & awareness</p>
<p>Independent learners By case study on vibration lead to develop ideas and ways of thinking and critically analyze issues. By providing expert lecture references help in to get extend subject knowledge. Find and evaluate information, using a variety of sources and technologies. Acknowledge the work and ideas of others.</p>	<p>2 Information literacy, gathering & processing</p>
<p>Problem solvers Take on challenges and opportunities in industries and organization related to vibration issues by case study. By Demonstration of effect of different type of vibration help in to understand problem faces in industries and try to give solution to resolve problems. Apply creative and logical to respond effectively. Make and implement decisions.</p>	<p>3 Problem solving skills</p>
<p>Effective communicators Report or Assignment writing help in improve written communication. Presentation need to give based on case study or research paper related to course. Work collaboratively and engage with people for innovative ideas related to subject and presentation. Recognize how culture can shape communication.</p>	<p>4 Written communication</p>
	<p>5 Oral communication</p>
	<p>6 Teamwork</p>
<p>Responsible Understand and Implements of science of vibration lead to sustainable design approach. Help in fulfilling in creating a safe structure or machines without harmful environment impact.</p>	<p>7 Sustainability, societal & environmental impact</p>

Lecture/tutorial times

As per the time table

Attendance Requirements

The University norms states that it is the responsibility of students to attend all lectures, tutorials, seminars and practical work as stipulated in the course outline. Minimum attendance requirement as per university norms is compulsory for being eligible for semester examinations

Details of referencing system to be used in written work

Text books, online sources and NPTEL videos.

Text books

1. Automobile Engineering book by Dr. Kirpal Singh.
2. R.K. Rajput, Automobile Engineering, Laxmi Publications.
3. Crouse, William H., and William Harry Crouse. Automotive mechanics. Tata McGraw-Hill Education, 1982.
4. Heisler, Heinz. Advanced vehicle technology. Elsevier, 2002.
Automobile Engineering-II by P .S. Gill, S K Katariya and sons publications

Additional Materials

Reference books:

1. GBS Narang, Automobile engineering, Khanna Publishers.
2. Automobile Engineering book by Dr. D.S. Kumar.

ASSESSMENT GUIDELINES

1) Theory Assessment:

- a) CIE theory will contains 60 marks and the distribution of marks will be as follows:

Distribution	Marks	Remarks
Mid Semester Examination	40	- Based on your performance in the examination
Assignment	10	- Two Assignments (each of 05 marks) - Assignment 1- Unit 1 &2 - Assignment 2- Unit 3 &4
Presentation	05	- Content of presentation will not be from the syllabus topics but must contain the application of subject - Marks will be provided on the basis of content, presentations & communication skills, questionnaires
- Attendance	05	- Bonus for all students having attendance > 80% - On prorated basis having attendance < 80%
Total marks	60	

- b) ESE theory will contain 40 marks.

SUPPLEMENTARY ASSESSMENT

Students who receive an overall mark less than 40% in internal component or less than 40% in the end semester will be considered for supplementary assessment in the respective components (i.e. internal component or end semester) of semester concerned. Students must make themselves available during the supplementary examination period to take up the respective components (internal component or end semester) and need to obtain the required minimum 40% marks to clear the concerned components.

Practical Work Report/Laboratory Report:

A report on the practical work is due the subsequent week after completion of the class by each group.

Late Work

Late assignments will not be accepted without supporting documentation. Late submission of the reports will result in a deduction of -% of the maximum mark per calendar day and extra innovative assignments will be provided.

Format

All assignments must be presented in a neat, legible format with all information sources correctly referenced. **Assignment material handed in throughout the session that is not neat and legible will not be marked and will be returned to the student.**

Retention of Written Work

Written assessment work will be retained by the Course coordinator/lecturer for two weeks after marking to be collected by the students.

University and Faculty Policies

Students should make themselves aware of the University and/or Faculty Policies regarding plagiarism, special consideration, supplementary examinations and other educational issues and student matters.

Plagiarism - Plagiarism is not acceptable and may result in the imposition of severe penalties. Plagiarism is the use of another person's work, or idea, as if it is his or her own - if you have any doubts at all on what constitutes plagiarism, please consult your Course coordinator or lecturer. Plagiarism will be penalized severely.

Do not copy the work of other students.

Do not share your work with other students (except where required for a group activity or assessment)

Course schedule (subject to change)

Week #	Topic & contents	CO Addressed	Teaching Learning Activity (TLA)
Weeks 1	Vehicle Classification and Layouts	CO-1,2	Lecture , chalk and talk , PPT
Weeks 2	Performance of Vehicle	CO-2	Lecture
Week 3	Frames & Body	CO-3,1	Lecture , chalk and talk , PPT
Week 4	Clutch	CO-1,3	Lecture
Week 5	Clutch, Transmission System	CO-1,3	Lecture
Week 6	Transmission System	CO-1,4	Lecture , chalk and talk , PPT
Week 7	Drive Line and Axles	CO-1,3	Lecture
Week 8	Drive Line and Axles	CO-1,4	Lecture , chalk and talk , PPT
Week 9	Wheels and Tyres	CO-1,4	Lecture
Week 10	Brakes	CO-1,3	Lecture
Week 11	Steering System	CO-1,4	Lecture , chalk and talk , PPT
Week 12	Suspension System	CO-1,4	Lecture

Program Map

B.TECH MECHANICAL ENGINEERING (2019)

