

# WIT WIL- TEACHING LEARNING METHOD

**WIT** – WHY AM I TEACHING

WHAT I AM TEACHING

**WIL** – WHY AM I LEARNING

WHAT I AM LEARNING

**SCENRIO** – Road Accidents

&

Vehicle Robbery

**VNR Vignana Jyothi Institute of Engineering &  
Technology  
Department of Automobile Engineering**

**AUTOMOTIVE INFOTRONICS  
(5AE75)**

**By**

**D.Suresh**

**Assistant Professor**

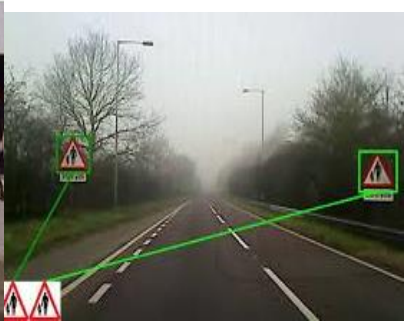
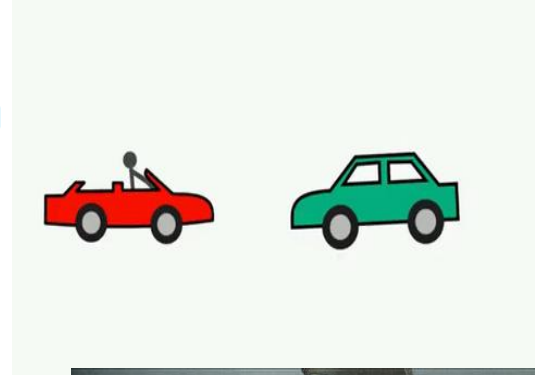
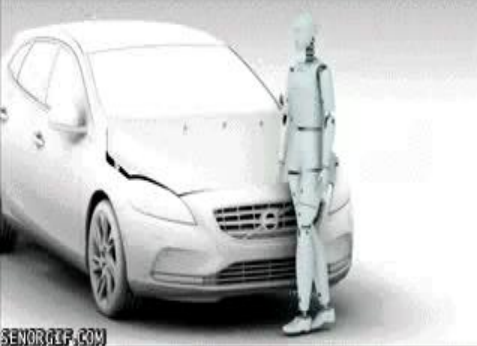
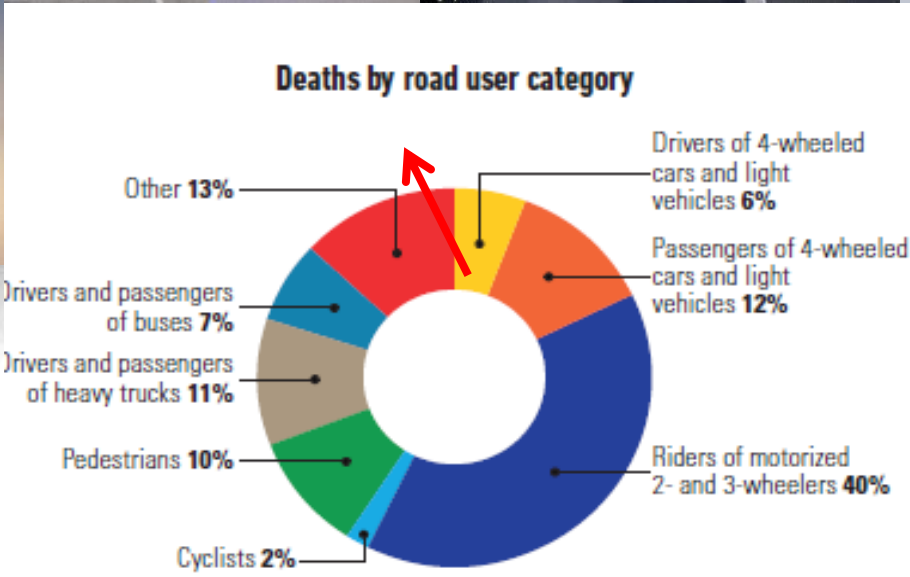
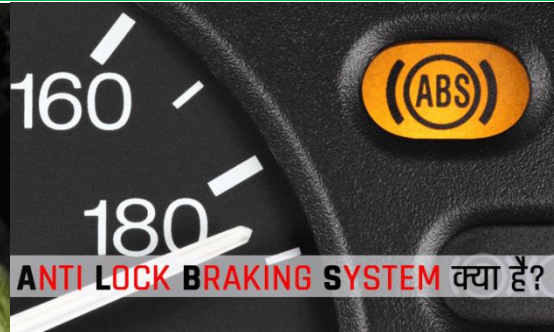
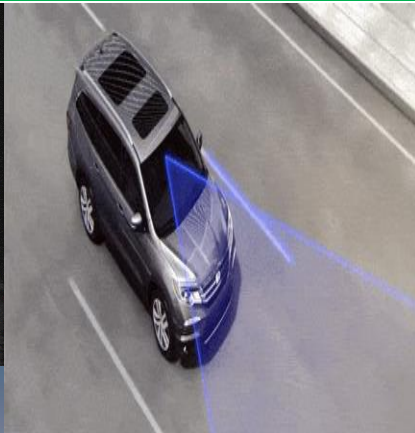
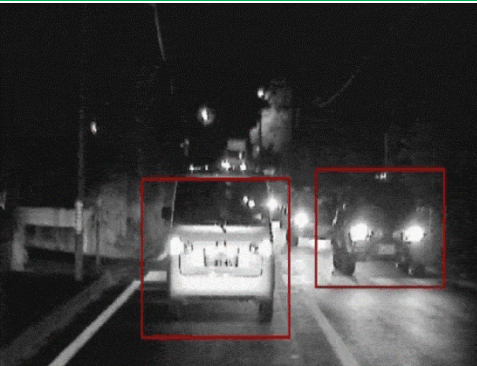
**Department of Automobile Engineering**

**VNR VJiet**

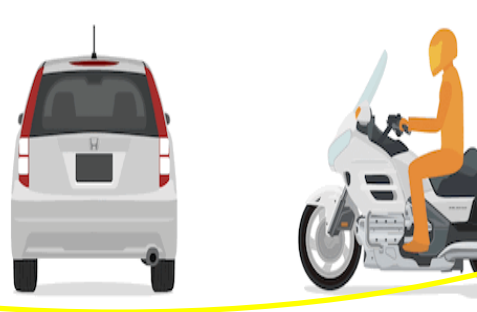
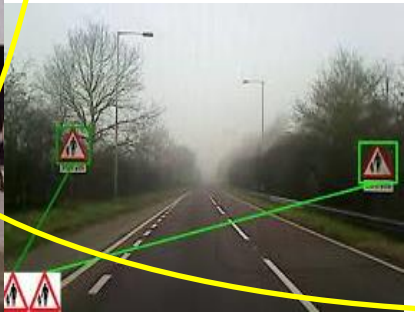
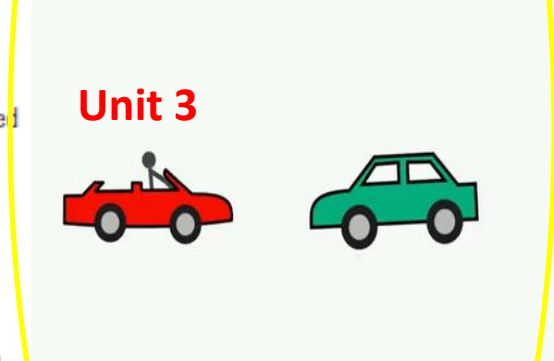
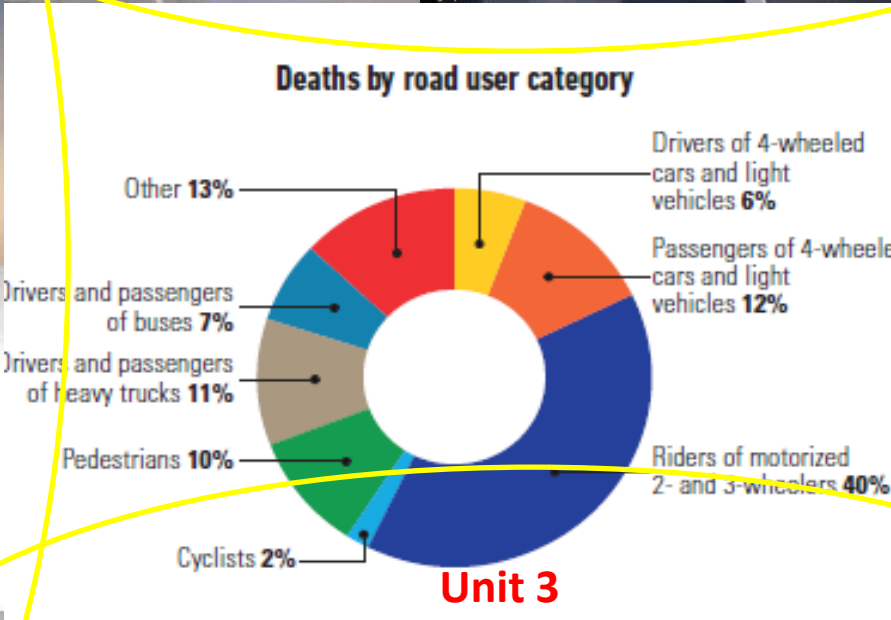
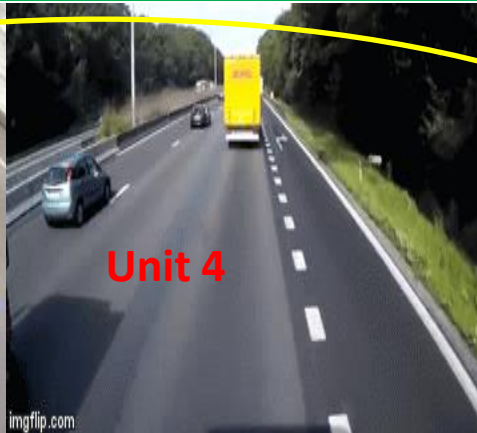
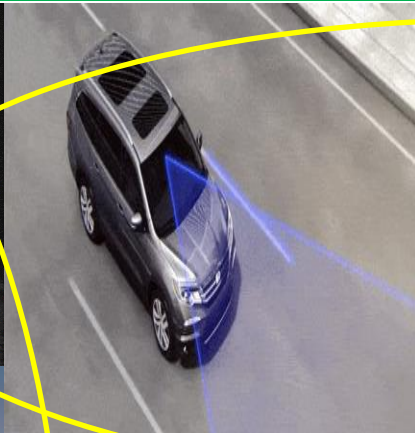
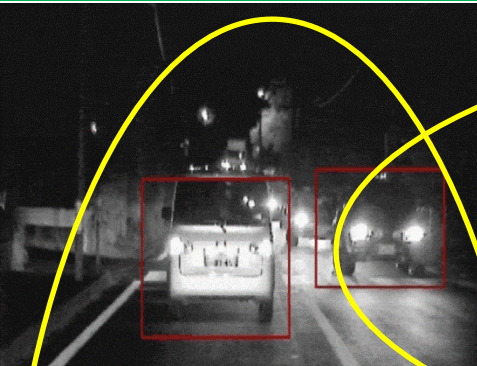
**[suresh\\_d@vnrvjiet.in](mailto:suresh_d@vnrvjiet.in)**

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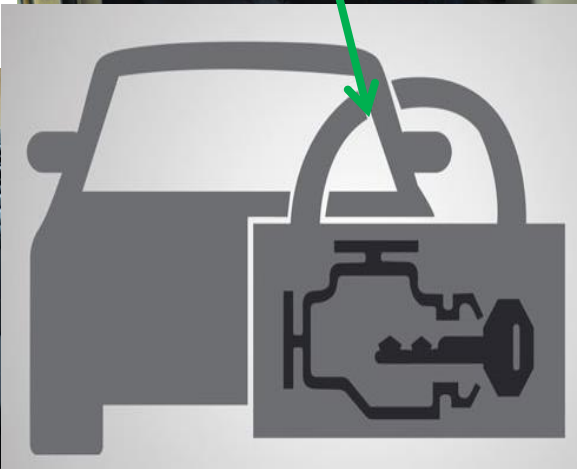
# SCENARIO: ROAD ACCIDENTS



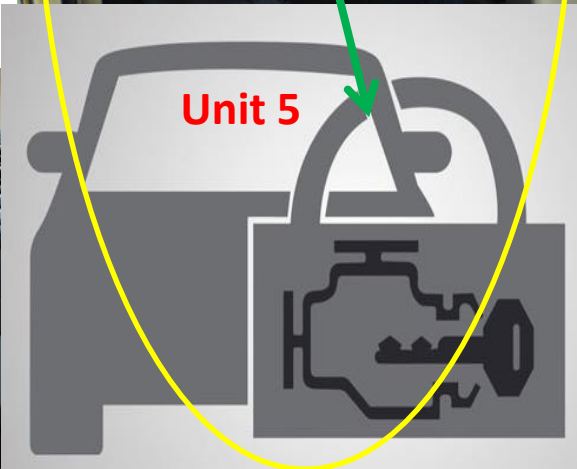
# SCENARIO: ROAD ACCIDENTS



# SCENARIO: Vehicle Robbery



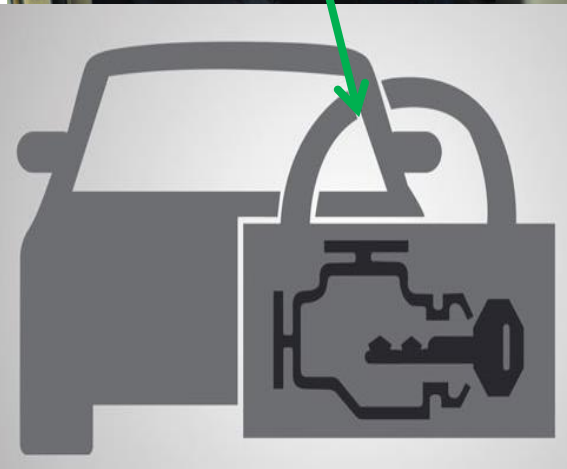
# SCENARIO: Vehicle Robbery



**VNR Vignana Jyothi Institute of Engineering &  
Technology  
Department of Automobile Engineering**

**MODERN AUTOMOTIVE TECHNOLOGIES  
(5AE72)**

# SCENARIO: Vehicle Theft





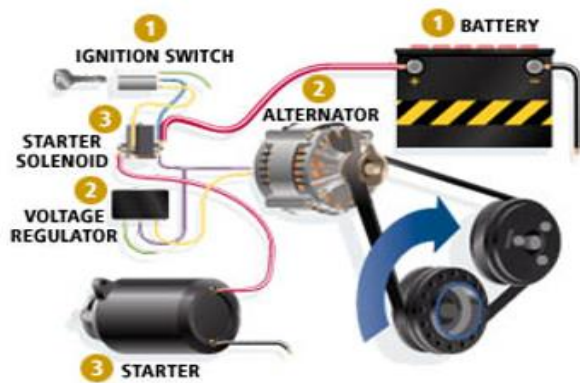
# Subject: Automotive Electrical and Electronics

III Year II Semester Automobile Engineering

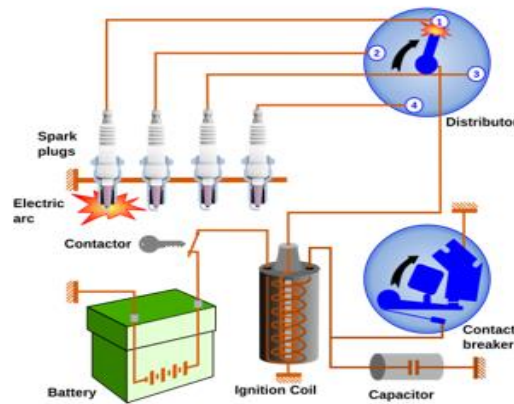
Why am I Teaching? - What I am Teaching?

## The Scenario

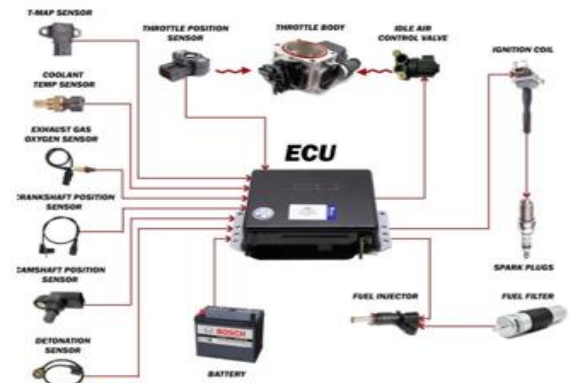
### Electrical and Electronic Systems in a Car



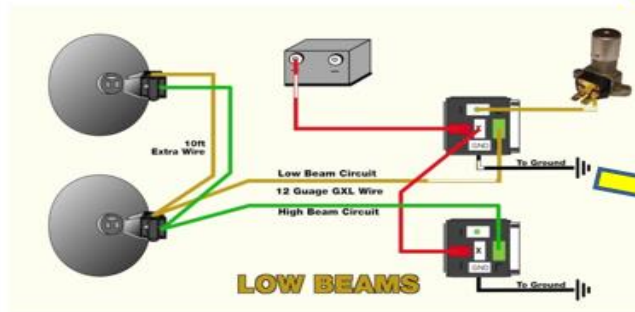
Starting and Charging System



Ignition System

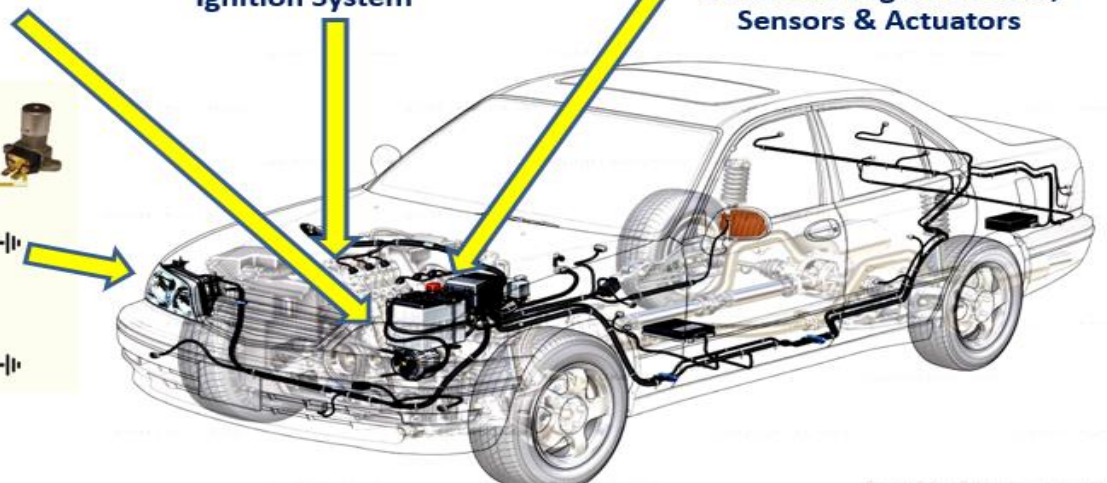


Electronic Engine Control, Sensors & Actuators



LOW BEAMS

Lighting System



## SCENARIO DESCRIPTION

The course "Automotive Electrical and Electronics" (5AE05) has been taught to III year I semester B.Tech. Automobile Engineering students. This course mainly deals with electrical and electronic systems like starting system, charging system, ignition system, lighting system and fuel injection system in an automobile. The scenario for this course is "Electrical and Electronic Systems in a Car". For starting a car engine, an electric motor is required along with starter drive mechanism to engage and disengage the engine flywheel with motor pinion. Battery support this starting system by supplying the electrical energy stored in it. Alternator coupled to the engine help to charge the battery and also for lighting and accessories. In modern cars, more electronics are involved with intelligent and control units. Systems like electronic fuel injection and ignition takes the help of various sensor for sensing parameters/requirements and actuators for metering correct amount of fuel and timing ignition. ECU is brain for these systems by taking inputs from various sensors and actuation by actuators, finally car performance and low emission is the outcome.

- Unit I deals with different types of rechargeable batteries used in automobiles, chemical reactions, performance rating, tests and maintenance techniques in detail. This unit also describes the construction of electric motor and drive mechanisms for engine starting.
- Unit II discusses conventional and electronic ignition system of petrol car along with significance of ignition timing, spark advancing and retarding mechanisms.
- Unit III explains the necessity of charging system, construction and working of components in it like alternator, cut-out and regulator. This unit also outlines the lighting system and accessories for safer running of a car.
- Unit IV explores various sensor and actuators used in modern car engine for optimum performance and minimum exhaust emissions. This unit mainly focuses on the principle, working and application of sensors and actuators in a vehicle.
- UNIT V discloses the electronic systems in a modern car like electronic fuel injection for metering of fuel, electronic ignition for timing of spark, engine mapping for optimum performance and low exhaust emissions and OBD for diagnosing and troubleshooting.

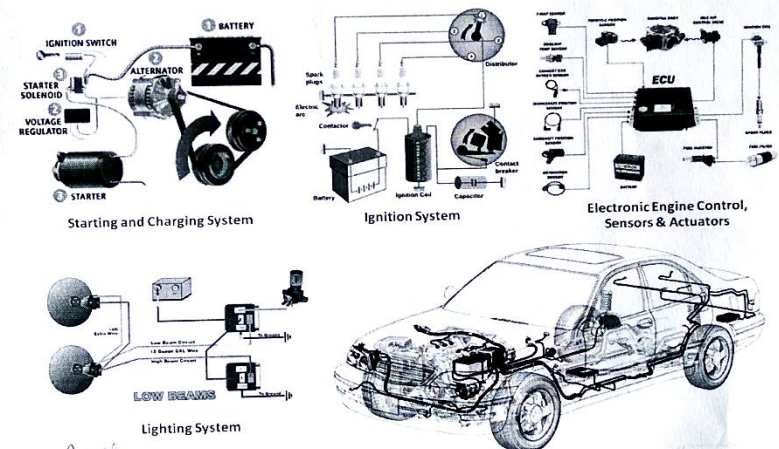
## ENDORSEMENT

### Industrial Endorsement

This is to endorse that the following WIT & WIL scenario titled "Electrical and Electronic systems in a Car" can be used as a teaching-learning methodology for the subject titled "Automotive Electrical and Electronics" for the students of B.Tech. III Year (Automobile Engineering).

WIT & WIL Methodology is a teaching-learning process of VNR Vignana Jyothi Institute of Engineering and Technology, Hyderabad which would aim to bridge the gap between institutional academic systems and industry requirements. The definition of "WIT & WIL" method explained as an active methodology of teaching and learning activity with "Why am I Teaching & What I am Teaching" from Teacher's perspective. From student's perspective, it is "Why am I Learning & What I am Learning".

### Scenario: Electrical and Electronic Systems in a Car



Signature with stamp

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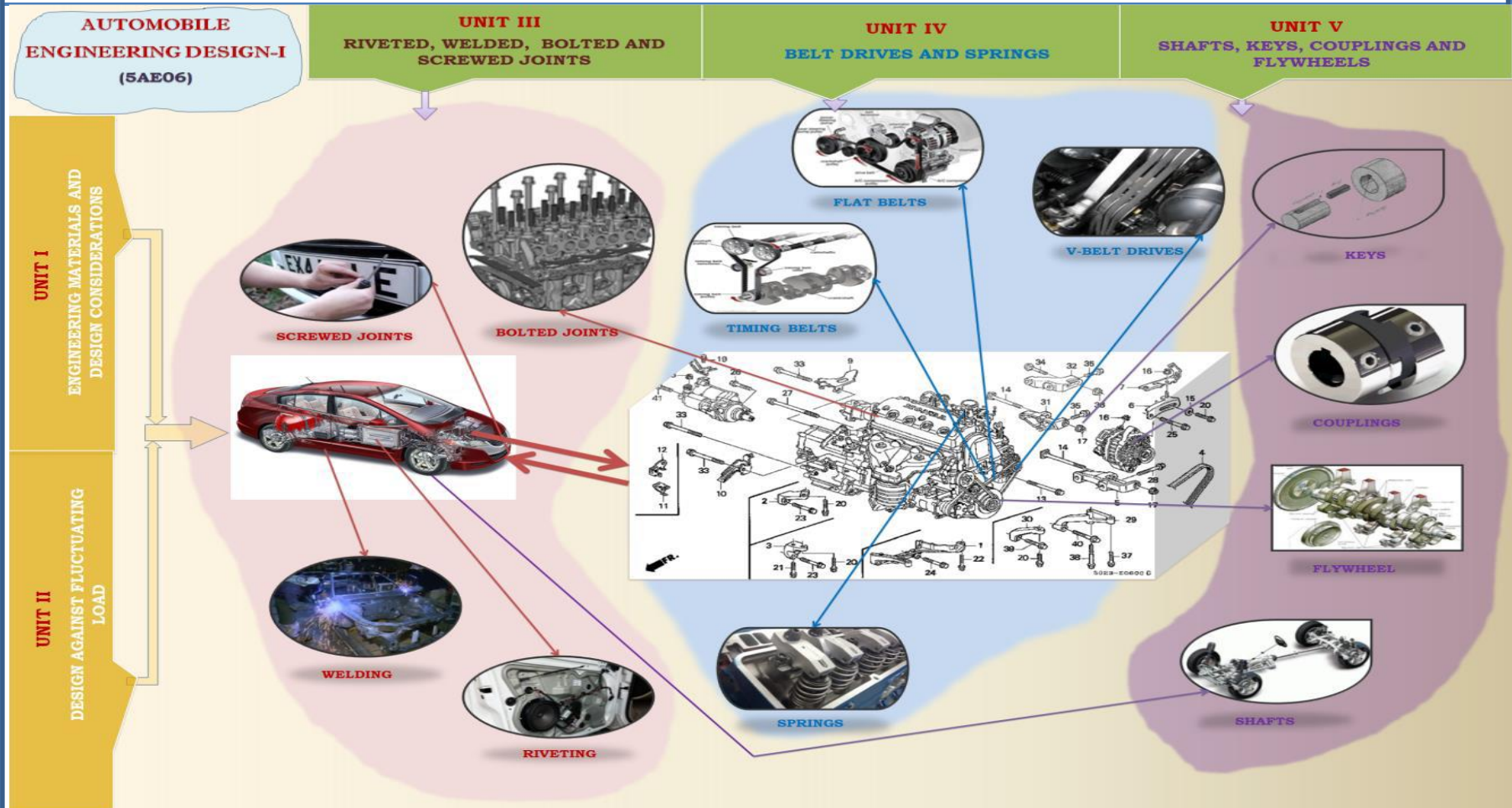
# Subject: Automobile Engineering Design - I

III Year I Semester Automobile Engineering

Why am I Teaching? - What I am Teaching?

## The Scenario

### DESIGNING OF AUTOMOBILE COMPONENTS



## SCENARIO DESCRIPTION

One of the driving forces in development is that of creativity and perfection. In this course, students will learn the fundamental aspects which are required in the world of entrepreneurship. This course is central to developing student's ability to analyze, design and/or select machine elements and therefore involves economic, societal, safety and manufacturing aspects. In addition to technological considerations, the team projects help develop the ability to work in teams, address open-ended engineering problems and written communication via reporting the results.

Various joints in the Automobile like bolted joints, Riveted Joints and Weld joints are designed by basic principles discussed in this course.

A shaft is a rotating member usually of circular cross-section (solid or hollow), which transmits power and rotational motion. Automobile elements such as gears, pulleys (sheaves), flywheels, clutches, and sprockets are mounted on the shaft and are used to transmit power from the engine through a machine.

Press fit, keys, dowel, pins and splines are used to attach these machine elements on the shaft. The shaft rotates on rolling contact bearings or bush bearings. Various types of retaining rings, thrust bearings, grooves and steps in the shaft are used to take up axial loads and locate the rotating elements. Couplings are used to transmit power from drive shaft (e.g., motor) to the driven shaft (e.g. gearbox, wheels).

Springs are fundamental mechanical components which form the basis of many mechanical systems. A spring can be defined to be an elastic member which exerts a resisting force when its shape is changed. Most springs are assumed linear and obey Hooke's Law. In this current scenario various springs are designed for automobile applications like suspension.

A belt is a looped strip of flexible material used to mechanically link two or more rotating shafts. A belt drive offers smooth transmission of power between shafts at a considerable distance. Belt drives are used as the source of motion to transfer, to efficiently transmit power or to track relative movement.

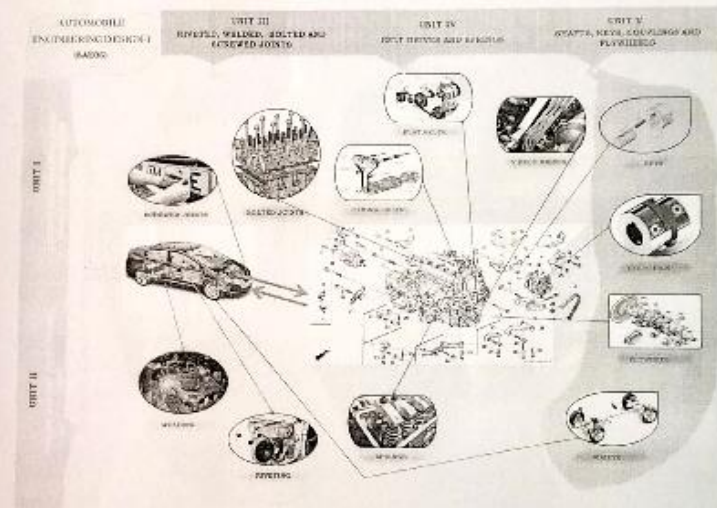
## ENDORSEMENT

### Industry Endorsement

This is to endorse that the following WIT & WIL scenario titled "Designing of Automobile components – WIT & WIL Scenario" can be used as a teaching-learning methodology for the subject titled "Automobile Engineering Design-I" for the students of III B.Tech I Sem. Automobile Engineering.

WIT & WIL Methodology is a teaching-learning process of VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY, which would aim to bridge the gap between institutional academic systems and industry requirements. The definition of "WIT & WIL" method explained as an active methodology of teaching and learning activity with "Why am I Teaching & What I am Teaching" from Teacher's perspective. From student's perspective, it is "Why am I Learning & What I am Learning".

### Scenario – Designing of Automobile components Subject: Automobile Engineering Design-I



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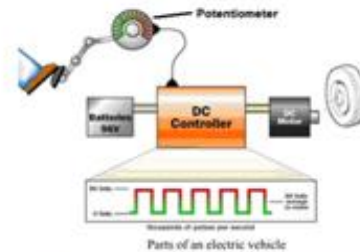
# Subject: Electric and Hybrid Electric Vehicle

IV Year I Semester Automobile Engineering

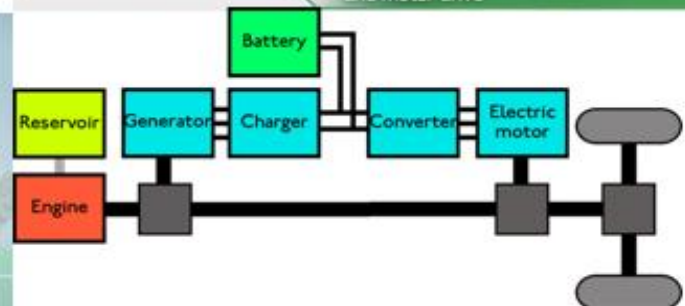
Why am I Teaching? - What I am Teaching?

## The Scenario

### Electric and Hybrid Electric Vehicle



## Electric and Hybrid Vehicles



## SCENARIO DESCRIPTION

A hybrid electric vehicle (HEV) is a type of hybrid vehicle that combines a conventional internal combustion engine (ICE) system with an electric propulsion system. The presence of the electric power train is intended to achieve either better fuel economy than a conventional vehicle or better performance. There is a variety of HEV types and the degree to which each function as an electric vehicle (EV) also varies. Modern HEVs make use of efficiency-improving technologies such as regenerative brakes which convert the vehicle's kinetic energy to electric energy to charge the battery.

An electric vehicle may be powered through a collector system by electricity from off-vehicle sources or may be self-contained with a battery, solar panels or an electric generator to convert fuel to electricity. EVs first came into existence in the mid-19th century, when electricity was among the preferred methods for motor vehicle propulsion, providing a level of comfort and ease of operation that could not be achieved by the gasoline cars of the time. Modern internal combustion engines have been the dominant propulsion method for motor vehicles for almost 100 years, but electric power has remained commonplace in other vehicle types, such as trains and smaller vehicles of all types.

The flexibility of PHEVs allows drivers to use electricity as often as possible while also being able to fuel up with gasoline if needed. Powering the vehicle with electricity from the grid reduces fuel costs, cuts petroleum consumption, and reduces tailpipe emissions compared with conventional vehicles. When driving distances are longer than the all-electric range, PHEVs act like hybrid electric vehicles, consuming less fuel and producing fewer emissions than similar conventional vehicles. Depending on the model, the internal combustion engine may also power the vehicle at other times, such as during rapid acceleration or when using heating or air conditioning. PHEVs could also use hydrogen in a fuel cell, bio fuels, or other alternative fuels as a back-up instead of gasoline.

## ENDORSEMENT

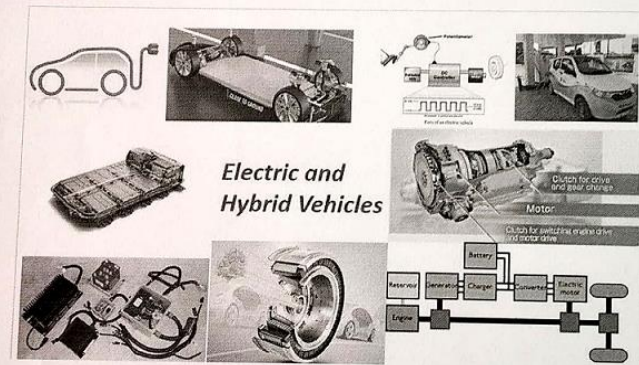
### Industrial Endorsement

This is to ensure that the following WIT & WIL, scenario titled "Alternate power train" can be used as a teaching-learning methodology for the subject titled "Electric and Hybrid vehicles" for B.Tech IV year I Semester of Automobile Engineering. The applications mentioned in the scenario are very much related to the subject and the concepts are fittingly used in the field as well.

WIT & WIL is a teaching – learning methodology developed by VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING & TECHNOLOGY, which aims at bridging the gap between institutional academic systems and industrial applications.

**WIT & WIL** – "Why am I teaching What I am teaching? & Why am I learning What I am learning?" is defined as an active methodology of teaching and learning with "Why am I teaching What I am teaching?" from teacher's perspective and "Why am I learning what I am learning?" "From learner's /student's perspective.

#### SCENARIO



*Koti Jeevith*

Signature / Stamp of Endorsing Industry

KOTI JEEVITH  
ZF PRODUCTION SYSTEMS &  
MANUFACTURING ENGINEER  
C/o ZF HERO CHASSIS SYSTEMS PVT.LTD.  
ORAGADAN, CHENNAI -  
TAMIL NADU  
INDIA.

# CAD/CAM

(Common to AE, ME)

(Why am I Teaching? - What I am Teaching?)

## The Scenario

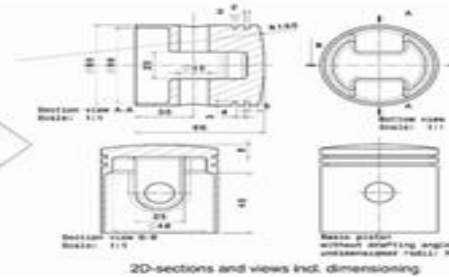
### Computer Aided Design and Manufacturing of Industrial Components



#### WHY AM I TEACHING CAD/CAM



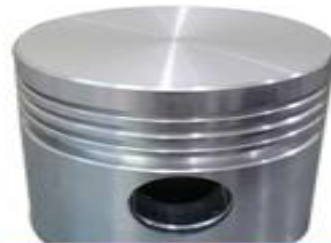
3D-CAD model



2D-sections and views incl. dimensioning



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#### Computer Aided Process Planning (CAPP)



## SCENARIO DESCRIPTION

CAD/CAM (computer-aided design and computer-aided manufacturing) refers to computer software that is used to both design and manufacture products. CAD is the use of computer technology for design and design documentation. CAD/CAM applications are used to both design a product and program manufacturing processes, specifically, CNC machining. CAM software uses the models and assemblies created in CAD software to generate tool paths that drive the machines that turn the designs into physical parts.

The application of computers in manufacturing has been to direct, monitor and control the processes as well as support the various functions of the operations. Computers are being applied in all aspects of manufacturing such as design and drafting, engineering, manufacturing, process planning, tool design, material requirement planning, scheduling, etc.

Major developments in computer hardware and software are directly driving these applications to greater extent. The conventional product cycle involves a number of interlinked operations. Computer aided design deals with all the operations that deal with the development of the product. A number of advantages are gained by the use of computers in the design process. Using CAD reduces a number of unwanted repetitive operations, at the same time improving the accuracy, reducing the developmental time and cost.

Computerized manufacturing is involved in all these types of operations. A number of benefits can be achieved by the use of computer aided manufacturing. Understanding the concepts of computer aided part programming using G and M codes as universal programming system used for large range of machine tools

Understand the need for group technology (GT) bringing the benefits of mass production to the relatively smaller production that is required in a majority of the present day manufacturing industries. The use of the computers for quality control of the product is called as the computer aided quality control or CAQC. Computer Integrated Manufacturing tries to link all the operations that are used in manufacturing such that the information is shared between all the operations. This would mean the reduction of waste leading to lean manufacturing.

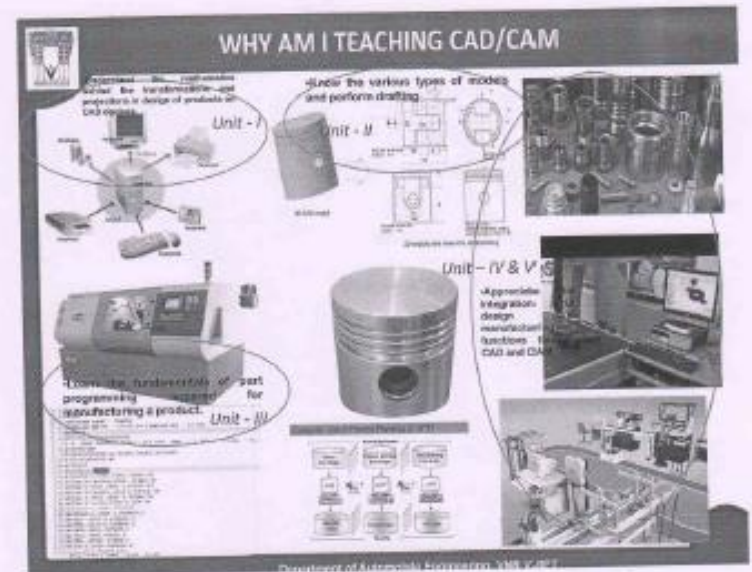
## ENDORSEMENT

### Industry Endorsement

This is to endorse that the following WIT & WIL scenario titled "**Computer Aided Design and Manufacturing of Industrial Components**" can be used as a teaching-learning methodology for the subject titled "CAD/CAM" for the students of IV B.Tech I Semester Automobile Engineering.

WIT & WIL Methodology is a teaching-learning process of VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY, which would aim to bridge the gap between institutional academic systems and industry requirements. The definition of "WIT & WIL" method explained as an active methodology of teaching and learning activity with "Why am I Teaching & What I am Teaching" from Teacher's perspective. From student's perspective, it is "Why am I Learning & What I am Learning".

### SCENARIO



*Handwritten signature:* P. P. Kishore  
G4, Tech4 - JES

Signature with stamp of Endorsing Industry



**Feedback form:**

<https://forms.gle/UK72Di9DGskxnHPW6>

**For more details contact:**

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