

# DIYguru Education & Research Private Limited

## PROGRAM PROSPECTUS

AUTOMOTIVE ROBOTICS AEROSPACE 3D PRINTING PYTHON FOR MECHANICAL ENGINEERING MATLAB FUNDAMENTAL CERTIFICATION COURSE MOTORCYCLE EN  
GINEERING ELECTRIC VEHICLE ENGINEERING SOLIDWORKS DRAFTING ASSEMBLY AND SIMULATION COURSE AUTOMOTIVE SKETCHING AND DRAWING COURSE  
VEHICLE DYNAMICS CERTIFICATION COURSE BSVI EMISSION NORMS AND CONTROL STRATEGIES BATTERY MANAGEMENT SYSTEM COURSE SUSPENSION ANALY  
SIS COURSE CATIA COUMPUTER AIDED DESIGN AND DRAFTING COURSE ADVANCECOURSE IN ELECTRIC VEHICLE DESIGN ENGINEERING MULTIBODY DYNAMICSC  
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## About DIYguru

DIYguru, is Gurugram based company, managed by brilliant passionate team of IITians & MBA professionals. Imparting On-line training as well as classroom training. DIYguru, started operation in 2014, from one training center in Delhi, has now operating 9 training centers in 6 challenging cities ( Delhi, Pune, Hyderabad, Vizag, Bangluru, and Chennai).

Currently having capacity to training appx 10,000 students in a year. On-line training courses on trending technologies by DIYguru is most popular, and even students from overseas (UAE, Germany, South Africa, France, Brazil etc) has done the course. Just in 6 years operations, DIY Guru has trained approximately 50,000 students till now. For course enquiry approximately 15,000 students show interest monthly and visit DIYguru website.





## Programs @ DIYguru

Electric Vehicle Certification Course

Advanced Course in Electric Vehicle Design Engineering

SOLIDWORKS- Drafting, Assembly & Simulation Course

Automotive Sketching and Drawing Course

Vehicle Dynamics Certification Course

Suspension Analysis Course

CATIA - Computer Aided Design and Drafting Course

Multibody Dynamics Certification Course

ANSYS - (FEA/FEM) | Nanodegree Course

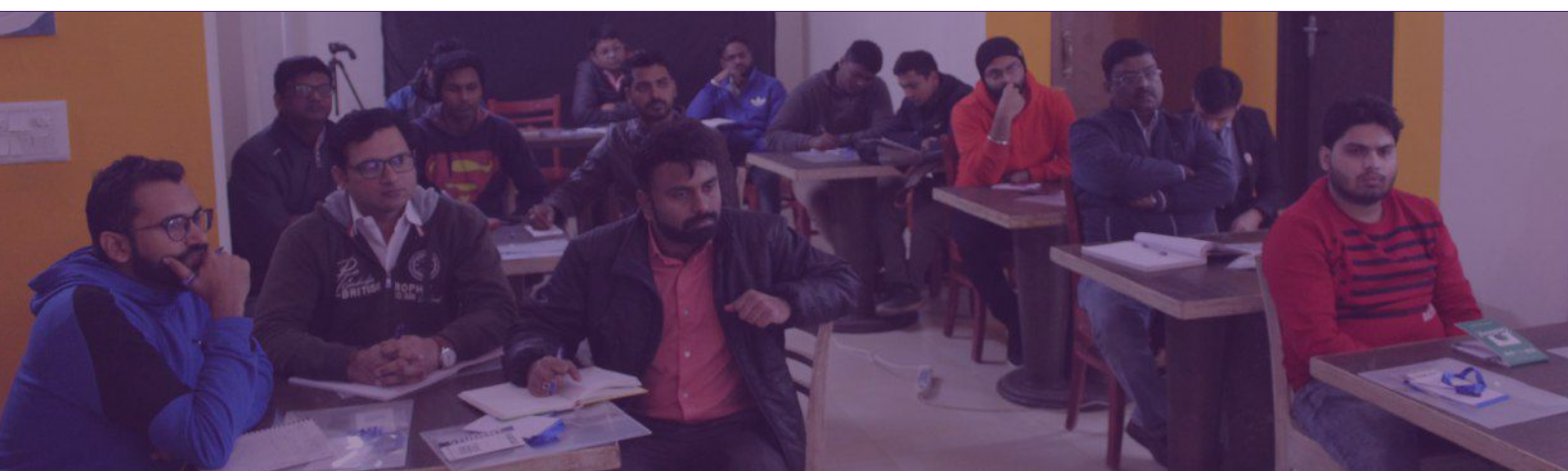
Business Opportunities in EV

LabVIEW - Industrial Application | Online Course

Car Repair and Maintenance Certification Course

MATLAB Fundamentals Certification Course

BS-VI Emission Norms and Control Strategies | Certification Course



Nano  
Degree Program

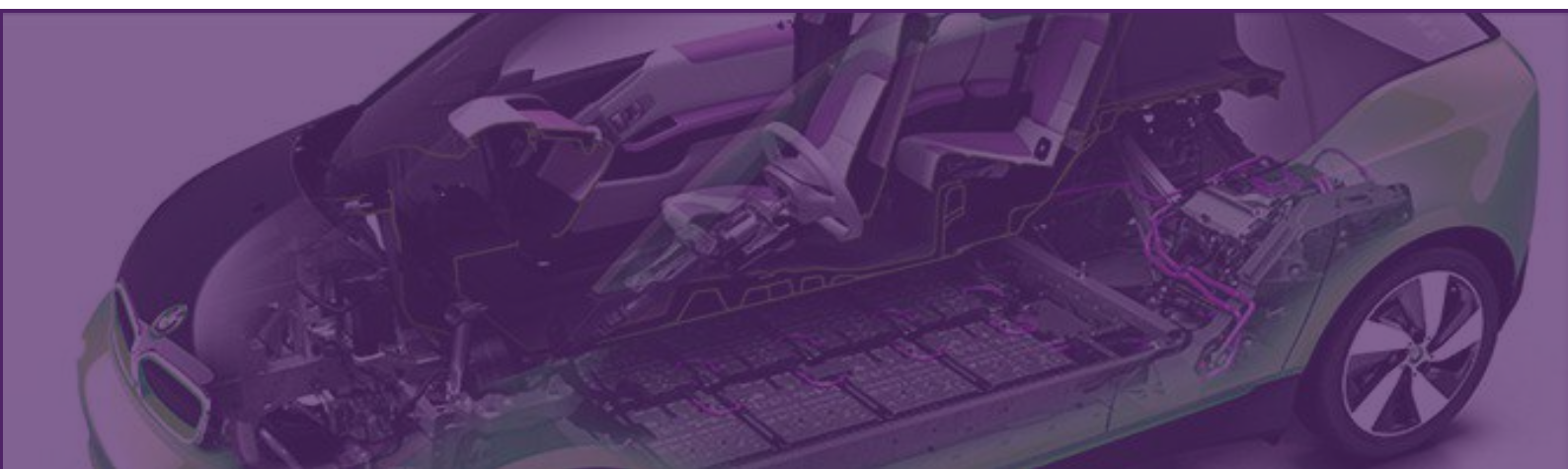
# Electric Vehicle Engineering





The electrical vehicle certification course is a Workshop Integrated Learning Programme designed for students and corporates aspire to work or working in automotive, auto-component, design and manufacturing sector and aim to develop the required skills to build and sustain future automobiles.

This program enables the engineering professionals working in manufacturing, design, analysis, support and allied areas in automotive-related fields to gain knowledge and expertise in Vehicle dynamics, Architecture, Motor Design, Ergonomics, Battery Technology to help in designing, building, testing and sustaining future automotive systems using Ev technologies.



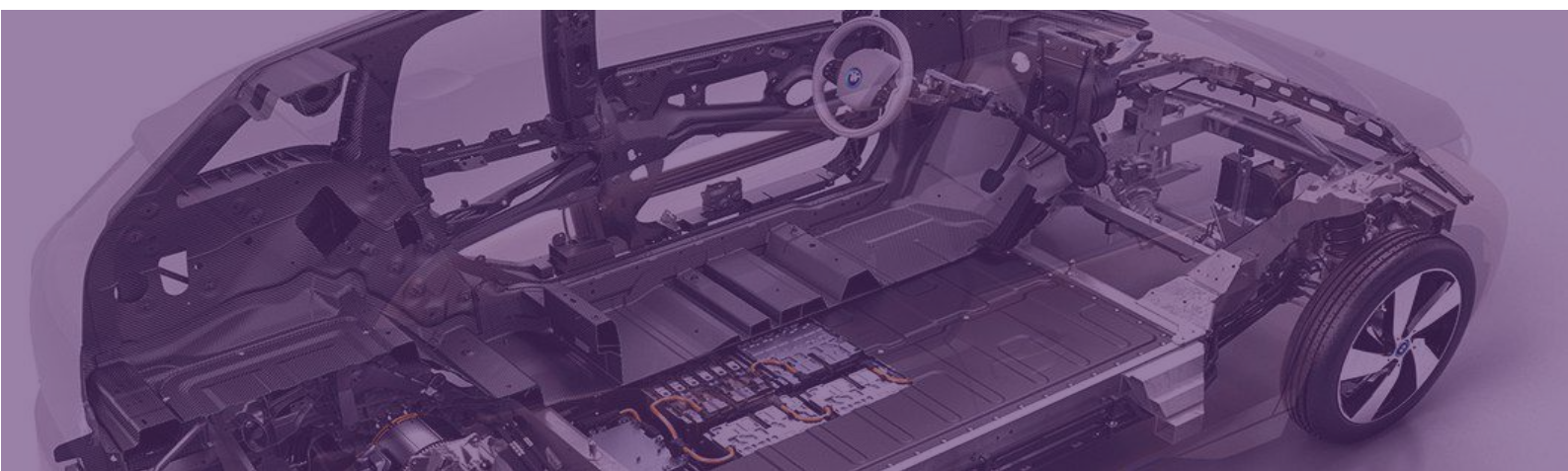
## What are the program objectives?

The programme tends to equip students and professionals with multidisciplinary expertise and increase the practical exposure with the tools and functioning of the Electric vehicle via small workshop prototypes.

This program follows the practical approach of learning (PLA model) to educate and offer cutting edge training to prepare engineers for the future industry workforce demand.

## What are the main highlights of the program?

- Learn without a career break with online classes available 24\*7.
- One can access the course at their own pace, but with the investment of 3-5 hours/week, it can be finished within a month.
- After completing the online course one can attend the workshop at the preferred location within 90 days.
- The electrical vehicle certification course is a Workshop Integrated Learning Programme designed for students or professionals aspire to work or working in automotive, auto-component, design and manufacturing sector and aim to develop the required skills to build and sustain future automobiles.
- The programme has a special emphasis on concepts such as Vehicle dynamics, Architecture, Motor Design, Ergonomics and Battery Technology.
- The programme includes basic concepts required for developing an Electric Vehicle.
- The programme uses a Continuous Evaluation System that assesses the learners over convenient and regular intervals. Such a system provides timely and frequent feedback and helps busy working professionals stay on course with the programme.
- The education delivery method is a blend of classroom and experiential learning.
- Participants who will complete the programme become eligible for Mentorship and Placement help through our Job Fairs.



## Who should apply?

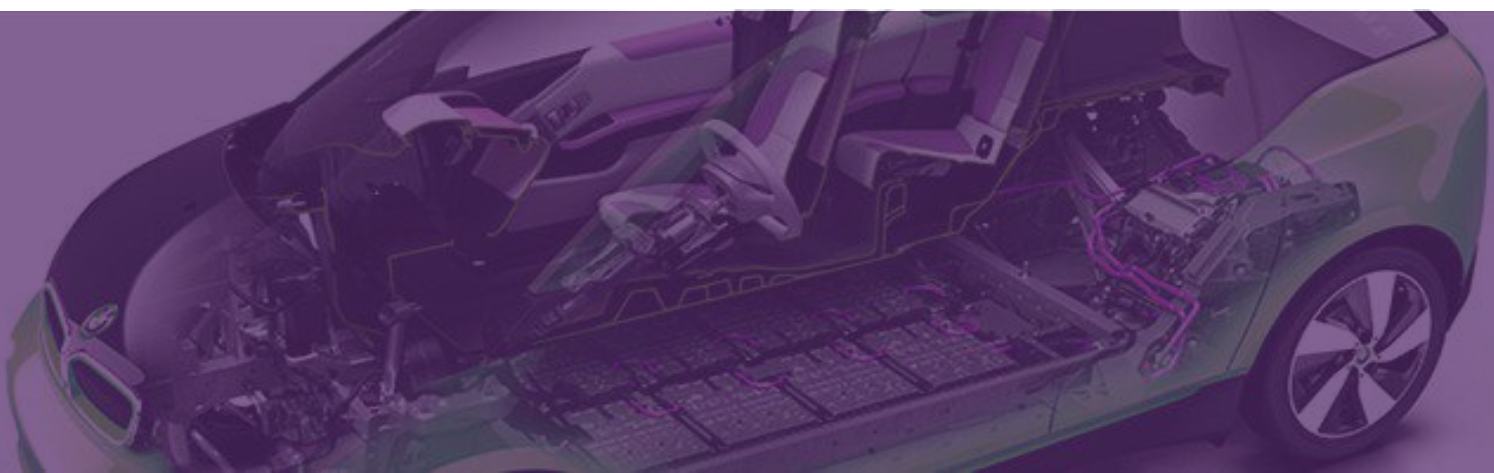
The programme is designed for students or professionals who are:

- Having a Diploma, BE / B.Tech or equivalent in domains such as Automotive, Mechanical, EEE, ECE, Instrumentation, Mechatronics.
- Automotive enthusiasts (No academic qualification mandatory)
- Working in industries such as Automotive, Auto component, Design, Manufacturing, etc
- Working in Functional areas such as R&D, Analysis, Maintenance, Projects, component design etc.
- Interested in pursuing further studies on the part-time or full-time basis in Automotive, Electrical, Electronics, and Mechanics sector.

## What are the Technical Requirements?

The programme to give its best will need following requirements:

- Computer/ Laptop will provide you with the best experience, but this program is quite compatible with smartphones to make it feasible for students worldwide.
- High-speed internet for crystal clear experience, but this program can also run without buffering with below-average connectivity for reaching out students from suburban and rural areas.
- A student should make their notes for future reference.
- A student should have basic knowledge about high-school physics and chemistry, even though the pre-requisite of this programme will brush up on one's basic concepts.



## What is the learning methodology?

The learning Methodology of this programme provides you with the most flexible learning environment possible. This programme is offered as a self-paced programme often referred to as asynchronous online programme which is time-independent, meaning that it can be accessed 24X7 within the tenure of 90 days. This programme can be accessed from multiple devices which make it easy to learn on the go.

Lectures that are pre-recorded or slide presentation with voice-over commentary, interactive discussion boxes that foster student to student interaction, Email communication with the instructor are part of this process. Downloadable educational tools such as e-books, research papers and government reports are made available at just one click. Three days of the instructor-led workshop is added to emphasize the practical approach of a student on programme relat-

## What are the learning outcomes?

- A student shall get to know about different modules of Electric Vehicles.
- A student shall understand the underlying concept behind Power Electronics & Battery Management System.
- A student shall understand the effects of external factors and assumptions taken for designing the vehicle and its power train.
- A student shall understand the mystery of chemistry within batteries.
- A student shall get mentored by Industry Experts.
- A student shall get project assistance.
- A student could get on request instructor-led hands-on workshop.
- A student shall get career mentorship in Electric / Green-tech fields.



## Online Course (90 Days)

### Basic

- Introduction
- History of EV
- Assumptions
- Basic Physics
- Know How of EVs
- Vehicle Ergonomics
- Electric Vehicle Modelling
- Electric Vehicle Powertrain Calculation

### Components

- Battery
- Motor
- Motor Controller
- Throttler
- Battery Management System
- Charger
- Charging Ports
- Converter, Inverter

### Vehicle Dynamics

- Acceleration
- Braking
- Suspension of EVs
- Steering of EVs
- Rollover Control
- Tyres
- Ride Comfort
- Dynamic Axle Loads

## Off-line Course (3 Days)

### Diagnosis

- Circuit Diagnosis
- Functionality of ECU(s)
- Circuit Diagram Reading
- Fault Detection

### Equipments

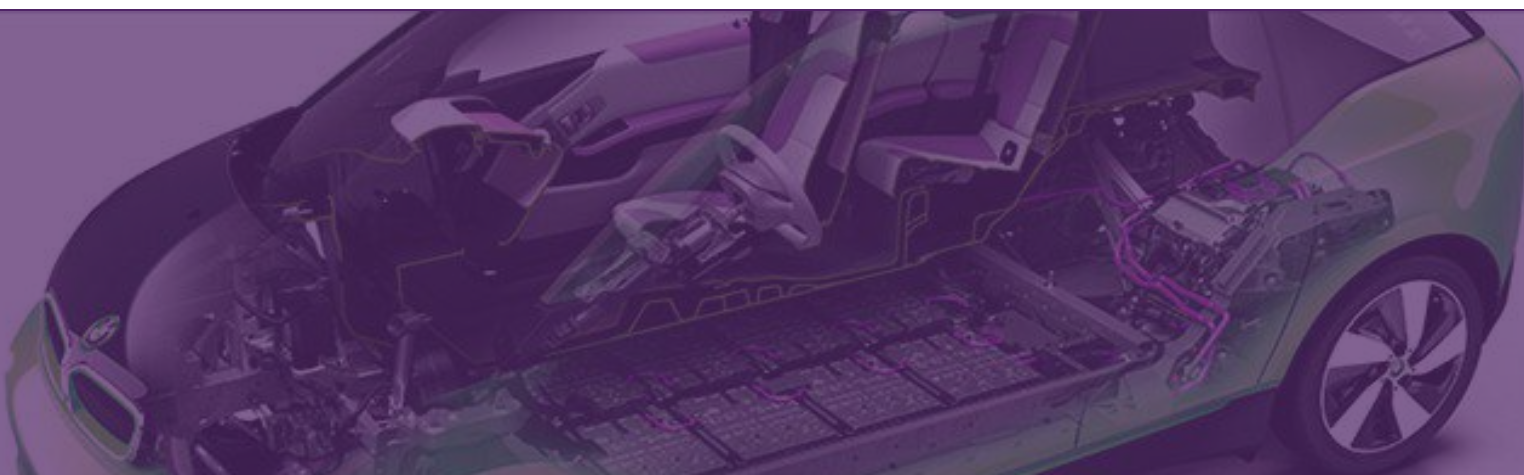
- Demonstration
- Safety Equipment
- Measurement
- Dissection

### Retrofitting Problem Statement

- Problem Statement
- Assumption
- Force Calculation
- Torque Calculation
- Battery Selection
- Battery Capacity Calculation
- Motor Power and Torque Calculation
- Motor Selection

### After Sales

- Best Maintenance Practices
- Owning Cost and Operational Cost
- Consumer Concerns
- Case Study



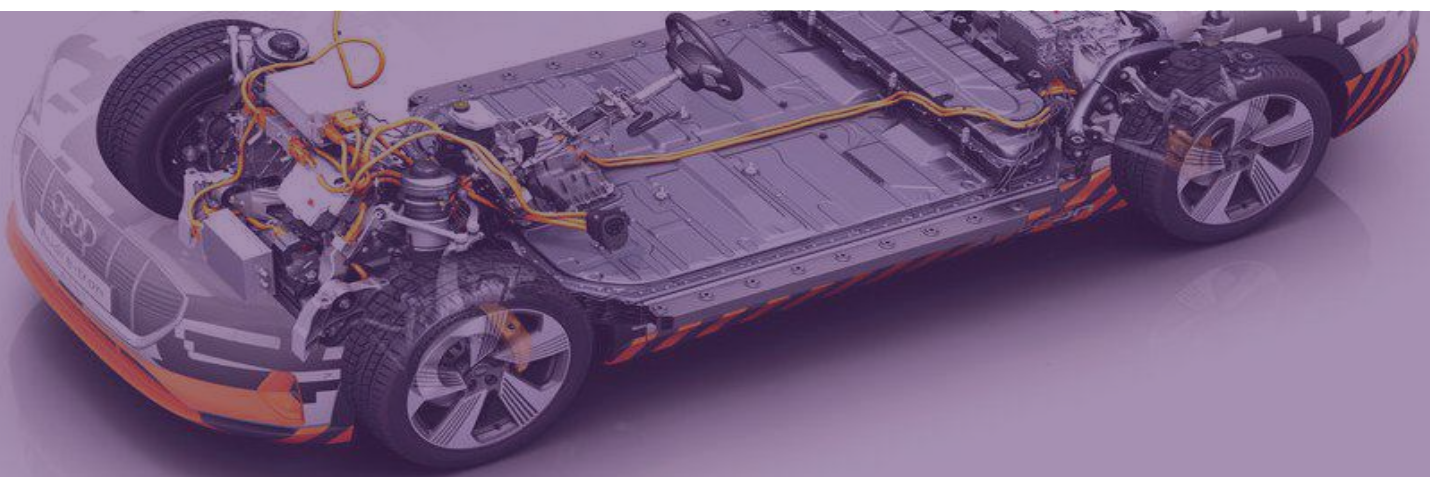
Nano  
Degree Program  
**ADVANCED COURSE  
IN ELECTRIC VEHICLE DESIGN  
ENGINEERING**





At this point it is difficult to reliably estimate the total job creation potential of electric vehicles. More electric vehicles, however, would also likely lead to some job losses in the oil industry. With that said, there is good reason to expect that electrification of personal transportation can drive job creation in a host of industries. More efficient automobiles require more technology, which are designed and produced by adding workers to the auto industry. Many of these jobs would be created in industrial sectors closely tied to auto manufacturing, advanced batteries, and research and development.

Moreover, electric vehicles are much cheaper to operate than conventional vehicles. Drivers who switch to electric vehicles will have more disposable income to spend in other sectors of the economy, such as housing and services. Spending in these sectors keeps more wealth moving within local economies and will drive job creation in sectors not immediately connected to producing electric vehicles.



## What are the program objectives?

The programme tends to equip students and professionals with multidisciplinary expertise and increase the practical exposure with the tools and functioning of the Electric vehicle .

This program follows the practical approach of learning (PLA model) to educate and offer cutting edge training to prepare engineers for the future industry workforce demand.

## What are the main highlights of the program?

- Learn without a career break with online classes available 24\*7.
- One can access the course at their own pace, but with the investment of 3-5 hours/week, it can be finished within a month.
- This program is designed in advanced level that can be understood only after the completion of Electric Vehicle Fundamental course
- The programme uses a Continuous Evaluation System that assesses the learners over convenient and regular intervals. Such a system provides timely and frequent feedback and helps busy working professionals stay on course with the programme.
- The education delivery method is a blend of classroom and experiential learning.
- Participants who will complete the programme become eligible for Mentorship and Placement help through our Job Fairs.



## Who should apply?

The programme is designed for students or professionals who are:

- Having a Diploma, BE / B.Tech or equivalent in domains such as Automotive, Mechanical, EEE, ECE, Instrumentation, Mechatronics.
- Designing enthusiasts (No academic qualification mandatory)
- Working in industries such as Automotive, Auto component, Design, Manufacturing, etc
- Working in Functional areas such as R&D, Analysis, Maintenance, Projects, component design etc.
- Interested in pursuing further studies on the part-time or full-time basis in Automotive, Electrical, Electronics, and Mechanics sector.

## What are the Technical Requirements?

The programme to give its best will need following requirements:

- Computer/ Laptop will provide you with the best experience, but this program is quite compatible with smartphones to make it feasible for students worldwide.
- High-speed internet for crystal clear experience, but this program can also run without buffering with below-average connectivity for reaching out students from suburban and rural areas.
- A student should make their notes for future reference.
- A student should have basic knowledge about high-school physics and chemistry, even though the pre-requisite of this programme will brush up one's basic concepts.



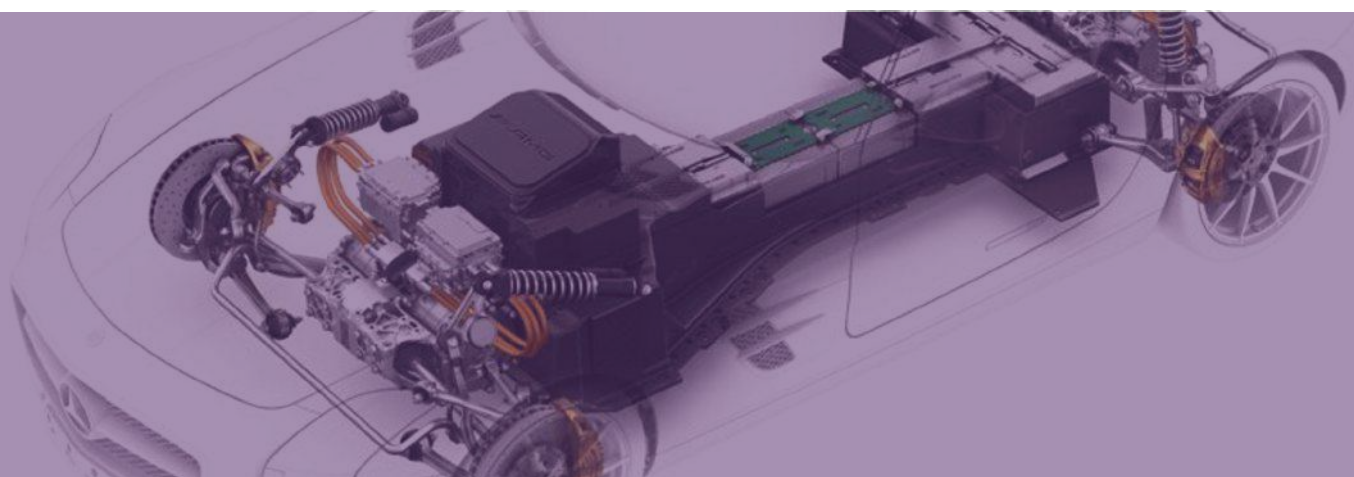
## What is the learning methodology?

DIYguru presents a Nano-degree program on Advance Course in Electric Vehicle Engineering. This program provides you with the most flexible learning environment possible. This program is offered as a self-paced program often referred to as asynchronous online program which is time independent, meaning that it can be accessed 24X7 within the tenure of 90 days. This program can be accessed from multiple devices which make it easy to learn on the go.

Lectures that are pre-recorded or slide presentation with voice-over commentary, interactive discussion boxes that foster student to student interaction, Email communication with the instructor are part of this process. Downloadable educational tools such as e-books, research papers and government reports are made available at just one click.

## What are the learning outcomes?

- To develop learn and apply new theories, concepts and methods.
- To critically evaluate, model and test the operation of electrical systems and components for automotive applications.
- Demonstrate a thorough understanding of electrical power conversion and power flow.
- To analyze the degradation mechanisms and ageing process of the automotive electrical and electronics systems.
- Awareness of current standard and specifications of the on board electronics and networking system. To design and assess systems and components.
- Conduct rigorous and ethical research / formal enquiry into related issues that require familiarity with a range of research sources and appropriate methodologies.
- To demonstrate awareness and ability to critically evaluate risks, including health and safety when conducting design and tests.



# Program Structure

Introduction and Explanation of Parameters of EV Transmission System

Explanation and Theoretical Calculations of EV at Different Conditions

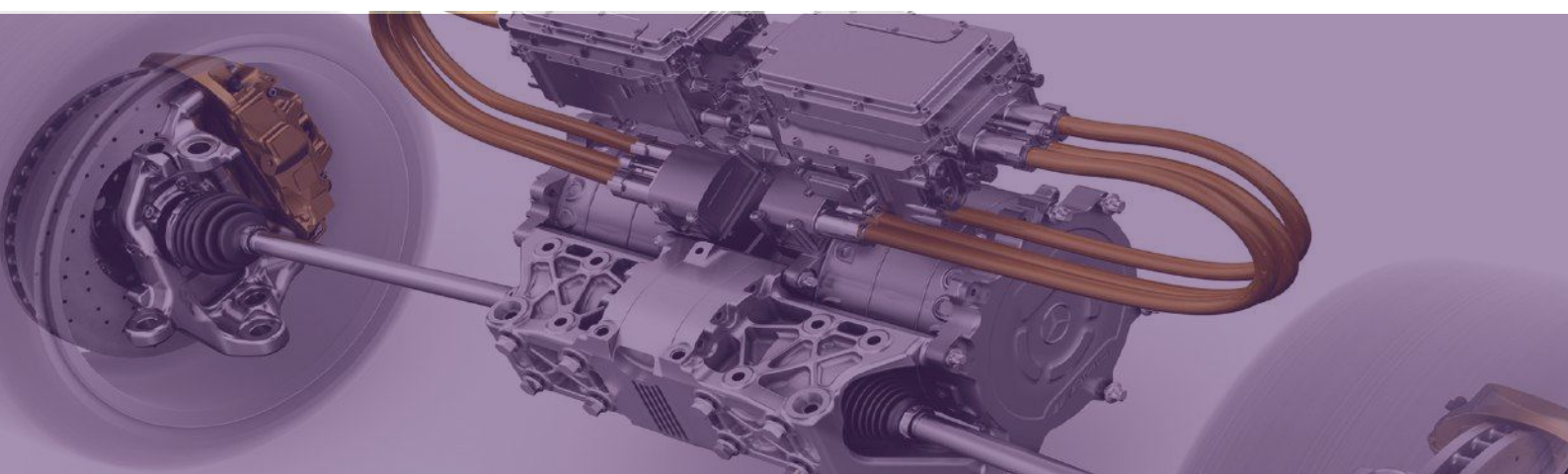
Different Variants and its Calculations of EV Transmission System

Selection of Battery , Range Calculation & C Rating

BMS Battery

Motors and Controller

Internal Structure



Nano  
Degree Program

# SOLIDWORKS

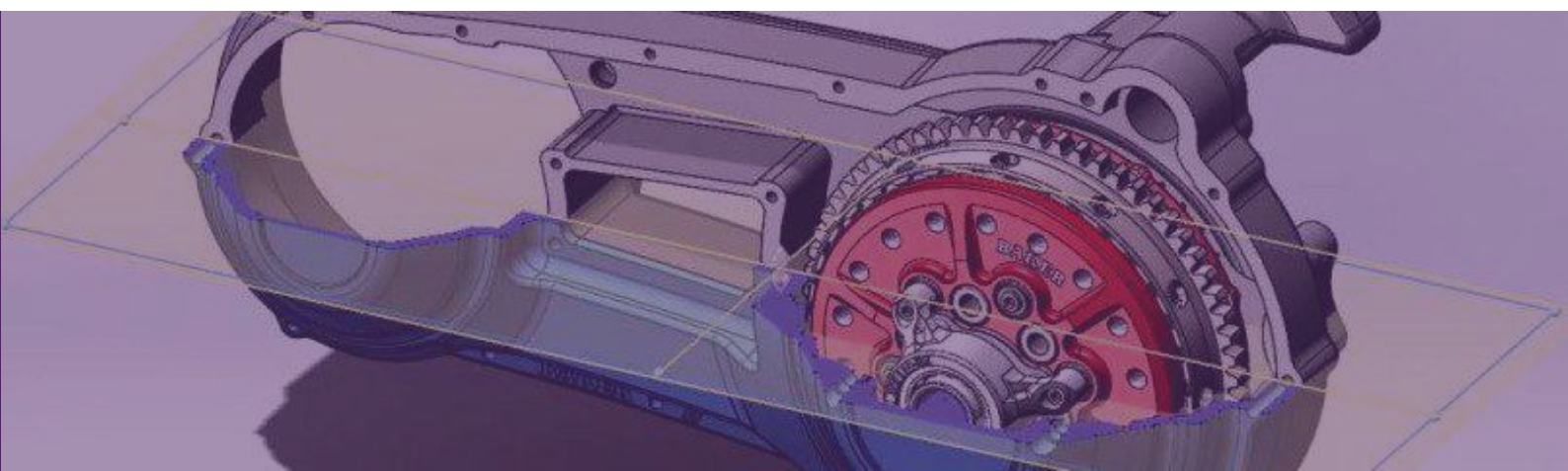
Drafting, Assembly and Simulation





The global computer-aided design (CAD) software market was valued at \$8,325.0 million in 2017 and is predicted to progress at a CAGR of 6.6% during 2018–2023. The increasing use of CAD software in the packaging industry and automotive industry is one of the key factors positively impacting the growth of the market.

On the basis of technology, the market has been bifurcated into 3D software and 2D software. Of these, 3D CAD software held the larger share in the CAD software market in 2017, owing to the growing need for design efficiency and accuracy and enhanced product visualization and presentation. In addition, 3D CAD also accelerates the development cycle with virtual testing and optimization.



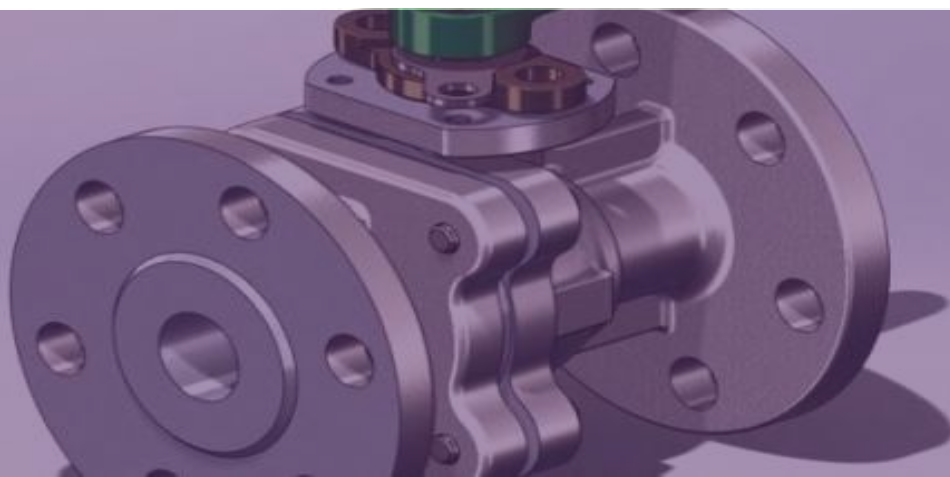
## What are the program objectives?

The course aims to give students and professionals the essentials that is needed to become a certified SOLIDWORKS associate. The course will help individuals use the software with confidence and design/draft the next innovative thing.

The course is designed to be a process or task based approach to learning the individual features and functions of SOLIDWORKS, thereby emphasizing processes and procedures for completion of any task. By building actual parts and assemblies, the student should learn the necessary commands, options and menus in the the context of completing a design task.

## What are the main highlights of the program?

- Learn without a career break with online classes available 24\*7.
- One can access the course at their own pace, but with the investment of 3-5 hours/week, it can be finished within a month.
- This Program is focused on student level competitions like SAE BAJA, SAE SUPRA and even Formula Bharat and Formula-e.
- The programme uses a Continuous Evaluation System that assesses the learners over convenient and regular intervals. Such a system provides timely and frequent feedback and helps busy working professionals stay on course with the programme.
- The education delivery method is a blend of classroom and experiential learning.
- Participants who will complete the programme become eligible for Mentorship and Placement help through our Job Fairs.



## Who should apply?

The programme is designed for students or professionals who are:

- Having a Diploma, BE / B.Tech or equivalent in domains such as Automotive, Mechanical, EEE, ECE, Instrumentation, Mechatronics.
- Designing enthusiasts (No academic qualification mandatory)
- Working in industries such as Automotive, Auto component, Design, Manufacturing, etc
- Working in Functional areas such as R&D, Analysis, Maintenance, Projects, component design etc.
- Interested in pursuing further studies on the part-time or full-time basis in Design and Engineering Sector.

## What are the technical requirements?

The programme to give its best will need following requirements:

- Computer/ Laptop will provide you with the best experience, but this program is quite compatible with smartphones to make it feasible for students worldwide.
- High-speed internet for crystal clear experience, but this program can also run without buffering with below-average connectivity for reaching out students from suburban and rural areas.
- A student should make their notes for future reference.
- A student should have basic knowledge about high-school physics and chemistry, even though the pre-requisite of this programme will brush up one's basic concepts.
- A student should have a compatible computer for SOLIDWORKS CAD software so that they can practice with the progress of the course.



## What is the learning methodology?

DIYguru presents the Nano-degree program on SOLIDWORKS– Drafting, Assembly and Simulation. You will be learning how make 3D models, 2D engineering drawing, assembly, animation, and high-quality render of a check valve in SOLIDWORKS. It will take you from the very beginning of opening SOLIDWORKS and teach you the entire designing workflow within SOLIDWORKS. This course is ideal for Engineering Drawing students and can also be opted by students those looking for project based training. This program provides you with the most flexible learning environment possible. This program is offered as a self-paced program often referred to as asynchronous online program which is time independent, meaning that it can be accessed 24X7 within the tenure of 30 days. This program can be accessed from multiple devices which make it easy to learn on the go.

## What are the learning outcomes?

- Demonstrate competency with multiple drawing and modification commands in SOLIDWORKS.
- Create three-dimensional solid models.
- Create three-dimensional assemblies incorporating multiple solid models.
- Apply industry standards in the preparation of technical mechanical drawings.
- Create Simulation of the assemblies incorporating multiple solid models.



## Online Course (21 Days)

### SOLIDWORKS Introduction

- Solidworks Licence
- Rollcage Design (CAD)
- Rollcage Design (CAD-FSAE)
- Introduction to 3 D Modelling
- Applying Weldments in SOLIDWORKS
- Suspension SOLIDWORKS Modelling
- SOLIDWORKS Simulation
- Static Structural Analysis of Hub

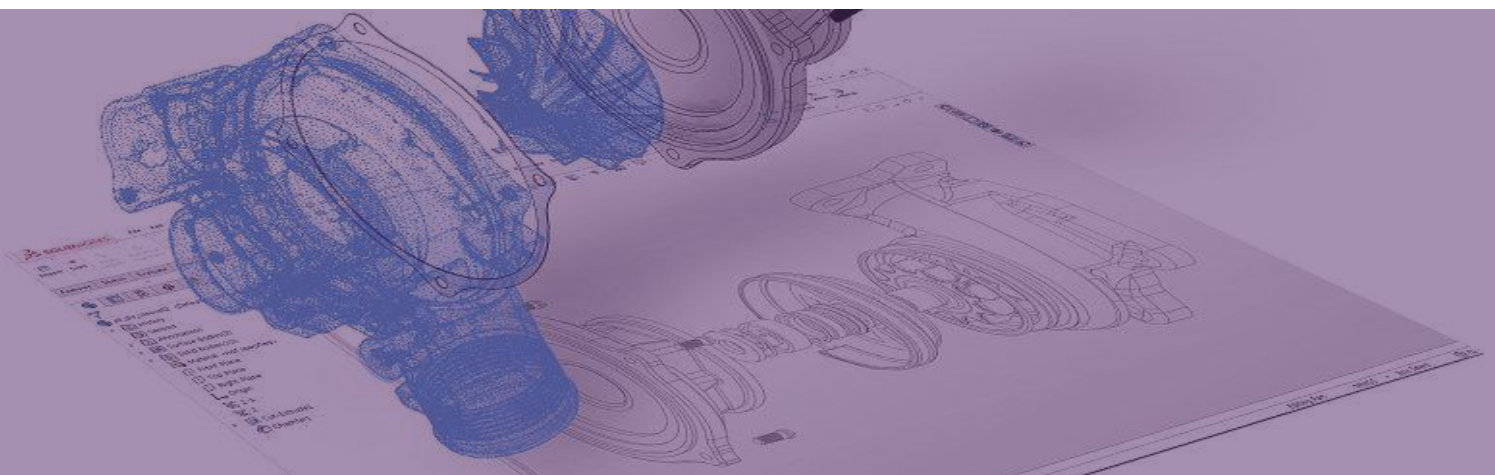
### SOLIDWORKS for BAJA SAE

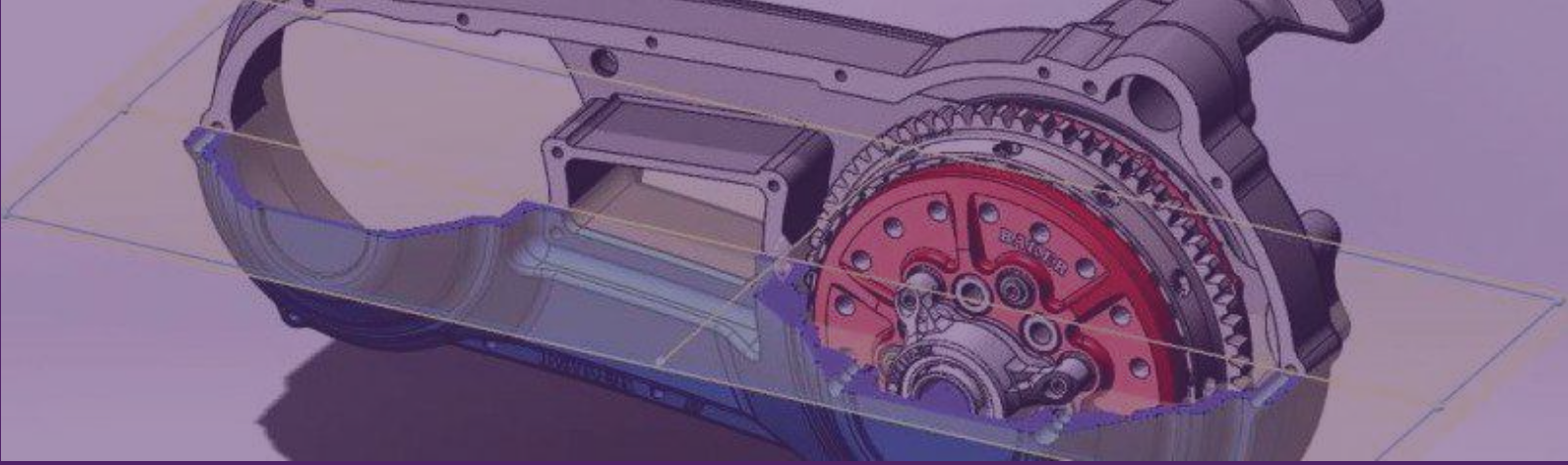
- BAJA Frame and Weldments
- Large Assembly Tips and Tricks
- Customizing SOLIDWORKS for BAJA

### SOLIDWORKS for Formula SAE

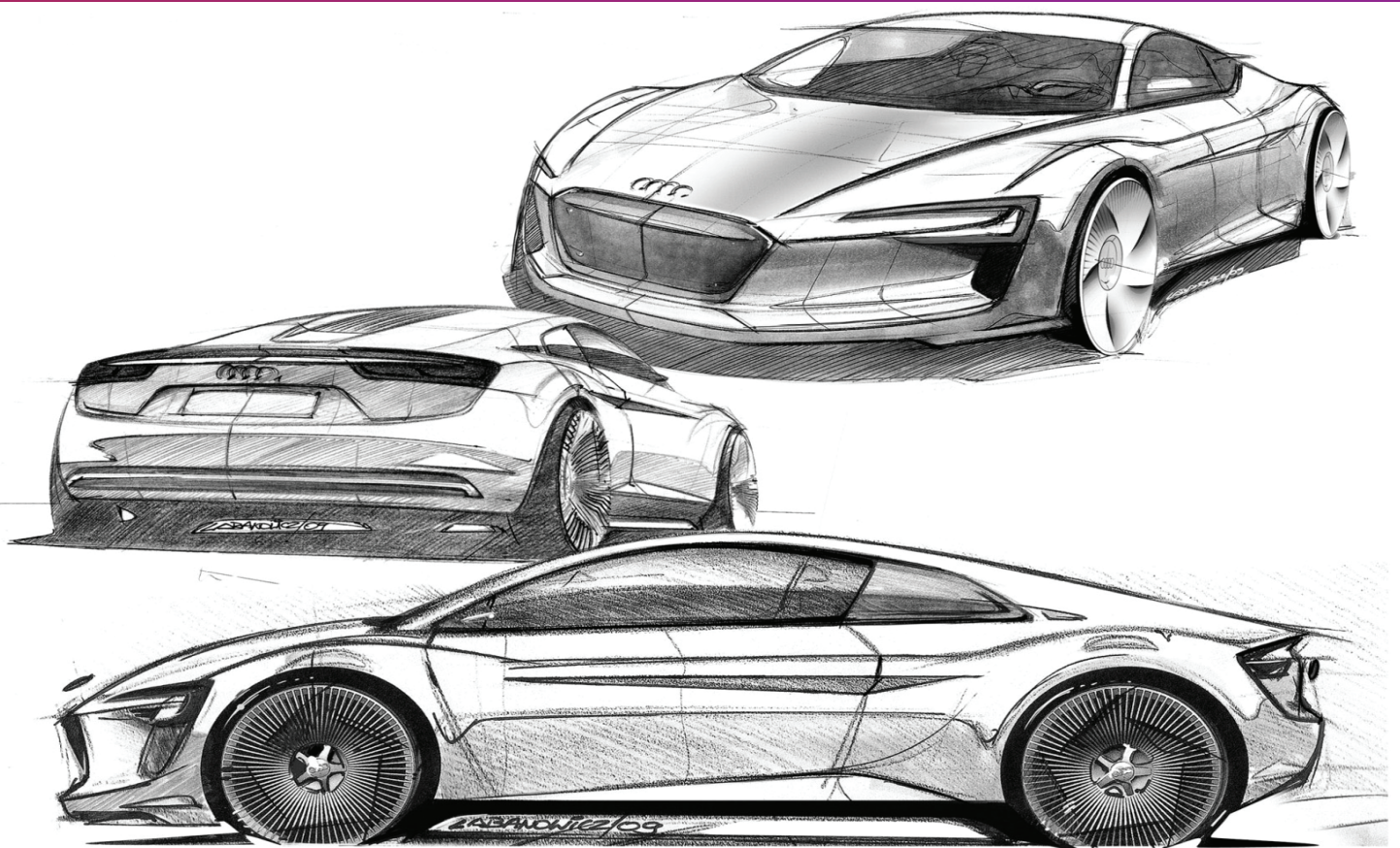
- FSAE SOLIDWORKS Sponsorship
- Modelling of FSAE Frame
- 3D Content for Central SOLIDWORKS
- FSAE Steering Assembly
- Introduction to FEA
- SimulationXpress Sheet Metal Bracket
- Stress Analysis of FSAE Spindle
- FSAE Tires and Wheels
- Tutorial Frame drawing cutlist flat pattern
- Analyzing a Frame
- Modeling an FSAE Frame
- Creating Molds for FSAE Parts

- Fatigue Analysis on a FSAE Hub
- Design Optimization of a Hub
- Modeling a Suspension Spring
- Using PhotoView 360 to Render Parts
- Using SOLIDWORKS Motion
- Tips and Tricks for FSAE Students
- Surfacing to Create FSAE Body Work
- Model a Formula SAE Exhaust
- SAE Thermal Stress
- SAE Intake Internal Flow
- SAE Intake Internal Flow
- SAE Mold Tutorial
- SAE Frame Analysis
- Optimization in SOLIDWORKS





Nano  
Degree Program  
**AUTOMOTIVE**  
**SKETCHING AND DRAWING**  
**COURSE**





Automotive design is a highly specialized field, incorporating various types of engineering, safety, business acumen, and creative talents. The industry is not limited to automobiles but includes all other forms of wheeled-transportation. Auto design involves teamwork; each member contributes from his or her specialized knowledge base. The field is dynamic and ever-changing, offering the designer a high-powered and progressive work environment.

For the most part, an automobile designer will work with a styling team during the design process for each specific model. The team typically consists of a chief designer, exterior designers, and interior designers. There may also be a trim and color designer involved in the process, as well as a clay model team and digital model team. Sometimes all these roles are fulfilled by one designer, but that is very unusual. Aside from these roles, there will be a studio head, managers, prototype engineers, and others involved in the overall design of each automobile.



## What are the program objectives?

The automotive sketching course teaches students to apply various techniques and materials in order to make informative and also pleasant, easy to read sketches. The course set up stresses the importance of observing (and copying) shapes, cars and perspectives, and consequently the 'construction' of complex car shapes. The ultimate goal is to accomplish expertise and comfort and fluency (pace as well) when designing and drawing vehicles. This course specifically addresses the automotive design field, however it provides very helpful knowledge, skills and reference materials for the broader field of industrial design as well. In other words, automotive sketching offers an advanced course for understanding and visualizing complex shapes, in an automotive context.

## What are the main highlights of the program?

- Learn without a career break with online classes available 24\*7.
- One can access the course at their own pace, but with the investment of 3-5 hours/week, it can be finished within a month.
- The programme uses a Continuous Evaluation System that assesses the learners over convenient and regular intervals. Such a system provides timely and frequent feedback and helps busy working professionals stay on course with the programme.
- The education delivery method is a blend of classroom and experiential learning.
- This course was designed with the "Learn by Doing" principle in mind so just follow along the design process.



## Who should apply?

The programme is designed for students or professionals who are:

- Having a Diploma, BE / B.Tech or equivalent in domains such as Automotive, Mechanical, EEE, ECE, Instrumentation, Mechatronics.
- Artistic enthusiasts (No academic qualification mandatory)
- Working in industries such as Automotive, Auto component, Design, Manufacturing, etc
- Working in Functional areas such as R&D, Analysis, Maintenance, Projects, component design etc.
- Interested in pursuing further studies on the part-time or full-time basis in Design and Engineering Sector.

## What are the technical requirements?

The programme to give its best will need following requirements:

- Computer/ Laptop will provide you with the best experience, but this program is quite compatible with smartphones to make it feasible for students worldwide.
- High-speed internet for crystal clear experience, but this program can also run without buffering with below-average connectivity for reaching out students from suburban and rural areas.
- A student should make their notes for future reference.
- A student should have basic knowledge about high-school physics, chemistry and maths, even though the pre-requisite of this programme will brush up on one's basic concepts.



## What is the learning methodology?

DIYguru presents a Nano Degree program on Automotive Sketching and Drawing Certification Course. This program provides you with the most flexible learning environment possible. This program is offered as a self-paced program often referred to as asynchronous online program which is time independent, meaning that it can be accessed 24X7 within the tenure of 90 days. This program can be accessed from multiple devices which make it easy to learn on the go.

Lectures that are pre-recorded or slide presentation with voice-over commentary, interactive discussion boxes that foster student to student interaction, Email communication with the instructor are part of this process.

## What are the learning outcomes?

- Vehicle architecture – A historical perspective
- Automotive body layout, proportions, packaging and themes
- Introduction to free hand sketching of simple geometries
- Sketching in perspective: 1-Point, 2-Point and 3-Point Perspectives
- Sketching Car block in 1, 2, and 3 point perspectives
- Sketching car side view proportion– Sedan, SUV, Sports car, Compact car and Truck
- Sketching car front view proportion
- Sketching car  $\frac{3}{4}$  front view;  $\frac{3}{4}$  rear view
- Concept car sketching
- Shading and Rendering best practices
- Digital rendering using Sketchbook pro



# Program Structure

## Using Pen & Paper

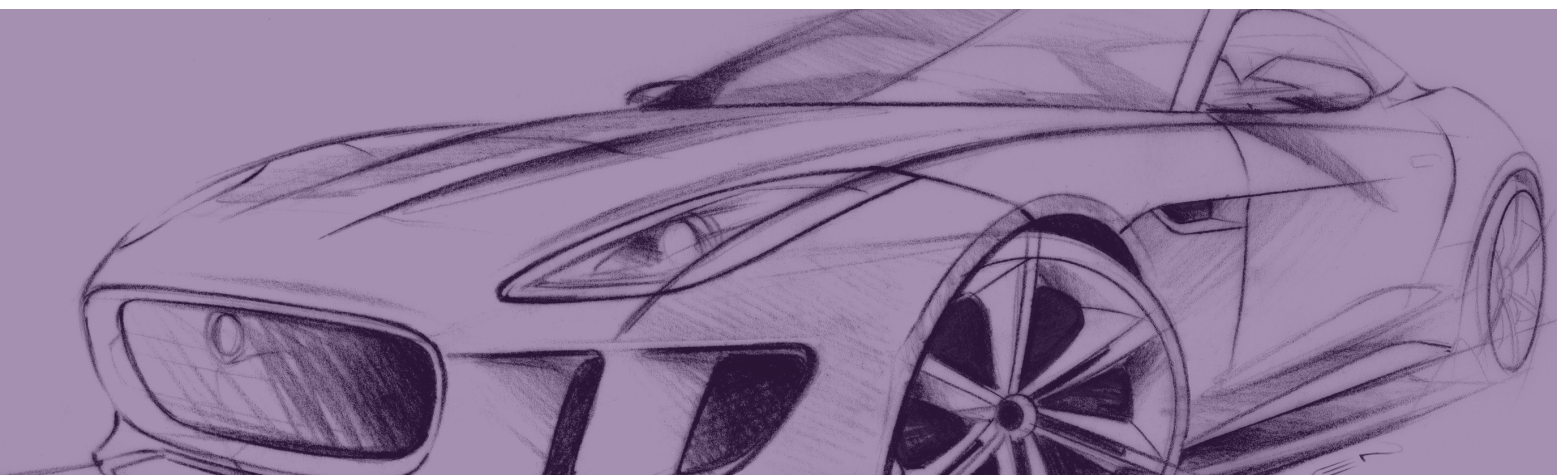
- Introduction
- Tools you need
- Ground & Wheels
- Outline & DLO
- Adding Design Elements
- Surface Basics
- Door Shutlines
- Basic Reflections
- Shading
- Advanced Shading
- Wheel Detail
- Final Touches
- Personal Touches
- Some Additional Touches

## Using Marker Renders

- Introduction
- Tools you need
- Skills you need
- Marker Basics
- Your Base Sketch
- Layer 1
- Layer 2
- Layer 3
- Layer 4
- Layer 5
- Fixing Mistakes
- Refining Lines
- Final Touches
- Summary

## In 3D

- Introduction
- Tools You Need
- Useful things on kick start
- Ground & Wheels
- Outline, DLO, Surface basics
- Midsection
- Front Perspective
- 3D Design Elements
- Door Shutlines
- Headlights
- Reflections, Shading(Side)
- Reflections, Shading(Front)
- Final Touches
- How to see & Fix Mistakes



Nano  
Degree Program

# VEHICLE DYNAMICS

## Certification Course





As a basic theory of the vehicle industry, the vehicle dynamics plays an important role in the development of the vehicle industry. In the past decades, great progress was made in the theory and experiment of vehicle dynamics.

In vehicle dynamics, the vehicle body (sprung mass), the suspension component (spring and damper) and tire (unsprung mass) are essential parts of the system. The modeling approaches and characteristics of the vehicle, tire and driver model with the respect to handling and driving dynamics are summarized in the program. The important research issues about the vehicle-pavement coupled dynamics are discussed in detail. Several problems and directions for the further studying in vehicle dynamics are pointed out.

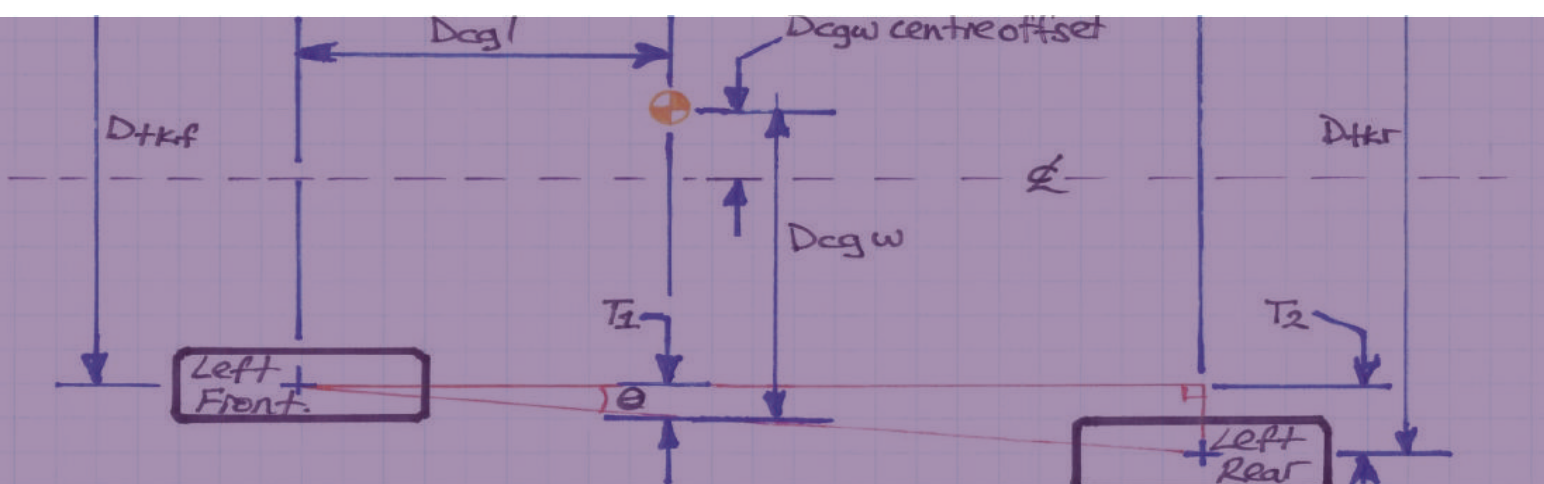


## What are the program objectives?

Understand the fundamentals of vehicle dynamics and suspension/steering design. Gain practical knowledge of how the vehicle moves and how the suspension and steering behaves. Gain hands on experience over simulation software of vehicle dynamics and suspension design.

## What are the main highlights of the program?

- Learn without a career break with online classes available 24\*7.
- One can access the course at their own pace, but with the investment of 3-5 hours/week, it can be finished within a month.
- This Program is focused on student level competitions like SAE BAJA, SAE SUPRA and even Formula Bharat and Formula-e.
- The programme uses a Continuous Evaluation System that assesses the learners over convenient and regular intervals. Such a system provides timely and frequent feedback and helps busy working professionals stay on course with the programme.
- The education delivery method is a blend of classroom and experiential learning.
- Participants who will complete the programme become eligible for Mentorship and Placement help through our Job Fairs.



## Who should apply?

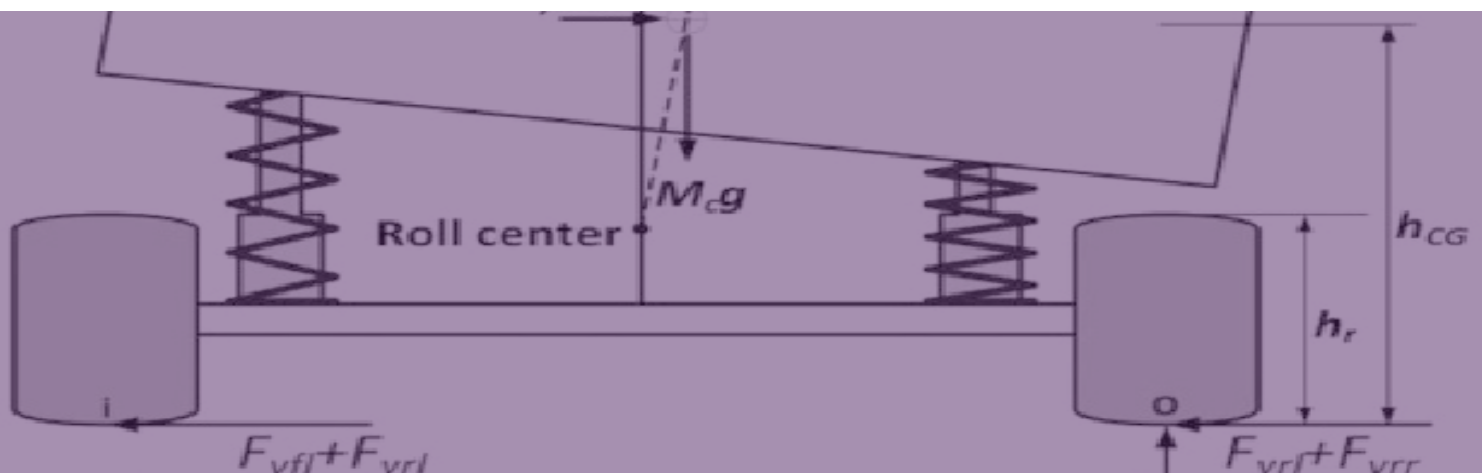
The programme is designed for students or professionals who are:

- Students participating in SAE Competitions (BAJA, FSAE, SUPRA, Formula Car Championships).
- Professionals who are in the R&D sector of Automotive Companies.
- Tech. & Ph.D. students working in Vehicle Dynamics.
- Enthusiasts who are making projects on Automobiles and are finding it hard to do the body balancing analysis.

## What are the technical requirements?

The programme to give its best will need following requirements:

- Computer/ Laptop will provide you with the best experience, but this program is quite compatible with smartphones to make it feasible for students worldwide.
- High-speed internet for crystal clear experience, but this program can also run without buffering with below-average connectivity for reaching out students from suburban and rural areas.
- A student should make their notes for future reference.
- A student should have basic knowledge about high-school physics and chemistry, even though the pre-requisite of this programme will brush up one's basic concepts.
- A student should have a compatible computer for simulation software so that they can practice with the progress of the course.



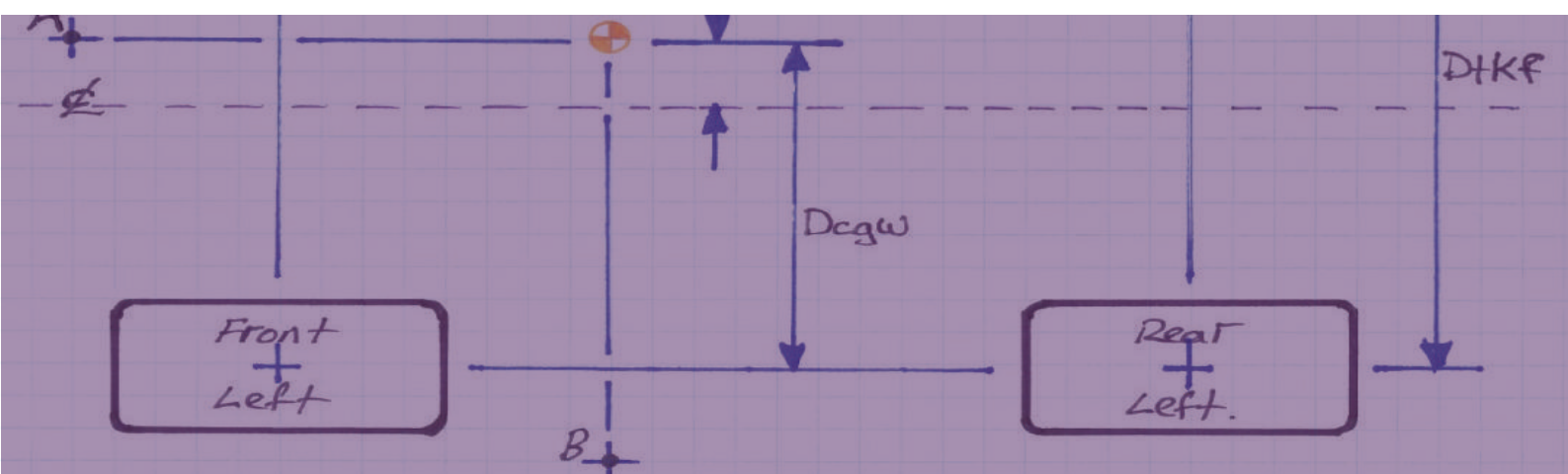
## What is the learning methodology?

DIYguru presents a Nano-degree program on Vehicle Dynamics. This program provides you with the most flexible learning environment possible. This program is offered as a self-paced program often referred to as asynchronous online program which is time independent, meaning that it can be accessed 24X7 within the tenure of 90 days. This program can be accessed from multiple devices which make it easy to learn on the go.

Lectures that are pre-recorded or slide presentation with voice-over commentary, interactive discussion boxes that foster student to student interaction, Email communication with the instructor are part of this process. Downloadable educational tools such as e-books, research papers and government reports are made available at just one click..

## What are the learning outcomes?

- Apply knowledge of mathematics, science, and engineering.
- Design and conduct experiments, as well as to analyze and interpret data.
- Function on multi-disciplinary teams.
- Identify, formulates, and solves engineering problems.
- Recognition of the need for, and an ability to engage in life-long learning.
- Utilize experimental, statistical and computational methods and tools necessary for engineering practice.
- To develop extensive knowledge and understanding of a wide range of computer modeling and simulation software.
- Conduct rigorous and ethical research / formal enquiry into related issues that require familiarity with a range of research sources and appropriate methodologies.



## Online Course (90 Days)

### Introduction to Vehicle Dynamics

An overview of Pre-Requisites for the Course

Mass

Coordinate System (Vehicle and Tire)

Motion Variables

Euler Angles

Fundamentals of Physics

Newton's Second Law

### Tires

Tire Construction, sidewall information and tire terminologies

Tire Stiffness

Mechanics of force generation

Tractive and cornering properties

Tire forces

Effective radius and rolling radius

### Suspension and Steering

Dependent and Independent Suspension

Motion Analysis

Instant center

Roll Center

Relative angles (Toe, Caster, Camber)

Anti dive and anti squat geometry

Suspension spring

Dampers

Anti Roll Bars

Steering Geometry

Steering ratio

Steering system forces and moments

Understeer, neutral steer, and oversteer

### Longitudinal Dynamics

Simple Vehicle Model

Acceleration

Traction Control System

Braking

Braking Forces

Brake Proportioning

Braking Efficiency

Anti-Lock Brake System

### Steady State Stability and Control

Low Speed Cornering

High Speed Cornering

Suspension Effects on Cornering

Equations of motions

Physical significance of derivatives

### Vibration

Discrete Model of the system.

Frequency response of vibrating system

Quarter Car Model

### Aerodynamic fundamentals

Properties of Air

Discussion on Bernoulli's Equation

Pressure Distribution

Consideration of Real Flows

SAE Aerodynamic Axis system

Aerodynamic forces and moment

coefficient

Drag and Downforce

Aerodynamic surfaces

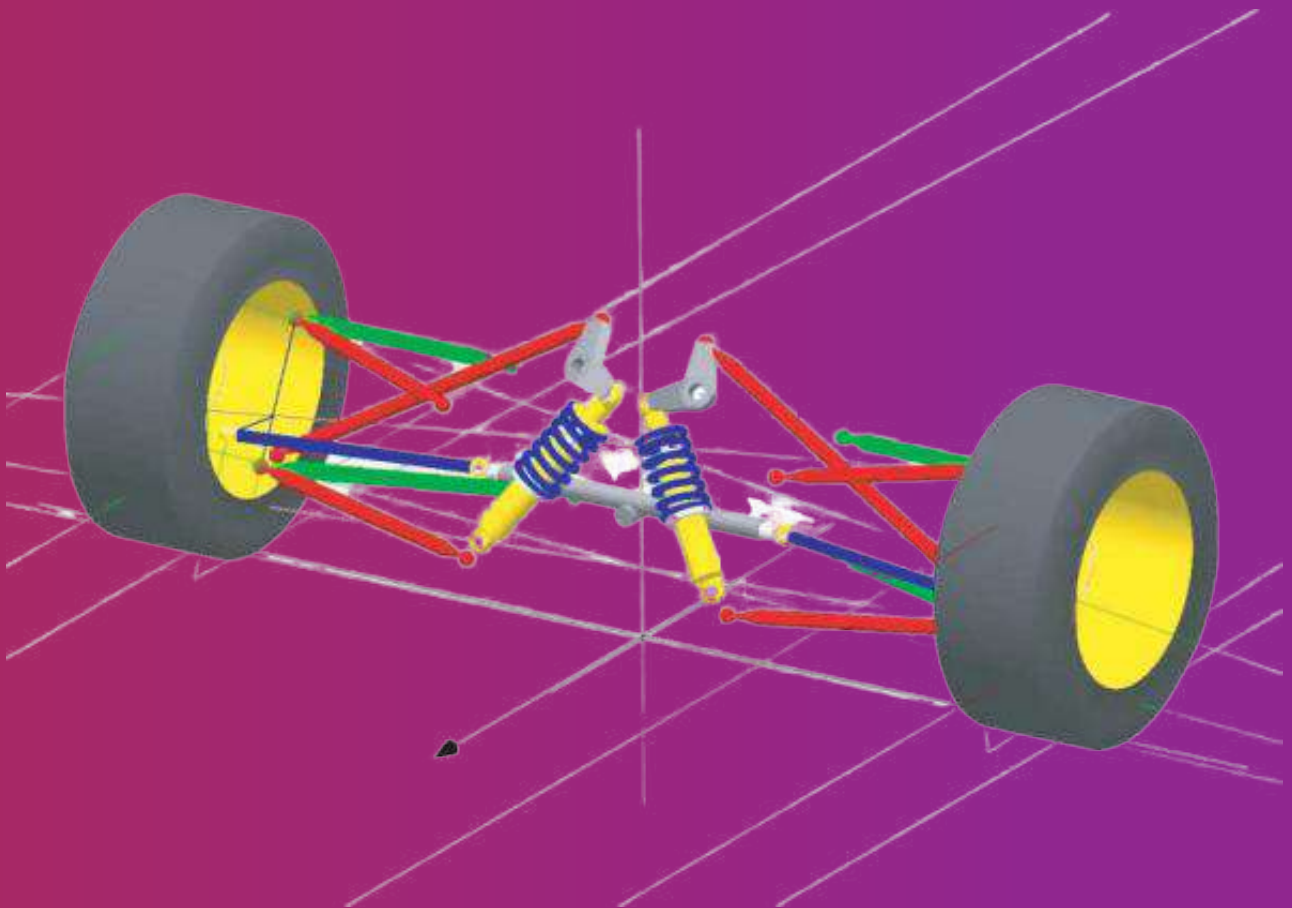
Ground effect



Nano  
Degree Program

# LOTUS SUSPENSION

## Analysis Course

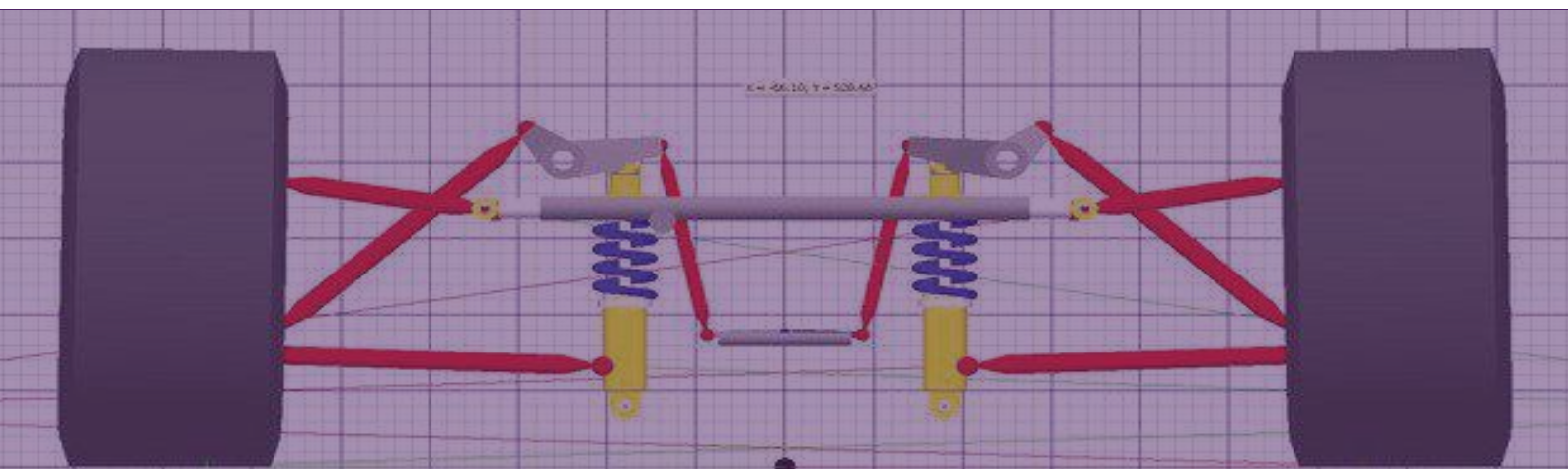




Lotus Suspension Analysis provides a user friendly tool for the design and analysis of suspension geometry. Standard suspension types using individual pre-filled templates provide easy creation of kinematic models in either 2D or 3D modes.

Lotus Suspension Analysis templates include Double Wishbones, Macpherson Struts, Trailing arm, Semi-trailing arms, Pull-rod and Push-rod damper actuation, 'A' frames and 'H' frames. Users can create and distribute their own unique templates.

Kinematic results include Camber Angle, Castor Angle, Toe, Kingpin Angle, Roll Centre Position, Damper Ratio, Spring Ratio, Track Change, Wheelbase Change, % Anti Squat, % Anti Dive and % Ackermann. Results can be displayed either graphically or numerically over specified Bump, Rebound, Roll and Steer articulations.



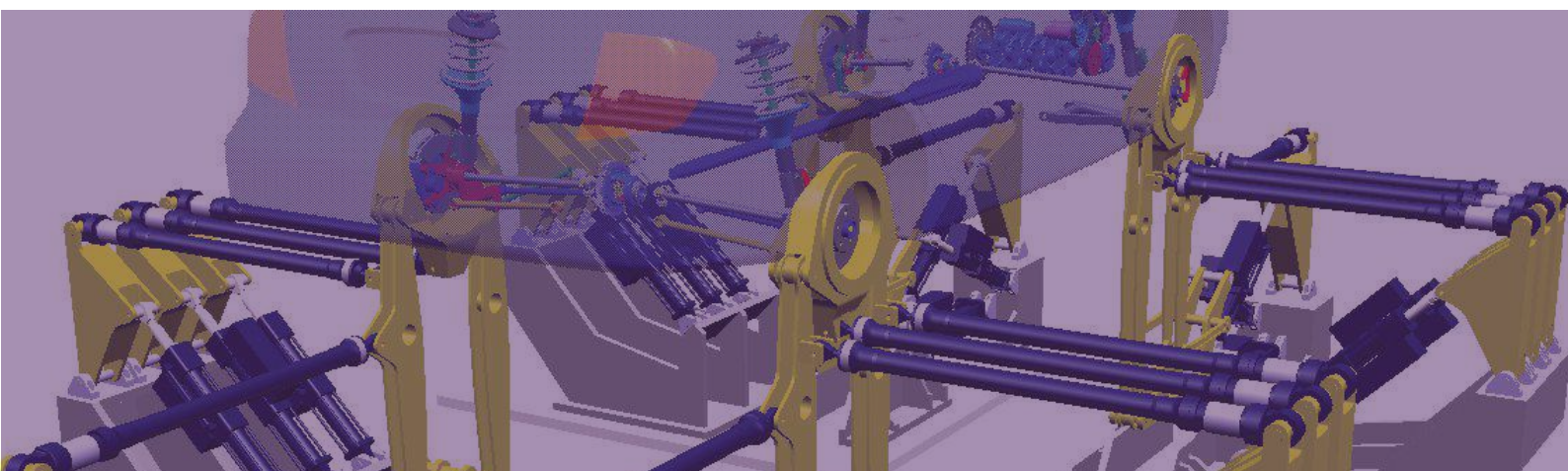
## What are the program objectives?

LOTUS provides built-in sub-system and system templates together with pre-defined virtual tests & maneuvers to facilitate the modeling & simulation (M&S) of suspension kinematics & dynamics as well as full-vehicle dynamics. If you are involved with vehicle engineering work at your school, especially for student competitions such as Formula SAE, Baja, Solar Car, and Hybrid or Autonomous Vehicles, then this product is likely to be of interest to you.

LOTUS software allows students to design and simulate their FSAE / BAJA vehicles to maximize their vehicle performance. With LOTUS, FSAE / BAJA teams can quickly build and test their functional virtual prototypes of complete vehicles and vehicle subsystems. FSAE / BAJA engineering teams can exercise their vehicle designs under various road conditions, performing the same tests they normally run in a test lab or on a test track, but in a fraction of time.

## What are the main highlights of the program?

- Learn without a career break with online classes available 24\*7.
- One can access the course at their own pace, but with the investment of 3-5 hours/week, it can be finished within a month.
- This Program is focused on student-level competitions like SAE BAJA, SAE SUPRA, and even Formula Bharat and Formula-E.
- The program uses a Continuous Evaluation System that assesses the learners over convenient and regular intervals. Such a system provides timely and frequent feedback and helps busy working professionals stay on course with the program.
- The education delivery method is a blend of classroom and experiential learning.
- Participants who will complete the programme become eligible for Mentorship and Placement help through our Job Fairs.





## Who should apply?

The programme is designed for students or professionals who are:

- Students participating in SAE Competitions (BAJA, FSAE, SUPRA, Formula Car Championships).
- Professionals who are in the R&D sector of Automotive Companies.
- Tech. & Ph.D. students working in Suspension Designing.
- Enthusiasts who are making projects on Automobiles and are finding it hard to do the body balancing analysis.

## What are the technical requirements?

The programme to give its best will need following requirements:

- Computer/ Laptop will provide you with the best experience, but this program is quite compatible with smartphones to make it feasible for students worldwide.
- High-speed internet for crystal clear experience, but this program can also run without buffering with below-average connectivity for reaching out students from suburban and rural areas.
- A student should make their notes for future reference.
- A student should have basic knowledge about high-school physics, chemistry and maths, even though the pre-requisite of this programme will brush up one's basic concepts.
- A student should have a compatible computer for LOTUS software so that they can practice with the progress of the course.



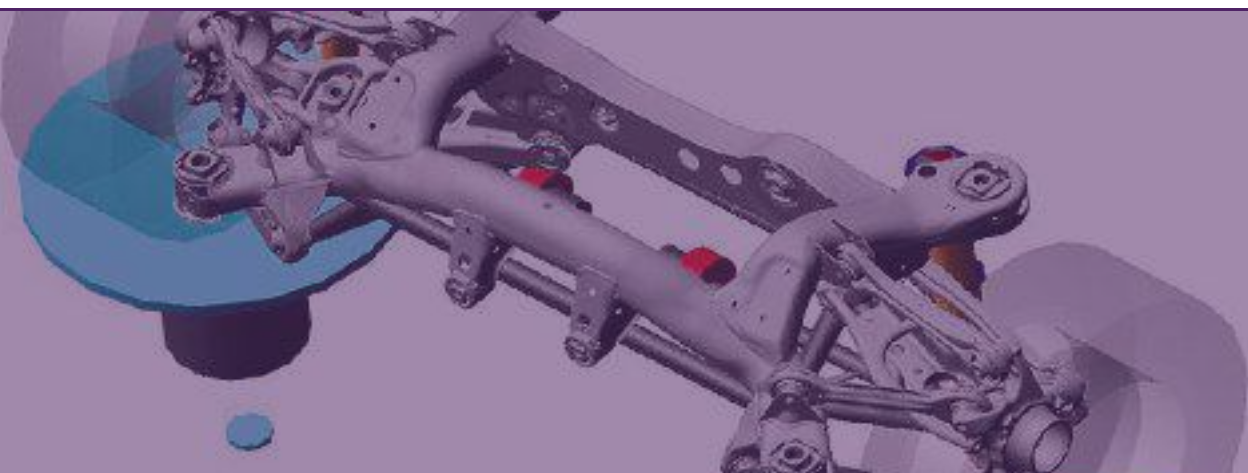
## What is the learning methodology?

DIYguru presents a Nano Degree program on LOTUS Suspension Analysis Course. This program provides you with the most flexible learning environment possible. This program is offered as a self-paced program often referred to as an asynchronous online program which is time-independent, meaning that it can be accessed 24X7 within the tenure of 10 days.

This program can be accessed from multiple devices which makes it easy to learn on the go. Lectures that are pre-recorded or slide presentation with voice-over commentary, interactive discussion boxes that foster student to student interaction, Email communication with the instructor are part of this process.

## What are the learning outcomes?

- Simulate your model and find ride heights at various state of the load
- Simulate your model and find ride frequencies
- Simulate your model and find roll stiffness or degree of lateral acceleration
- Simulate your model and find the distribution of load front and rear
- Simulate your model and find jounce travel in bump or compression
- Simulate your model and find rebound travel in drop or extension
- Simulate your model and find camber
- Simulate your model and find caster
- Simulate your model and find toe in/out





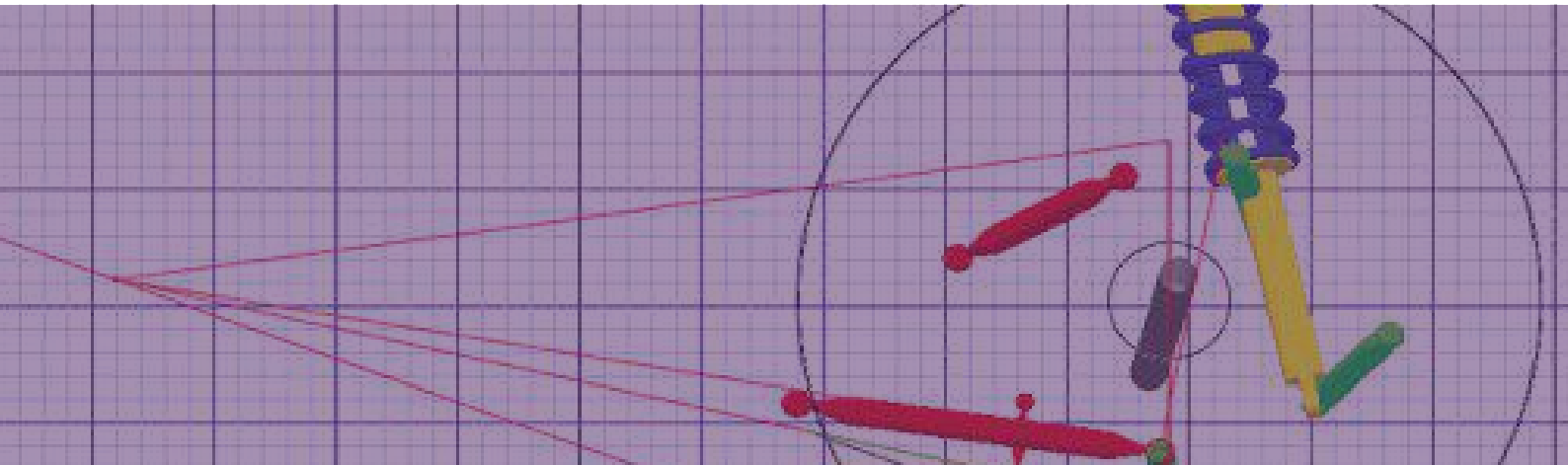
# Program Structure

Software Install & Download

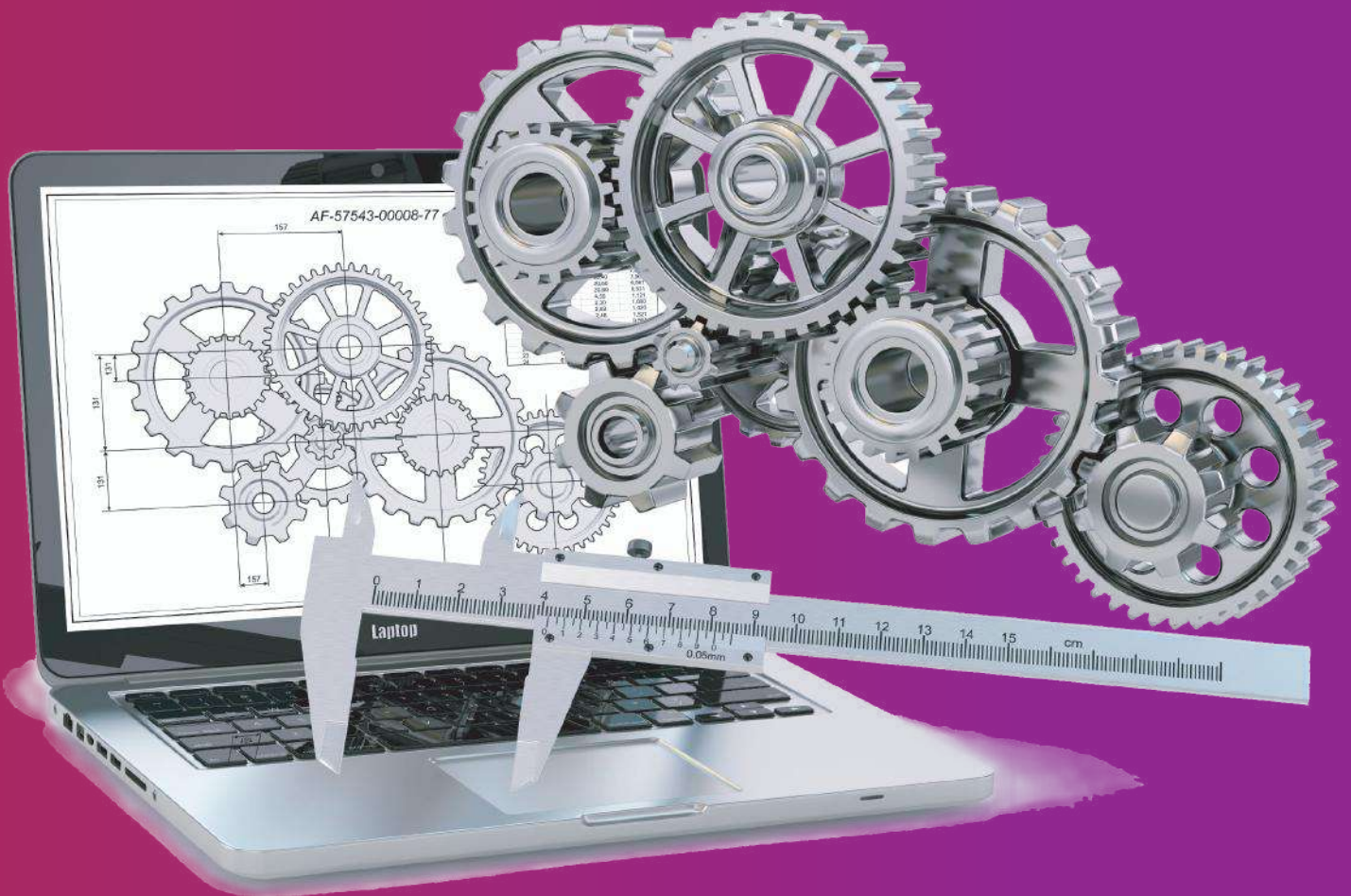
Selecting Suspension Points

Changing Parameters

Design of Suspension



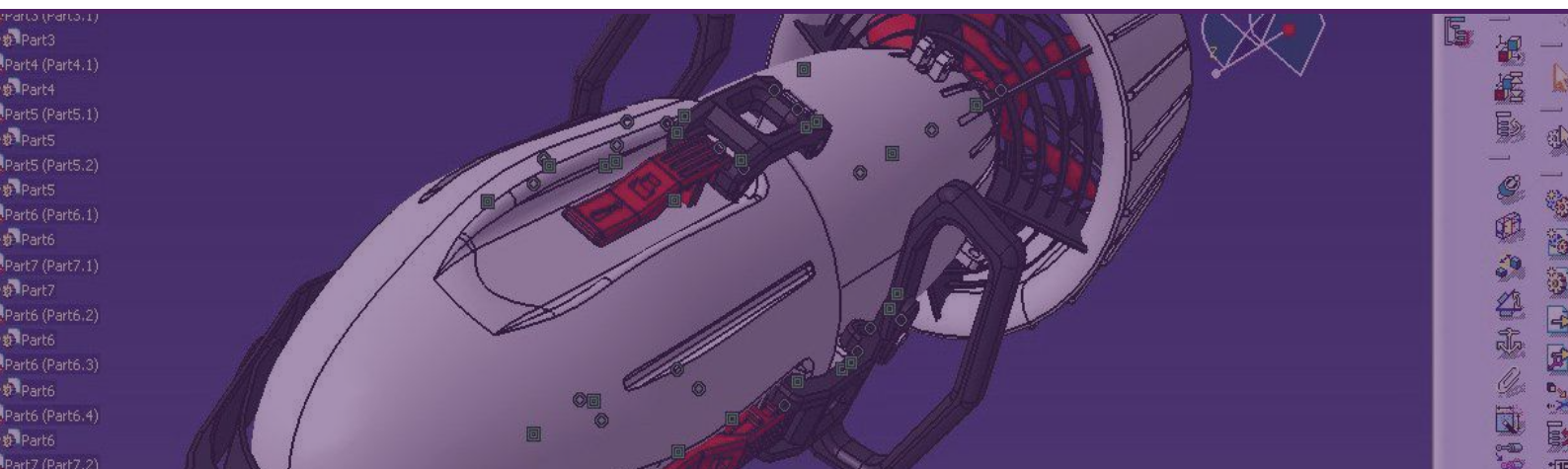
Nano  
Degree Program  
**CATIA**  
Computer Aided  
Design & Drafting Course





The global computer-aided design (CAD) software market was valued at \$8,325.0 million in 2017 and is predicted to progress at a CAGR of 6.6% during 2018–2023. The increasing use of CAD software in the packaging industry and automotive industry is one of the key factors positively impacting the growth of the market.

On the basis of technology, the market has been bifurcated into 3D software and 2D software. Of these, 3D CAD software held the larger share in the CAD software market in 2017, owing to the growing need for design efficiency and accuracy and enhanced product visualization and presentation. In addition, 3D CAD also accelerates the development cycle with virtual testing and optimization.





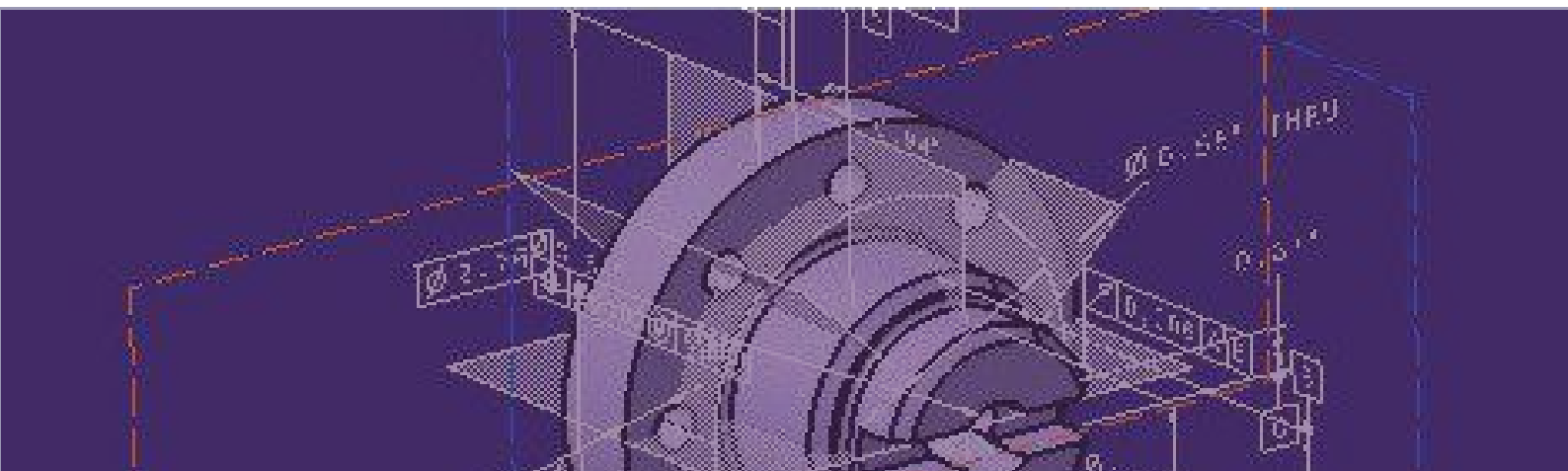
## What are the program objectives?

The course aims to give students and professionals the essentials that is needed to become a certified CATIA associate. The course will help individuals use the software with confidence and design/draft the next innovative thing.

The course is designed to be a process or task based approach to learning the individual features and functions of CATIA, thereby emphasizing processes and procedures for completion of any task. By building actual parts and assemblies, the student should learn the necessary commands, options and menus in the the context of completing a design task.

## What are the main highlights of the program?

- Learn without a career break with online classes available 24\*7.
- One can access the course at their own pace, but with the investment of 3-5 hours/week, it can be finished within a month.
- The programme uses a Continuous Evaluation System that assesses the learners over convenient and regular intervals. Such a system provides timely and frequent feedback and helps busy working professionals stay on course with the programme.
- The education delivery method is a blend of classroom and experiential learning.
- Participants who will complete the programme become eligible for Mentorship and Placement help through our Job Fairs.





## Who should apply?

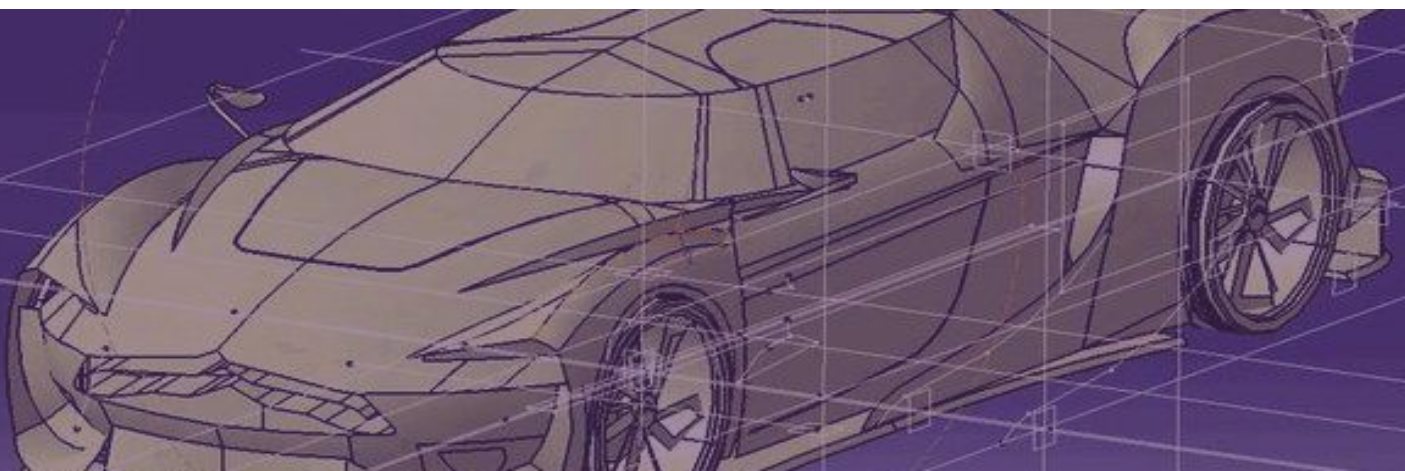
The programme is designed for students or professionals who are:

- Having a Diploma, BE / B.Tech or equivalent in domains such as Automotive, Mechanical, EEE, ECE, Instrumentation, Mechatronics.
- Designing enthusiasts (No academic qualification mandatory)
- Working in industries such as Automotive, Auto component, Design, Manufacturing, etc
- Working in Functional areas such as R&D, Analysis, Maintenance, Projects, component design etc.
- Interested in pursuing further studies on the part-time or full-time basis in Design and Engineering Sector.

## What are the technical requirements?

The programme to give its best will need following requirements:

- Computer/ Laptop will provide you with the best experience, but this program is quite compatible with smartphones to make it feasible for students worldwide.
- High-speed internet for crystal clear experience, but this program can also run without buffering with below-average connectivity for reaching out students from suburban and rural areas.
- A student should make their notes for future reference.
- A student should have basic knowledge about high-school physics and chemistry, even though the pre-requisite of this programme will brush up one's basic concepts.
- A student should have a compatible computer for CATIA CAD software so that they can practice with the progress of the course.

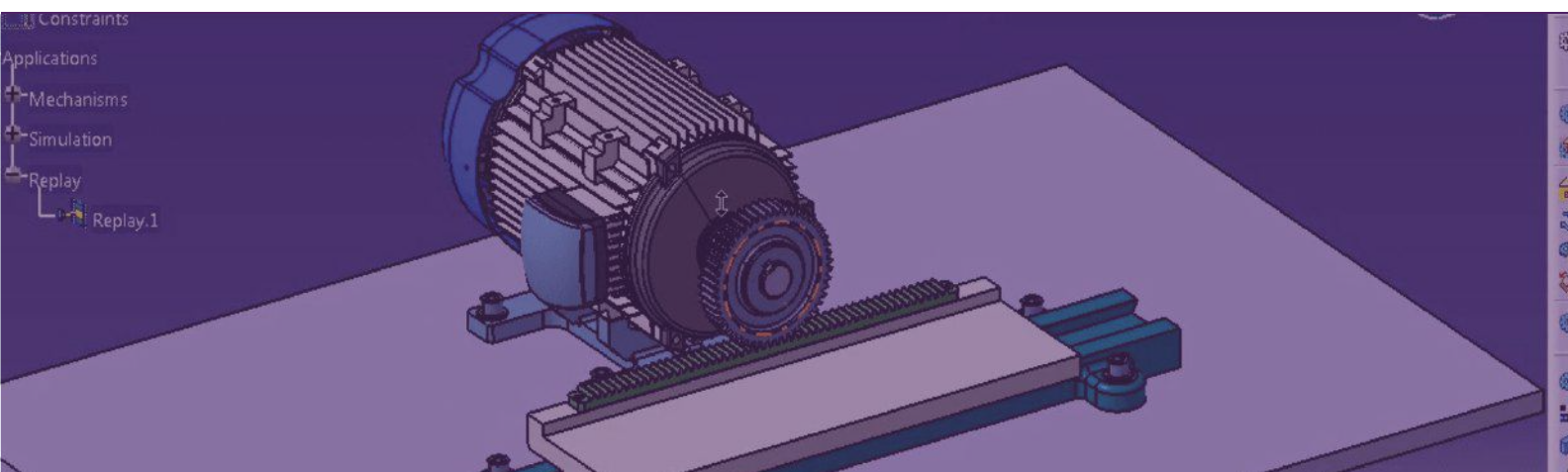


## What is the learning methodology?

DIYguru presents the Nano-degree program on CATIA Computer Aided Design and Drafting. You will be learning how to make 3D models, 2D engineering drawing, assembly, animation, and high-quality render of a product in CATIA. It will take you from the very beginning of opening CATIA and teach you the entire designing workflow within CATIA. This course is ideal for Engineering Drawing students and can also be opted by students those looking for project based training. This program provides you with the most flexible learning environment possible. This program is offered as a self-paced program often referred to as asynchronous online program which is time independent, meaning that it can be accessed 24X7 within the tenure of 30 days. This program can be accessed from multiple devices which make it easy to learn on the go.

## What are the learning outcomes?

- Demonstrate competency with multiple drawing and modification commands in CATIA.
- Create three-dimensional solid models.
- Create three-dimensional assemblies incorporating multiple solid models.
- Apply industry standards in the preparation of technical mechanical drawings.
- Create Simulation of the assemblies incorporating multiple solid models.



## Online Course (30 Days)

### Introduction to CATIA V5

- What is CATIA
- How to Access and Create a Part File
- Settings & Options

### The CATIA V5 User Interface

- Toolbars & Icons
- Understanding the Menu
- Modelling Tree
- Compass & Corner Axis
- Mouse Functions
- Part Visualization
- Data Selection

### Part Design Workflow

- Creating a Sketch
- Making a Solid
- Dressing up the Solid
- Basic Editing

### Sketch Options and Settings

- Types of Sketches
- Entering and Exiting Sketcher
- Sketch Tools Toolbar
- Sketcher Options
- Sketch Visualizations

### Creating and Editing Sketch Curves

- Profile Toolbar
- Operation Toolbar
- Constraints
- Sketch Analysis
- Sketch Exercise

### Part Design

- Pad or Pocket
- Shaft and Groove
- Hole
- Fillet and Chamfer
- Draft
- Shell
- Mirror
- Part Exercise

### Measures and Analysis

- Measure Distance
- Measure Item
- Measure Inertia

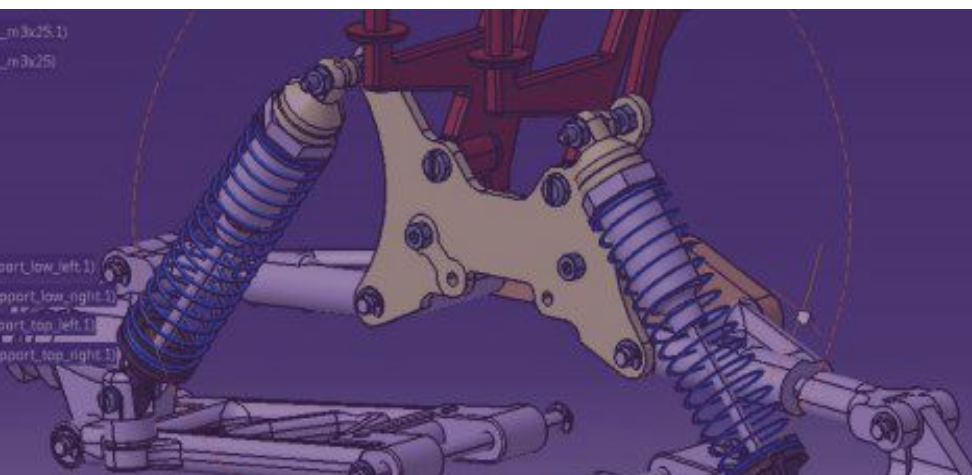
### Building a Product

- What is a Product File?
- Inserting Parts
- Moving Parts Around
- Constraints and Relationships
- Save Management

### Drafting

- Creating the Initial Drawing:
- Page Setup
- Dimensions
- Text and Editor
- Save and Print

rounded\_screw\_m3x25 (rounded\_screw\_m3x25.1)  
rounded\_screw\_m3x25 (rounded\_screw\_m3x25)  
bolt\_m3x16 (bolt\_m3x16.1)  
bolt\_m3x16 (bolt\_m3x16)  
bolt\_m3x16 (bolt\_m3x16)  
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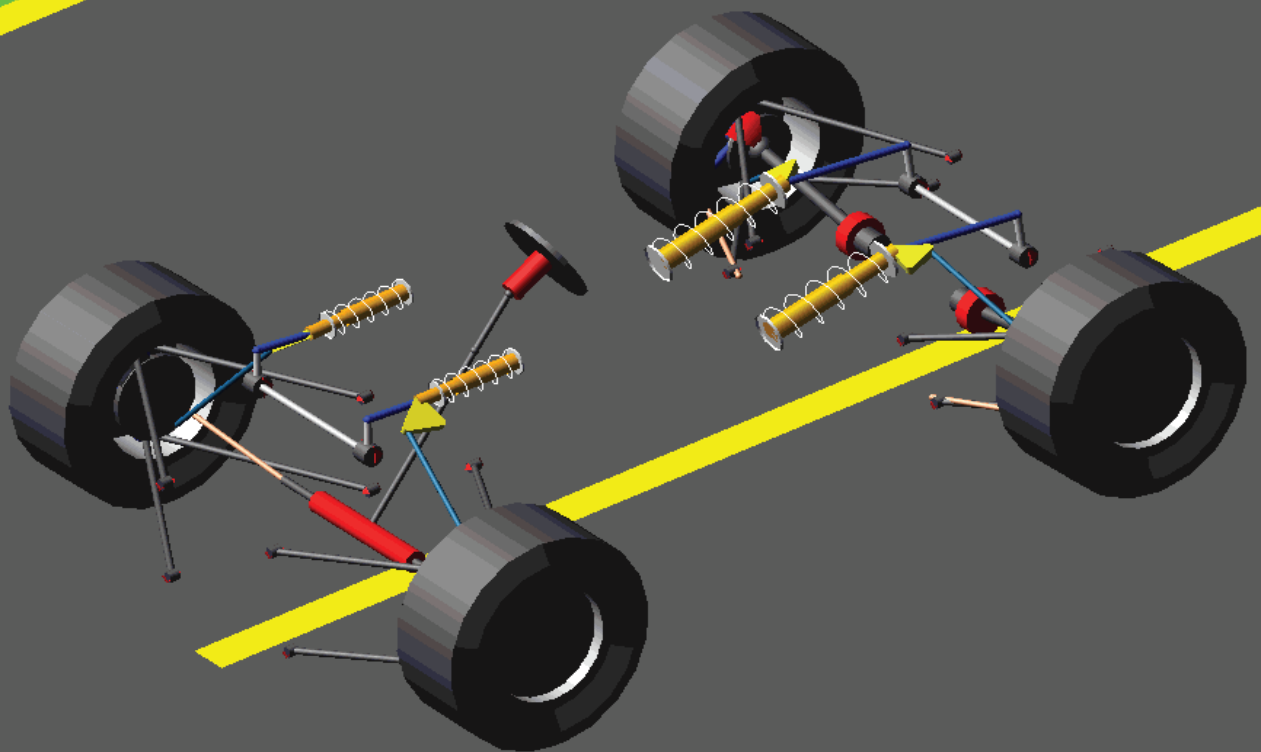


Nano  
Degree Program

# MULTIBODY DYNAMICS

## Certification Course

Equilibrium Frame=001

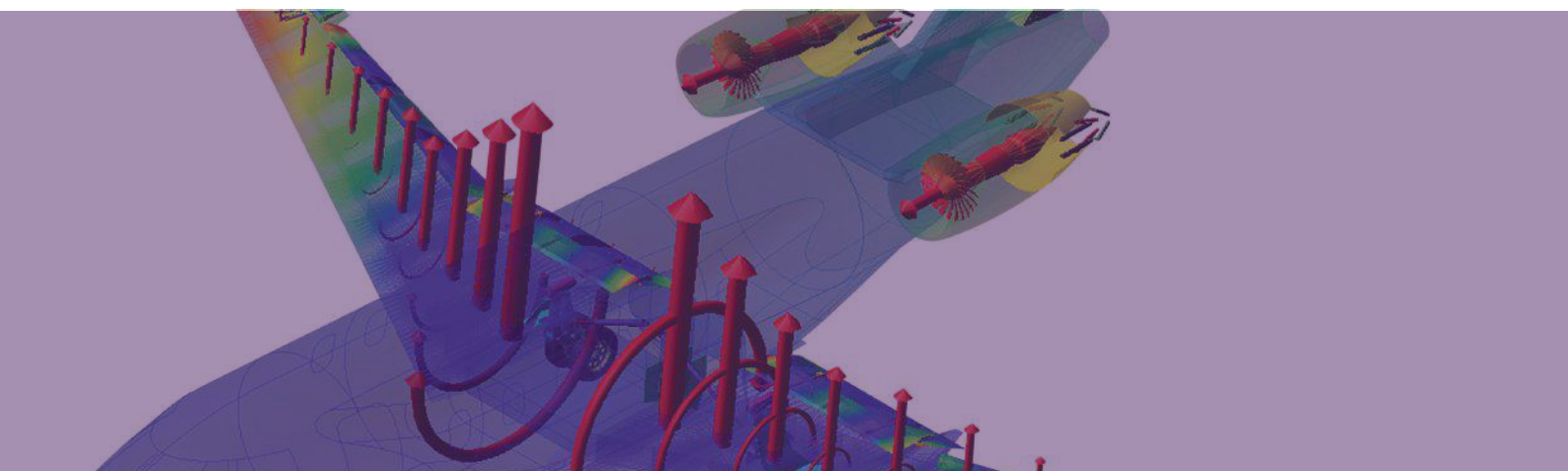




MSC Software develops simulation software technology that enables engineers to validate and optimize their designs using virtual prototypes. Customers in almost every part of manufacturing use MSC software to complement, and in some cases even replace the physical prototype “build and test” process that has traditionally been used in product design.

MSC Software's technology is used by leading manufacturers for linear and nonlinear finite element analysis (FEA), acoustics, fluid-structure interaction (FSI), multi-physics, optimization, fatigue and durability, multi-body dynamics, and control systems simulation.

Suspension systems, Drivetrains, brake systems, steering systems, engines, control systems, transmissions, boot joints, bearings, clutches, chassis structure are analysed in automotive industry. Apart from it Aerospace, Defence, Manufacturing, Heavy Equipment, Medical, Consumer products and energy industry deals with Multi Body Dynamics.



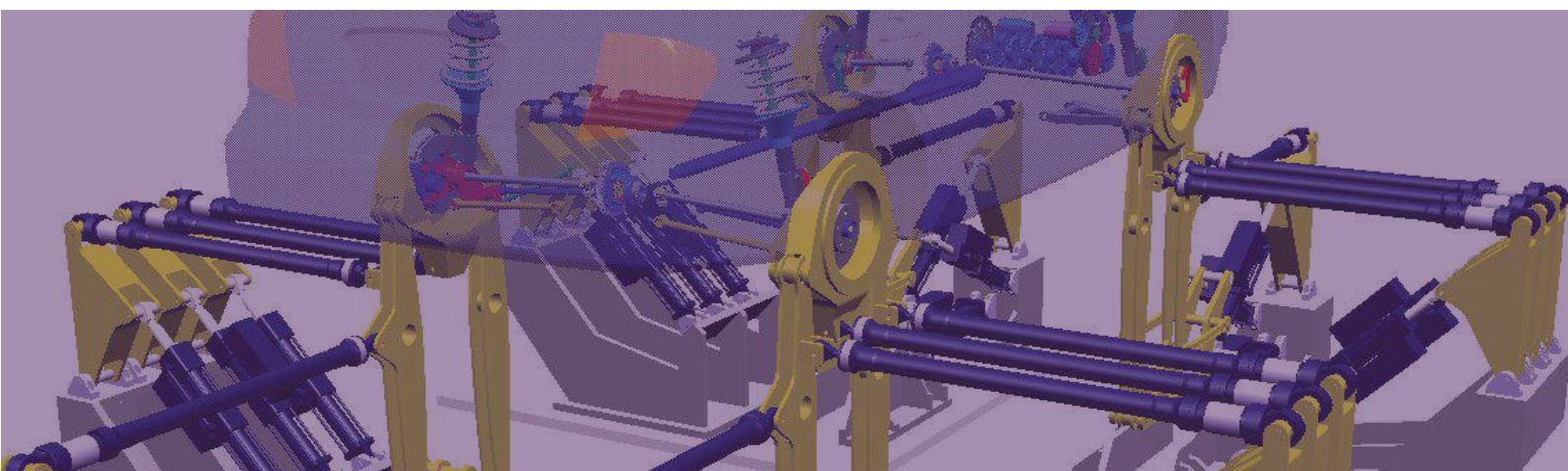
## What are the program objectives?

Adams/Car provides built-in sub-system and system templates together with pre-defined virtual tests & maneuvers to facilitate the modeling & simulation (M&S) of suspension kinematics & dynamics as well as full-vehicle dynamics. If you are involved with vehicle engineering work at your school, especially for student competitions such as Formula SAE, Baja, Solar Car, and Hybrid or Autonomous Vehicles, then this product is likely to be of interest to you.

Adams Car software allows students to design and simulate their FSAE / BAJA vehicles to maximize their vehicle performance. With Adams Car, FSAE / BAJA teams can quickly build and test their functional virtual prototypes of complete vehicles and vehicle subsystems. FSAE / BAJA engineering teams can exercise their vehicle designs under various road conditions, performing the same tests they normally run in a test lab or on a test track, but in a fraction of time.

## What are the main highlights of the program?

- Learn without a career break with online classes available 24\*7.
- One can access the course at their own pace, but with the investment of 3-5 hours/week, it can be finished within a month.
- This Program is focused on student level competitions like SAE BAJA, SAE SUPRA and even Formula Bharat and Formula-e.
- The programme uses a Continuous Evaluation System that assesses the learners over convenient and regular intervals. Such a system provides timely and frequent feedback and helps busy working professionals stay on course with the programme.
- The education delivery method is a blend of classroom and experiential learning.
- Participants who will complete the programme become eligible for Mentorship and Placement help through our Job Fairs.



## Who should apply?

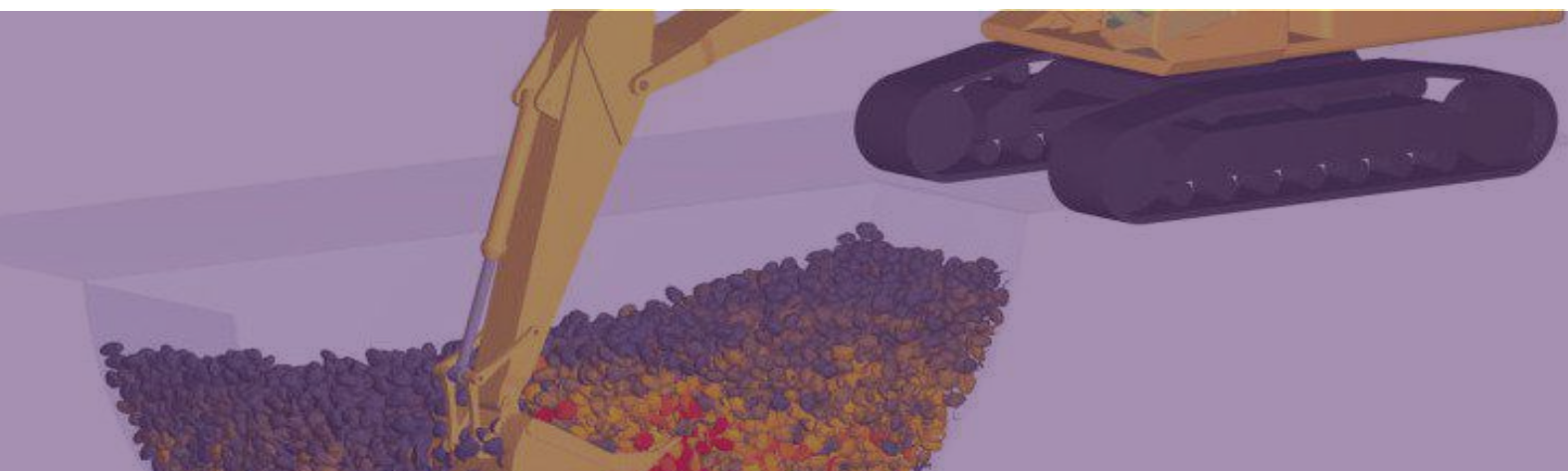
The programme is designed for students or professionals who are:

- Students participating in SAE Competitions (BAJA, FSAE, SUPRA, Formula Car Championships).
- Professionals who are in the R&D sector of Automotive Companies.
- Tech. & Ph.D. students working in Multi Body Dynamics.
- Enthusiasts who are making projects on Automobiles and are finding it hard to do the body balancing analysis.

## What are the technical requirements?

The programme to give its best will need following requirements:

- Computer/ Laptop will provide you with the best experience, but this program is quite compatible with smartphones to make it feasible for students worldwide.
- High-speed internet for crystal clear experience, but this program can also run without buffering with below-average connectivity for reaching out students from suburban and rural areas.
- A student should make their notes for future reference.
- A student should have basic knowledge about high-school physics, chemistry and maths, even though the pre-requisite of this programme will brush up one's basic concepts.
- A student should have a compatible computer for ADAMS Car software so that they can practice with the progress of the course.



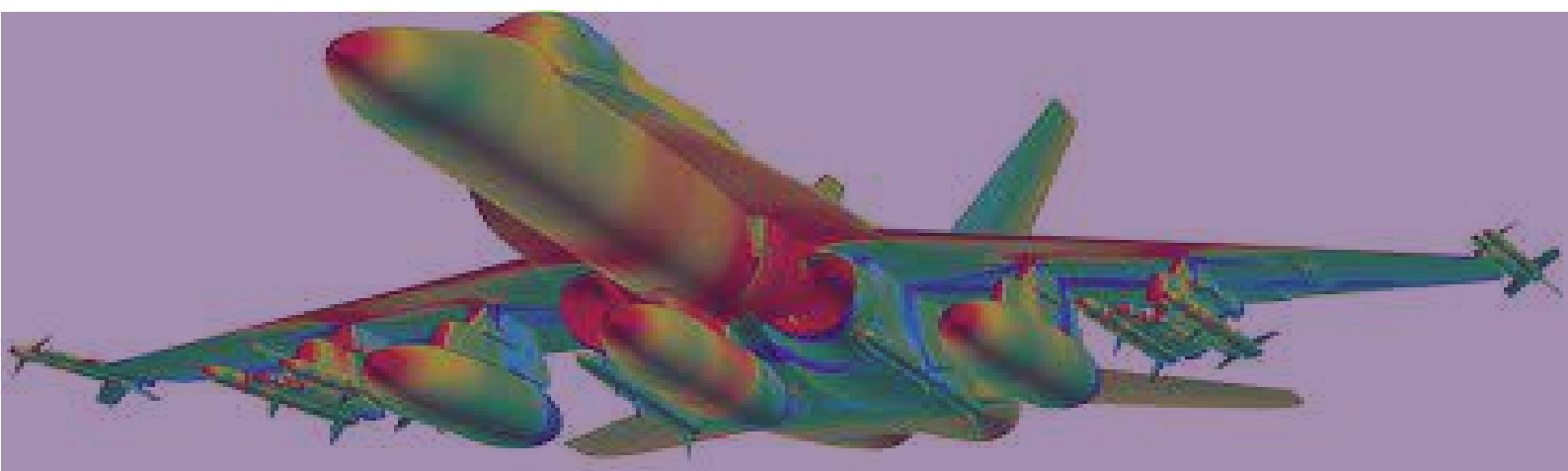
## What is the learning methodology?

DIYguru presents a Nano Degree program on MSC Multi Body Dynamics Certification Course. This program provides you with the most flexible learning environment possible. This program is offered as a self-paced program often referred to as asynchronous online program which is time independent, meaning that it can be accessed 24X7 within the tenure of 90 days.

This program can be accessed from multiple devices which make it easy to learn on the go. Lectures that are pre-recorded or slide presentation with voice-over commentary, interactive discussion boxes that foster student to student interaction, Email communication with the instructor are part of this process.

## What are the learning outcomes?

- To develop learn and apply new theories, concepts and methods.
- To develop extensive knowledge and understanding of a wide range of computer modeling and simulation software.
- Identify, formulates, and solves engineering problems.
- Apply knowledge of mathematics, science, and engineering.
- Design and conduct experiments, as well as to analyze and interpret data.
- Handsome command over ADAMS/View and ADAMS/Solver
- Firm grasp of multi-body dynamics fundamentals.
- Pre-requisite for advanced "Grey Box" M&S environment of ADAMS/Car





# Program Structure

ADAMS Tutorial KIT

Adams For Formula SAE

ADAMS Car Suspension for BAJA

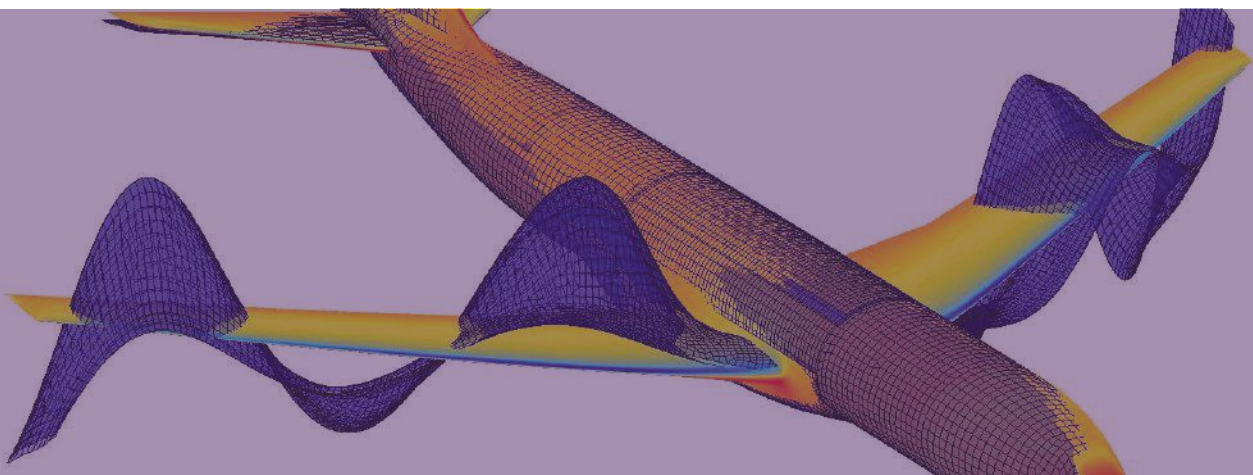
Improve Performance of Commercial Vehicles with Multibody Dynamics

Generating Accurate Dynamic Loads for Finite Element Analysis

Conduct Vehicle Safety Analysis using Adams Car

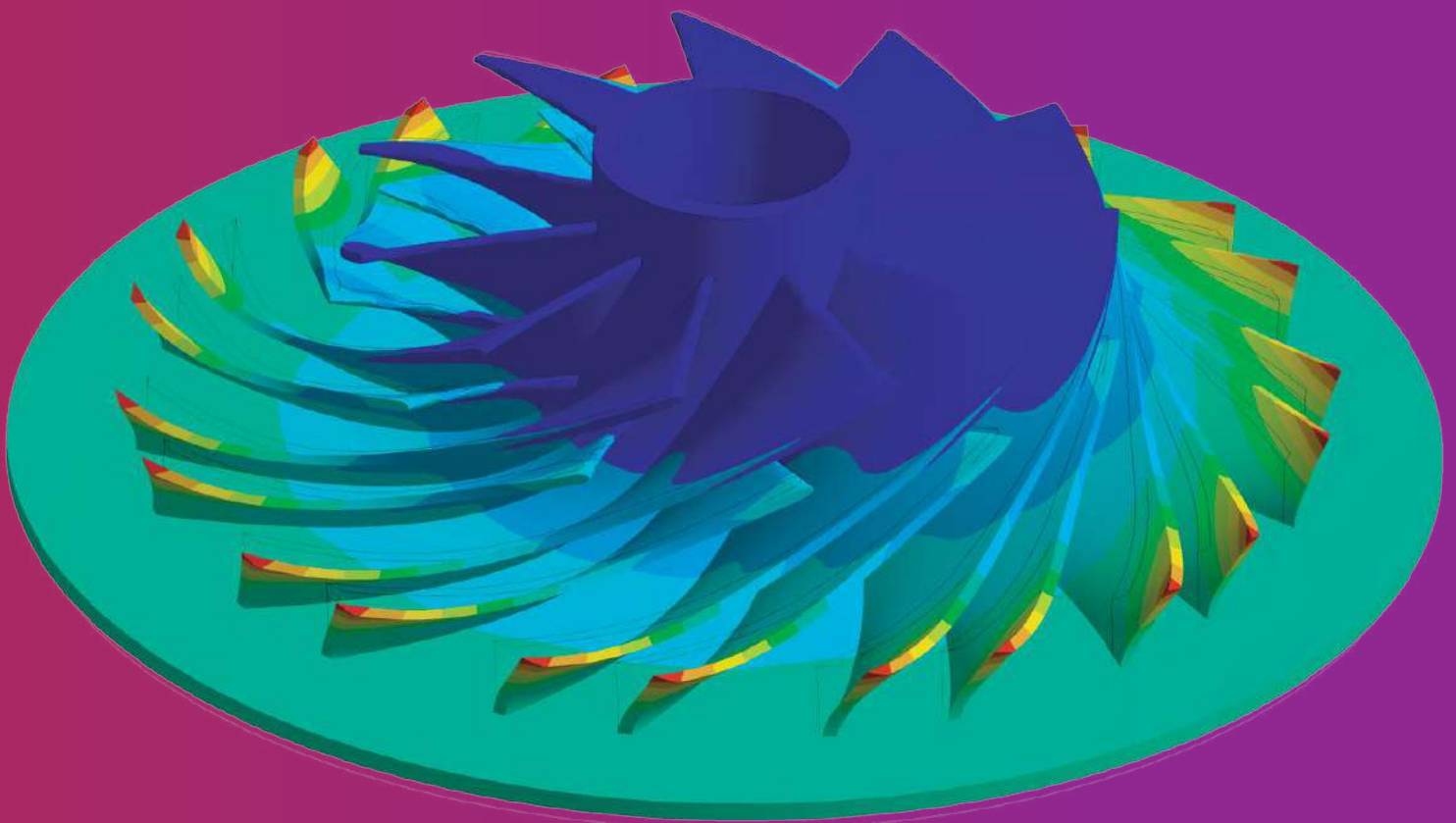
Complete Multibody Dynamics Analysis with Adams

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Nano  
Degree Program

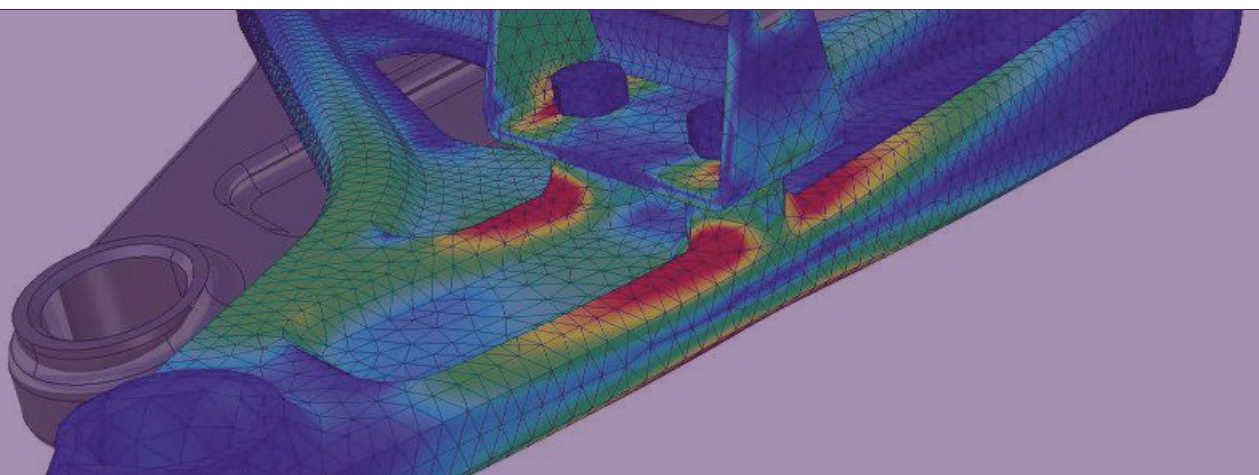
# ANSYS - FEA/FEM Fundamentals





The global computer aided engineering market size was valued at USD 7.3 billion in 2019 and is expected to register a CAGR of 9.3% over the forecast period, owing to increased outsourcing of manufacturing processes to emerging economies such as India, China, and Russia. The market is poised for unprecedented growth over the forecast period as integrated software solutions eliminate the need for multiple prototypes and product recall concerns, thereby reducing the cost associated with prototyping and product recall strategy.

The CAE market is segmented into Finite Element Analysis (FEA), Computational Fluid Dynamics (CFD), multibody dynamics, and optimization and simulation. The FEA segment dominated the market for computer aided engineering in terms of revenue in 2019. FEA is a computational analysis methodology that helps in determining the strength of a product with respect to the loading. FEA simulates real components to analyze problems pertaining to heat transfer, structural analysis, electromagnetic potential, and mass transport.



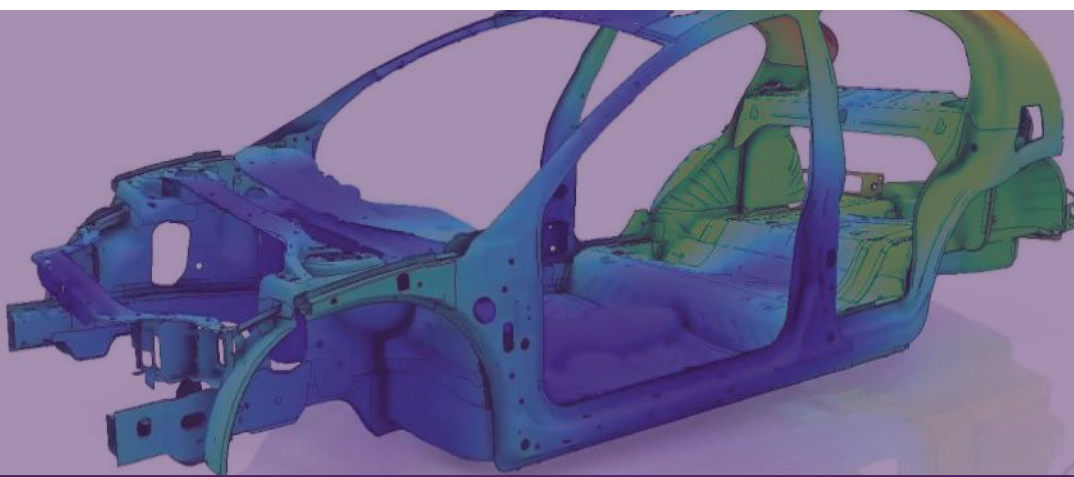
## What are the program objectives?

This is a problem-based course where you'll learn by doing. The focus will be on understanding what's under the blackbox so as to move beyond garbage-in, garbage-out. You'll practice using a common solution approach to problems involving different physics: structural mechanics, fluid dynamics and heat transfer. We'll solve textbook examples to understand the fundamental principles of finite-element analysis and computational fluid dynamics. Then we'll apply these principles to simulate real-world examples in the tool including a bolted rocket assembly and a wind turbine rotor. By working through examples in a leading simulation tool that professionals use, you'll learn to move beyond button pushing and start thinking like an expert.

Join us to discover why simulations have changed how engineering is done and how you can be a part of this revolution.

## What are the main highlights of the program?

- Learn without a career break with online classes available 24\*7.
- One can access the course at their own pace, but with the investment of 3-5 hours/week, it can be finished within a month.
- This program empowers technocrats for student level competitions like SAE BAJA, SAE SUPRA and even Formula Bharat and Formula-e.
- The programme uses a Continuous Evaluation System that assesses the learners over convenient and regular intervals. Such a system provides timely and frequent feedback and helps busy working professionals stay on course with the programme.
- The education delivery method is a blend of classroom and experiential learning. Participants who will complete the programme become eligible for Mentorship and Placement help through our Job Fairs.



## Who should apply?

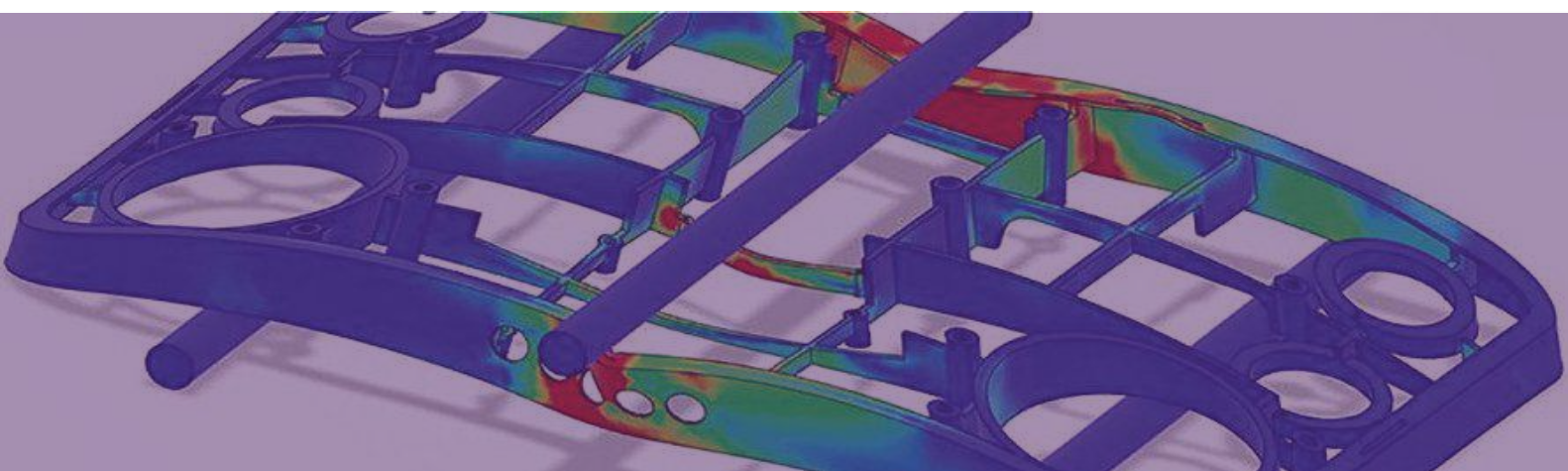
The programme is designed for students or professionals who are:

- Having a Diploma, BE / B.Tech or equivalent in domains such as Automotive, Mechanical, EEE, ECE, Instrumentation, Mechatronics.
- Designing enthusiasts (No academic qualification mandatory)
- Working in industries such as Automotive, Auto component, Design, Manufacturing, etc
- Working in Functional areas such as R&D, Analysis, Maintenance, Projects, component design etc.
- Interested in pursuing further studies on the part-time or full-time basis in Design and Engineering Sector.

## What are the Technical Requirements?

The programme to give its best will need following requirements:

- Computer/ Laptop will provide you with the best experience, but this program is quite compatible with smartphones to make it feasible for students worldwide.
- High-speed internet for crystal clear experience, but this program can also run without buffering with below-average connectivity for reaching out students from suburban and rural areas.
- A student should make their notes for future reference.
- A student should have basic knowledge about high-school physics and chemistry, even though the pre-requisite of this programme will brush up one's basic concepts.
- A student should have a compatible computer for ANSYS software so that they can practice with the progress of the course.





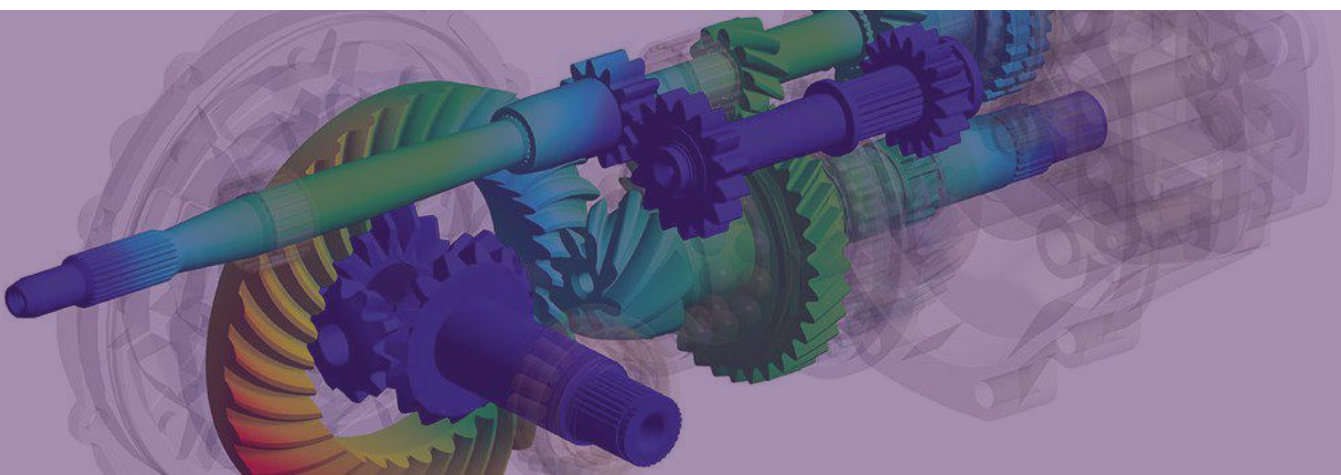
## What is the learning methodology?

DIYguru presents a Nano Degree program on ANSYS-(FEA/FEM) Fundamental Certification Course. This program provides you with the most flexible learning environment possible. This program is offered as a self-paced program often referred to as asynchronous online program which is time independent, meaning that it can be accessed 24X7 within the tenure of 30 days. This program can be accessed from multiple devices which make it easy to learn on the go.

Lectures that are pre-recorded or slide presentation with voice-over commentary, interactive discussion boxes that foster student to student interaction, Email communication with the instructor are part of this process.

## What are the learning outcomes?

- To develop learn and apply new theories, concepts and methods
- To develop extensive knowledge and understanding of a wide range of computer modeling and simulation software.
- Identify, formulates, and solves engineering problems
- Apply knowledge of mathematics, science, and engineering
- Design and conduct experiments, as well as to analyze and interpret data
- Big ideas in finite-element analysis and computational fluid dynamics
- Structural mechanics simulations using ANSYS Mechanical™
- Fluid dynamics simulations using ANSYS Fluent™
- Mathematical models underlying simulations
- Building simulations of real-world applications using ANSYS® software
- Verification and validation of simulations including checking against hand calculations
- Build an approach within engineering analysis and simulations like an expert



# Program Structure

Introduction

General Preprocessing

Static Structural Analysis

Remote Boundary Conditions

Vibration Analysis

Results and Postprocessing

Training Exercises

Mechanical Basics

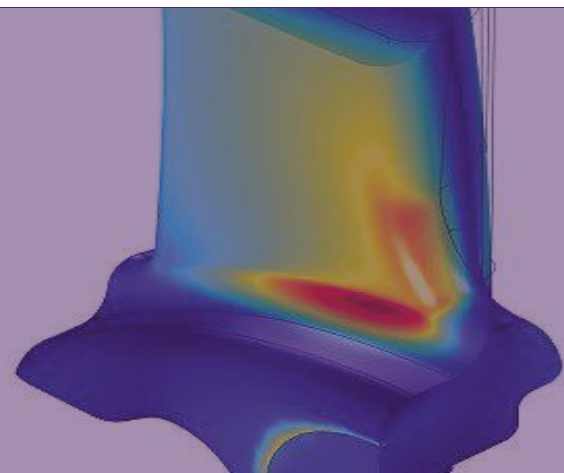
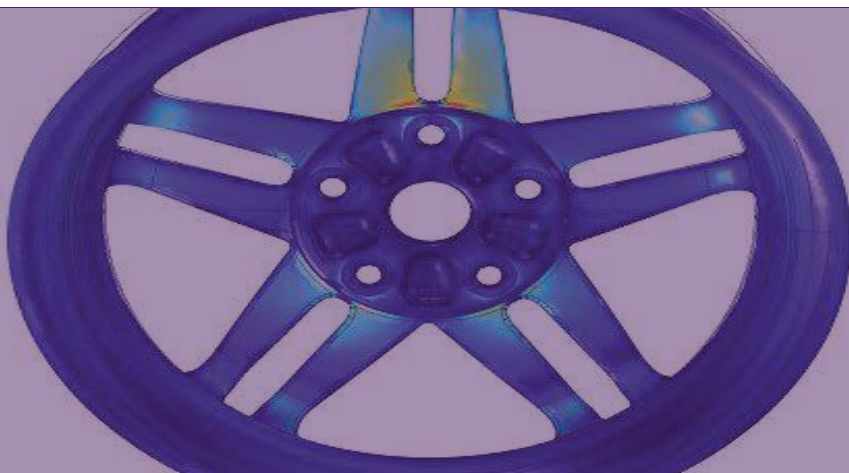
Meshing in Mechanical

Modelling Connections

Multistep Analysis

Thermal Analysis

CAD Parameters



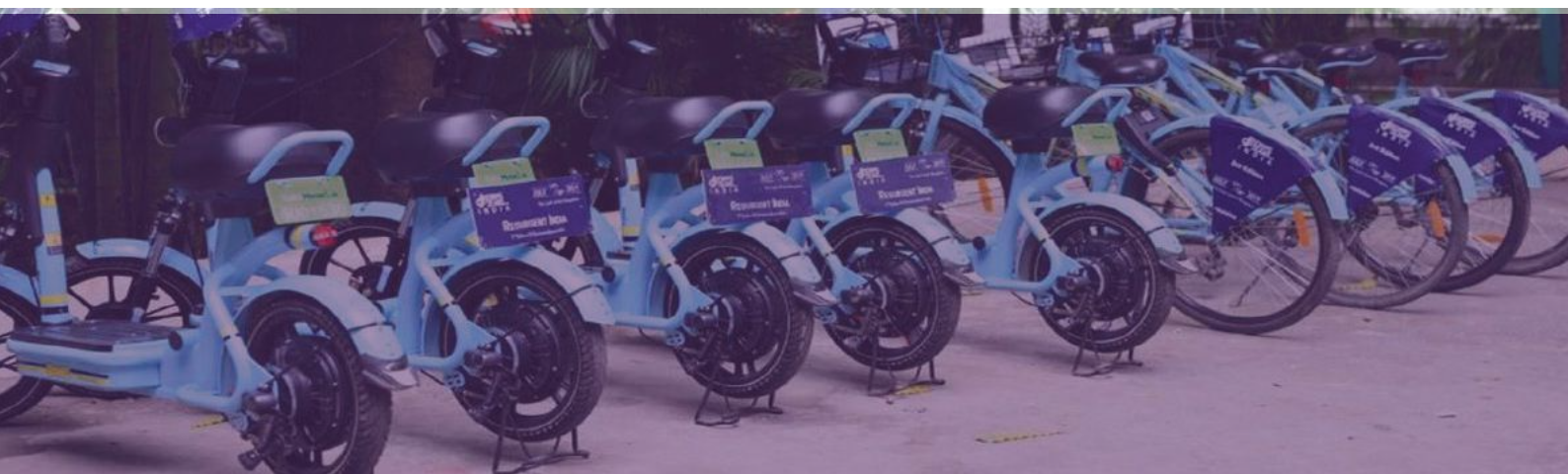
Nano  
Degree Program  
**BUSINESS**  
**OPPORTUNITIES**  
**IN ELECTRIC VEHICLE**





Electric cars are more than a novel means of mobility. They have been recognized as an essential building block of the energy transition. Fulfilling their promise will imply a significant change in the technical, digital and social dimensions of transport and energy infrastructure. As the massive adoption of electric mobility will deeply change our society and our individual routines, government intervention is called for.

Moreover, electric vehicles are much cheaper to operate than conventional vehicles. Drivers who switch to electric vehicles will have more disposable income to spend in other sectors of the economy, such as housing and services. Spending in these sectors keeps more wealth moving within local economies and will drive job creation in sectors not immediately connected to producing electric vehicles.



## What are the program objectives?

The programme tends to equip new entrepreneur with proficiency on electric vehicle technology and government initiatives to promote electric vehicles, its ancillaries and charging infrastructure. This course explains how electric mobility can work for various businesses, including fleet managers, automobile manufacturers and charging infrastructure providers.

This course will help entrepreneurs to find answers of How electric cars are disrupting conventional business models; How to apply advanced business innovation tools; How to develop profitable e-mobility business models; Innovation in future mobility.

## What are the main highlights of the program?

- Learn without a career break with online classes available 24\*7.
- One can access the course at their own pace, but with the investment of 3-5 hours/week, it can be finished within a month.
- This program is designed in advanced level that can be understood only after the completion of electric vehicle fundamental knowledge
- The programme uses a Continuous Evaluation System that assesses the learners over convenient and regular intervals. Such a system provides timely and frequent feedback and helps busy working professionals stay on course with the programme.
- The education delivery method is a blend of classroom and experiential learning.



## Who should apply?

The programme is designed for students or professionals who are:

- Having a Diploma, BE / B.Tech or equivalent in domains such as Automotive, Mechanical, EEE, ECE, Instrumentation, Mechatronics.
- Designing enthusiasts (No academic qualification mandatory)
- Working in industries such as Automotive, Auto component, Design, Manufacturing, etc
- Working in Functional areas such as R&D, Analysis, Maintenance, Projects, component design etc.
- Interested in establishing business in E-mobility sector.

## What are the Technical Requirements?

The programme to give its best will need following requirements:

- Computer/ Laptop will provide you with the best experience, but this program is quite compatible with smartphones to make it feasible for students worldwide.
- High-speed internet for crystal clear experience, but this program can also run without buffering with below-average connectivity for reaching out students from suburban and rural areas.
- A student should make their notes for future reference.
- A student should have basic knowledge about high-school physics and chemistry, even though the pre-requisite of this programme will brush up on one's basic concepts.



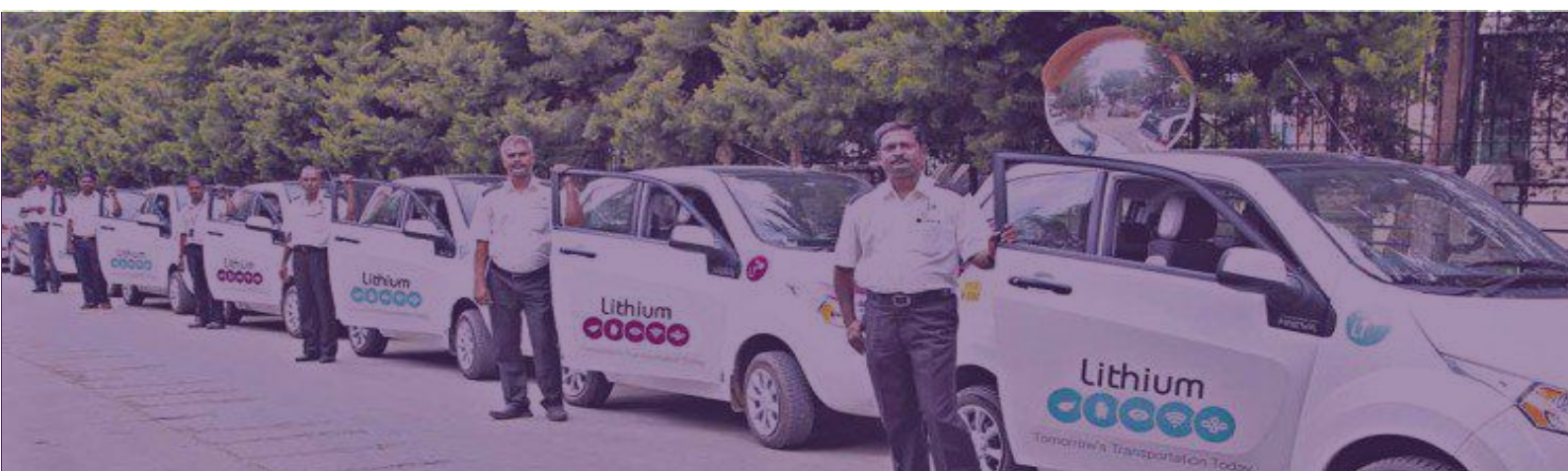
## What is the learning methodology?

DIYguru presents a Nano-degree program on Business Opportunities in Electric Vehicle Technology. This program provides you with the most flexible learning environment possible. This program is offered as a self-paced program often referred to as asynchronous online program which is time independent, meaning that it can be accessed 24X7 within the tenure of 90 days. This program can be accessed from multiple devices which make it easy to learn on the go.

Lectures that are pre-recorded or slide presentation with voice-over commentary, interactive discussion boxes that foster student to student interaction, Email communication with the instructor are part of this process.

## What are the learning outcomes?

- Understand the global and Indian market scenario related to Electric Vehicles
- Understand the business opportunities in the field of EVs and EV support equipment
- Identify new product development, technology partnership, markets for your business
- Evaluate EV market for diversification
- Become conversant at EV and EV supporting technologies





# Program Structure

How electric cars are disrupting conventional business models

How to develop profitable e-mobility business models

How to apply advanced business innovation tools

EV Business - Government rules and opportunity



Nano  
Degree Program

# LabVIEW Industrial Application Online Course





Many startups use LabVIEW for rapid prototyping, building breadboard and proof of concept systems prior to building the final shipping products. LabVIEW is especially valuable for companies who want to ship complex systems that need all of embedded software, FPGA software and client applications for the same product as LabVIEW allows developing the whole stack in a single high level language cutting the total development cost and time significantly. In addition many companies use it for testbeds, R&D tools and manufacturing and service tools for hardware products that were developed using some other embedded programming language.

Industries :

1. NASA
2. ARAI
3. Automotive industries
4. Biomedical sector



# What are the program objectives?

## Educators

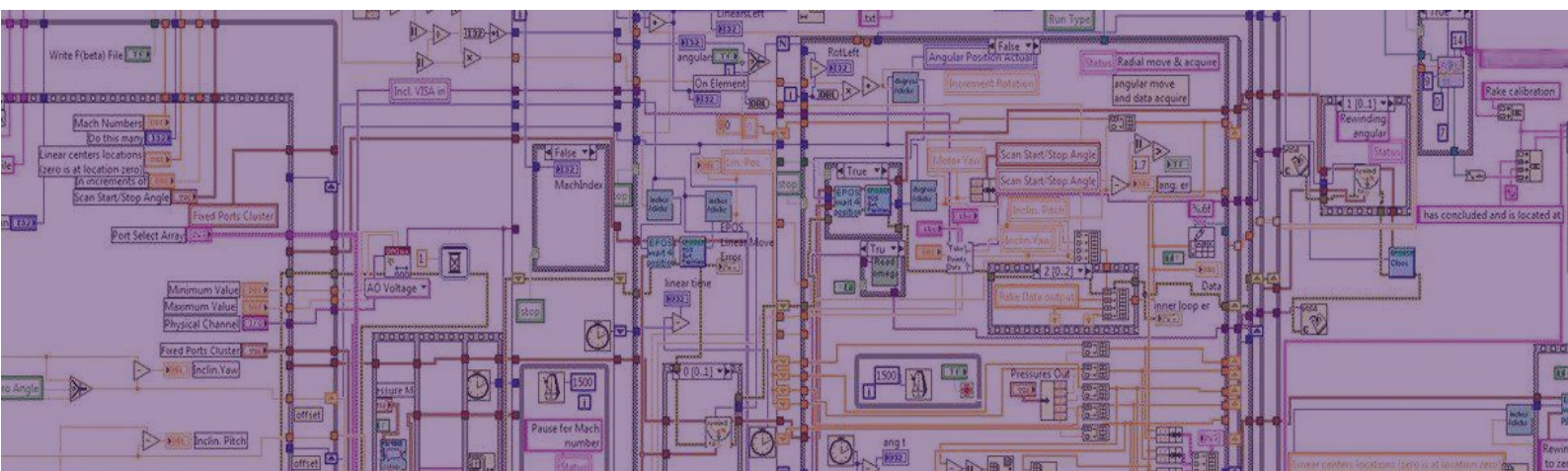
Not only can you use LabVIEW to enhance your students' learning experience in both the lecture and the laboratory, it can also provide you with substantial productivity gains in your area of research.

## Students

With LabVIEW, you can write sophisticated programs and applications in a shorter amount of time without needing a computer science degree. While you are in school, LabVIEW can improve your performance on projects and research. When you graduate, LabVIEW skills can help you get a job at thousands of companies around the world.

# What are the main highlights of the program?

- Learn without a career break with online classes available 24\*7.
- One can access the course at their own pace, but with the investment of 3-5 hours/week, it can be finished within a month.
- The programme uses a Continuous Evaluation System that assesses the learners over convenient and regular intervals. Such a system provides timely and frequent feedback and helps busy working professionals stay on course with the programme.
- The education delivery method is a blend of classroom and experiential learning.
- Participants who will complete the programme become eligible for Mentorship and Placement help through our Job Fairs.



# Who should apply?

The programme is designed for students or professionals who are:

- This Labview online course is meant for anyone who is interested in learning programming with it as a whole. No prior programming knowledge is needed.
- Programming enthusiasts
- Students, Researchers and Engineers in the field of mechanics of electronics, robotics, mecha-tronics, industries, medicine and industrial automation

# What are the technical requirements?

The programme to give its best will need following requirements:

- A computer or laptop – With Window 7 or later, > 2Gb of RAM (4Gb Reccomended) , 1.5Ghz Processor or higher (Multicore Core 2Ghz processor Recommended).
- LabVIEW Software in trial version or you can purchase a license.



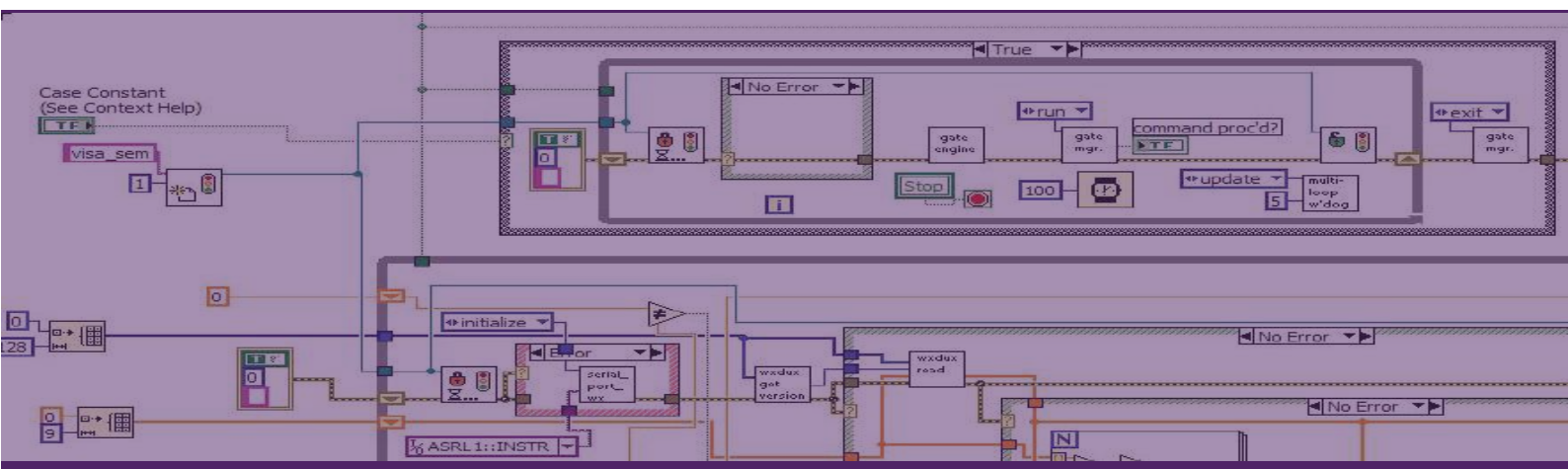
## What is the learning methodology?

DIYguru presents a Nano-degree program on LabVIEW. This program provides you with the most flexible learning environment possible. This program is offered as a self-paced program often referred to as asynchronous online program which is time independent, meaning that it can be accessed 24X7 within the tenure of 30 days. This program can be accessed from multiple devices which make it easy to learn on the go.

Lectures that are pre-recorded or slide presentation with voice-over commentary, interactive discussion boxes that foster student to student interaction, Email communication with the instructor are part of this process.

## What are the learning outcomes?

This is a Complete Labview online course, which takes you from zero to an advanced level, where you will be able to create your own programmes and understand other codes as well. You can put your skills to test with a minor project and major project. (Major project will be a workshop in a Makerspace with mentors). It solves engineering challenges across a broad range of application areas.



## Online Course (30 Days)

Introduction to Labview

Arrays and Clusters

Array

Interleave

rotate-search-sort(f)

decimating final(f)

cluster-by-name(f)

cluster-without-name(f)

String functions

Format-into-string(f)

replace-string(f)

search-and-replace(f)

Structures in LabVIEW

For loop 1

Case Structure

Event Structure

Formula Node – 1

Flat Sequence

Strings Length Concatenate

Replace String (Revised)

Search String (Revised)

Plotting Waveform and Graphs

Chart

Graph

XY Graph

Multiple Signals

Property Nodes

Property Node 1

Property Node 2

Property Nodes 2a

Property Nodes 2b

File I/O and Report Generation Toolkit

File Text RW

TDMS

Word Report

Word Report Controls

Miscellaneous

Shift Register

SubVI

Dialog

Shift Register

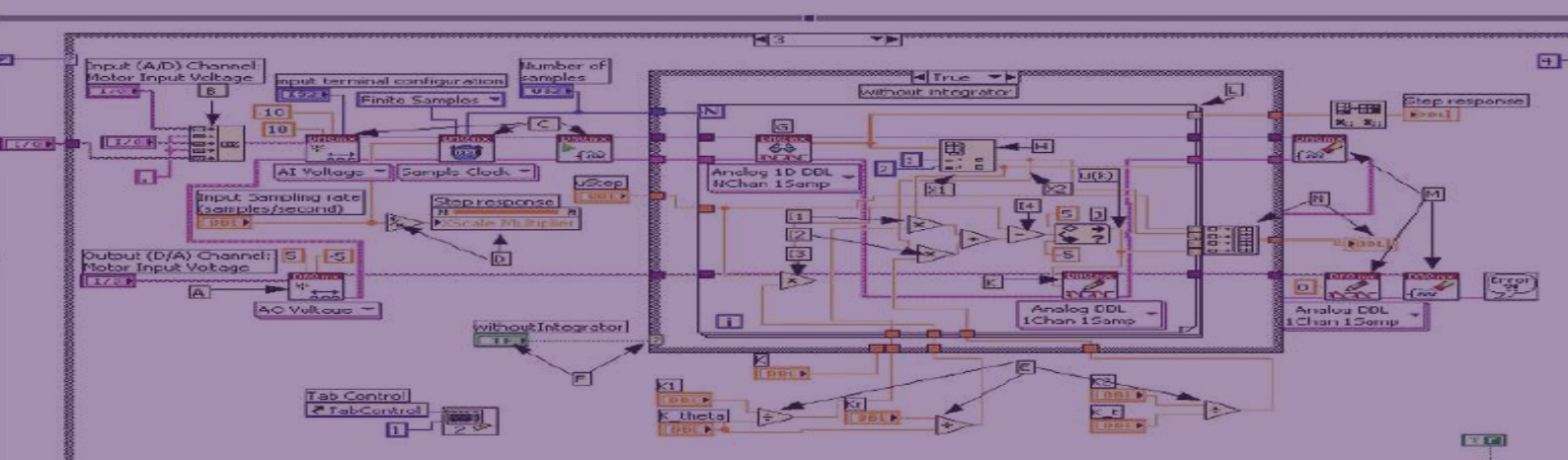
Variable

Global Variable

Local Variable

Web Services

Projects



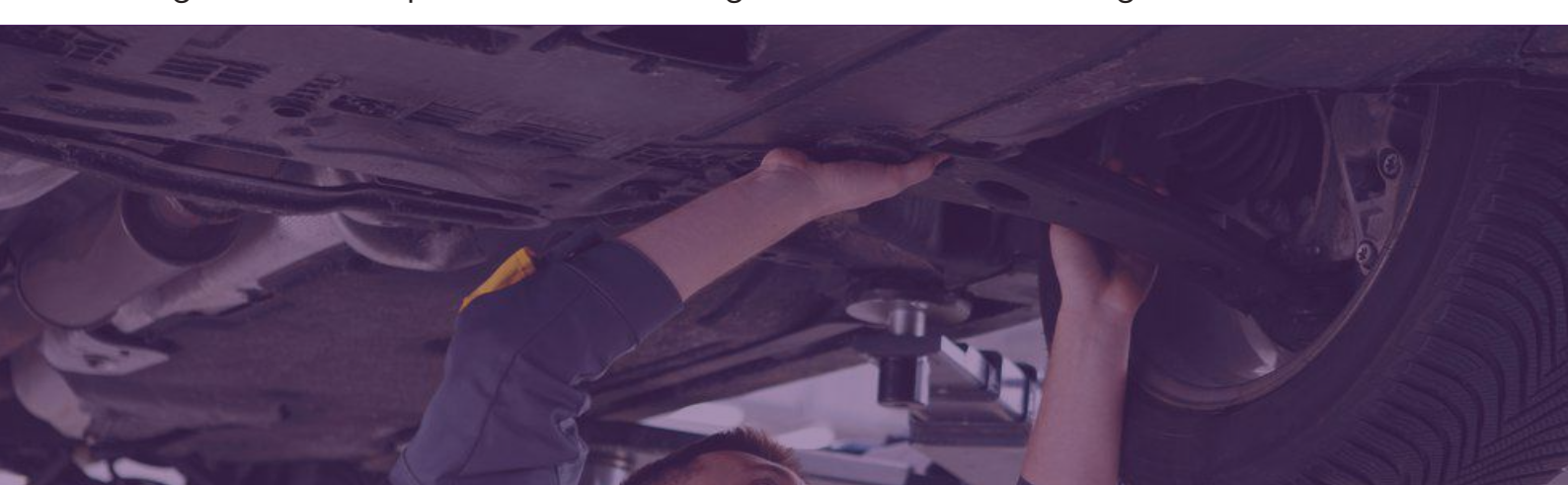
Nano  
Degree Program  
**CAR REPAIRING AND  
MAINTENANCE CERTIFICATION  
COURSE**





The first car ever made was around 1885, which was a massive step for mankind. Cars make our lives so much easier by providing us quick and easy transport anywhere we want. The modern automobile industry has also seen a lot of innovation and produced cars that are roomy or fast or luxurious, basically feeding all the niches.

The global Automotive Repair & Maintenance Service Market is estimated to reach USD 810.30 Billion by 2026, according to a new report by Reports and Data. This can be mainly associated with the growing need for passenger's safety. An increase in awareness related to vehicle maintenance and safety is expected to drive the market. Increased road safety awareness among the general population, the average maintenance and repair expenses by an individual are anticipated to drive the market. Moreover, an increase in sales of used cars in many regions, especially in emerging economies; technological advancements pertaining to vehicle safety, are also fuelling the market growth. Furthermore, cost-effectiveness, availability of service flexibility and reliable maintenance services are also propelling the market growth globally. Based on statistics, an increase in the average age of vehicles due to technological advancements and the average miles driven per vehicle are also significant factors stimulating market demand.



## What are the program objectives?

This course will initially introduce you to general safety rules and tools you will need to explore underneath the hood of your car. You will get a quick guide to general maintenance which will allow you to take good care of your car with ease. Following that, you will discover more about dashboard indicators, tires, IC engines, and engine oil. Finally, you take a schematic view on the cooling system, fuel system, electrical system, drive train, brakes and understand a bit about the auto repair industry. Getting this course would be a great idea for anyone because it doesn't just help you take care of your car as you can utilize the skills developed professionally as well. It will assist you in beginning a career in the automotive repair industry.

## What are the main highlights of the program?

- Learn without a career break with online classes available 24\*7.
- One can access the course at their own pace, but with the investment of 3-5 hours/week, it can be finished within a month.
- The programme uses a Continuous Evaluation System that assesses the learners over convenient and regular intervals. Such a system provides timely and frequent feedback and helps busy working professionals stay on course with the programme.
- The education delivery method is a blend of classroom and experiential learning.



## Who should apply?

The programme is designed for students or professionals who are:

- Having a Diploma, BE / B.Tech or equivalent in domains such as Automotive, Mechanical, EEE, ECE, Instrumentation, Mechatronics.
- Automotive enthusiasts (No academic qualification mandatory)
- Working in industries such as Automotive, Auto component, etc.
- Working in Functional areas such as After Sales, Service, Maintenance, etc.
- This course is also designed for the person who just wants to know a little bit about the automotive field for their own vehicle repairs.

## What are the technical requirements?

The programme to give its best will need following requirements:

- Computer/ Laptop will provide you with the best experience, but this program is quite compatible with smartphones to make it feasible for students worldwide.
- High-speed internet for crystal clear experience, but this program can also run without buffering with below-average connectivity for reaching out students from suburban and rural areas.
- A student should make their notes for future reference.
- A student should have basic knowledge about high-school physics, chemistry and maths, even though the pre-requisite of this programme will brush up on one's basic concepts.





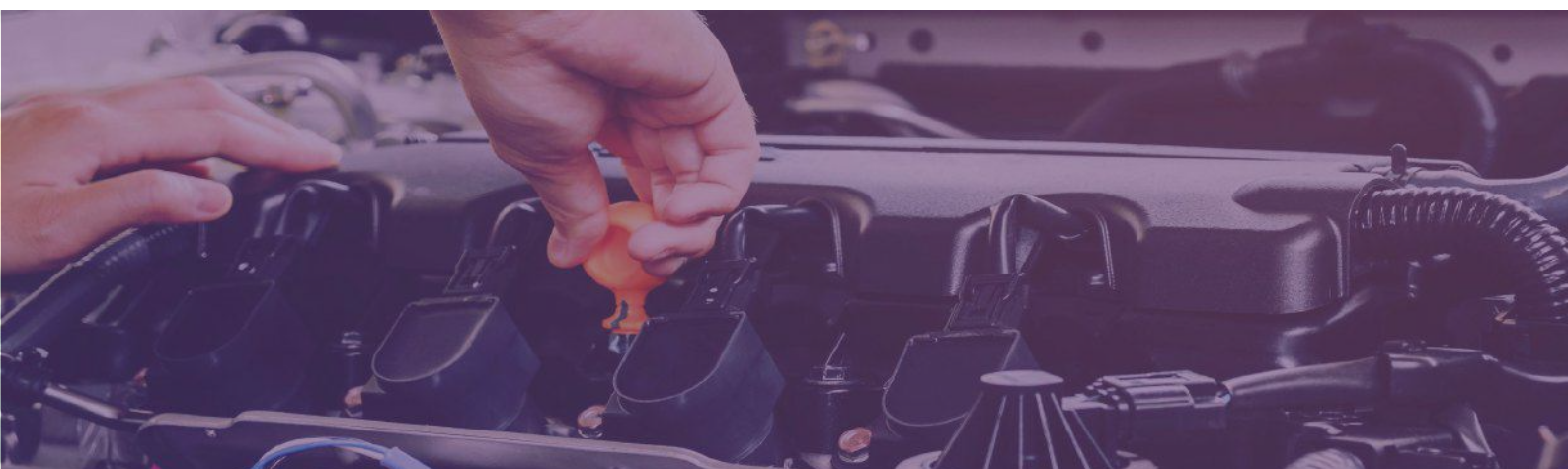
## What is the learning methodology?

DIYguru presents the Nano-degree program on Car Repair and Maintenance Certification Course. This program provides you with the most flexible learning environment possible. This program is offered as a self-paced program often referred to as an asynchronous online program which is time-independent, meaning that it can be accessed 24X7 within the tenure of 21 days. This program can be accessed from multiple devices which makes it easy to learn on the go.

Lectures that are pre-recorded or slide presentation with voice-over commentary, interactive discussion boxes that foster student to student interaction, Email communication with the instructor are part of this process.

## What are the learning outcomes?

- Assist in performing vehicle service and maintenance
- Assist in performing the actual repair/ replacement of various parts/ aggregates in a vehicle
- Plan and organize work requirements including various activities, deliverables or work output required in the given time
- Maintain set quality standards
- Use resources in a responsible manner (both material/equipment and manpower)
- Interact & communicate effectively with colleagues including the member in the own group as well as other groups
- Monitor the working environment and make sure it meets requirements for health, safety, and security.





# Program Structure

## Getting Started and Staying Safe

What is under the bonnet?; What you need in your toolbox; Preparing to work; Basic safety techniques; Clean up and disposal

## Basic Maintenance

Changing a tire; Checking and changing the oil; Installing windshield wipers; Replacing headlights; Small bodywork repairs

## More Advanced Maintenance

How to change your filters; Checking your transmission fluid; Heating and cooling systems  
Checking, changing and charging a battery; Replacing fuses and spark plugs

## Brake Maintenance

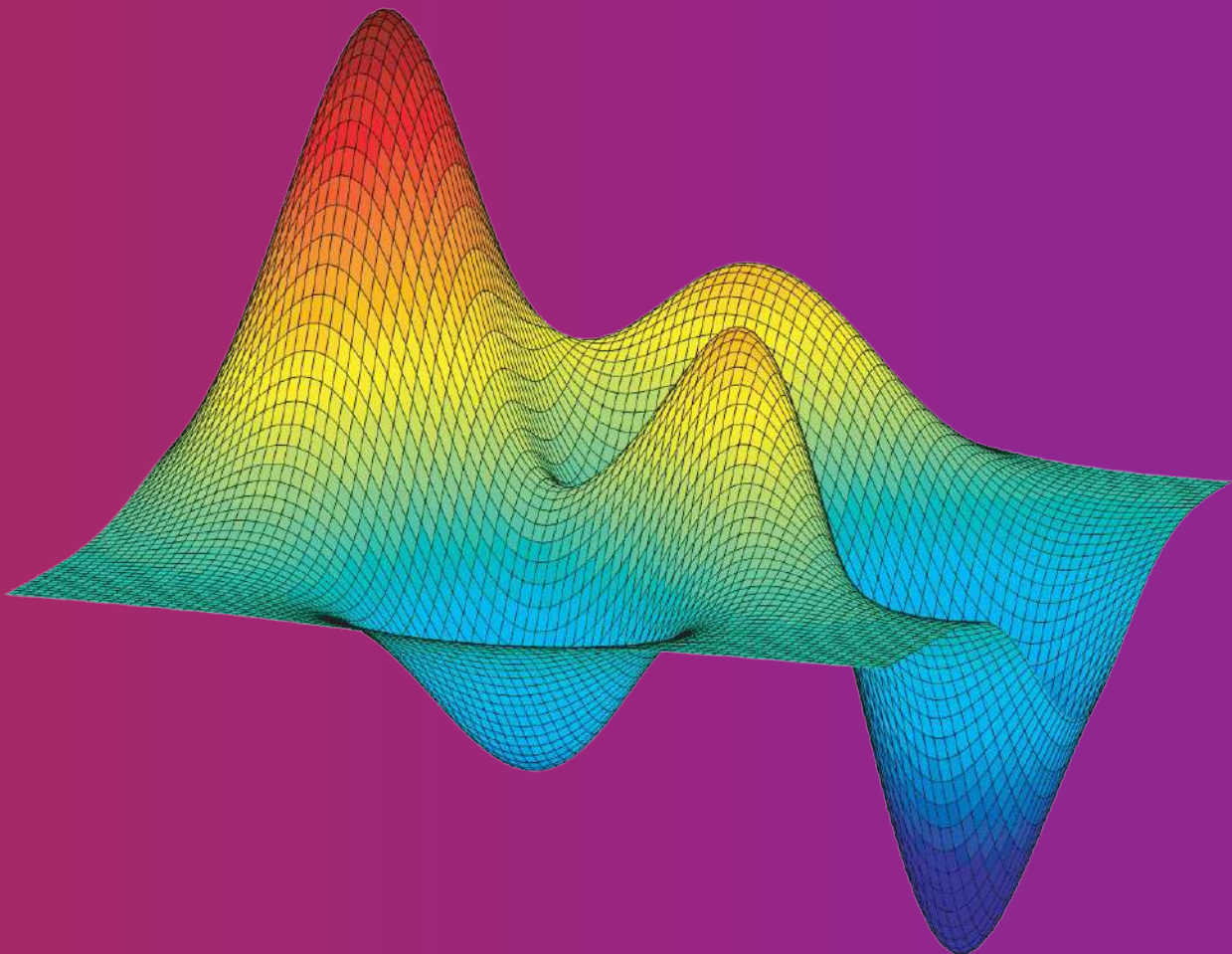
Troubleshooting brake problems; How to check and inspect your brakes; How to check and change your brake fluid; How to check your wheel bearings

## Other Maintenance You Can Do Yourself

Replacing belts; Fixing leaks; Paint touch-ups; Adding amenities to the car; Keeping your car beautiful



Nano  
Degree Program  
**MATLAB**  
Fundamentals





Manufacturers of equipment used in manufacturing, testing, and power generation applications face complex challenges to develop embedded applications that integrate with mechanical, electrical, control, and signal processing systems. Forward-looking companies are turning to Model-Based Design to redefine the way they perform system-level design.

Model-Based Design enables industrial equipment makers to create executable specifications in the form of Simulink® models that provide clear design direction to diverse engineering groups.

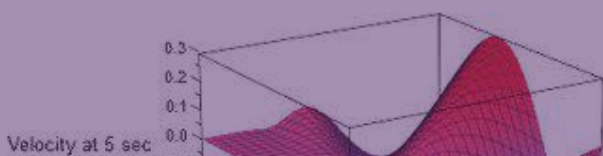
Sharing models shifts the focus of the development process from design and test on hardware to design and test with models, enabling early verification across domains before investing in prototypes. Machine makers then leverage code-generation technology to reduce rework, link code to design, and allow software engineers to focus on software architecture.

Derive velocity at  $t = 5$  sec and setting  $K$  equal to 1. This represents a parametric surface with  $M$  and  $K$  as the parameters.

$$\text{velocity\_at\_5\_sec} = \text{velocity} | t=5 | R=1$$
$$e^{\frac{s(\sqrt{1-4KM}-1)}{2M}} \frac{(\sqrt{1-4KM}-1)}{2\sqrt{1-4KM}} + e^{\frac{-s(\sqrt{1-4KM}+1)}{2M}} \frac{(\sqrt{1-4KM}+1)}{2\sqrt{1-4KM}}$$

Plot parametric surface for velocity at  $t = 5$  sec

```
plotfunc3d(velocity_at_5_sec, M=0.01..2, K=0.01..5, AxesTitles = ["Mass", "Elasticity", "Velocity at 5 sec"])
```

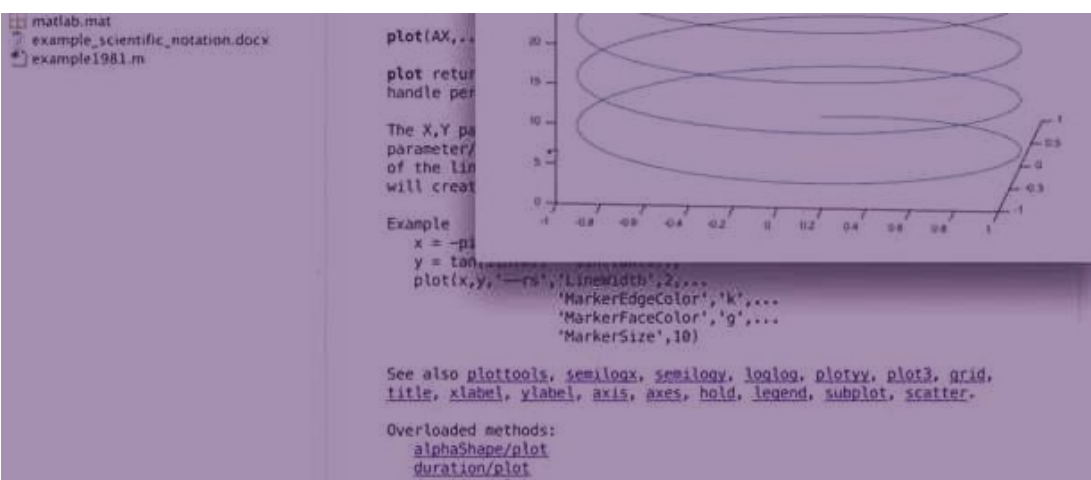


# What are the program objectives?

This course teaches computer programming to those with little to no previous experience. It uses the programming system and language called MATLAB to do so because it is easy to learn, versatile and very useful for engineers and other professionals. MATLAB is a special-purpose language that is an excellent choice for writing moderate-size programs that solve problems involving the manipulation of numbers. The design of the language makes it possible to write a powerful program in a few lines. The problems may be relatively complex, while the MATLAB programs that solve them are relatively simple. As a result, MATLAB is being used in a wide variety of domains from the natural sciences, through all disciplines of engineering, to finance, and beyond, and it is heavily used in industry. Hence, a solid background in MATLAB is an indispensable skill in today's job market.

# What are the main highlights of the program?

- Learn without a career break with online classes available 24\*7.
- One can access the course at their own pace, but with the investment of 3-5 hours/week, it can be finished within a month.
- The programme uses a Continuous Evaluation System that assesses the learners over convenient and regular intervals. Such a system provides timely and frequent feedback and helps busy working professionals stay on course with the programme.
- The education delivery method is a blend of classroom and experiential learning.
- Participants who will complete the programme become eligible for Mentorship and Placement help through our Job Fairs.
- Students taking the course will get a MATLAB Online license free of charge for the duration of the course.



## Who should apply?

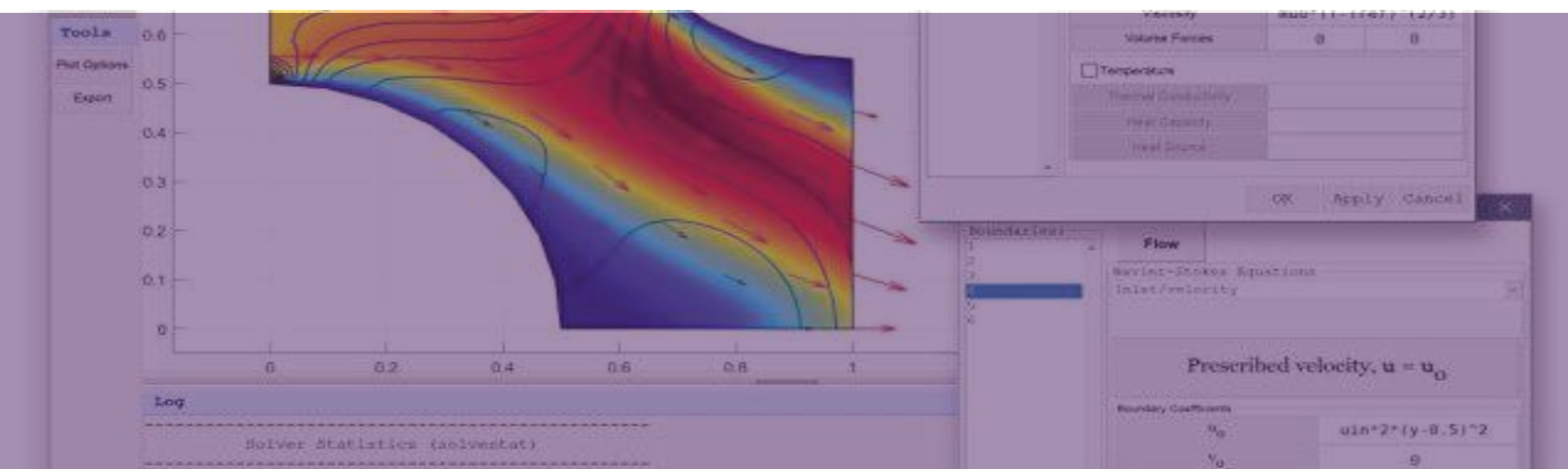
The programme is designed for students or professionals who are:

- Having a Diploma, BE / B.Tech or equivalent in domains such as Automotive, Mechanical, EEE, ECE, Instrumentation, Mechatronics.
- Programming enthusiasts (No academic qualification mandatory)
- Working in industries such as Automotive, Auto component, Design, Manufacturing, etc
- Working in Functional areas such as R&D, Analysis, Maintenance, Projects, component design etc.
- Interested in pursuing further studies on the part-time or full-time basis in Design and Engineering Sector.

## What are the technical requirements?

The programme to give its best will need following requirements:

- Computer/ Laptop will provide you with the best experience, but this program is quite compatible with smartphones to make it feasible for students worldwide.
- High-speed internet for crystal clear experience, but this program can also run without buffering with below-average connectivity for reaching out students from suburban and rural areas.
- A student should make their notes for future reference.
- A student should have basic knowledge about high-school physics, chemistry and maths, even though the pre-requisite of this programme will brush up one's basic concepts.
- A student should have a compatible computer for MATLAB software so that they can practice with the progress of the course.



# What is the learning methodology?

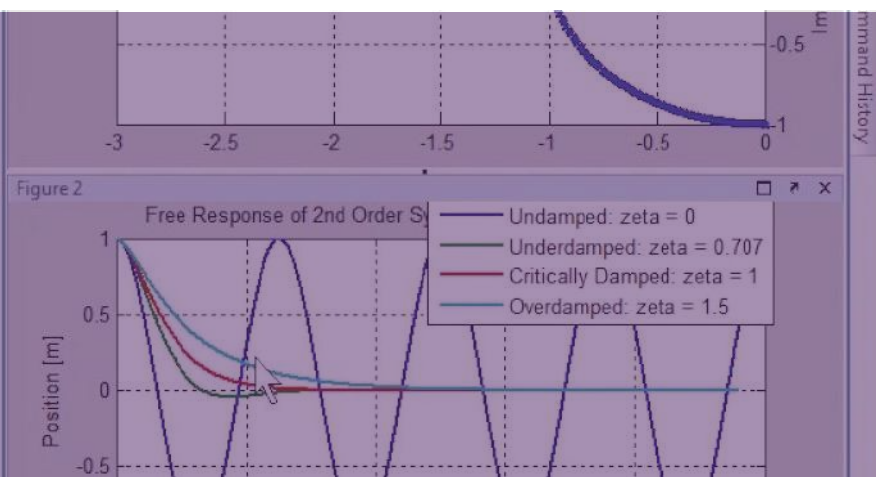
DIYguru presents a Nano Degree program on MATLAB Fundamental Certification Course. This program provides you with the most flexible learning environment possible. This program is offered as a self-paced program often referred to as asynchronous online program which is time independent, meaning that it can be accessed 24X7 within the tenure of 30 days. This program can be accessed from multiple devices which make it easy to learn on the go.

Lectures that are pre-recorded or slide presentation with voice-over commentary, interactive discussion boxes that foster student to student interaction, Email communication with the instructor are part of this process.

# What are the learning outcomes?

- Able to use Matlab for interactive computations.
- Familiar with memory and file management in Matlab.
- Able to generate plots and export this for use in reports and presentations.
- Able to program scripts and functions using the Matlab development environment.
- Able to use basic flow controls (if-else, for, while).
- Familiar with strings and matrices and their use.
- Use MATLAB effectively to analyze and visualize data.
- Apply numeric techniques and computer simulations to solve engineering-related problems.
- Apply a top-down, modular, and systematic approach to design, write, test, and debug sequential MATLAB programs to achieve computational objectives.
- Design and document computer programs and analyses in a careful and complete manner so as to effectively communicate results, to facilitate evaluation and debugging by another programmer, and to anticipate and resolve user errors.
- Demonstrate understanding and use of fundamental data structures (classes).
- Create and control simple plot and user-interface graphics objects in MATLAB.

```
130 - end;
131
132 - figure % Plot character
133
134 - plot(S, 'bx', 'linewidth'
135 - set(gca, 'YAxisLocation'
136 - xlabel('Real Axis', 'Pos:
137 - ylabel('Imaginary Axis',
138 - title('Loci of Character
139
140
141 - %% Show the "odesys" functi
142 - %%
```



# Program Structure

Introduction

Starting out with Matlab

Managing Vectors & Matrices

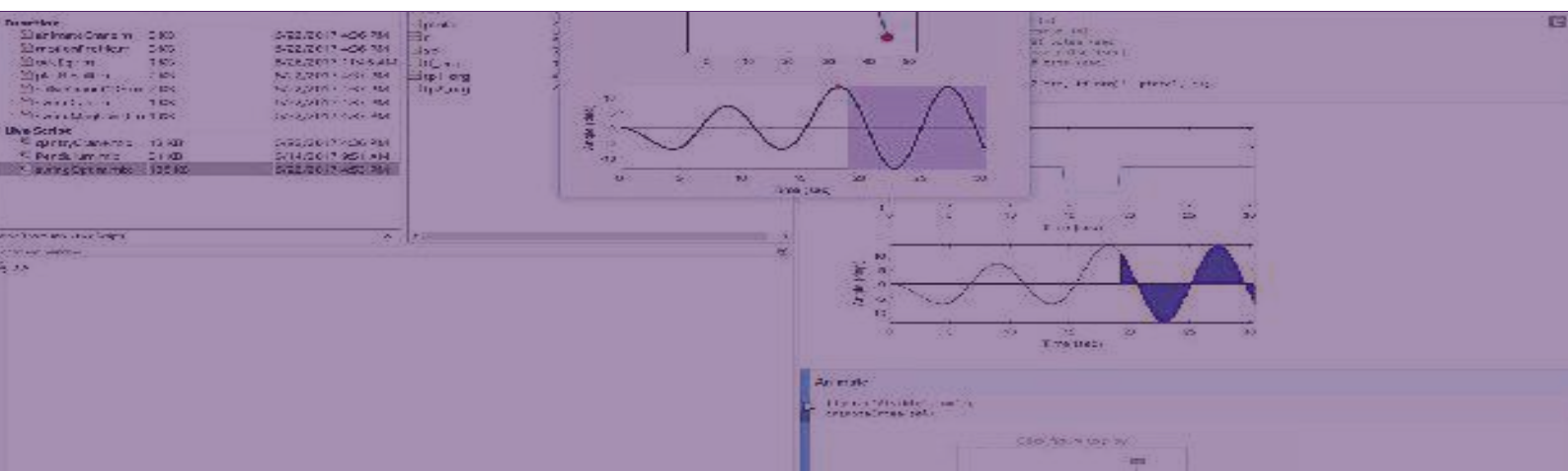
Creating MATLAB Scripts

Conditional Logic & Loops

Managing Strings & Data Structure

Performing advanced Plotting and Statistical Analysis

Conclusion



Nano  
Degree Program  
**BS-VI EMISSION NORMS  
& CONTROL STRATEGIES**



↑ NO<sub>x</sub>  
↓ CO<sub>2</sub>



CO<sub>2</sub> ↑  
NO<sub>x</sub> ↓



The story of vehicle emission controls began in India when mass emission norms were enforced for the first time for petrol vehicles in 1991 and for diesel vehicles in 1992. Emission norms were further tightened in 1996 with the compulsory fitment of catalytic converters in petrol cars. Bharat Stage emission norms (equivalent to Euro norms for four-wheeled vehicles) were first introduced in 2000. These norms specify the maximum permissible emission limit for carbon monoxide (CO), hydrocarbons (HC), nitrous oxides (NOx) and particulate matter (PM).

While the application of a stricter emission norm may sound good, especially amidst the mounting concerns over the ever-rising pollution levels in the country, there's a lot more to it than just that. Firstly, it takes years for automakers to develop a new kind of engine or to tweak around with the current ones used in their vehicles.

Once the research and development are over, the task of setting up full-scale production comes up. All of this comes at a cost that eventually makes the vehicle more expensive for the end customer of the product and that can be a cause of concern for automakers given how price-sensitive the Indian market is.

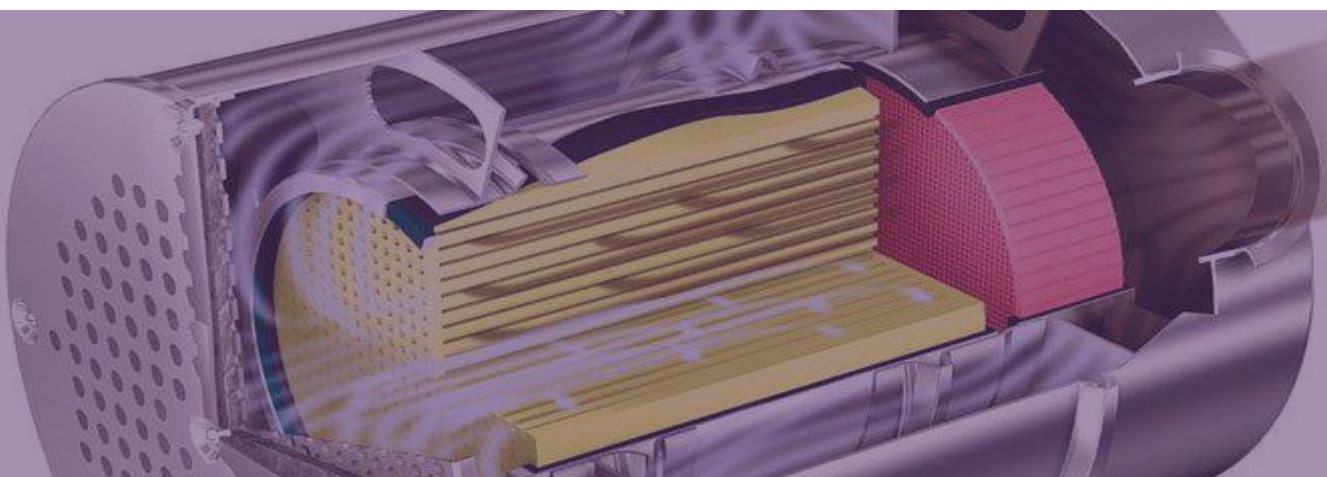


## What are the program objectives?

This program equips you with thorough knowledge of Bharat Stage Norms, Bharat Stage norms in comparison with Euro Norms, history of pollution norms, technological advancements made by the automotive giants to manufacture new vehicles which strictly holds BS6 norms competency and also the study of consumer prospective to understand the mindset of costumers.

## What are the main highlights of the program?

- Learn without a career break with online classes available 24\*7.
- One can access the course at their own pace, but with the investment of 3-5 hours/week, it can be finished within a month.
- The programme uses a Continuous Evaluation System that assesses the learners over convenient and regular intervals. Such a system provides timely and frequent feedback and helps busy working professionals stay on course with the programme.
- The education delivery method is a blend of classroom and experiential learning.



## Who should apply?

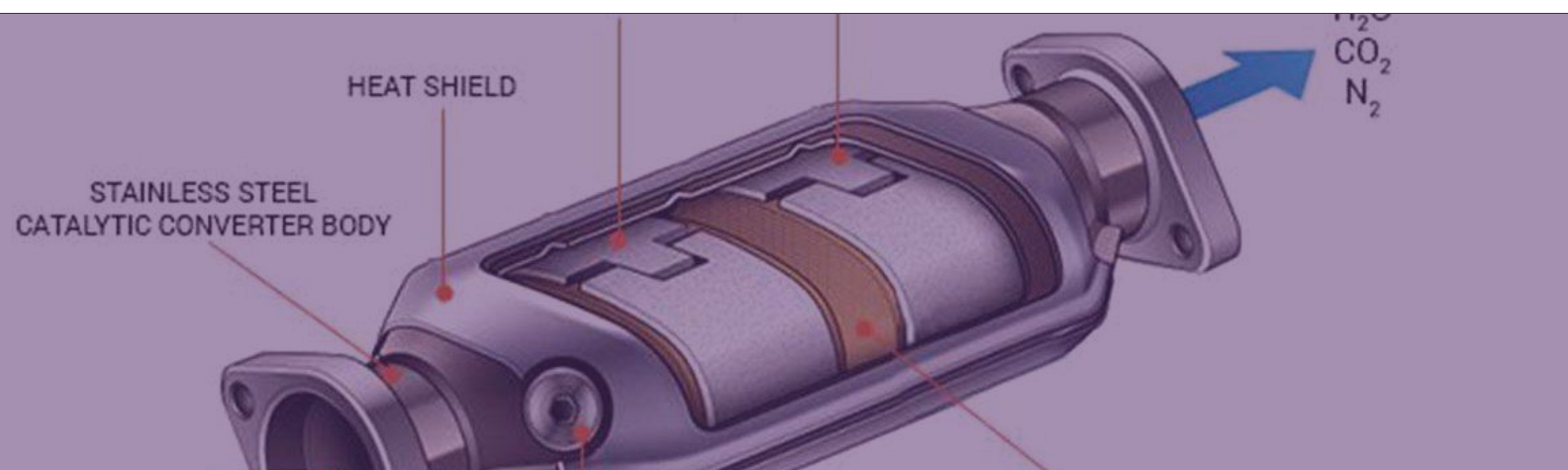
The programme is designed for students or professionals who are:

- Having a Diploma, BE / B.Tech or equivalent in domains such as Automotive, Mechanical, EEE, ECE, Instrumentation, Mechatronics.
- Automotive enthusiasts (No academic qualification mandatory)
- Working in industries such as Automotive, Auto component, Design, Manufacturing, etc
- Working in Functional areas such as R&D, Analysis, Maintenance, Projects, component design etc.
- Students who are interested in understanding BS6 emission norms.
- Professionals who want to increase their knowledge of BS6 control strategies.
- Consumers of an automobile who are interested to know about the technology in which automotive giants are improvising on BS 6 compliant vehicles.

## What are the technical requirements?

The programme to give its best will need following requirements:

- Computer/ Laptop will provide you with the best experience, but this program is quite compatible with smartphones to make it feasible for students worldwide.
- High-speed internet for crystal clear experience, but this program can also run without buffering with below-average connectivity for reaching out students from suburban and rural areas.
- A student should make their notes for future reference.
- A student should have basic knowledge about high-school physics, chemistry and maths, even though the pre-requisite of this programme will brush up on one's basic concepts.



## What is the learning methodology?

DIYguru presents the Nano-degree program on Emission Norms and Control Strategies. This program provides you with the most flexible learning environment possible. This program is offered as a self-paced program often referred to as an asynchronous online program which is time-independent, meaning that it can be accessed 24X7 within the tenure of 14 days. This program can be accessed from multiple devices which makes it easy to learn on the go.

Lectures that are pre-recorded or slide presentation with voice-over commentary, interactive discussion boxes that foster student to student interaction, Email communication with the instructor are part of this process.

## What are the learning outcomes?

- A better understanding of different emission norms.
- Deep know-hows about European and Bharat Stage Norms.
- How pollutants are generated and what are the corrective measures to be taken.
- Thorough knowledge of all the technological shifts which are implemented by automotive giants.
- Understanding consumer mindsets and what are the brighter and darker sides of BS 6 norms.





# Program Structure

Introduction to Emission Norms

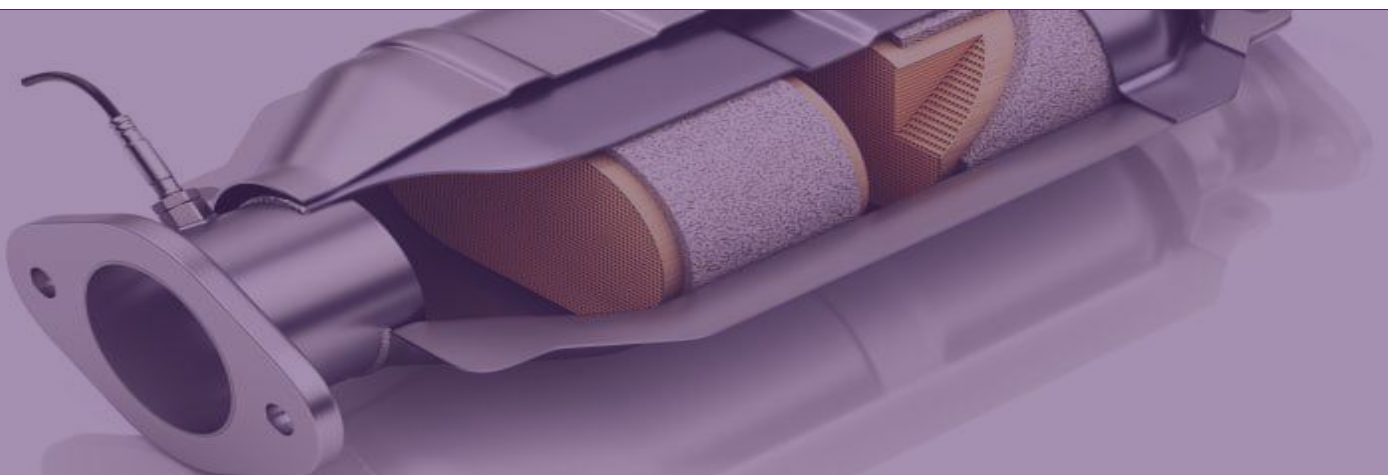
History of Emission Norms

Chemistry of Fuel

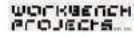
Pollutants

Technological Changes

Consumer Perspective



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