

**SANJEEVAN ENGINEERING & TECHNOLOGY INTITUTE PANHALA**

**DEPARMENT OF AUTOMOBILE ENGINEERING**

**PROGRAMME OUTCOMES**

The curriculum and syllabus for B.E. Automobile engineering program conform to outcome based teaching learning process at Sanjeevan Engineering and Technology Institute affiliated to Shivaji University, Kolhapur.

<b>PO'S No.</b>	<b>Program Outcomes</b>
PO1	An ability to apply knowledge of mathematics and engineering science.
PO2	An ability to identify, develop and conduct experiments, as well as analyze and interpret data.
PO3	An ability to design a system component, or process to meet desired needs within realistic constraints.
PO4	An ability to examine complex problems by conducting the investigations.
PO5	An ability to plan and execute the projects and manage financial aspects.
PO6	To understand role play of Automobile engineering solutions in society with contempory issues.
PO7	An ability to communicate and present effectively in both verbal and written form.
PO8	An ability to perform and create sustainable working environment.
PO9	Recognition of need for self-improvement and an ability to engage in lifelong learning
PO10	An ability to understand professional and ethical responsibilities.
PO11	An ability to use the techniques, skills, and modern engineering tools necessary for automobile engineering practice.
PO12	An ability to perform individually as well as team member or team leader.

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**DEPARMENT OF AUTOMOBILE ENGINEERING**

**Program Specific Outcomes (PSO):**

- 1) Apply mathematical and basic science skills to solve automotive design, dynamics and performance problems
- 2) Make a use of mechanical & automotive equipment for diagnose and maintenance of various automotive system
- 3) Create awareness in society regarding automotive road safety & emission norms

**Program Educational Objectives (PEOs):**

- 1) Apply technical expertise to interpret, analyse and solve complex and emerging technical problem in the field of automobile engineering
- 2) Inculcate strong leadership and communication skills in the student top enhance them to global standards
- 3) Develop moral , ethical standards along with life long learning in students professional currier.

## Holy-Wood Academy's Sanjeevan Engineering and Technology Institute (SETI), Panhala

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	EM-III [63380]
<b>Year</b>	Second Year	<b>Semester</b>	III
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Develop abstract, logical and critical thinking and the ability to reflect critically upon their work.		
CO2	Apply probability theories and statistical techniques to practical engineering problems.		
CO3	Devise engineering solutions for given situations in their profession.		
CO4	Formulate a mathematical model of a real life and engineering problem, solve and interpret the solution in real world.		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	ET[63381]
<b>Year</b>	Second Year	<b>Semester</b>	III
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	knowledge about to operate DC motor, DC generator, Three phase motor		
CO2	knowledge about electrical heating process		
CO3	electronics equipments working & its parts		
CO4	knowledge about microprocessor , OP-amp		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	Fluid Mechanics [63384]
<b>Year</b>	Second Year	<b>Semester</b>	III
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	1. Students able to identify various Engineering materials and their properties.		
CO2	2. Students acquire knowledge of Ferrous Alloys and non-Ferrous Alloys.		
CO3	3. Students understand the knowledge of Casting Process and Metal Forming.		
CO4	4. Students understand the knowledge of Casting Process and Metal Forming.		
CO5	5. Students able to identify and study advanced manufacturing processes.		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	ATD [63382]
<b>Year</b>	Second Year	<b>Semester</b>	III
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Understand basic concepts of physics and chemistry behind thermodynamics		
CO2	Understand basic concept of entropy		
CO3	Analyze the problem of available and unavailable energy		
CO4	Identify problems in gas power cycles and resolve it		
CO5	Differentiate between refrigeration and air conditioning		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	Instrumentation Lab [63385]
<b>Year</b>	Second Year	<b>Semester</b>	III
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	To observe different microstructures.		
CO2	To verify heat treatment processes and their outcome.		
CO3	To observe cast iron types and its microstructures.		
CO4	To perform etching process.		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	Workshop-III [63387]
<b>Year</b>	Second Year	<b>Semester</b>	III
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	1. To list and define various casting processes.		
CO2	2. To differentiate various operations on lathe machine and perform practical on same		
CO3	3. To discuss and summarize various safety measures for performing job in a workshop.		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	KOM [63389]
<b>Year</b>	Second Year	<b>Semester</b>	IV
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Able to select mechanism as per design requirement to get desired motion		
CO2	Able to analyse velocity and acceleration of given mechanism		
CO3	Able to design cam as per requirement		
CO5	able to analyse various characteristics of governor		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	CM [63388]
<b>Year</b>	Second Year	<b>Semester</b>	IV
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Define basic concept of numerical methods		
CO2	Identify the types of computational method to solve problem.		
CO3	identify mathematical problem and apply it.		
CO5	Help while solving FEA and optimization problem		

Name of the Programme	Automobile Engineering	Name of the Course	Fluid Machinery [63391]
Year	Second Year	Semester	IV
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Understand working principle of Impulse and Reaction turbine.		
CO2	Understand the concept of Centrifugal pumps and various efficiencies related to it.		
CO3	Understand the concept of centrifugal and Axial compressors.		
CO4	Understand working of Gas Turbines and know its various configurations.		

Name of the Programme	Automobile Engineering	Name of the Course	MMT [63390]
Year	Second Year	Semester	IV
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	1. Students able to classify the different metal alloys.		
CO2	2. Students acquire knowledge of Select the suitable heat treatment process.		
CO3	3. Students understand Test the metallurgical properties of metals.		
CO4	4. Students able to compare the metals with non-metals.		

Name of the Programme	Automobile Engineering	Name of the Course	SOM [63392]
Year	Second Year	Semester	IV
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	1. To gain knowledge of different types of stresses, Strains and deformation induced in Mechanical Components due to external loads.		
CO2	2. To study the distribution of various stresses in Mechanical Elements.		
CO3	3. To study the effect of component dimensions and shape on stresses and deformations		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	C++ [63393]
<b>Year</b>	Second Year	<b>Semester</b>	IV
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	To understand the fundamentals of Programming languages.		
CO2	To execute the programme as per requirement.		
CO3	To solve various programmes like addition, subtraction and multiplication etc.		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	PS-I [63395]
<b>Year</b>	Second Year	<b>Semester</b>	IV
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Acquire English as a language for specific purpose.		
CO2	2.Prepare themselves according to the requirements of professional life.		
CO3	3.Improve his personality traits.		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	Workshop Practice-IV [63394]
<b>Year</b>	Second Year	<b>Semester</b>	IV
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	1. To list, define and perform various operations on a lathe machine.		
CO2	2. To study and demonstrate spur gear manufacturing.		
CO3	3. To discuss and summarize various safety measures for performing job in a workshop		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	ACD [63386]
<b>Year</b>	Second Year	<b>Semester</b>	V
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	able to understand BIS Convention of various standard parts		
CO2	able to draw free hand sketches of various parts		
CO3	able to understand and draw assembly and detail drawing		
CO4	able to acquire knowledge of auxiliary and intersection of solid		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	HP [66257]
<b>Year</b>	Third Year	<b>Semester</b>	V
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Explain the different types of chassis frames & its construction, materials & testing methods		
CO2	Summaries the different steering geometry and types of front axle.		
CO3	State the various types of suspension systems & its construction		
CO4	Describe the types of wheels and tyres & its construction		
CO5	5. Identify the different types of braking systems & its construction, advantage disadvantage.		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	Auto Chassis [66258]
<b>Year</b>	Third Year	<b>Semester</b>	V
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Explain the different types of chassis frames & its construction, materials & testing methods		
CO2	Summaries the different steering geometry and types of front axle.		
CO3	State the various types of suspension systems & its construction		
CO4	Describe the types of wheels and tyres & its construction		
CO5	5. Identify the different types of braking systems & its construction, advantage disadvantage.		



<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	Metrology & Quality Control [66259]
<b>Year</b>	Third Year	<b>Semester</b>	V
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Distinguish various instruments and their characteristics		
CO2	Apply knowledge of instruments to use and interpret the data.		
CO3	Apply knowledge for solving problems on limits, fits and tolerances.		
CO4	Explain the types of control chart to use, depending on given data.		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	HMT [66260]
<b>Year</b>	Third Year	<b>Semester</b>	V
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Define the basic concepts of Heat and Mass Transfer.		
CO2	State and describe mechanism of heat transfer.		
CO3	Analyze the problem of heat transfer and able to find heat transfer rate and intermediate temperatures.		
CO4	Differentiate between heat and mass transfer.		
CO5	Identify problems in heat and resolve it.		
CO6	Describe and Sketch the types of heat exchanger operations.		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	PS-II [66262]
<b>Year</b>	Third Year	<b>Semester</b>	V
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Acquire English as a language for specific purpose.		
CO2	2. Prepare themselves according to the requirements of professional life.		
CO3	3. Possess corporate ethics.		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	IOEE [66261]
<b>Year</b>	Third Year	<b>Semester</b>	V
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	State the concept of business environment and social responsibility		
CO2	Summarize various functions of management like planning, organizing, staffing, leading etc.		
CO3	Explain basic economic terms and different methods for cost accounting analysis.		
CO4	Describe financial management and marketing.		
CO5	Explain production, material management, industrial safety and concept of entrepreneurship.		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	Vehicle Body Engineering [66901]
<b>Year</b>	Third Year	<b>Semester</b>	VI
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Identify the concepts of wind tunnel testing and vehicle body optimization techniques to reduce drag.		
CO2	Explain the concept of car body design, passenger safety, crumple zone and crash testing.		
CO3	Demonstrate the various types of bus body construction, seating layout, regulations and comfort.		
CO4	Correlate the various heavy vehicle bodies, driver's visibility and cabin design.		
CO5	Distinguish the different types of materials and painting techniques for vehicle body.		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	ICE [66900]
<b>Year</b>	Third Year	<b>Semester</b>	VI
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Identify various components of engine		
CO2	Study and Analyze engine cycle and performance.		
CO3	Understand fuel supply system and combustion phenomenon.		
CO4	Understand system like turbocharging, supercharging, MPFI and CRDI , Cooling and lubricating.		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	AT[66902]
<b>Year</b>	Third Year	<b>Semester</b>	VI
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Understand basic working principle of basic elements of automobile transmission system.		
CO2	Explain working of automatic transmission.		
CO3	Draw performance characteristics of various transmission components.		
CO4	Explain working of hydrostatic drive.		
CO5	Elaborate electric drive & its advantage & disadvantage.		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	MD [66903]
<b>Year</b>	Third Year	<b>Semester</b>	VI
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Able to explain aesthetic and ergonomics to design machine component		
CO2	Able to design shaft, key and different types of coupling as per requirement		
CO3	Able to design against static load for specific requirement		
CO4	Able to design different machine component		
CO5	Able to design and select of standard component from manufacturing catalogue.		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	ARAC[66904]
<b>Year</b>	Third Year	<b>Semester</b>	VI
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	To impart fundamental knowledge of refrigeration & air conditioning		
CO2	To study various operating cycles in refrigeration & air conditioning		
CO3	To study various refrigerants used for refrigeration & air conditioning units		
CO4	To study the Psychometric properties of air		
CO5	To understand design procedure of refrigeration & air conditioning systems for specific application		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	CAD/CAM Lab [66905]
<b>Year</b>	Third Year	<b>Semester</b>	VI
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	To understand 2 D drawings		
CO2	To understand part design		
CO3	To draw dress up features and other features regarding to the components.		
CO4	To understand assembly design.		

<b>Name of the Programme</b>	Automobile Engineering	<b>Name of the Course</b>	Seminar[66906]
<b>Year</b>	Third Year	<b>Semester</b>	VI
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	knowledge about specific technical area.		
CO2	confidence about stage daring & to deliver the seminar content		
CO3	able to improve their proficiency in computer.		

<b>Name of the Programme</b>	<b>Automobile Engineering</b>	<b>Name of the Course</b>	ICED [67608]
<b>Year</b>	Final Year	<b>Semester</b>	VII
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Acquire knowledge and solve problem related to design for fluctuating load		
CO2	Student will able to select engine as per requirement		
CO3	student will able to design engine component and accessories as per requirement		
CO4	student will able to design valve mechanism and get knowledge about cooling and lubricating system		
CO5	student will able to design and select any type of bearing from manufacturing catalogue		

Name of the Programme	Automobile Engineering	Name of the Course	VD [67609]
Year	Final Year	Semester	VII
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	1. Define the basic concepts associated with vehicle dynamics such as lumped mass, coordinate systems and dynamic load transfer.		
CO2	2. Define and describe various parameters influencing the acceleration performance.		
CO3	3. Classify various braking systems and design a new braking system according to requirements of specification of a vehicle.		
CO4	4. Differentiate between low speed cornering and high speed cornering, calculate parameters such as under-steer gradient, yaw velocity and lateral acceleration gain.		
CO5	5. Discuss various sensors used in automobile and explain new technology in recent automobiles such as ABS, EBD, ESP, Cruise control etc.		

Name of the Programme	Automobile Engineering	Name of the Course	Finite Element Method [67610]
Year	Final Year	Semester	VII
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Understand the need and application of Finite Element Analysis. Formulate and solve problem on Shape function, interpolation function.		
CO2	Formulate, solve and analyze element characteristic matrices for Field problems such as Structural, torsion Field problem using Different Method.		
CO3	Formulate, solve and analyze element characteristic matrices for Field problems such as Thermal Field problem.		
CO4	Analyze and solve the dynamic behaviour of structure using FEM.		
CO5	Formulate and solve the higher order elements and is parametric elements. Interpret the Rules of meshing, result interpretation & verification of FEA results.		

Name of the Programme	Automobile Engineering	Name of the Course	VM [67858]
Year	Final Year	Semester	VII
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	the student shall gain appreciation & understanding various types of maintenance completed at service station		
CO2	shall be able to know procedure required for wheel alignment & wheel balancing		
CO3	student shall gain knowledge of dismantling & assembly of two wheeler single cylinder engine.		
CO4	student shall gain knowledge of CNG & LPG gas kit.		

Name of the Programme	Automobile Engineering	Name of the Course	Transport Management [67615]
Year	Final Year	Semester	VII
Course Outcomes			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Student will understand the need of transport management		
CO2	Student will understand the procedure for getting insurance of vehicle after accident.		
CO3	Student will understand the taxation act & various methods of saving.		
CO4	Student will understand the organization of passenger transport & its operation		

Name of the Programme	Automobile Engineering	Name of the Course	Automotive Industrial Training [67617]
Year	Final Year	Semester	VII
Course Outcomes			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	knowledge about industry working environment professionalism		
CO2	confidence about stage daring & to deliver the seminar content		
CO3	Able to improve their proficiency in computer.		
CO4	aware about dressing sense.		

Name of the Programme	Automobile Engineering	Name of the Course	ICET [67616]
Year	Final Year	Semester	VII
Course Outcomes			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Able to Explain ISI codes for engine testing		
CO2	To Conduct different tests on IC engine		
CO3	To Analyze test data for finding various parameters of I.C Engines		
CO4	Able To Explain heat balance sheet		

Name of the Programme	Automobile Engineering	Name of the Course	Project Phase-I [67618]
Year	Final Year	Semester	VII
Course Outcomes			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Identify the topic in the advanced areas of Automobile Engineering		
CO2	Review literature to identify gaps and define objectives and scope of the work		
CO3	Apply the ideas in the literature and develop research methodology		
CO4	Develop a model, experimental set-up and or computational techniques necessary		

Name of the Programme	Automobile Engineering	Name of the Course	AFE [67789]
Year	Final Year	Semester	VIII
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Students will able to explain different types of alternative fuels& their sources.		
CO2	Student will be able to identify modification required for use of alternative fuel in existing engines.		
CO3	Students will understand production methods of different fuels & their storages methods.		
CO4	Students will have knowledge of emission measurements & their regulations		
CO5	Students will able to differentiate of SI & CI engines emissions & their control technologies.		

Name of the Programme	Automobile Engineering	Name of the Course	AE [67790]
Year	Final Year	Semester	VIII
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	1. Define basic concept of Automotive battery		
CO2	2. Identify the basic types of automotive wiring, types of terminals, and wiring diagrams.		
CO3	3. Describe the types, construction and operations of automotive battery along with ratings, performance, maintenance, and testing.		
CO4	4. Identify ignition and lightening accessory-circuit components, and state their functions		
CO5	5. Identify equipments& accessories, sensors and actuators and explain their functions		

Name of the Programme	Automobile Engineering	Name of the Course	Vehicle Performance [67792]
Year	Final Year	Semester	VIII
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Recognize the importance of Vehicle Performance.		
CO2	Compare automotive clutches, geared transmission.		
CO3	Describe testing procedure of vehicle systems.		
CO4	Identify active and passive safety systems.		
CO5	Explain causes and remedies for noise and vibration.		

Name of the Programme	Automobile Engineering	Name of the Course	ASD [67791]
Year	Final Year	Semester	VIII
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	To list and define various systems in Automobile and their working principles or mechanisms and should be able to explain them		
CO2	To derive the equation required for design purpose should be able to select materials required for designing a system in an automobile.		
CO3	To differentiate various systems in automobile, analyze them and will be able to solve related problems		
CO4	To design a full or partial system in an automobile, if possible optimize it and explain it with valid methods with good communication.		

Name of the Programme	Automobile Engineering	Name of the Course	Energy Engineering [67797]
Year	Final Year	Semester	VIII
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Identify different renewable energy systems.		
CO2	Explain latest trends in automobile sectors.		
CO3	Describe basic energy management terms		
CO4	Define Geothermal and water energy conversions.		

Name of the Programme	Automobile Engineering	Name of the Course	Project Phase-II [68492]
Year	Final Year	Semester	VIII
<b>Course Outcomes</b>			
S. No.	Upon successful completion of this course, the student will be able to:		
CO1	Identify the materials and methods for carrying out experiments/develop a code.		
CO2	Reorganize the procedures with a concern for society, environment and ethics.		
CO3	Analyse, discuss and justify the results/trends and draw valid conclusions.		
CO4	Prepare the report as per recommended format and present the work orally adhering to stipulated time.		