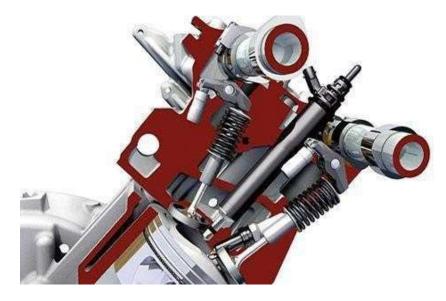


# Certificate Course ON

# **AUTOMOBILE MECHANICS & IC ENGINE**

From 17th December 2018 to 22nd December 2018



### ORGANIZED BY

# DEPARTMENT OF MECHANICAL ENGINEERING AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY,

(Approved by AICTE, Permanently Affiliated to JNT University Kakinada, ACCREDITED BY NAAC and Recognized under 2(f) &12 (b) by UGC, NewDelhi) Tamaram, Makavarapalem, Narsipatnam (RD), Visakhapatnam-531113

### AVANTHI EDUCATIONAL SOCIETY

Avanthi Educational Society under the Leadership of Sri M. Srinivasa Rao garu as chairman was started in the Year 1991. Within a short span of its establishment, the group has made a remarkable stride in the field of education offering various courses at Under Graduate, Post Graduate, Pharmacy & Engineering levels. This milestone is achieved as the institution carved itself to impart quality and career oriented education, countering the challenges of the modern world through planning, dedication, determination, prompt execution and with the innovative ideas of our advisory board.

Today, Avanthi Educational Society is proud to have a strength of over 16000 students with 15 institutions under its ambit. It is the path of glory towards the success during the last 19 years. The institution has been adjudged many times as the second best educational institutions in the twin cities and 16th best in all over India through the impartial survey made by the renowned magazine "India Today".

### AVANTHI INSTITUTE OF ENGINEERING & TECHNOLOGY

AIET started in the year 1999 and offers various courses at Engineering and PG level. The college is providing with rooms, computer centre, laboratories and seminar hall with audio-visual equipments. Industry Institute interaction is conducted regularly to emphasize on the latest trends in the present market.



It is very near to Narsipatnam. Frequent bus facilities are available both from and to Visakhapatnam and Narsipatnam. Very safe and secure hostel facility is available for Girl students. These are the additional facilities besides excellent academic atmosphere in the college campus.

## DEPARTMENT OF MECHANICAL ENGINEERING

Mechanical Engineering department was started in the year 2005 with intake strength of 60 seats, this was increased to 120 students in 2012 and this was increased to 180 students in 2013. The department has well qualified and trained faculty members. It has well equipped laboratories and workshops and includes a CAD/CAM laboratory where students are imparted training in advanced production techniques and design and analysis of machine elements.

The department of Mechanical Engineering has been contributing its humble share of the Mechanical Engineering graduates for national needs. Several of the graduates who have passed out of this department are occupying responsible positions in various Engineering Industries like Hindustan Shipyard Limited, Renault Nissan, Varun Motors, Tata Consultancy Services, HP and IBM and holding responsible positions in the premier educational institutes in and outside India.

### ABOUT WORKSHOP

Mainly focuses from Basics to Advanced concepts in Automobile Engineering. It covers chassis design, working of Suspension unit, Steering System, Braking unit, Transmission, Fuel Supply System, IC Engine and Advanced Technologies like ABS, EBD, DTS-Fi, MPFI, VVTI.

The internal combustion engine is a rich source of examples of almost every conceivable type of heat transfer. There are a wide range of temperatures and heat fluxes in the various components of the internal combustion engine. Internal combustion engines come in many sizes, from small model airplane engines with a 0.25 " (6 mm) bore and stroke to large stationary engines with a 12" (300 mm)

## TOPICS TO BE COVERED

Chassis Design, Brief terminology - Multi point strut bar. Fender bar. Anti-roll bar, Types of chassis –Ladder frame chassis. Tubular space frame chassis. Monocoque frame chassis. Ulsab monocoque. Backbone frame chassis, Aluminium space frame. Carbon fibre monocoque, Suspension Unit - Brief terminology, Transmission system, Fuel Supply System and IC Engines.

For Registration, please contact Mr. A.N.S.Surya Prakash, Assistant Professor, Department of Mechanical Engineering.

**CHIEF PATRON** 

Smt .M.Gnaneswari President , Avanthi Educational Society PATRON

Dr. C P V N J Mohan Rao Principal, Avanthi Institute Of Engineering And Technology **CHAIRMAN** 

Sri. V. Harikiran Head of the Department Mechanical Engineering



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# DEPARTMENT OF MECHANICAL ENGINEERING

# **CIRCULAR**

Date: 10/12/2018

We are happy to inform you that, Department of Mechanical Engineering, AIET is organizing six day certificate course on "Automobile Mechanics and IC Engines" from 17<sup>th</sup> December, 2018 to 22<sup>nd</sup> December, 2018 in virtual mode for all II B. Tech students. Interested candidates are directed to enrol above course on or before 16/12/2020. For further details contact Course Coordinator Mr. A. N. S. Surya Prakash, Assistant Professor, Mechanical Engineering.

# Resource Person Details:

1. Sri R. Rudrabhiram,

Associate Professor,

Department of Mechanical Engineering,

VIGNAN'S Institute of Information & Technology,

Duvvada, Visakhapatnam.

2. Dr. S. Jai Kumar,

Assistant Professor.

Department of Mechanical Engineering,

GITAM College,

Rushikonda, Visakhapatnam.

V Hankiran

HOD of Mechanical Engineering Department

Head of the Department
Department of Mechanical Engg.
Avanthi Institute of Engg. & Tech.,
Makavarapalem, Visakhapatnam-531113.

Copy to: Principal, AIET

# Marian Marian

# AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

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# DEPARTMENT OF MECHANICAL ENGINEERING

A six-day workshop on

# Automobile Mechanics & IC Engine

17th December - 22nd December 2018

# Syllabus of the Workshop:

# Chapter-1

• Introduction to Automobile IC Engines, Brief history. Changes over the years. Indian automobile industry.

# Chapter-2

· Chassis Design, Brief terminology - Multi point strut bar. Fender bar. Anti-roll bar.

# Chapter-3

• Types of chassis -Ladder frame chassis. Tubular space frame chassis. Monocoque frame chassis. Ulsab monocoque. Backbone frame chassis, Aluminium space frame. Carbon fibre monocoque.

# Chapter-4

Suspension Unit - Brief terminology - Weight Transfer, Jacking forces, Camber and Caster angle, Spring
 Rate

Types of suspensions - Dependent suspension, independent suspension

 Steering System - Ackerman Steering Principle, Steering Mechanisms, Rack and Pinion Recirculating Ball Type, Worm and Sector, Understeer, Oversteer, Power Steering

# Chapter-5

Transmission system- Flywheel, Clutch, Single Plate Clutch, Multi Plate Clutch, Cone Clutch, Centrifugal Clutch, Electromagnetic Clutch

- Gearbox- Constant mesh type, Synchromesh type, Sliding mesh type Reverse and its working
   Types of Transmission- Manual, Semi-Automatic, Automatic
   CVT
- Differential
- 2WD, 4WD, AWD

# Chapter-6

- · Fuel Supply System
  - Fuel Filter
  - Carburettor

- Fuel Injector
- · Spark Plug

# IC Engine

- · Types of IC Engine
- 4-Stroke Engine
- · 2-Stroke Engine
- · Engine Layout and working
- · Valves and Valve Timing
- Engine Cooling
- Turbochargers
- · Superchargers
- · Latest Technologies
  - PGMFI
  - MPFI
  - CRDI

# **EXPECTED OUTCOMES**

- · This workshop will provide insight on IC Engines
- It will strengthen participants skills in Automobile Engines and components to solve various mechanical problems.
- Workshop will help to understand application of Automobile IC Engines in the multidisciplinary areas such as mechanical and advancements in Automobile Sector.

COORDINATOR

HÓD

Head of the Department Department of Mechanical Engg. Avanthi Institute of Engg. & Tech., Makavarapalem, Visakhapatnam - 531113.

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# AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

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# DEPARTMENT OF MECHANICAL ENGINEERING

# Automobile Mechanics and IC Engines

From 17th December to 22nd December 2018

# Schedule

# Program Schedule

# Session-1 (17/12/2018)

9.00 AM to 11.00 AM - Introduction to Automobile IC Engines, Brief history. Changes over the years. Indian automobile industry.

11.00 AM to 11.15 AM - Tea Break

11.15 AM to 1.15 PM - Chassis Design, Brief terminology

1.15 PM to 2.15 PM - Lunch Break

2.15 PM to 4.15 PM - Types of Chassis, Suspension Unit - Brief terminology

# Session-2 (18/12/2018)

9.00 AM to 11.00 AM - Types of suspensions, Steering System

11.00 AM to 11.15 AM - Tea Break

11.15 AM to 1.15 PM - Transmission system

1.15 PM to 2.15 PM - Lunch Break

2.15 PM to 4.15 PM - Gearbox and its Design and function

### Session-3 (19/12/2018)

9.00 AM to 11.00 AM - Types of Transmission Systems

11.00 AM to 11.15 AM - Tea Break

11.15 AM to 1.15 PM - Reverse and its working

1.15 PM to 2.15 PM - Lunch Break

2.15 PM to 4.15 PM - Gear Shifting Mechanism

# Session-4 (20/12/2018)

9.00 AM to 11.00 AM - Breaking systems

11.00 AM to 11.15 AM - Tea Break

11.15 AM to 1.15 PM - Various types of Breaking systems

1.15 PM to 2.15 PM - Lunch Break

2.15 PM to 4.15 PM - Differentials and its design and working

# Session-5 (21/12/2018)

9.00 AM to 11.00 AM - Fuel Supply System

11.00 AM to 11.15 AM - Tea Break

11.15 AM to 1.15 PM - IC Engine and types of IC engines

1.15 PM to 2.15 PM - Lunch Break

2.15 PM to 3.30 PM - Valves and valve timing, Latest Technologies

3.30 PM to 4.00 PM - Q&A Discussion

# Session-6 (22/12/2018)

9.00 AM to 11.00 AM - Applications of IC Engines

11.00 AM to 11.15 AM - Tea Break

11.15 AM to 1.15 PM - Advancement in IC engines

1.15 PM to 2.15 PM - Lunch Break

2.15 PM to 3.30 PM - Future Scope

3.30 PM to 4.00 PM - Valedictory/ Feedback session

COORDINATOR

HOD

Head of the Department Department of Mechanical Engg. Avanthi Institute of Engg. & Tech., Makavarapalem, Visakhapatnam - 531113.



# AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY TAMARAM (V), MAKAVAAPALEM (M), VISAKHAPATNAM - 531113

# DEPARTMENT OF MECHANICAL ENGINEERING

# Automobile Mechanics & IC Engines

# From 17-12-2018 to 22-12-2018 STUDENTS ATTENDANCE LISTS

S.NO	ROLL NUMBER	NAME OF THE STUDENT	17.12.2018	18.12.2018	19.12.2018	20.12.2018	21.12.2018	22.12.2018
1		AKOJU DURGA PRASAD	×		/	/		1/
2	16811A0302	AKULA KIRAN		./	1			V
3		ALLA SURYA NARAYANA	V		1	./	1	1
4		ANGULARI VENKAT SUDHEER	V	~		1	-	1
5		BALAGA JAGADEESWARA RAO		-	V	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		1
6		BOBBILI PURUSHOTHAM KUMAR		V .		7		1
7		BODDU TARUN	-		~	V /		V
8		BOLEM KANAKA VARAPRASAD	×	V	~	V		1
9		BUDDHA MOHAN VAMSI KRISHNA	×			~		-
10				V,	V	V/		C
_		CHINTAKAYALA MANIKANTA SWAMY	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	V .	~	V		-
11		DASARI MANIKANTA RAJULU	V	V.	X	V .		-
12		DOLA DILEEP KUMAR	V	1	V	V,	X	V/
13		DULLA GANGADHAR	V ,	V,	V	-		- V
14		EERLA GANESH	V /	1/	V	V/		X
15		GADE SAI KUMAR	~	V,	~	V,		V ,
16		GALLA YESWANTH NAGA KUMAR	×	V,	V	~	V/	V/
17	The second liverage and the se	GANTA JOHN	V.	V.	~	V.	V/	V
18		GANTLA DURGA PRASAD	/	/	V	~		V
19		GAVIREDDI DATTASAI			V	×	_/_	V.
20	16811A0327	GEDDAM RAMESH			V	Va	/	V
21	16811A0328	GORLI SAI KUMAR	~	V.	V	V	V.	V
22	16811A0329	JANAPALA SATYA GANESH	×	V	~		V	/
23	16811A0330	JEERU AYYAPPA			V		V.	V.
24	16811A0332	KANCHI SHANMUKHA TEJA	1		V			
25	16811A0333	KARANAM SATHISH			V		×	V
26		KOILADA MANIKUMAR	V	7	1			1
27		KOSURU CHANDRA SEKHAR			V		V.	V
28		KOYYA RAVI TEJA		1/	V	./	-//	
29		KUPPA VENKATESH	~	- 1	./		-	V
30		LINGAM JOSHI SAI JASWANTH	×	~				
31		MALLA KUMAR	5	,	×			./
32		MATTE VARA PRASAD	./					17
_		MEESALA SHYAM PRASAD	~	Ž				./
33		MOHAMMED SHABZAN	V.	. 7	~	-		7
34	1681110343	MUPPIDI GIRI SAI VENKATA DURGA PRA			×			./
35					V	-	~	
36		NAGIREDDY LEELA SATYA PRASANNA	- Y	V	V		- //	5
37		NAGULAPALLE SAI KUMAR	-V	-V,	V			-
38		NAKKA SAIRAM		-/-	V		-	
39		NALLALA CHARAN	X		V			
40		NAMMINA SOMESH	V.	-V	~	-	4	
41		NEERUKONDA PRABHU DEVA	~	V	~		V	<u> </u>
42		NETHINTI THARUN KUMAR	V	V,	~	×	V	V_
43		PAILA PAVAN KUMAR	//	V	V	~	~	V
44	16811A0358	PAKKURTHI BALAJI	V	V,	V	~		-V
45	16811A0359	PALLA GANESH	~	V	V	/	V	V
46		PALLA VENKATESH	×	V,	V	/	V .	Va
47		PANNASA BHASKAR RAO	V.	V	V	V		V
48		PEELA ARUN KUMAR		1	V	V,	V	V
49		PENTAKOTA PHANI KUMAR	V.	V	×	V,	/	1
50	16811A0365	PERLA HEMANTH KUMAR	~		V	V	1/4	V
51		PETLA PAVAN KUMAR	~	V	V	X	V	X
32		POTHURAJU NANDA KISHOR	V	V.	/	/	V	V,
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52 53 54 55	16811A0369 16811A0370 16811A0371 16811A0372 16811A0374	POTTI SOMESWARA RAO RAPETI AVINASH	7	14	V	1	7	7

60 61 62 63 64 65 66 67 68 69	16811A0378 16811A0380 16811A0381	SHAIK MANSOOR SOORA SAI PAVAN	1		V	1		1
62 63 64 65 66 67 68	16811A0380 16811A0381	SOOKA SALPAVAN						
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65 66 67 68	16811140393	TALARI MAHESH			V		1	
66 67 68	1681140382	TAMARANA RAVITEJA			V			
67 68	1681140383	THATIKONDA NAGA SAI KIRAN			×	IV		
68	1681140384	THOKADA SRINU VASU	<b>/</b>				1	V.
_	16811A0386	VAKADA NAGA RAJU	V.		V	V		
03	16811A0387	VANGAPANDU JAGAN SAI	V.		~		V	
70	16811A0388			V		1	V	
71	16811A0389	VENU SAI KRISHNA	~	/			χ.	
72		VINDULA KALYAN KUMAR	V	/	V			V
73	16811A0391	VOLLU HANISH	/	/	×		V	
74	16811A0392	VYBOINA ASHOK KUMAR	/	V	V		V	V.
75	16811A0393	YALAMANCHILI VENKATA PRUDHVI	-	/	V		V .	
76	16811A0394	YARRAMSETTI HEMANTH SAI PRASAD		X	V		V.	V.
77	16811A0395	YEDURU HARISH	×	V.	<b>/</b>		1	
78	16811A0396	YELLAPU VUAY KUMAR	1	V.	V			1
79	16811A0397	INDALA PRASAD	/	V.	V	X	V.	1
80	1781540301	JALLI VENKATESH	V	V	V	V	1	
81	17815A0301	ALLA MEGHANA SANTHI ANGA RAJESH	- V	V,	V	/		/
82		APPANA MAHENDRA	-	V,	V		1	/
83	1781540303	ARJILLI RAJASEKHAR		V .	V		1	/
84	1781540305	BALLA RAHUL	X,	V	1	/		V
85		BONDALA HARISH KUMAR	- V	V,	-	V		
86	17815A0307	CH BHAVANI		V,	V	/	/	
			~	V	V		V	
87	17815A0308	CH YESWANTH DURGA CHELLA RAO	/	. /		/		
88	17815A0309	CHEEPURUPALLI RAMUDU	Ť	V	V	/	V	V
	100000000000000000000000000000000000000	CHINTAKAYALA VENKATA VARAHA		V	-	V	V	
89	17815A0310	SATYA PRAKASH		x	. /	/	/	
90	17815A0311	DAKARAPU DURGA PRASAD	·		V		V	V.
91	17815A0312	DANIMIREDDI ASHOK	V .	V	V	V ,	V,	/
92		DODDI LAXMIKANTH	<b>'</b>	-	V	~	V.	/
93		DUPPATLA VINAY	~	V,	V	/	/	
94		GORLI PAWAN KUMAR	~	<del></del>	V	/	×	
95	17815A0316	GUDIVADA TEJA	Y		1		V	V.
96	17815A0317	JAYACHANDRA NAVEEN KUMAR		V	V		V.	-/-
97	17815A0318	KADIYAM PRAVEEN KUMAR	×.	~	×	~	V	~
98	17815A0319	KAKARA ANVESH	<b>'</b>	V	×	~	-	
99	17815A0320	KAMBAM BHASKAR REDDY		/	-	-	V	X
100	17815A0321	KANDRAKOTA KRANTHI KUMAR		V	Y		V	V,
101	17815A0322	KANDREGULA SURESH	1	1	V	V ,	V	V
102	17815A0323	KANDREGULA THANUJ		1	× -	-/	V,	V
103	17815A0324	KANNAM SATYA VENKATA SAI			_	~	V	V
104	17815A0325	KARI RAJESH		V			-/-	
105	17815A0326	KARRI VENKATESH		V	V	Y		V
106	17815A0327	KINTADA VENKATESH	V.	V	~	×		
108	17815A0328	KONA HARI VAMSI RAM		V	~		V	1/4
109	17815A0329	KONDA MANIKANTA		V.			~	
110	17815A0330	KRISHNA BANDI	<b>_</b>		~	./	V	-
111		LANKA MOULI MAJJI HEMA SATYA SAI		X	V			
112	17815A0333	MALLA JAYA PRADEEP CHANDRA	_/		~		7	~
113	17815A0334	MAMIDI SHYAM	V	~	~	1/	/	
			V	V	V			1
114	17815A0335	MANGALAGIRI SHANMUKA SURYA SAI	×	1				
115		MARISETTI ARIVINDA MOULI	-	~	V			V
116	17815A0337	MRUTYUNIAY SHUKLA		V,	~			
117	17815A0338	MYLAVARAPU SUMANTH	V/	V/	V	/	1	7
118	17815A0339	NAKKA APPALARAJU	-X	V	V			1
119	17815A0340	NAKKA HARI KRISHNA	V/	V	V	V		<b>-</b>
120	17815A0341	NELLURI SAI	V	X	V	/	1	
121	17815A0342	PAILA JEEVAN KUMAR	×	V	V	V		
122	17815A0343	PALIPINI GANESH		Y	V	V		/
123	17815A0344	PALLI MURALI	-4	V/	V	X		7
	17815A0345	PAPPU BALA GANAPATUV	*/	Y	V	V	/.	1
124	17815A0346	PEDAPATI NAVEEN	×	x	V	V		/
125							/	

126	17815A0347	PEDAPATI VENKATACHARI	V	<b>/</b>	/	~	/	1
127	17815A0348	PITTA KOTESWARA RAO	<b>/</b>	/	/		✓	1
128	17815A0349	POLARAPU RAJU	V	/	/	/	/	/
129	17815A0350	RAMANA OSIPALLI	1	/	/	/	<b>/</b>	*
130	17815A0351	RAYI MANI KANTA	*	/	/	~	/	1
131	17815A0352	REDDI APPALANAIDU	V	1	<b>/</b>	$\checkmark$	/	1
132	17815A0353	REDDI GOPAL	<b>V</b>	/	<b>/</b>	1	<b>V</b>	<b>V</b>
133	17815A0354	REDDY GOVINDARAO	1	/	<b>/</b>	<b>V</b>	/	V
134	17815A0355	S KARTHIK KUMAR	/	×	/	~	<b>V</b>	~
135	17815A0356	SALAPU LAXMISRINIVAS	<b>✓</b>	/	<u> </u>	<b>✓</b>	/	<b>/</b>
136	17815A0357	SAMBARU BHARGAVRAM	/	1	✓	✓	~	/
137	17815A0358	SARAGADAM JAYA KRISHNA MURTHY	V	1	/	✓	/	<b>V</b>
138	17815A0359	SARAGADAM SATHEESH	<b>/</b>	/	<b>V</b>	✓	<b>/</b>	<b>/</b>
139	17815A0360	SEERAM RAM KUMAR	/	~	<b>/</b>	У .	/	/
140	17815A0361	SUDIKONDA MANIKANTA	/	/	<b>√</b> ,	/	/	<b>/</b>
141	17815A0362	THAMARANA SIVA KUMAR	/	1	/	/	<b>V</b>	1
142	17815A0363	THUTTA DURGA PRASAD	/	~	✓	V	~	<u> </u>
143	17815A0364	VANTAKULA SIVA KUMAR	/	<b>/</b>	<b>/</b>	~	V	<b>/</b>
144	17815A0365	VIJAYAKUMAR BEHARA	<b>V</b>	/	/	V	~	1
145	17815A0366	VOODI NARENDHRA	<b>/</b>	/	/	V	*	/
146	17815A0367	ADARI DURGA PRASANTH	<b>/</b>	<b>/</b>	/	/		/
147	17815A0368	SONTENA BRAHMAJI	~			/	/	<u> </u>

COORDINATOR

HOD

Head of the Department
Department of Mechanical Engg.
Avanthi Institute of Engg. & Tech.,
Makavarapalem, Visakhapatnam - 531113.



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# **CERTIFICATE OF PARTICIPATION**

This is to certify that Mr/Mrs		of
	has participated in	the Certificate Course entitled
on "Automobile Mechanics and IC	Engines" during from	17 <sup>th</sup> December 2018 to 22 <sup>nd</sup>
December 2018 in Department of Mec	hanical Engineering.	
	нов	n · · · · ·
Coordinator	HOD	Principal



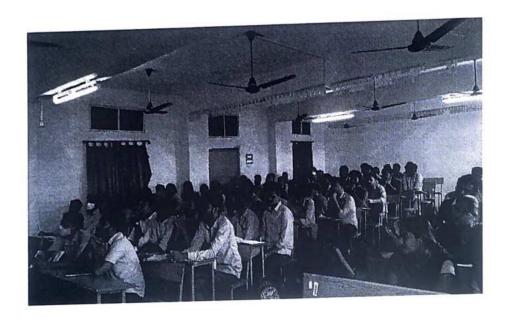
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# DEPARTMENT OF MECHANICAL ENGINEERING

A 5-Day Workshop on

# **Automobile Mechanics & IC Engines**

Dated on - 17th December 2018 to 22nd December 2018



COORDINATOR

HOD

Head of the Department
Department of Mechanical Engg.
Avanthi Institute of Engg. & Tech.,
Makavarapalem, Visakhapatnam-531113.



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Tamaram, Makavarapalem, Narsipatnam (RD), Visakhapatnam-531113

# Department of Mechanical Engineering

Dt:23/12/2018

# BRIEF REPORT

Department of Mechanical Engineering, Avanthi Institute of Engineering and Technology had organized a certificate course on "AUTOMOBILE MECHANICS & IC ENGINE" from 17th DEC 2018 to 22nd DEC 2018.

We had Mr. R. Rudrabhiram, Associate Professor, from VIGNAN'S College, as the speaker to explain each and every detail Introduction of Automobile IC Engines in Industrys. He explained the need for Chassis Design, working of Suspension System, Steering system, later he discussed about the types of Chassis, and the major advantage to more horsepower developed per unit weight and low cost compared to that of external combustion engine.

We had Dr. S. Jai Kumar, Assistant Professor, from GITAM College, he explain about Chassis Design, Transmission system, IC Engines. He gave the limitations that fuel used is very expensive and not suitable for large scales etc. These are generally used for Air Crafts and motor boats, Some of the topics are focused during the course Suspension system, steering system, Transmission system, Fuel supply system, later he explained about Carbon fiber monocoque, various types of breaking systems. Finally he concluded with the real time applications of IC Engines in various automobile industries.

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