JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA – 533 003, Andhra Pradesh, India

DEPARTMENT OF AUTOMOBILE ENGINEERING

COURSE STRUCTURE AND SYLLABUS

For UG – R20

B. TECH - AUTOMOBILE ENGINEERING

(Applicable for batches admitted from 2020-2021)

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COURSE STRUCTURE

I Year – I SEMESTER

S. No	Course Code	Course Title	L	T	P	Credits
1	BSC-1	Mathematics - I	3	0	0	3
2	BSC-2	Engineering Chemistry	3	0	0	3
3	ESC-1	Engineering Mechanics	3	0	0	3
4	HSC-1	Communicative English	3	0	0	3
5	ESC-2	Programming for Problem Solving using C	2	0	2	3
6	BSC-L1	Engineering Chemistry Laboratory	0	0	3	1.5
7	ESC-L1	Programming for Problem Solving using C Laboratory	0	0	3	1.5
8	HSC-L1	English Communication Skills Laboratory	0	0	3	1.5
9	MC -1	Environmental Science	2	0	0	0
Total Credits			**17**	**0**	**11**	**19.5**

I Year – II SEMESTER

S. No	Course Code	Course Title	L	T	P	Credits
1	BSC-3	Mathematics – II (Mathematical Methods)	3	0	0	3
2	BSC-4	Engineering Physics	3	0	0	3
3	ESC-3	Metallurgy & Materials Science	3	0	0	3
4	ESC-4	Basic Electrical and Electronics Engineering	3	0	0	3
5	ESC-5	Engineering Graphics	2	0	2	3
6	ESC-L2	Basic Electrical and Electronics Engineering Lab	0	0	3	1.5
7	BSC-L2	Engineering Physics Laboratory	0	0	3	1.5
8	ESC-L3	Engineering Workshop & IT Workshop Laboratory	0	0	3	1.5
9	MC-2	Constitution of India	2	0	0	0
Total Credits			**17**	**0**	**9**	**19.5**

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II YEAR I SEMESTER

S. No.	Course Code	Course Title	L	T	P	Credits
1	BSC-5	MATHEMATICS-III(Vector Calculus, Transforms and PDE)	3	--	--	3
2	PCC-1	Thermodynamics	3	--	--	3
3	PCC-2	Mechanics of Solids	3	--	--	3
4	PCC-3	Fluid Mechanics & Hydraulic Machines	3	--	--	3
5	PCC-4	Components of Automobile Chassis	3	--	--	3
6	PCC-L1	Mechanics of Solids & Metallurgy Lab	0	0	3	1.5
7	PCC-L2	Automobile Chassis lab	--	--	3	1.5
8	PCC-L3	Fluid Mechanics & Hydraulic Machines lab	--	--	3	1.5
9	SOC-1	Computer aided drafting and modelling lab	0	0	4	2
10	MC-3	Essence of Indian Traditional Knowledge	2	0	0	0
		Total Credits	**17**	--	**13**	**21.5**

II YEAR II SEMESTER

S. No	Course Code	Course Title	L	T	P	Credits
1	ESC-6	Applied Thermodynamics	3	--	--	3
2	BSC-6	Complex Variables and Statistical Methods	3	--	--	3
3	PCC-5	Automobile Engines	3	--	--	3
4	PCC-6	Automobile Electrical and Electronics	3	--	--	3
5	HSC-2	Operations Research	3	--	--	3
6	ESC-L4	Automobile Assembly Drawing	--	--	3	1.5
7	PCC-L6	Automobile Engines & Fuels Lab	0	--	3	1.5
8	PCC-L7	Automobile Electrical & Electronics Lab	0	--	3	1.5
9	SOC-2	Machine Tools and Metrology Lab	1	0	2	2
		Total Credits	**16**	--	**11**	**21.5**
Honors/Minor courses			**4**	0	**0**	**4**

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III YEAR I SEMESTER

S. No.	Course Code	Course Title	L	T	P	Credits
1	PCC-7	Theory of Machines	3	--	--	3
2	PCC-8	Production Technology	3	--	--	3
3	PCC-9	Vehicle Dynamics	3	--	--	3
4	OE-1	**OPEN ELECTIVE**	3	--	--	3
5	PEC-1	1.Alternative Fuels for engines 2. Two and Three Wheelers 3. Microprocessor and Micro Controllers 4. Heat Transfer 5. Industrial Hydraulics and Pneumatics 6. MOOC's/NPTEL	3	--	--	3
6	PCC-L6	Production Technology Lab	--	--	3	1.5
7	PCC-L7	Theory of Machines Lab	--	--	3	1.5
8	SOC-3	Vehicle Design & Analysis Lab	0	0	4	2
9	MC-4	Professional Ethics And Human Values	2	0	0	0
10	Evaluation of Summer Internship, completed after II B. Tech II Semester					1.5
		Total Credits	**17**	--	**10**	**21.5**
Honors/Minor courses			**4**	0	**0**	**4**

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III YEAR II SEMESTER

S. No	Course Code	Course Title	L	T	P	Credits
1	PCC-10	Automobile Components and Chassis Design	3	--	--	3
2	PCC-11	Automobile Transmission systems	3	--	--	3
3	PCC-12	Vehicle Body Engineering	3	--	--	3
4	OE-2	**OPEN ELECTIVE**	3			3
5	PEC-2	1. CFD for Automobile Applications 2. Condition Monitoring 3. Noise Vibrations and Harshness 4. Mechatronics 5. Measurements and Control systems 6. MOOC's/NPTEL	3	--	--	3
6	PCC-L8	Auto Scanning & Vehicle Testing Lab	--	--	3	1.5
7	PCC-L9	Vehicle Maintenance Lab	--	--	3	1.5
8	PCC-L10	Vehicle Evaluation Lab	--	--	3	1.5
9	SOC-4	Soft Skills	--	--	4	2
10	MC-5	Research Methodologies	2	--		0
		Total Credits	**17**	--	**13**	**21.5**
Honors/Minor courses			**4**	**0**	**0**	**4**

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IV B.TECH I SEMESTER

S.No	Code	Course Title	L	T	P	Credits
1	PEC-3	1. Automobile Safety 2. Automobile HVAC 3. Special Purpose Vehicles 4. Engine Management Systems 5. Vehicle Infotronics 6. MOOC's/NPTEL	3	0	0	3
2	PEC-4	1. Automobile Certification and Homologation 2.Total Quality Management 3.Electric Vehicles and Hybrid Technology 4.Facilities Planning and Material Handling 5.Rapid Prototyping 6. MOOC's/NPTEL	3	0	0	3
3	PEC-5	1. Automobile Comfort Systems And Ergonomics 2.Lean Manufacturing 3.Vehicle Design Data Characteristics 4. Reliability Engineering 5.Smart, Autonomous and Connected Vehicles 6. MOOC's/NPTEL	3	0	0	3
4	OE-3	**OPEN ELECTIVE**	3	0	0	3
5	OE-4	**OPEN ELECTIVE**	3	0	0	3
6	HSC-3	Universal Human Values : Understanding Harmony	3	0	0	3
7	SOC-5	Artificial Intelligence and Machine Learning Lab	1	0	2	2
Evaluation of Summer Internship completed after III B.Tech II Semester						3
		Total credits				**23**
Honors/Minor courses			**4**		**0**	**4**

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IV B.TECH II SEMESTER

SNo.	Category	Code	Course Title	L	T	P	Credits
1	Major Project	PROJ	Project work*	0	4	16	12
						Total credits	**12**

***Students can complete Project work @ Industries/ Higher Learning Institutions/ APSSDC.**

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OPEN ELECTIVES:

OPEN ELECTIVE-I:	1.Basic Automobile Engineering 2.Automobile Maintenance and Safety 3. Automobile Emissions and Effects
OPEN ELECTIVE-II:	1.Alternative Fuels for Automobiles 2.Vehicle Stability and Control 3. Electric Vehicles and Hybrid Technology
OPEN ELECTIVE-III:	1. Automobile Safety 2. Automobile Powertrain 3.IC Engines
OPEN ELECTIVE-IV:	1. Automobile Materials and Manufacturing Techniques 2.Engine Management Systems 3. Automobile Electrical and Electronics

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MINOR in AUTOMOBILE ENGINEERING:

S.NO	Subject	Prerequisites
1	Basic Automobile Engineering	NIL
2	IC Engines	NIL
3	Vehicle Body Engineering	Basic AE
4	Vehicle Dynamics	Basic AE, VBE
5	Automobile Electrical and Electronics	Basic AE
6	Electric Vehicles and Hybrid Technology	Basic AE ,AEE
7	Automobile Materials and Manufacturing	Basic AE
8	Automobile Pollution and its Effects	Basic AE, ICE

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PROPOSED SUBJECTS FOR B. Tech (HONORS) IN AUTOMOBILE ENGINEERING

HONORS IN AUTOMOBILE ENGINEERING		Pre-requisites
POOL – 1 (in II-II)		
1.	Engine Tribology	Automobile Engines
2.	Micro Electrical Mechanical Systems	Nil
3.	Standards And Test Procedures Of Fuel And Vehicle Emissions	Components of Automotive Chassis
4.	Engine Modeling	Automobile Engines
POOL-2 (in III-I)		
1.	Metal Forming Processes	Production Technology
2.	Statistical Design in Quality Control	Nil
3.	Design for Manufacturing & Assembly	Production Technology
4.	Robotics & Automation	Kinematics of Machinery
POOL-3 (in III-II)		
1.	Advanced Microcontroller for Automobile Systems	Basic Electrical & Electronics
2.	Automobile Sensors Actuators & Data Acquisition System	Automotive Electrical & Electronics
3.	Automobile Instrumentation And Embedded System	Automotive Electrical & Electronics
4.	Automobile Accident Investigation	Nil
POOL-4 (in IV-I)		
1.	Automobile Product Design And Development	Nil
2.	Analysis and Synthesis of Mechanisms	Kinematics of Machinery
3.	Gas Dynamics	Dynamics of Machinery
4.	Gear Engineering	Kinematics of Machinery