



APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

(A State Government University)

B. Tech

Curriculum (2024)- Semester I to VIII

Automobile Engineering

Branch Code: AU

(Group C)

Ambady Nagar, Sreekaryam

Thiruvananthapuram- 695016

FIRST SEMESTER (July-December)														
10 Days Compulsory Induction Program and UHV														
Sl. No:	Slot	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit Structure				SS	Total Marks		Credits	Hrs./Week
						L	T	P	R		CIA	ESE		
1	A	GYMAT101	BSC	GC	Mathematics for Physical Science - 1	3	0	0	0	4.5	40	60	3	3
2	B S1/ S2	GZPHT121	BSC	GC	Physics for Physical Science	3	0	2	0	5.5	40	60	4	5
		GCCYT122			Chemistry for Physical Science									
3	C	GCEST103	ESC	GC	Engineering Mechanics	3	0	0	0	4.5	40	60	3	3
4	D	GCEST104	ESC	GC	Introduction to Mechanical Engineering & Civil Engineering (Part1: Mechanical Engineering)	2	0	0	0	3	20	30	2+2=4	4
					(Part 2: Civil Engineering)	2	0	0	0	3	20	30		
5	F	UCEST105	ESC	UC	Algorithmic Thinking with Python	3	0	2	0	5.5	40	60	4	5
6	L	GCESL106	ESC	GC	Engineering Workshop	0	0	2	0	1	50	50	1	2
7	I* S1/ S2	UCHWT127	HWP	UC	Health and wellness	1	0	1	0	0	50	0	1	2
		UCHUT128	HMC		Life Skills and Professional Communication	2	0	-	0	3	100	0		
8	S1/ S2	UCSEM129	SEC	UC	Skill Enhancement Course: Digital 101(30 Hours, NASSCOM)	MOOC				2			-	
Total										30/ 32			20	24
Bridge Course (Mathematics or Introduction to Computer Science) *:										Total 15 Hrs.				

*Valuation for HMC courses will be done at college level, Question papers will be provided by the University.

*No Grade Points will be awarded for the MOOC course and I slot course.

- L-T-P-R: Lecture-Tutorial-Practical-Project
- SS(Self Study) Hours= 1.5L+0.5 T+0.5P+R
- CIA: Continuous Internal Assessment, ESE: End Semester Examination

Digital 101 (NASSCOM)		
Sl. No:	Technologies Covered	Hours
1	Artificial intelligence and Big Data Analytics (AI/BDA)	11
2	Internet of Things (IoT)	2.5
3	Cyber Security	2.5
4	Block Chain	2.5
5	Robotic Process Automation	1.5
6	Augmented and Virtual Reality (AR and VR)	2.5
7	Cloud Computing	2.5
8	3 D Printing and Modelling	2
9	Web, Mobile Dev and Marketing	2
10	Responsible AI	1
Total Hours		30

Note:

Engineering Physics, Engineering Chemistry, Health and Safety and Life skill and Universal Human Values shall be offered in both S1 and S2. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for

Engineering Physics/ Health and wellness in SI and Engineering Chemistry/ Life Skills and Professional Communication in S2 & vice versa.

SECOND SEMESTER (January-June)														
Sl. No:	Slot	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit Structure				SS	Total Marks		Credits	Hrs./Week
						L	T	P	R		CIA	ESE		
1	A	GYMAT201	BSC	GC	Mathematics for Physical Science - 2	3	0	0	0	4.5	40	60	3	3
2	B S1/ S2	GZPHT121	BSC	GC	Physics for Physical Science	3	0	2	0	5.5	40	60	4	5
		GCCYT122			Chemistry for Physical Science									
3	C	GCEST203	ESC	GC	Engineering Graphics and Computer Aided Drawing	2	0	2	0	4	40	60	3	4
4	D	GZEST204	ESC	GC	Basic Electrical & Electronics Engineering (Part 1: Electrical Engineering)	2	0	0	0	3	20	30	2+2=4	4
					(Part 2: Electronics Engineering)	2	0	0	0	3	20	30		
5	E	PCAUT205	PC	PC	Automobile Power Plant	3	1	0	0	5	40	60	4	4
6	F	UCEST206	ESC	UC	Engineering Entrepreneurship & IPR	3	0	0	0	4.5	60	40	3	3
7	I* S1/ S2	UCHWT127	HWP	UC	Health and wellness	1	0	1	0	0	50	0	1	2
		UCHUT128	HMC		Life Skills and Professional Communication	2	0	-	0	3	100	0		
8	L	GZESL208	ESC	GC	Basic Electrical and Electronics Engineering workshop	0	0	2	0	1	50	50	1	2
9	S1/ S2	UCSEM129	SEC	UC	Skill Enhancement Course: Digital 101(30 Hours, NASSCOM)	MOOC							1	
Total										34			24	27

*No Grade Points will be awarded for the MOOC course and I slot course.

THIRD SEMESTER (July-December)														
Sl. No:	Slot	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit Structure				SS	Total Marks		Credits	Hrs./ Week
						L	T	P	R		CIA	ESE		
1	A	GYMAT301	BSC	GC	Mathematics for Physical Science - 3	3	0	0	0	4.5	40	60	3	3
2	B	PCAUT302	PC	PC	Fluid Mechanics and Hydraulic Machines	3	1	0	0	5	40	60	4	4
3	C	PCAUT303	PC	PC	Automotive Chassis	3	1	0	0	5	40	60	4	4
4	D	PBAUT304	PC-PBL	PB	Material Science and Metallurgy	3	0	0	1	5.5	60	40	4	4
5	F	GNEST305	ESC	GC	Introduction to Artificial Intelligence and Data Science	3	1	0		5	40	60	4	4
6	G S3/S4	UCHUT346	HMC	UC	Engineering Economics	2	0	0	0	3	50	50	2	2
		UCHUT347			Engineering Ethics and Sustainable Development									
7	L	PCAUL307	PCL	PC	Fluid Mechanics and Machinery Lab	0	0	3	0	1.5	50	50	2	3
8	Q	PCAUL308	PCL	PC	Vehicle Systems Lab	0	0	3	0	1.5	50	50	2	3
9	R/M		VAC		REMEDIAL/MINOR/COURSE	3	1	0	0	5			4*	4*
Total										31/36			25/29*	27/31*

FOURTH SEMESTER (January-June)														
Sl. No:	Slot	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit Structure				SS	Total Marks		Credits	Hrs./ Week
						L	T	P	R		CIA	ESE		
1	A	GCMAT401	BSC	GC	Mathematics for Physical Science - 4	3	0	0	0	4.5	40	60	3	3
2	B	PCMUT402	PC	PC	Mechanics of Solids	3	1	0	0	5	40	60	4	4
3	C	PCAUT403	PC	PC	Thermodynamics and Heat Transfer	3	1	0	0	5	40	60	4	4
4	D	PBAUT404	PC-PBL	PB	Industrial Manufacturing Process	3	0	0	1	5.5	60	40	4	4
5	E	PEAUT41N	PE	PE	Program Elective-1	3	0	0	0	4.5	40	60	3	3
6	G S3/S4	UCHUT346	HMC	UC	Engineering Economics	2	0	0	0	3	50	50	2	2
		UCHUT347			Engineering Ethics and Sustainable Development									
7	L	PCAUL407	PCL	PC	Production Engineering Lab	0	0	3	0	1.5	50	50	2	3
8	Q	PCAUL408	PCL	PC	Thermal Engineering Lab	0	0	3	0	1.5	50	50	2	3
9	R/M /H		VAC		Remedial/Minor/Honours Course	3	1	0	0	5			4*	4*
Total										31/ 36			24/ 28*	26/ 30*

Note: Engineering Economics and Engineering Ethics and Sustainable Development shall be offered in both S3 and S4. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Engineering Economics in S3 and Engineering Ethics & Sustainable Development in S4 and vice versa.

PROGRAM ELECTIVE I: PEAUT41N

SLOT	COURSE CODE	COURSES	L-T-P-R	HOURS	CREDIT
E	PEAUT411	Alternate Energy Sources for Automobile	3-0-0-0	3	3
	PEAUT412	Marketing Management	3-0-0-0		3
	PEAUT415	Industrial Safety Engineering	3-0-0-0		5/3

Note : Level 5 courses in the B. Tech curriculum carry a total of 5 credits, consisting of 3 credits for the Programme Elective and 2 additional credits. The additional 2 credits shall be awarded only if the student meets the eligibility conditions specified in the B. Tech. -2024 regulations. If those conditions are not fulfilled, the student will receive only 3 credits for the course.

FIFTH SEMESTER (July-December)															
Sl. No:	Slot	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit Structure					SS	Total Marks		Credits	Hrs./ Week
						L	T	P	R	CIA		ESE			
1	A	PCAUT501	PC	PC	Automobile Electrical and Electronics	3	1	0	0	5	40	60	4	4	
2	B	PCAUT502	PC	PC	Theory of Machines	3	1	0	0	5	40	60	4	4	
3	C	PCAUT503	PC	PC	Automotive Transmission	3	0	0	0	4.5	40	60	3	3	
4	D	PBAUT504	PC-PBL	PB	Computer Aided Design and Manufacturing	3	0	0	1	5.5	60	40	4	4	
5	E	PEAUT52N	PE	PE	Program Elective-2	3	0	0	0	4.5	40	60	3	3	
6	I*	UCHUM506	HMC	UC	Constitution Of India (MOOC)	-	-	-	-	2	-	-	1	-	
7	L	PCAUL507	PCL	PC	Automotive Electrical Lab	0	0	3	0	1.5	50	50	2	3	
8	Q	PCAUL508	PCL	PC	Computer Aided Design and Analysis Lab	0	0	3	0	1.5	50	50	2	3	
9	R/M/H		VAC		Remedial/Minor/Honours Course	3	1	0	0	5			4*	4*	
	S ₅ / S ₆	Industrial Visit (Maximum 12 Days are permitted, Not Exceeding more than 6 Working Days) /Industrial Training													
Total										30 / 35			23/27*	24/28*	

*No Grade Points will be awarded for the MOOC course and I slot course.

PROGRAM ELECTIVE 2: PEAUT 52N

SLOT	COURSE CODE	COURSES	L-T-P-R	HOURS	CREDIT
C	PEAUT 521	Mechatronics and Control Systems	3-0-0-0	3	3
	PEAUT 522	Automotive Pollution and Testing	3-0-0-0		3
	PEAUT 523	Automotive Refrigeration and Air Conditioning	3-0-0-0		3
	PEAUT524	Operations Management in Auto Industry	3-0-0-0		3
	PEAUT525	Electric Drives and Controls for Automation	3-0-0-0		5/3

SIXTH SEMESTER (January-June)														
Sl. No:	Slot	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit Structure				SS	Total Marks		Credits	Hrs/ Week
						L	T	P	R		CIA	ESE		
1	A	PCAUT601	PC	PC	Hybrid and Fuel cell vehicles	3	1	0	0	5	40	60	4	4
2	B	PCAUT602	PC	PC	Vehicle Stability and Dynamics	3	0	0	0	4.5	40	60	3	3
3	C	PEAUT63N	PE	PE	Program Elective-3	3	0	0	0	4.5	40	60	3	3
4	D	PBAUT604	PC-PBL	PB	Automotive Component Design	3	0	0	1	5.5	60	40	4	4
5	F	GCEST605	ESC	GC	Design Thinking and Product Development	2	0	0	0	3	40	60	2	2
6	O	OEMET61N /IEMET61N	OE/ILE	OE/IE	Open Elective/Industry Linked Elective-1	3	0	0	0	4.5	40	60	3	3
7	L	PCAUL607	PCL	PC	Autotronics Lab	0	0	3	0	1.5	50	50	2	3
8	P	PCAUP608	PWS	PC	Mini Project: Socially Relevant Project	0	0	0	3	3	50	50	2	3
9	R/ M/ H		VAC		Remedial/Minor/Honours Course	3	1	0	0	5			4*	4*
	S5 / S6	Industrial Visit (Maximum 12 Days are permitted, Not Exceeding more than 6 Working Days) /Industrial Training												
Total										32 / 36			23/27*	25/29*

Note: Open Electives are such courses which will be offered by other departments. Like CSE department students have to opt open electives from ECE/ME/EEE etc. departments.

PROGRAM ELECTIVE 3: PEAUT 63N

SLOT	COURSE CODE	COURSES	L-T-P-R	HOURS	CREDIT
A	PEAUT 631	Two and Three wheeled Vehicles	3-0-0-0	3	3
	PEAUT 632	Autonomous Driving and ADAS	3-0-0-0		3
	PEAUT 633	Vehicle Transport and Fleet Management	3-0-0-0		3
	PEAUT 635	Vehicle Maintenance	3-0-0-0		5/3

OPEN ELECTIVE 1: OEAUT 61N

SLOT	COURSE CODE	COURSES	L-T-P-R	HOURS	CREDIT
O	OEMUT611	Automated guided and Autonomous Vehicles	3-0-0-0	3	3
	OEMUT612	Modern Automotive Technologies	3-0-0-0		3

	OEMUT614	Special Types of Vehicles	3-0-0-0		3
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SEVENTH SEMESTER (July-December)															
Sl. No:	Slot	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit Structure					SS	Total Marks		Credits	Hrs/Week
						L	T	P	R	CIA		ESE			
1	A	PEAUT74N / PEAUM74N	PE	PE	Program Elective-4 (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	3	0	0	0	4.5	40	60	3	3	
2	B	PEAUT75N/ PEAUM75N	PE	PE	Program Elective-5 (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	3	0	0	0	4.5	40	60	3	3	
3	O	OEAUT72N /IEAUT72N/ OEAUM72N	OE/ ILE	OE/IE	Open Elective/Industry Linked Elective-2 (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	3	0	0	0	4.5	40	60	3	3	
4	I*	UEHUT704 / UEHUM70N	HMC	UE	University Elective (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	2	0	0	0	3	50	50	2	2	
5	S	PCAUT705	PS	PC	Seminar	0	0	3	0	1.5	50	0	2	3	
6	P	PCAUP706/ PCAUI706	PS	PC	Option 1: Major Project Option 2: Internship (4-6 Months)	0	0	0	12	12	100	0	4	8	
7	R/H		VAC		Remedial/Honours Course	3	0	0	0	4.5			3*	3*	
Total										26/31			17/20*	22/25*	

*No Grade Points will be awarded for the I slot courses

*The students can take the internship option either in 7th or in 8th semester.

* Option 1: Work on a Project in the institute/department under the mentorship of faculty members.

Option 2: Full semester Internship in Industry/organization (7th or 8th semester)

Note: Open Electives are such courses which will be offered by other departments.

PROGRAM ELECTIVE 4: PEAUT 74N

SLOT	COURSE CODE	COURSES	L-T-P-R	HOURS	CREDIT
A	PEAUT 741	Vehicle Body Engineering	3-0-0-0	3	3
	PEAUT 742	Total Quality Management	3-0-0-0		3
	PEAUT 745	Advanced Automotive Manufacturing Materials	3-0-0-0		5/3

PROGRAM ELECTIVE 5: PEAUT 75N

SLOT	COURSE CODE	COURSES	L-T-P-R	HOURS	CREDIT
B	PEAUT 751	Block Chain in Automotive Industry	3-0-0-0	3	3
	PEAUT 752	Vehicle Aerodynamics	3-0-0-0		3
	PEAUT 753	Supply Chain Management	3-0-0-0		3

	PEAUT 755	Noise , Vibration and Harshness	3-0-0-0		5/3
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OPEN ELECTIVE 2: OEAUT 72N

SLOT	COURSE CODE	COURSES	L-T-P-R	HOURS	CREDIT
O	OEMUT721	Electric and Hybrid Vehicle	3-0-0-0	3	3
	OEMUT722	Automotive Ergonomics and Safety	3-0-0-0		3
	OEAUT723	Vehicle Aerodynamics	3-0-0-0		3

SL. No	Course Code	Slot I: HMC Elective
1	UEHUT704	Project Management: Planning, Execution, Evaluation and Control
2	UEHUM701	Proficiency course in French. (MOOC) (B1 level)
3	UEHUM702	Proficiency Course in German (B1 Level). (MOOC)
4	UEHUM703	Proficiency Course in Spanish (B1 Level) (MOOC)
5	UEHUM704	Introduction to Japanese Language and Culture (N5 level). (MOOC)

EIGHT SEMESTER (January-June)

Sl. No:	Slot	Course Code	Course Type	Course Category	Course Title (Course Name)	Credit Structure				SS	Total Marks		Credits	Hrs/Week
						L	T	P	R		CIA	ESE		
1	A	PEAUT86N / PEAUM86N	PE	PE	Program Elective-6 (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	3	0	0	0	4.5	40	60	3	3
2	O	OEAUT83N / IEAUT83N / OEAUM83N	OE/ILE	OE/IE	Open Elective/Industry Linked Elective-3 (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	3	0	0	0	4.5	40	60	3	3
3	I*	UEHUT803 / UEHUM803	HMC	UC	Organizational Behavior and Business Communication (Internship Students: Self Study/MOOC Approved by the University/Online Classes)	2	0	0	0	3	50	50	1	2
4	P	PCAUP806/ PCAUI806/ PCAUJ806	PS	PC	Option 1: Major Project Option 2: Internship (4-6 Months) Option 3: Major Project Phase -II (For the students who have not opted for internship in S7/S8)	0	0	0	12	12	100	0	4	8
	R/H		VAC		Project: Honours Course	0	0	0	4	4			4*	4
Total										24 / 28			11/15*	16/20

*No Grade Points will be awarded for the I slot courses

* Option 2: Full semester Internship in Industry/organization (7th or 8th semester)

PROGRAM ELECTIVE 6: PEAUT 86N

SLOT	COURSE CODE	COURSES	L-T-P-R	HOURS	CREDIT
A	PEAUT861	Automotive Comfort and Safety engineering	3-0-0-0	3	3
	PEAUT862	Advanced Automotive Electrical and Electronics	3-0-0-0		3
	PEAUT865	Advanced Vehicle Technology	3-0-0-0		5/3

OPEN ELECTIVE 3:OEAUT 83N

SLOT	COURSE CODE	COURSES	L-T-P-R	HOURS	CREDIT
O	OEAUT831	Vehicle Performance and Testing	3-0-0-0	3	3
	OEAUT832	Hydrogen and Fuel cell Vehicles	3-0-0-0		3
	OEAUT833	Industrial Safety Engineering	3-0-0-0		3

HMC Courses

Sl. No:	Semester	Course Area	Credits
1	S1/S2	Life Skills and Professional Communication	1
2	S3	Engineering Economics	2
3	/S4	Engineering Ethics and Sustainable Development	2
4	S5	Constitution Of India. (MOOC)	1
5	S7	Elective (Project Management/Foreign Languages)	2
6	S8	Organizational Behavior and Business Communication	1
Total Credits			9

BSC Courses

Sl. No:	Semester	Course Area	Credits
1	S1	Mathematics for Physical Science-1	3
2	S1/S2	Physics for Physical Science	4
3		Chemistry for Physical Science	4
4	S2	Mathematics for Physical Science-2	3
5	S3	Mathematics for Physical Science-3	3
6	S4	Mathematics for Physical Science-4	3
Total Credits			20

ESC Courses (Group C)			
Sl. No:	Semester	Course Area	Credits
1	S1	Engineering Mechanics	3
2		Introduction to Mechanical Engineering/ Civil Engineering	4
3		Algorithmic Thinking with Python	4
4		Engineering Workshop	1
5	S2	Engineering Graphics and Computer Aided Drawing	3
6		Basic Electrical and Electronics Engineering	4
7		Engineering Entrepreneurship and IPR	3
8		Basic Electrical and Electronics Engineering Workshop	1
9	S3	Introduction to Artificial Intelligence and Data Science	4
10	S6	Design Thinking and Creativity	2
Total Credits			29

Programme Core Courses (PC)			
Sl. No:	Semester	Course Area	Credits
1	S2	Automobile Power Plant	4
2	S3	Fluid Mechanics and Hydraulic Machines	4
3		Automotive Chassis	4
4		Fluid Mechanics and Machinery Lab	2
5		Vehicle Systems Lab	2
6		S4	Mechanics of Solids
7	Thermodynamics and Heat Transfer		4
8	Production Engineering Lab		2
9	Thermal Engineering Lab		2
10	S5	Automobile Electrical and	4
11		Electronics Theory of Machines	4
12		Automotive Transmission	3
13		Automotive Electrical Lab	2
14		Computer Aided Design and Analysis Lab	2
15	S6	Hybrid and Fuel cell vehicles	4
16		Vehicle Stability and Dynamics	3
17		Autotronics Lab	2
Total Credits (Theory -10, Lab-7)			52

Programme Core-Project Based Learning (PBL)			
Sl. No:	Semester	Course Area	Credits
1	S3	Core PBL-1	4
2	S4	Core PBL-2	4
3	S5	Core PBL-3	4
4	S6	Core PBL-4	4
Total Credits			16

Programme Elective Courses (PE)			
Sl. No:	Semester	Course Type	Credits
1	S4	PE-1	3
2	S5	PE-2	3
3	S6	PE-3	3
4	S7	PE-4	3
5		PE-5	3
6	S8	PE-6	3
Total Credits			18

Open Elective Courses/Industry Elective(OE/IEL)			
Sl. No:	Semester	Course Type	Credits
1	S6	OE/ILE-1	3
2	S7	OE/ILE-2	3
3	S8	OE/ILE-3	3
Total Credits			9

Project/ Internship and Seminar			
Sl. No:	Semester	Course Type	Credits
1	S6	Mini Project	2
2	S7	Seminar	2
3		Major Project/Internship	4
4	S8	Major Project/Internship/Research Project	4
Total Credits			12

Activity Points				
Sl. No.	Group	Courses	Credits	Minimum Credit Requirements
1	I	NSS, NCC, NSO (National Sports Organization)	1 (40 Points)	3 Credits (One credit from each Group)
2		Arts/Sports/Games		
3		Union/Club Activities		
4	II	English Proficiency Certification (TOFEL, IELTS, BEC etc.)	1 (40 Points)	
5		Aptitude Proficiency Certification (GRE, CAT, GMAT etc.)/ Valid Gate Score.		
6		Short Term Internship (Minimum 2 weeks), Clinical Exposure/Training (Minimum 2 weeks), Conferences/Paper Presentation/ Workshop Activities/ Professional Body Activities, Participation in University level/State Level/ National Level Hackathons		
7	III	Journal Publication, Patents, Start-Up, Innovation, Winners of National/ International Level Hackathons	1 (40 Points)	
8		Skilling Certificates (Approved by the University)		

- Students are required to acquire a minimum of 120 activity points, with at least 40 points per group, to fulfill the curriculum requirement of 3 activity credits.
- For B. Tech Lateral Entry students, 30 points per group are required. A minimum of 90 activity points must be acquired to obtain the 3 activity credits mandated by the curriculum.

Course classifications of the B. Tech Programmes and Overall Credit Structure			
Sl. No	Category	Code	Credits
1	Humanities and Social Sciences including Management Courses	HMC	9
2	Basic Science Courses	BSC	20
3	Engineering Science Courses	ESC	29
4	Programme (Professional) Core Courses	PCC	52
5	Programme (Professional) Core Courses-Project Based Learning	PBL	16
6	Programme Elective Courses	PEC	18
7	Open Elective Courses/Industry Linked Elective	OEC/ILE	9
8	Mini Project, Project Work/Internship and Seminar	PWS	12
9	Health and Wellness	HWP	1
10	Skill Enhancement Courses (Digital 101)	SEC	1
11	Mandatory Student Activities	MSA	3
Total Credits			170