

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
UNIVERSITY POLYTECHNIC

DIPLOMA IN AUTOMOBILE ENGINEERING



**CURRICULUM BASED ON CHOICE BASED CREDIT SYSTEM
(CBCS)
2023**

INSTITUTE VISION AND MISSION

VISION

To emerge as a leading technical training institution in the country and serve the nation and engineering profession with distinction by developing the most skilled human resources with comprehensive and modern training and skillsets in selected engineering disciplines and trades.

MISSION

1. To administer a technical training institute of highest standard of education and training commensurate with modern engineering practices.
2. To offer technical diploma and certificate courses to cater to contemporary demand and relevance to the engineering industry.
3. To adopt and implement modern curriculum of technical education and training.
4. To continuously upgrade the infrastructure necessary for practical training with new and contemporary machines and methods.
5. To arrange on job training and internships for the students and staff members with proper supervision.
6. To liaise with industry for internship and collaboration, and, for arranging periodic review of infrastructure and training methods and modernizing teaching and training curriculum.
7. To create special program for the youth of the State of Jharkhand to help them acquire entrepreneurial and managerial skills, manufacturing capability, career advancement training and professional confidence.

Vision of Automobile Engineering Department University Polytechnic, BIT Mesra

To foster and train young minds and develop them into highly skilled and motivated manpower in Automobile engineering discipline, who persistently work their way forward to demonstrate their creativity and use their talent in development of the society.

Mission of Automobile Engineering, University Polytechnic BIT Mesra.

- Provide in-depth knowledge in Automobile Engineering and awareness of latest development in allied fields of engineering to the students and make them industry ready engineers (T – shaped engineers)
- Develop a challenging environment that supports and encourages the students to become an entrepreneur.
- Develop a culture that promotes individual and teamwork for carrying out innovative projects, assignments, and research work in engineering sciences.
- To prepare the youth of the Jharkhand with knowledge of fundamentals of Automobile Engineering and Technology so that they can fulfill to the society, state, and nation's skilled manpower requirement.
- A competitive degree structure is provided, that responds to time, need and technology.

PROGRAM OUTCOMES (POs)

Diploma holders of the Automobile Engineering Program will be able to:

1. **Basic and Discipline specific knowledge:** Apply knowledge of basic mathematics, fundamentals of science to solve the engineering problems.
2. **Problem analysis:** Identify and analyse well-defined engineering problems using standard methods.
3. **Design/ development of solutions:** Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.

4. **Engineering Tools, Experimentation and Testing:** Apply modern engineering tools and appropriate techniques to conduct standard tests and measurements.

5. **Engineering practices for society, sustainability, and environment:** Apply appropriate technology in context of society, sustainability, environment and ethical practices.

6. **Project Management:** Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.

7. **Life-long learning:** Ability to analyse individual needs and engage in updating in the context of technological changes.

Program Education Objective [PEOs]

PEO 1: To prepare Automobile Engineering graduates with an outstanding knowledge of mathematical, scientific, engineering, technology, management, humanities and various other interdisciplinary subjects.

PEO 2: To prepare graduates for successful career in government services, research organizations, corporate sector, academic institutes, and industries at local, regional and global level.

PEO 3: Apply the knowledge of Automobile Engineering to solve the problems of Maintenance, diagnostics, servicing and to encourage the spirit of entrepreneurship.

PEO 4: To build the attitude of graduate that will support the service industries, economic development and to address social and engineering challenges of the nation.

PEO 5: Engage in life-long learning, career enhancement, necessary skills for industrial competency and adopt to change in professional and societal needs also to motivating the students to pursue higher studies and research.

PEO 6: Work effectively as individuals and as team members in multi-disciplinary projects abiding professional.

Programme Specific Outcome

PSO 1: Apply the concepts of alternative advanced fuels, emission norms and control.

PSO 2: Make a use of mechanical & automotive equipment for diagnose and maintenance of various Automotive system.

COURSE STRUCTURE (DIPLOMA ALL BRANCHES)

1ST SEMESTER

THREE WEEKS INDUCTION PROGRAM

Including UNIVERSAL HUMAN VALUE (UHV-I)

S. N.	COURSE CODE	COURSE TITLE	SEGMENT	L	T	P	LECTURE HOUR	CREDIT
1	DBS 101	Engineering Chemistry	BS	3	1		4	4
2	DBS 103	Applied Physics-I	BS	2	1		3	3
3	DBS 105	Mathematics-I	BS	3	1		4	4
4	DES 101 / DES 201	Introduction to IT Systems / Fundamentals of Electrical & Electronics Engineering	ES	2	1		3	3
5	DBS 104/ DES 202	Applied Physics Lab / Fundamentals of Electrical & Electronics Engineering Lab	BS			2	2	1
6	DHS 101	Communication Skills-I	HS	3	0	0	3	3
7	DHS 102/104/106	Sports and Yoga/NSS/NCC	HS			2	2	1
8	DES 102	Engineering Graphics	ES			3	3	1.5
9	DES 104	Engineering Workshop Practice	ES			3	3	1.5
		Periods per week		13	4	10	27	
		Total credits						22
		Total periods per week						27

COURSE STRUCTURE (DIPLOMA ALL BRANCHES)

2ND SEMESTER (DIPLOMA)

S. N.	COURSE CODE	COURSE TITLE	SEGMENT	L	T	P	LECTURE HOUR	CREDIT
1	DBS 201	Applied Physics-II	BS	2	1		3	3
2	DBS 203	Mathematics-II	BS	3	1		4	4
3	DES 101 / DES 201	Introduction to IT Systems / Fundamentals of Electrical & Electronics Engineering	ES	3			3	3
4	DES 203	Engineering Mechanics	ES	3			3	3
5	DAU 201	Environmental Sciences	AUDIT	2			2	0
6	DBS 202	Applied Chemistry Lab	BS			2	2	1
7	DBS 104/ DES 202	Applied Physics Lab / Fundamentals of Electrical & Electronics Engineering Lab	ES			2	2	1
8	DES 204	Engineering Mechanics Lab	ES			2	2	1
9	DES 206	Introduction To IT Systems Lab	ES			2	2	1
10	DHS 202/204/206	Sports and Yoga/NSS/NCC	HS			2	2	1
		Periods per week		13	2	10	25	
		Total credits						18
		Total periods per week						25

COURSE STRUCTURE (DIPLOMA)

THIRD SEMESTER

Category	Subject Code	Segment	Subject	L	T	P	Credit
Program Core	DME 301	PC	Thermal Engineering	3	0	0	3
Program core	DME 303	PC	Manufacturing Process	3	0	0	3
Program Core	DAE 315	PC	Fluid Mechanics & Hydraulic Machines	3	1		4
Program Core	DAE 317	PC	Basics of Automobile Engineering	3	0	0	3
Program Core	DME 308	PC	Machine Drawing	0	0	3	1.5
Program Core	DME304	PC	Manufacturing Process Lab.	0	0	2	1
Program Core	DME 302		Thermal Engineering Lab.	0	0	2	1
Program Core	DAE 316	PC	Fluid mechanics & Hydraulic M/C Lab	0	0	3	1.5
UHV-II	DHS 301	HS	Universal Human Values-II	2	0	0	0
Summer Internship - 1(4 weeks)	DSE 351		Internship	0	0	0	2
			Periods per week	14	1	10	-
			Total credits	-	-	-	20
			Total periods per week	-	-	-	25

FOURTH SEMESTER

Category	Subject Code	SEGMENT	Subject	L	T	P	Credit
Program core	DME 401	PC	Strength of Materials	3	0	0	3
Program core	DAE 404	PC	Chassis Body Transmission	3	0	0	3
Program core	DAE 403	PC	Automotive Engine	0	0	2	1
Program Elective 1		PE		3	0	0	3
Program Elective 2		PE		3	0	0	3
Open Elective 1		OE		3	0	0	3
Program Core	DME 402	PC	Strength of Materials Lab.	0	0	2	1
Program Core	DAE 402	PC	Automotive Design Lab	0	0	2	1
Minor project	DPR 411	MP	Minor Project			4	2
Mandatory course	DMC 401	MC	Essence of Indian Knowledge & Tradition	2			0
			Periods per week	17	0	10	
			Total credits	-	-	-	20
			Total periods per week	-	-	-	27
		Program Elective Any					
Program Elective P1	DOE 411	Garage Equipment and Supervisory Management					
	DOE 412	Basics of Motor Sports Engineering					
	DOE 413	Industrial Robotics and Automation					
Program Elective P2	DOE 414	Fundamentals of Nano Science					
	DOE 415	Paint Technology					
	DOE 416	Digital Marketing					
	DOE 417	Mechatronics					
	DOE 419	Basics of Mechanical Engineering					

FIFTH SEMESTER

Category	Subject Code	SEGMENT	Subject	L	T	P	Credit
Program core	DAE 501	PC	Autotronics	3	0	0	3
Program core	DAE 503	PC	Industrial Management	3	0	0	3
Program core	DAE 505	PC	Transport Management	3	0	0	3
Program. Elective 3		DP		3	0	0	3
Open Elective 2		OE		3	0	0	3
Program core	DAE 507	PC	Motor Vehicle Technology	0	0	2	1
Program core	DAE 509	PC	Automotive Materials	0	0	2	1
Program core	DAE 502	PC	Driving Practice Lab	0	0	2	1
Program core	DAE 504	PC	Automobile Engineering lab	0	0	2	1
Summer Internship-II	DSI 511	SI	(6 weeks) after IV th Sem	0	0	0	3
Major Project	DPR 511	PR	Project-I	0	0	2	1
			Periods per week	15	0	10	
			Total credits	-	-	-	23
			Total periods per week				25
			Program elective3				
Program elective 3. (P3)	DPE 511		Automotive Aerodynamics	3	0	0	
	DPE512		Modern Vehicle Technology	3	0	0	
	DPE 513		Non-Conventional Energy Resources	3	0	0	
Open Elective 2 for Other Branch	DOE 511		Total Quality Management	3	0	0	
	DOE 512		Industrial Automation	3	0	0	

SIXTH SEMESTER

Category	Subject Code	SEGMENT	Subject	L	T	P	Credit
Program Core	DAE 601	PC	Electric Vehicles	3	1	0	4
Program Core	DAE 603	PC	Automotive Emission and Control System	3	0	0	3
Program Core	DAE 605	PC	Special Purpose Vehicles & Equipment's				
Humanities and Social Science course	DHS 601	HS	Entrepreneurship and Start-ups	3	1	0	4
Mandatory Course	DAU 601	MC	Indian Constitution	3	0	0	0
Program elective 4		PE		3	0	0	3
Open Elective3		OE	Elective	3	0	0	3
Program Core	DAE 612		Automobile Maintenance Lab	0	0	2	1
Major Project	DPR 612	PR	Project-II	0	0	6	3
	DSE 612	SE	Seminar	0	0	1	1
			Periods per week	18	2	9	-
			Total credits	-	-	-	22
			Total periods per week	-	-	-	29
			Program Elective (Anyone)				
P4	DPE 611		Vehicles Dynamics	3	0	0	
	DPE 612		Vibration and Noise Control1	3	0	0	
	DPE 613		Operation Research	3	0	0	
Open Elective 3 for other branch	DOE 612		Artificial Intelligence	3	0	0	
	DOE 613		Modelling of Vehicle systems	3	0	0	