

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
UNIVERSITY POLYTECHNIC

DIPLOMA IN COMPUTER 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.

DEPARTMENT VISION AND MISSION

VISION

To produce competent, committed and confident professionals and entrepreneurs with a zeal to excel in the field of Computer Engineering and lead the society in its path of technological, economic and social development, by imparting quality technical education and extensive exposure to the latest trends in the field.

MISSION

1. To impart technical knowledge and practical skills in Computer Engineering - including hardware, software, and networking concepts, to the students through effective teaching and learning methodologies.
2. To equip students with problem solving skills and knowledge in the domain of Computer Engineering as per the requirements of the computer industry and also the needs of the modern society.
3. To enhance educational experience of our students and foster innovation and entrepreneurship in the field of Computer Engineering.
4. To cultivate a strong work ethics and professionalism among students, along with good communication skills and the ability to work effectively in teams.
5. To maintain pace with the developments in the software industry through industry collaboration and regular faculty training.

(A) Programme Outcomes (POs)

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

1. Basic and Discipline Specific Knowledge: Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.
2. Problem Analysis: Identify and analyse well-defined engineering problems using codified 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 technique 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-SPECIFIC OUTCOMES (PSOs)

Students are expected to:

1. Acquire sound subject knowledge in computer engineering fundamentals as well as advanced subjects like Data Structures, Databases, Data Communication and Networks, Web Technology and Internet of things etc., that could also be supportive in pursuing higher studies.
2. Develop good programming and problem-solving skills on most of the modern programming languages and paradigms, along with Software Engineering practices, preparing them to work productively as a software developer.
3. Gain Provide adequate hands-on in specific areas like web development, multimedia and animation, computer hardware diagnostics and setting up computer networks, mainly preparing them for entrepreneurial ventures.

PROGRAM EDUCATIONAL OBJECTIVE

1. To prepare students with sound technical knowledge and practical skills in various domains of computer engineering, who are confident in accepting challenges and apply their knowledge to solve them.
2. To prepare students who possess enough creativity and entrepreneurial skills who can venture into developing new products or services in the field of computer engineering.

3. To foster in them a culture of lifelong learning, by equipping them with strong concepts in Computer Engineering, enabling them to pursue advanced degrees and professional development opportunities.

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

DIPLOMA IN COMPUTER ENGINEERING
SEMESTER- III

Semester/ Session of study (Recommended)	Course Level	Category of Course	Course Code No	Course Title	Mode of delivery & credits L-Lecture; T-Tutorial; P-Practical (Hours per Week)			Total contact hrs/ week	Total Credits	
					L	T	P			
THIRD Monsoon	THEORY									
	ES	Program Core Course	DCE 301	Computer Programming	3	0	0	3	3	
	ES	Program Core Course	DCE 303	Introduction to DBMS	3	0	0	3	3	
	ES	Program Core Course	DCE 305	Computer Organization	3	0	0	3	3	
	ES	Program Core Course	DCE 307	Operating Systems	3	0	0	3	3	
	ES	Program Core Course	DCE 309	Web Technologies	3	0	0	3	3	
	HS	UHV-II	DHS 301	Universal Human Values- II	2	0	0	2	0	
	LABORATORIES									
	ES	Program Core Course	DSI 321	Summer Internship-1	0	0	0	0	2	
	ES	Program Core Course	DCE 302	Computer Programming Lab -1	0	0	2	2	1	
	ES	Program Core Course	DCE 304	Introduction to DBMS Lab	0	0	2	2	1	
	ES	Program Core Course	DCE 306	Computer Organization Lab	0	0	2	2	1	
	ES	Program Core Course	DCE 308	Operating Systems Lab	0	0	2	2	1	
	ES	Program Core Course	DCE 310	Web Technologies Lab	0	0	2	2	1	
					TOTAL	17	0	10	27	22

DIPLOMA IN COMPUTER ENGINEERING
SEMESTER- IV

Semester/ Session of study (Recommended)	Course Level	Category of Course	Course Code No	Course Title	Mode of delivery& credits L-Lecture; T-Tutorial; P-Practical (Hours per Week)			Total contact hrs/ week	Total Credits
					L	T	P		
FOURTH Spring	THEORY								
	ES	Program Core Course	DCE 401	Data Structures	3	0	0	3	3
	ES	Program Core Course	DCE 403	.NET	3	0	0	3	3
	ES	Program Core Course	DCE 405	Computer Networks	3	0	0	3	3
	ES	Program Core Course	DCE 407	Computer System Architecture	3	0	0	3	3
		Mandator y Course	DAU 401	Essence of Indian Knowledge and Tradition	2	0	0	2	0
		Open Elective		Annexure I	3	0	0	3	3
	LABORATORIES								
	ES	Program Core Course	DCE 402	Data Structures Lab	0	0	2	2	1
	ES	Program Core Course	DCE 404	.NET LAB	0	0	2	2	1
	ES	Program Core Course	DCE 406	Computer Programming Lab-2	0	0	2	2	1
	ES	Program Core Course	DCE 408	Python Lab	0	0	4	4	2
	ES	Minor Project	DPR 421	Minor Project	0	0	2	2	1
				TOTAL	17	0	12	29	21

DIPLOMA IN COMPUTER ENGINEERING
SEMESTER- V

Semester/ Session of study (Recommended)	Course Level	Category of Course	Course Code No	Course Title	Mode of delivery& credits L-Lecture; T-Tutorial ; P- Practical (Hours per Week)			Total contact hrs/ week	Total Credits
					L	T	P		
FIFTH Monsoon	THEORY								
	ES	Program Core Course	DCE 501	Java Programming	3		0	3	3
	ES	Program Core Course	DCE 503	Software Engineering	3	0	0	3	3
	ES	Program Elective Course		Elective-I Annexure II	3	0	0	3	3
	ES	Program Elective Course		Elective-II Annexure II	3	0	0	3	3
		Open Elective		Annexure I	3	0	0	3	3
	LABORATORIES								
	ES	Program Core Course	DCE 502	Java Programming Lab	0	0	2	2	1
	ES	Program Core Course	DCE 504	Multimedia Technology Lab	0	0	2	2	1
	ES	Major Project	DPR 521	Major Project	0	0	4	4	2
		Summer Internship	DSI 521	Summer Internship	0	0	0	0	2
				TOTAL	15	0	8	23	21

DIPLOMA IN COMPUTER ENGINEERING
SEMESTER- VI

Semester/ Session of study (Recommended)	Course Level	Category of Course	Course Code No	Course Title	Mode of delivery & credits			Total contact hrs/ week	Total Credits
					L- Lecture;	T- Tutorial;	P- Practical (Hours per Week)		
SIXTH Spring	THEORY								
	ES	Program Core Course	DCE 601	Computer Hardware	3	0	0	3	3
	ES	Program Elective Course		Elective-III Annexure II	3	0	0	3	3
	ES	Program Elective Course		Elective-IV Annexure II	3	0	0	3	3
	HS	Humanities and Social Science course	DHS 601	Entrepreneurship and Start-ups	3	1	0	4	4
	ES	Open Elective			3	0	0	3	3
		Mandatory Course	DAU 601	Indian Constitution	2	0	0	2	0
	LABORATORIES								
	ES	Program Core Course	DCE 602	Computer Hardware lab	0	0	2	2	1
	ES	Program Core Course	DCE 604	IOT lab	0	0	2	2	1
		Seminar	DSE 621		0	0	2	2	1
		Major Project	DPR 621	Project	0	0	4	4	2
				TOTAL	17	1	10	28	21

OPEN ELECTIVE COURSES

Semester/ Session of study (Recommended)	Course Level	Category of Course	Course Code No	Course Title	Mode of delivery& credits			Total contact hrs/ week	Course Level
					L- Lecture;	T- Tutorial ;	P- Practical (Hours per Week)		
					L	T	P		
THEORY									
4th SEMESTER	ES	Open Elective I	DOE 421	C Programming Language	3	0	0	3	3
			DOE 422	Introduction to Python	3	0	0	3	3
			DOE 423	Data Base Concepts	3	0	0	3	3
5th SEMESTER	ES	Open Elective II	DOE 521	Web Programming Concepts	3	0	0	3	3
			DOE 522	Data Structures in C	3	0	0	3	3
			DOE 523	PC maintenance & Networking	3	0	0	3	3
6th SEMESTER	ES	Open Elective III	DOE 621	Introduction to Computer Graphics	3	0	0	3	3
			DOE 622	Introduction to Machine Learning	3	0	0	3	3
			DOE 623	Introduction to Multimedia	3	0	0	3	3

PROGRAM ELECTIVE COURSES

Semester/ Session of study (Recommended)	Course Level	Catego ry of Course	Course Code No	Course Title	Mode of delivery & credits L- Lecture; T- Tutorial ; P-Practical (Hours per			Semeste r/ Session of study (Recom mended)	Cours e Level
					L	T	P		
THEORY									
5th SEMESTER	ES	Progra m Electiv e Course I	DPE 521	Computer Graphics	3	0	0	3	3
			DPE 522	Introduction to Cloud Computing	3	0	0	3	3
			DPE 523	Object oriented programming in C++	3	0	0	3	3
	ES	Progra m Electiv e Course II	DPE 524	Introduction to Computer Algorithms	3	0	0	3	3
			DPE 525	Data Mining & Warehousing	3	0	0	3	3
			DPE 526	Discrete Mathematics	3	0	0	3	3
6th SEMESTER	ES	Progra m Electiv e Course I	DPE 621	Artificial Intelligence	3	0	0	3	3
			DPE 622	Soft Computing	3	0	0	3	3
			DPE 623	Cyber Security					
	ES	Progra m Electiv e Course II	DPE 624	Internet of Things	3	0	0	3	3
			DPE 625	Machine Learning	3	0	0	3	3
			DPE 626	Computer oriented Numerical and statistical Methods	3	0	0	3	3
				TOTAL					