

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI

UNIVERSITY POLYTECHNIC

**DIPLOMA IN ELECTRONICS & COMMUNICATIONS
ENGINEERING**



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

2023

DEPARTMENT OF ELECTRONICS AND COMMUNICATIONS ENGINEERING

INSTITUTE 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 skill-sets in selected engineering disciplines and trades.

INSTITUTE 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 also, 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 OF ELECTRONICS AND COMMUNICATIONS ENGINEERING

DEPARTMENT VISION

To strive towards the development of the skilled human resources with comprehensive and modern technical skill-sets in the field of Electronics and Communication Engineering while adhering to Universal Human Values to serve the nation and engineering profession with distinction.

DEPARTMENT MISSION

1. To offer quality technical education and skill development in the field of electronics and communication engineering.
2. To nurture students' problem-solving abilities and familiarize them with the most recent advancements within the Electronics & Communication discipline.
3. To promote interactions between industry and the institute to enhance students' employability and readiness for the workforce.
4. To encourage faculty engagement in Faculty Development Programs focused on upcoming technologies within Electronics and Communication and to additionally, coordinate a range of technical activities, including electronic circuitry, simulation software, and troubleshooting, for students and staff under the department's appropriate supervision.
5. To facilitate partnerships with industry for internships and collaborations, and update the teaching and training curriculum within the field of Electronics and Communication Engineering, emphasizing the department's key strengths.
6. To develop a distinctive program that enables students to gain entrepreneurial and managerial proficiencies in the Electronics and Communication industry. This initiative is intended to merge with Universal Human Values to instil ethical values in students, thus fostering a commitment to serving the nation and the profession.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The program in Electronics and Communication Engineering will prepare students:

PEO1: To develop expertise amongst students to understand and solve real-life problems related to Electronics and Communication Engineering by applying the knowledge acquired.

PEO2: To adapt to state-of-the-art Electronics and Communication Engineering technologies to work in multidisciplinary environments.

PEO3: To respond to the growing and changing needs of industries and academics through continuous learning of modern technologies in Electronics and Communication.

PEO4: To inculcate an attitude to work efficiently in a team with professional ethics and universal human values.

(A) PROGRAM OUTCOMES (POs)

Diploma holders of the Electronics & Communication Engineering Program will be able to:

1. **Basic and Discipline specific knowledge:** Apply knowledge of basic mathematics, science and engineering fundamentals and Electronics and Communication engineering 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 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.

(B) PROGRAM SPECIFIC OUTCOMES (PSOs)

1. Apply the knowledge acquired in basic sciences and engineering to solve electronics and communication engineering problems.
2. To develop proficiency in the installation, troubleshooting, and maintenance of electronic equipment and appliances.
3. To develop advanced skills in various domains of Electronics and Communication Engineering.

DEPARTMENT OF ELECTRONICS AND COMMUNICATIONS ENGINEERING

1ST Semester (Diploma)

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATIONS ENGINEERING

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 / 201	DES 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/ 202	DES 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

DEPARTMENT OF ELECTRONICS AND COMMUNICATIONS ENGINEERING

NEW COURSE STRUCTURE – To be effective for Diploma 2023-24 [2 nd Year Onwards]								
Based on CBCS system & OBE model								
Recommended scheme of study								
(For Diploma in Electronics & Communication Engineering)								
Semester of Study (Recommended)	Category of course	Course Code	Subjects	Mode of delivery & credits			Total Credits C- Credit	
				L	T	P		
THEORY								
THIRD	PC	DEC 301	Basic Electronics	3	1	0	4	
		DEC 303	Digital Electronics	3	0	0	3	
		DEC 305	Electronic Measurements and Instrumentation	3	0	0	3	
		DEC 307	Electric Circuits and Network	3	0	0	3	
		DCE 301	Computer Programming	3	0	0	3	
	HS	DHS 301	Universal Human Values-II	2	0	0	0	
	SESSIONAL							
	PC	DEC 302	Basic Electronics Lab	0	0	2	1	
		DEC 304	Digital Electronics Lab	0	0	2	1	
		DEC 306	Electronic Measurements and Instrumentation Lab	0	0	2	1	
		DCE 302	Computer Programming Lab	0	0	2	1	
	Summer Internship	DSI 331	Summer Internship-I (4 weeks) after II Semester	0	0	0	2	
	TOTAL CREDITS							22
Total Lectures Per Week						26		
THEORY								
FOURTH	PC	DEC 401	Analog Communication	3	0	0	3	
		DEC 403	Microprocessor and Microcontroller	3	1	0	4	
		DEC 405	IC Technology	3	0	0	3	
	PE	DPE 431/432/433	PE-I	3	0	0	3	
	OE	DOE 431/432/433	OE-I [Courses from other Branches]	3	0	0	3	
	SESSIONAL							
	PC	DEC 402	Analog Communication Lab	0	0	2	1	
		DEC 404	Microprocessor and Microcontroller Lab	0	0	2	1	
	Project	DPR 431	Minor Project	0	0	4	2	
	Mandatory Course	DAU 401	Essence of Indian Knowledge and Tradition	2	0	0	0 (Non-credit)	
TOTAL (Theory + Sessional)							20	
Total Lectures Per Week						26		
GRAND TOTAL FOR SECOND YEAR							42	

DEPARTMENT OF ELECTRONICS AND COMMUNICATIONS ENGINEERING

NEW COURSE STRUCTURE – To be effective for Diploma 2023-24								
Based on CBCS system & OBE model								
Recommended scheme of study								
<i>(For Diploma in Electronics & Communication Engineering)</i>								
Semester of Study (Recommended)	Category of course	Course Code	Subjects	Mode of delivery & credits			Total Credits	
				L-Lecture;	T-Tutorial;	P-Practical		
				L	T	P	C	
THEORY								
FIFTH	PC	DEC 501	Digital Communication	3	0	0	3	
		DEC 503	Embedded Systems	3	0	0	3	
	PE	DPE 531/532/533/534	PE-II	3	0	0	3	
		DPE 535/536/537	PE-III	3	0	0	3	
	OE	DOE 531/532/533	OE-II [Courses from other Branches]	3	0	0	3	
	SESSIONAL							
	PC	DEC 502	Digital Communication Lab	0	0	2	1	
		DEC 504	Embedded Systems Lab	0	0	2	1	
		DEC 506	Control & Instrumentation Lab	0	0	2	1	
	Summer Internship	DSI 531	Summer Internship-II (6 weeks) after IV Semester	0	0	0	3	
Project	DPR 531	Project	0	0	4	2		
TOTAL CREDITS							23	
Total Lectures Per Week						25		
THEORY								
SIXTH	PC	DEC 601	Information Theory and Coding	3	0	0	3	
		DEC 603	Wireless and Mobile Communication	3	0	0	3	
	PE	DPE 631/632/633	PE-IV	3	0	0	3	
	OE	DOE 631/632/633	OE-III [Courses from other Branches]	3	0	0	3	
	HSS	DHS 601	Entrepreneurship and Startup	3	1	0	4	
	Mandatory Course	DAU 601	Indian Constitution	2	0	0	0 (Non-credit)	
	SESSIONAL							
PE	DPE 634/635/636	PE-V	0	0	2	1		
Major Project	DPR 631	Project	0	0	4	2		
Seminar	DSE631	Seminar	1	0	0	1		
TOTAL CREDITS							20	
Total Lectures Per Week						25		
GRAND TOTAL FOR THIRD YEAR							43	

DEPARTMENT OF ELECTRONICS AND COMMUNICATIONS ENGINEERING**PROGRAMME ELECTIVES (PE)***

SEMESTER	Code no.	Name of the PE courses	Prerequisite/ Co-requisite courses with code	L	T	P	C
PE-I							
SEM-IV	DPE 431	Electronic Equipment Maintenance	Basic Electronics	3	0	0	3
	DPE 432	Electronics Devices	Basic Electronics	3	0	0	3
	DPE 433	Computer System Architecture	Digital Electronics	3	0	0	3
PE-II							
SEM- V	DPE 531	Industrial Automation	Electronic Measurements and Instrumentation	3	0	0	3
	DPE 532	Control System	Electronic Measurements and Instrumentation	3	0	0	3
	DPE 533	Signals and Systems	Electric Circuits and Network	3	0	0	3
	DPE 534	Introduction to IOT	Microprocessor and Microcontroller	3	0	0	3
PE-III							
SEM-V	DPE 535	Microwave and RADAR	Analog Communication	3	0	0	3
	DPE 536	Optical Communication and Networking	Analog Communication	3	0	0	3
	DPE 537	Introduction to Antenna	Analog Communication	3	0	0	3
PE-IV							
SEM-VI	DPE 631	Satellite Communication	Digital Communication	3	0	0	3
	DPE 632	Data Communication and Networking	Digital Communication	3	0	0	3
	DPE 633	Programmable Logic Controllers	Microprocessor and Microcontroller	3	0	0	3
PE-V [Sessional]							
SEM-VI	DPE 634	Microwave and Antenna Lab	Analog Communication	0	0	2	1
	DPE 635	Programmable Logic Controllers Lab	Microprocessor and Microcontroller	0	0	2	1
	DPE 636	Wireless Communication and Networking Lab	Digital Communication	0	0	2	1

DEPARTMENT OF ELECTRONICS AND COMMUNICATIONS ENGINEERING

OPEN ELECTIVES (OE)*

SEMESTER	Code No.	Name of the OE courses	Prerequisites courses with code	L	T	P	C
OE-I							
FOURTH	DOE 431	Digital Electronics and Application	N/A	3	0	0	3
	DOE 432	Analog Electronics and Applications	N/A	3	0	0	3
	DOE 433	Circuit Theory and Application	N/A	3	0	0	3
OE- II							
FIFTH	DOE 531	Introduction to Communication System	N/A	3	0	0	3
	DOE 532	Sensors and Transducers	N/A	3	0	0	3
	DOE 533	Consumer Electronics	N/A	3	0	0	3
OE- III							
SIXTH	DOE 631	Bio-Medical Electronics	N/A	3	0	0	3
	DOE 632	Modern Instrumentation System	N/A	3	0	0	3
	DOE 633	IoT and its Applications	N/A	3	0	0	3
*OPEN ELECTIVES TO BE OPTED ONLY BY OTHER DEPARTMENT STUDENTS							