



JAGADGURUKUL
UNIVERSITY NCR, HARYANA

COURSE STRUCTURE
ELECTRONICS AND COMMUNICATION
ENGINEERING

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

1. To prepare students to excel in undergraduate programmes and succeed in industry/ technical profession through global, rigorous education.
2. To provide students with a solid foundation in mathematical, scientific and engineering fundamentals required to solve engineering problems and also to pursue higher studies.
3. To train students with good scientific and engineering breadth so as to comprehend, analyze, design, and create novel products and solutions for the real life problems.
4. To provide students with foundation in skill development required to design, develop and fabricate engineering products
5. To inculcate in students professional and ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach, and an ability to relate engineering issues to broader social context, additional courses with regard to physical, psychological and career growth.
6. To provide student with an academic environment aware of excellence, outstanding leadership, written ethical codes and guidelines with moral values, and the life-long learning needed for successful professional career.

PROGRAMME OUTCOMES (POs)

Engineering Graduates will be able to:

- 1) **Engineering knowledge:** Apply knowledge of mathematics, science, engineering fundamentals, and Electronics Engineering to the solution of engineering problems.
- 2) **Problem analysis:** Identify, formulate, review literature and analyze Electronics Engineering problems to design, conduct experiments, analyze data and interpret data.
- 3) **Design /development of solutions:** Design solution for Electronics Engineering problems and design system component of processes that meet the desired needs with appropriate consideration for the public health and safety, and the cultural, societal and the environmental considerations.
- 4) **Conduct investigations of complex problems:** Use research based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions in Electronics Engineering.
- 5) **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to Electronics Engineering activities with an understanding of the limitations.
- 6) **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to mechanical engineering practice.
- 7) **Environment and sustainability:** Understand the impact of the Electronics Engineering solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.
- 8) **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the Electronics Engineering practice.
- 9) **Individual and team work:** Function affectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings in Electronics Engineering.
- 10) **Communication:** Communicate effectively on complex engineering activities with the engineering committee and with society at large, such as, being able to comprehend and write affective reports and design documentation, make effective presentations in Electronics Engineering.
- 11) **Project Management and finance:** Demonstrate knowledge & understanding of the mechanical engineering principles and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments in Electronics Engineering.
- 12) **Life - long learning:** Recognize the need for, and the preparation and ability to engage in independent research and lifelong learning in the broadest context of technological changes in Electronics Engineering.

B.TECH PROGRAM ELECTRONICS AND COMMUNICATION ENGINEERING

MANDATORY INDUCTION PROGRAM (3-WEEKS DURATION)

When new students enter an institution, they come with diverse thoughts, backgrounds and preparations. It is important to help them adjust to the new environment and inculcate in them the ethos of the institution with a sense of larger purpose. A 3-week long induction program for the UG students entering the institution, right at the start, has to be planned. Normal classes will start only after the induction program is over. Its purpose is to make the students feel comfortable in their new environment, open them up, set a healthy daily routine, create bonding in the batch as well as between faculty and students, develop awareness, sensitivity and understanding of the self, people around them, society at large, and nature.

4 year Curriculum structure

Undergraduate Degree in Engineering & Technology

Branch / course : Electronics and Communication Engineering

Total credits (4 year course): 175

I. Induction Program (Please refer Appendix-A for guidelines)

Induction program (mandatory)	3 weeks duration (Please refer Appendix-A for guidelines & also details available in the curriculum of Mandatory courses)
Induction program for students to be offered right at the start of the first year.	Physical activity Creative Arts Universal Human Values Literary Proficiency Modules Lectures by Eminent People Visits to local Areas Familiarization to Dept./Branch & Innovations

Semester-wise structure of Curriculum

[L= Lecture, T = Tutorials, P = Practicals & C = Credits]

JAGANNATH UNIVERSITY BACHELOR OF TECHNOLOGY ELECTRONICS AND COMMUNICATION ENGINEERING

COMMON TO ALL BRANCHES FIRST SEMESTER

Theory Papers			Course Category	No. of Teaching Hours			Marks Allocation				Total	Credits
Code	Type of Course	Course Title		L	T	P	Theory		Practical			
						IA	EA	IA	EA			
BT 101	Basic Science Courses	Physics (Semi-Conductor)	BSC	3	1	4	30	70	20	30	150	6

		Physics)										
BT 102	Basic Science Courses	Mathematics-I (Calculus & Linear Algebra)	BSC	3	1	0	30	70	-	-	100	4
BT 103	Engineering Science Courses	Basic Electrical Engineering	ESC	3	1	2	30	70	20	30	150	5
BT 104	Engineering Science Courses	Engineering Graphics and Design	ESC	1	0	4	20	30	20	30	100	3
BT 105	Engineering Science Courses	Computer Fundamentals	ESC	3	0	0	30	70	-	-	100	3
BT 106	Humanities & Social Sciences including Management	English and Communication Skills	HSMC	2	0	2	20	30	20	30	100	3
BT 107	Engineering Science Courses	Workshop/ Manufacturing Practices	ESC	0	0	2	-	-	20	30	50	1
TOTAL											750	25

SECOND SEMESTER

Theory Papers			Course Category	No. of Teaching Hours			Marks Allocation					Credits
Code	Type of Course	Course Title		L	T	P	Theory		Practical		Total	
							IA	EA	IA	EA	Total	Credits
BT 201	Basic Science Courses	Chemistry-I	BSC	3	1	4	30	70	20	30	150	6
BT 202	Basic Science Courses	Mathematics-II (Probability and Statistics)	BSC	3	1	0	30	70	-	-	100	4
BT 203	Engineering Science	Programming for Problem Solving	ESC	3	0	4	30	70	20	30	150	5

	Courses											
BT 204	Engineering Science Courses	Workshop/ Manufacturing Practices	ESC	1	0	4	-	-	30	70	100	3
BT 205	Humanities & Social Sciences including Management	English	HSMC	2	0	2	20	30	20	30	100	3
TOTAL											600	21

**BACHELOR OF TECHNOLOGY
THIRD SEMESTER**

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BTECE 301	Applied Mathematics III	3	1		30	70	100	4
BTECE 302	Circuit Analysis & Synthesis	3	1		30	70	100	4

BTECE 303	Electronic Devices & Circuits	3			30	70	100	3
BTECE 304	Data Structures and Algorithms	3			30	70	100	3
BTECE 305	Electronic Measurements and Instrumentation	3			30	70	100	3
BTECE 306	Electromechanical Energy Conversion	3			30	70	100	3
PRACTICALS/VIVA VOCE		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	Sessional	Practical	Total	Credits
BTECE 307	Circuit Analysis and Synthesis Lab			2	30	20	50	1
BTECE 308	Data Structures and Algorithms Lab			2	30	20	50	1
BTECE 309	Electronic Measurements and Instrumentation Lab			2	30	20	50	1
BTECE 310	Electronic Devices & Circuits Lab			2	30	20	50	1
BTECE 051	Electronic Engineering Design Lab			2				1
	TOTAL	18	2	10	330	520	850	25

**BACHELOR OF TECHNOLOGY
FOURTH SEMESTER**

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BTECE 401	Telecommunication Engineering	3			30	70	100	3
BTECE 402	Analog Communication	3			30	70	100	3
BTECE 403	Signals and Systems	3	1		30	70	100	4
BTECE 404	Industrial Electronics	3			30	70	100	3
BTECE 405	Electromagnetic Field and Theory	3	1		30	70	100	4
BTECE 406	Analog Electronics	3			30	70	100	3
PRACTICALS/VIVA VOCE		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	Sessional	Practical	Total	Credits
BTECE 407	Analog Communication Lab			2	30	20	50	1
BTECE 408	Signal and system Lab			2	30	20	50	1
BTECE 409	Industrial Electronics Lab			2	30	20	50	1
BTECE 410	Analog Electronics Lab			2	30	20	50	1
BTECE 052	Technical Seminar			2	30	20	50	1
	TOTAL	18	2	10	330	520	850	25
	4 -6 weeks training will be held after fourth semester, viva will be conducted in fifth sem.							

**BACHELOR OF TECHNOLOGY
FIFTH SEMESTER**

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BTECE 501	Microwave and RADAR Engineering	3			30	70	100	3
BTECE 502	Microprocessors and Microcontrollers	3			30	70	100	3
BTECE 503	Digital Communication	3			30	70	100	3
BTECE 504	Control Systems	3	1		30	70	100	4
BTECE 505	Digital Signal Processing	3	1		30	70	100	4
	Elective Subject (Any one)							
BTECE001	Computer Organization and Architecture	3			30	70	100	3
BTECE002	Electronic Material and Process	3			30	70	100	3
BTECE003	Biomedical Instrumentation	3			30	70	100	3
BTECE004	Grid Computing	3			30	70	100	3
BTECE005	Object Oriented Programming Structure	3			30	70	100	3
PRACTICALS/VIVA VOCE		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	Sessional	Practical	Total	Credits
BTECE 506	Digital Signal Processing Lab			2	30	20	50	1
BTECE 507	Microprocessor and Microcontroller Lab			2	30	20	50	1
BTECE 508	Digital Communication Lab			2	30	20	50	1
BTECE 509	Microwave and Radar Engg. Lab			2	30	20	50	1
BTECE 053	Control Systems Lab			2	30	20	50	1
BTECE 054	Training and viva voce			0	30	20	50	2
		18	2	10	360	540	900	27

**BACHELOR OF TECHNOLOGY
SIXTH SEMESTER**

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BTECE 601	Operational Amplifier	3	1		30	70	100	4
BTECE 602	Antenna, Wave Propagation and TV Engineering	3	1		30	70	100	4
BTECE 603	Wireless Communication	3			30	70	100	3
BTECE 604	IC Technology	3			30	70	100	3
BTECE 605	Digital System Design	3	1		30	70	100	4
	Elective Subject(Any One)							
BTECE006	Synthesis & Optimization of Logic Circuits	3			30	70	100	3
BTECE007	Database Management System	3			30	70	100	3
BTECE008	Parallel Computing	3			30	70	100	3
BTECE 009	Adaptive Signal Processing	3			30	70	100	3
BTECE010	Software Engineering	3			30	70	100	3
PRACTICALS/VIVA VOCE		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	Sessional	Practical	Total	Credits
BTECE 606	Antenna Lab			2	30	20	50	1
BTECE 607	Wireless Communication Lab			2	30	20	50	1
BTECE 608	Digital System Design Lab			2	30	20	50	1
BTECE055	PCB and Circuit designing Lab			2	30	20	50	1
BTECE056	Industrial Tour/In-house Workshop			0	30	20	50	2
BTECE057	Communication for professional lab			1	30	20	50	1
		18	3	9	360	540	900	28
	4 -6 weeks training will be held after sixth semester, viva will be conducted in seventh sem.							

**BACHELOR OF TECHNOLOGY
SEVENTH SEMESTER**

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BTECE 701	Optical Communication	3			30	70	100	3
BTECE 702	VLSI Design and Technology	3	1		30	70	100	4
BTECE 703	Embedded Systems	3	1		30	70	100	4
BTECE 704	Introduction to Nanotechnology	3			30	70	100	3
ELECTIVE-I (any one)								
BTECE011	Advanced DSP	3			30	70	100	3
BTECE012	Introduction to MEMS	3			30	70	100	3
BTECE013	PLC and SCADA Systems	3			30	70	100	3
BTECE014	Radar and Navigation	3			30	70	100	3
BTECE015	RF Devices and Circuits	3			30	70	100	3
Open ELECTIVE-II (any one)		No. of Teaching Hours			Marks Allocation			
BTECE016	Project Management	3			30	70	100	3
BTECE017	Economics for Engineers	3			30	70	100	3
BTECE018	Sociology and Elements of Indian History for engineers	3			30	70	100	3
BTECE019	Industrial Management	3			30	70	100	3
BTECE020	Communication Skills for Professionals	3			30	70	100	3
PRACTICALS/VIVA VOCE		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	Sessional	Practical	Total	Credits
BTECE 705	VLSI Design Lab			2	30	20	50	1
BTECE 706	Optical Communication Lab			2	30	20	50	1
BTECE 707	Embedded Lab			2	30	20	50	1
BTECE058	Training and viva voce			0	30	20	50	2
BTECE 708	Minor project			4	30	20	50	2
		18	2	10	360	540	900	27

**BACHELOR OF TECHNOLOGY
EIGHTH SEMESTER**

THEORY PAPERS		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	IA	EA	Total	Credits
BTECE 801	Satellite Communication	3			30	70	100	3
BTECE 802	DIGITAL SPEECH & IMAGE PROCESSING	3	1		30	70	100	4
	Elective (any one)							
BTECE 021	Mobile Computing	3			30	70	100	3
BTECE 022	ASIC Design	3			30	70	100	3
BTECE 023	GPS and GIS	3			30	70	100	3
BTECE 024	Robotics	3			30	70	100	3
BTECE 025	Consumer Electronics	3			30	70	100	3
BTECE 026	Cyber Crime	3			30	70	100	3
BTECE 027	Entrepreneurship	3			30	70	100	3
	Elective (open)(any one)							
BTECE 028	Mechatronics	3			30	70	100	3
BTECE 023	Computer Graphics and Multimedia	3			30	70	100	3
BTECE 030	Human Values and Professional Ethics-II	3			30	70	100	3
BTECE 031	Advanced Software Engineering	3			30	70	100	3
BTECE 032	Next Generation Networks	3			30	70	100	3
PRACTICALS/VIVA VOCE		No. of Teaching Hours			Marks Allocation			
Code	Subject/Paper	L	T	P	Sessional	Practical	Total	Credits
BTECE 803	Satellite Communication LAB			2	30	20	50	1
BTECE 804	SPEECH AND IMAGE PROCESSING LAB			2	30	20	50	1
BTECE 805	Major Project			0	240	160	400	12
	Community Services			0				1
Total		12	2	4	420	480	900	28
Grand Total of credits		138	17	73	2820	4180	7000	210
L- Lecture, T-Tutorial, P-Practical, IA-Internal Assessment, EA-External Assessment								
<p>The student will submit a synopsis at the beginning of the semester for approval from the departmental committee in a specified format ,thereafter he/she will have to present the progress of the work through seminars and progress reports. Seminar related to the project should be delivered one after starting of semester .The progress will be monitored through seminars and progress reports.</p> <p style="text-align: center;">Note:--</p> <p style="text-align: center;">1. The total number of the credits of (ECE) Programme are = 210.</p>								

2. Each student shall be required to appear for examinations in all courses. However, for the award of the degree a student shall be required to earn minimum of 200 credits.

For lateral entry students in Third SEMESTER ::--

1.The total number of credits of the B. Tech (ECE)Programme = 160

2.Each student shall be required to appear for examination for all courses third semester onwards .However, for the award of the degree a student shall be required to earn the minimum of 150 credits .