Syllabus for
B.Tech in Electronics and Communication Engineering

Academic Year 2022-2023

Department of Electronics & Communication Engineering

School of Engineering and Technology

Central University of Rajasthan

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. List of programs offered by the department (Officially correct nomenclature to be followed)

- B.Tech in Electronics & Communication Engineering (ECE)
- PhD in ECE

2. For B.Tech ECE program:

(a) Program specific Objectives:

1. Graduates of the programme will adapt to the continuous changes in the field of Electronics & Communication Engineering.
2. Graduates of the programme will have a successful professional career.
3. Graduates will be able to communicate and work as a part of a team in order to be an effective member of the work place and the society.

Program Outcomes:

PO1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **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.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **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 the professional engineering practice.

PO7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering 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.

PO12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

b. Approved Intake (60)

Admission through JEE Main: 60 (Seats)

c. Minimum Eligibility for entry

d. Course Structure – Semester-wise, identifying Core courses, Discipline Electives, Extra-Departmental Electives, Practice/Lab/Workshop Courses,

4 Year B.Tech in Electronics and Communication Engineering

Detailed Scheme

First Year

SEMESTER I						
Sr. No	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
			Hours/week			
1	ECE 101	Engineering Mathematics-I	3	1	0	4
2	ECE 102	Engineering Physics	3	0	0	3
3	ECE 103	Basic Electrical Engineering	3	0	1	4
4	ECE 104	English (Language and Communication Writing Skills-I)	3	1	0	4
5	ECE 105	Engineering Graphics & Design	3	0	2	4
6	ECE 106	Engineering Physics Lab	0	0	2	1
Total Credit						**20**

SEMESTER II						
Sr. No	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
			Hours/week			
1	ECE 107	Engineering Mathematics-II	3	1	0	4
2	ECE 108	Introduction to Programming	3	0	0	3
3	ECE 109	Basic Electronics Engineering	3	0	1	4
4	ECE 110	Universal Human Value (UHV)	3	0	0	3
5	ECE 111	Workshop Practice	1	0	4	4
6	ECE 112	Programming Lab	0	0	2	1
7	ECE 113	Engineering Chemistry	3	0	1	4
Total Credit						**20**

***** *The Course on University Human Value (UHV) is compulsory course as an audit course which should be cleared by all the students; however, this will not affect the credits of the programme.

Second Year

SEMESTER III						
Sr. No	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
			Hours/week			
1	ECE201	Discrete mathematics	3	1	0	4
2	ECE202	Electronics devices and circuits	3	0	0	3
3	ECE203	Electronic Measurement and Instrumentation	3	0	0	3
4	ECE204	Circuit theory and Network Analysis	3	1	0	4
5	ECE205	Data structures & Algorithms	3	0	0	3
6	ECE206	Electronic devices and circuits Lab	0	0	2	1
7	ECE207	Electronic measurement and instrumentation Lab	0	0	2	1
8	ECE208	Data structure and algorithm Lab	0	0	2	1
Total Credit						**20**

SEMESTER IV						
Sr. No	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
			Hours/week			
1	ECE209	Principles and Practices of management	3	0	0	3
2	ECE210	Electromagnetic wave and Transmission line	3	1	0	4
3	ECE211	Signal and System	3	0	0	3
4	ECE212	Analog and Linear Integrated Circuit	3	0	0	3
5	ECE213	Digital system design	3	0	0	3
6	ECE214	Signal and System Lab	0	0	2	1
7	ECE215	Analog and Linear Integrated Circuit Lab	0	0	2	1
8	ECE216	Digital system design Lab	0	0	2	1
9	ECE217	Seminar-I	0	0	1	1
Total Credit						**20**

Third Year

SEMESTER V						
Sr. No	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
			Hours/week			
1	ECE301	Environmental Studies	3	0	0	3
2	ECE302	Control System Engineering	3	1	0	4
3	ECE303	Analog Communication System	3	0	0	3
4	ECE304	Antenna and wave propagation	3	0	0	3
5	ECE305	Digital Communication and system	3	0	0	3
6	ECE306	Analog and Digital Communication Lab	0	0	2	1
7	ECE307	Antenna and wave propagation Lab	0	0	2	1
8	ECE308	Electronic Circuit Design workshop	0	0	4	2
Total Credit						**20**

SEMESTER VI						
Sr. No	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
			Hours/week			
1	ECE309	Managerial Economics	3	0	0	3
2	ECE310	Optical Fiber Communication	3	0	0	3
3	ECE311	Power Electronics	3	1	0	4
4	ECE312	Microcontrollers and embedded system	3	0	0	3
5	ECE313	Microwave theory and techniques	3	0	0	3
6	ECE314	Microcontrollers and embedded system lab	0	0	2	1
7	ECE315	Microwave theory and techniques Lab	0	0	2	1
8	ECE316	Optical Fiber Communication Lab	0	0	2	1
9	ECE317	Seminar-II	0	0	1	1
Total Credit						**20**

- **Internship: 6-8weeks industrial training can be conducted at the end of VI Semester but evaluation will be done next semester.**

Fourth Year

SEMESTER VII						
Sr. No	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
			Hours/week			
1	ECE401	VLSI Design and Technology	3	0	0	3
2	ECE402	Digital Signal Processing	3	0	0	3
3	--	Program elective 1	3	0	0	3
5	--	Open elective I	3	0	0	3
6	ECE403	VLSI Design and Technology Lab	0	0	2	1
7	ECE404	Digital Signal Processing Lab	0	0	2	1
8	ECE405	Project -I	0	1	6	4
9	ECE406	Internship	0	0	4	2
Total Credit						**20**

SEMESTER VIII						
Sr. No	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
			Hours/week			
1	--	Program elective 2	3	0	0	3
4	--	Program elective 3	3	0	0	3
2	--	Open Elective-II	3	0	0	3
3	--	Open Elective-III	3	0	0	3
4	ECE407	Project -II	0	1	9	8
Total Credit						**20**

Total Credit is: 20+20+20+20+20+20+20+20=160

Program elective1: Mobile Communication and Network

Program elective 2: Computer Network

Program elective 3: Satellite Communication

Open Elective I: Biomedical Electronics

Open Elective II: Nanoelectronics

Open Elective III: Machine learning and AI

List of electives/open electives

1. ECE501: Microprocessor theory applications

2. ECE502: Introduction to MEMS
3. ECE503: Electrical Machines
4. ECE504: Information Theory and Coding
5. ECE505: Speech and Audio Processing
6. ECE506: Electronic Device Modeling
7. ECE507: Problem solving using computer
8. ECE508: Embedded system and IOT
9. ECE509: Bio-Medical Electronics
10. ECE510: Computer Network
11. ECE511: Analog and Mixed signal RFIC design and Analysis
12. ECE512: Nano electronics
13. ECE513: Satellite communication
14. ECE514: Mobile Communications and network

List of Lab for B.Tech (ECE) Program

- **First Year**

    1. Basic Electrical Lab
    2. Programming in C lab
    3. Workshop practice lab

- **Second Year**
    1. Electronic Devices and Circuits Lab
    2. Electronic Measurement and instrumentation lab
    3. Data structure and algorithm lab
    4. Signal and system lab
    5. Analog Electronics and linear IC lab
    6. Digital system design lab

- **Third year**

    1. Analog and digital communication lab
    2. Antenna and wave propagation lab
    3. Microcontroller and embedded lab
    4. Microwave theory and techniques lab
    5. Electronics Circuit design workshop

- **Fourth year**

    1. VLSI design and technology lab
    2. Digital signal processing lab
    3. Internship
    4. Project -I
    5. Project -II