UG SCHEME: Department of Electronics & Communication Engineering,
Malaviya National Institute of Technology Jaipur
CURRICULUM FIRST YEAR

First Semester (COMMON to ALL Branches)

1. **Course Name:** Technical Communication (Basic/Advanced)
   Category: PC
   Type: Theory
   Credits: 2
   L-T-P: 2-0-0

2. **Course Name:** Mathematics I
   Category: PC
   Type: Theory
   Credits: 4
   L-T-P: 3-1-0

3. **Course Name:** Physics
   Category: PC
   Type: Theory
   Credits: 3
   L-T-P: 2-1-0

4. **Course Name:** Computer Science and Programming
   Category: PC
   Type: Theory
   Credits: 2
   L-T-P: 2-0-0

5. **Course Name:** Basics of Electronics Engineering
   Category: PC
   Type: Theory
   Credits: 2
   L-T-P: 2-0-0

6. **Course Name:** Basics of Electrical Engineering
   Category: PC
   Type: Theory
   Credits: 2
   L-T-P: 2-0-0

7. **Course Name:** Language Lab (Basic/Advanced)
   Category: PC
   Type: Lab
   Credits: 1
   L-T-P: 0-0-2

8. **Course Name:** Electrical Engineering Lab
   Category: PC
   Type: Lab
   Credits: 1
   L-T-P: 0-0-2
9. **Course Name:** Electronics Engineering Lab
   Category: PC
   Type: Lab
   Credits: 1
   L-T-P: 0-0-2
10. **Course Name:** Programming Lab
    Category: PC
    Type: Lab
    Credits: 1
    L-T-P: 0-0-2
11. **Course Name:** Physics Lab
    Category: PC
    Type: Lab
    Credits: 1
    L-T-P: 0-0-2

Total Credits (First Semester Common): 20

First Semester (Department of ECE)

1. **Course Code:** 22ECT101
   Course Name: Electronic Measurement and Instrumentation
   Category: PC
   Type: Theory
   Credits: 3
   L-T-P: 3-0-0
2. **Course Code:** 22ECT102
   Course Name: Circuits and Networks
   Category: PC
   Type: Theory
   Credits: 3
   L-T-P: 3-0-0

Total Credits (First Semester ECE): 6

Second Semester (COMMON to ALL Branches)

1. **Course Name:** Basic Economics
   Category: PC
   Type: Theory

Credits: 2
L-T-P: 2-0-0

2. **Course Name:** Mathematics II
   Category: PC
   Type: Theory
   Credits: 4
   L-T-P: 3-1-0
3. **Course Name:** Chemistry
   Category: PC
   Type: Theory
   Credits: 3
   L-T-P: 2-1-0
4. **Course Name:** Engineering Drawing and Sketching
   Category: PC
   Type: Theory
   Credits: 2
   L-T-P: 1-1-1
5. **Course Name:** Environmental Science and Ecology
   Category: PC
   Type: Theory
   Credits: 2
   L-T-P: 2-0-0
6. **Course Name:** Introduction to Mechanical Systems
   Category: PC
   Type: Theory
   Credits: 2
   L-T-P: 2-0-0
7. **Course Name:** Product Realization through Manufacturing
   Category: PC
   Type: Lab
   Credits: 1
   L-T-P: 0-0-2
8. **Course Name:** Chemistry Lab
   Category: PC
   Type: Lab
   Credits: 1
   L-T-P: 0-0-2

Total Credits (Second Semester Common): 17

Second Semester (Department of ECE)

1. **Course Code:** 22ECT103
   Course Name: Electronic Devices and Circuits

Category: PC
Type: Theory
Credits: 3
L-T-P: 3-0-0

2. **Course Code:** 22ECT104
   Course Name: Signals and Systems
   Category: PC
   Type: Theory
   Credits: 3
   L-T-P: 3-0-0

3. **Course Code:** 22ECP105
   Course Name: Electronic Devices and Circuits Lab
   Category: PC
   Type: Lab
   Credits: 1
   L-T-P: 0-0-2

4. **Course Code:** 22ECP106
   Course Name: Signals and Systems Lab
   Category: PC
   Type: Lab
   Credits: 1
   L-T-P: 0-0-2

Total Credits (Second Semester ECE): 8

Here is the complete extracted data from the second and third year curriculum tables in plain text format, with no information missed and without using tables:

CURRICULUM SECOND YEAR
Third Semester – Department of ECE

1. Course Code: 22ECT201
   Course Name: Analog Communication
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

2. Course Code: 22ECT202
   Course Name: Data Structures & Algorithms
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

3. Course Code: 22ECT203
   Course Name: Digital Logic Design

Category: PC
Type: Theory
Credit: 3
L-T-P: 3-0-0

4. Course Code: 22ECT204
   Course Name: Electromagnetic Field Theory
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

5. Course Code: 22ECT205
   Course Name: Linear Integrated Circuits
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

6. Course Code: 22ECT206
   Course Name: Operating System Concepts
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

7. Course Code: 22ECP207
   Course Name: Analog Communication Lab
   Category: PC
   Type: Lab
   Credit: 1
   L-T-P: 0-0-4

8. Course Code: 22ECP208
   Course Name: Data Structures & Algorithms Lab
   Category: PC
   Type: Lab
   Credit: 1
   L-T-P: 0-0-4

9. Course Code: 22ECP209
   Course Name: Digital Logic Design Lab
   Category: PC
   Type: Lab
   Credit: 1
   L-T-P: 0-0-2

10. Course Code: 22ECP210
    Course Name: Linear Integrated Circuits Lab
    Category: PC
    Type: Lab

Credit: 1
L-T-P: 0-0-2

11. Course Code: 22ECP211
    Course Name: Operating System Concepts Lab
    Category: PC
    Type: Lab
    Credit: 1
    L-T-P: 0-0-2

Total Credits for Third Semester: 24

Fourth Semester – Department of ECE

1. Course Code: 22ECT212
   Course Name: Analog CMOS IC
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

2. Course Code: 22ECT213
   Course Name: Computer Architecture
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

3. Course Code: 22ECT214
   Course Name: Digital Communication Systems
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

4. Course Code: 22ECT215
   Course Name: Digital Signal Processing
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

5. Course Code: 22ECT216
   Course Name: Microwave Engineering
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

6. Course Code: 22ECT217
   Course Name: Technical Documentation
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

7. Course Code: 22ECT217 (reused)
   Course Name: Control Systems Engineering
   Category: PLEAS
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

8. Course Code: 22ECP218
   Course Name: Analog CMOS IC Lab
   Category: PC
   Type: Lab
   Credit: 1
   L-T-P: 0-0-2

9. Course Code: 22ECP219
   Course Name: Digital Communication Systems Lab
   Category: PC
   Type: Lab
   Credit: 1
   L-T-P: 0-0-2

10. Course Code: 22ECP220
    Course Name: Digital Signal Processing Lab
    Category: PC
    Type: Lab
    Credit: 1
    L-T-P: 0-0-2

11. Course Code: 22ECP221
    Course Name: Microwave Engineering Lab
    Category: PC
    Type: Lab
    Credit: 1
    L-T-P: 0-0-2

12. Course Code: 22ESC222
    Course Name: Technical Report Writing & Presentation
    Category: PC
    Type: Seminar
    Credit: 1
    L-T-P: 0-0-2

Total Credits for Fourth Semester: 24

CURRICULUM THIRD YEAR
Fifth Semester – Department of ECE

1. Course Code: 22ECT301
   Course Name: Antenna & Wave Propagation
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

2. Course Code: 22ECT302
   Course Name: Digital CMOS IC
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

3. Course Code: 22ECT303
   Course Name: Embedded Systems
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

4. Course Code: 22ECT304
   Course Name: Microprocessors
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

5. Course Code: 22ECT305
   Course Name: VLSI Testing & Testability
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

6. Course Code: 22ECP306
   Course Name: Antenna & Wave Propagation Lab
   Category: PC
   Type: Lab
   Credit: 1
   L-T-P: 0-0-2

7. Course Code: 22ECP307
   Course Name: Digital CMOS IC Lab
   Category: PC
   Type: Lab

Credit: 1
L-T-P: 0-0-2

8. Course Code: 22ECP308
   Course Name: Embedded Systems Lab
   Category: PC
   Type: Lab
   Credit: 1
   L-T-P: 0-0-2

9. Course Code: 22ECP309
   Course Name: Microprocessors Lab
   Category: PC
   Type: Lab
   Credit: 1
   L-T-P: 0-0-2

10. Course Code: 22ECP310
    Course Name: Project Lab I
    Category: PC
    Type: Lab
    Credit: 2
    L-T-P: 0-0-6

11. HONS 1: PE – Theory – 3 Credits – L-T-P: 3-0-0

12. HONS 2: PE – Theory – 3 Credits – L-T-P: 3-0-0

13. Minor 1: PE – Theory – 3 Credits – L-T-P: 3-0-0

14. Minor 2: PE – Theory – 3 Credits – L-T-P: 3-0-0

Earn 6 Credits HONS/Minor

15. Course Code: 22ECT801
    Course Name: Universal Human Values & Professional Ethics
    Category: Audit
    Type: Theory
    Credit: 2
    L-T-P: 2-0-0

Total Credits for Fifth Semester: 28

Sixth Semester – Department of ECE

1. Course Code: 22BMT302
   Course Name: Management Principles for Engineers
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

2. Course Code: 22ECT311
   Course Name: Neural Networks & Fuzzy Logic
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

3. Course Code: 22ECT312
   Course Name: Optical Communication Systems
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

4. Course Code: 22ECT313
   Course Name: Satellite & Radar Engineering
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

5. Course Code: 22ECT314
   Course Name: Wireless & 5G Communication
   Category: PC
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

6. Course Code: 22ECT315
   Course Name: Computer & Network Security
   Category: PLEAS
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

7. Course Code: 22ECP316
   Course Name: Optical Communication Systems Lab
   Category: PC
   Type: Lab
   Credit: 1
   L-T-P: 0-0-2

8. Course Code: 22ECP317
   Course Name: Wireless & 5G Communication Lab
   Category: PC
   Type: Lab
   Credit: 1
   L-T-P: 0-0-2

9. Course Code: Not specified
   Course Name: Neural Networks and Fuzzy Logic Lab

Category: PC
Type: Lab
Credit: 1
L-T-P: 0-0-2

10. Course Code: 22ECP318
    Course Name: Project Lab II
    Category: PC
    Type: Lab
    Credit: 2
    L-T-P: 0-0-4

11. HONS 3:
    Category: PE
    Type: Theory
    Credit: 3
    L-T-P: 3-0-0

12. HONS 4:
    Category: PE
    Type: Theory
    Credit: 3
    L-T-P: 3-0-0

13. Minor 3:
    Category: PE
    Type: Theory
    Credit: 3
    L-T-P: 3-0-0

14. Minor 4:
    Category: PE
    Type: Theory
    Credit: 3
    L-T-P: 3-0-0

Earn 6 Credits from HONS/Minors (combined).

Total Semester Credits: 29

Fourth Year – Department of ECE

Seventh Semester – Dept. of ECE

1. Course Name: Programme Elective 1
   Category: PE
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0

2. Course Name: Programme Elective 2
   Category: PE
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0
3. Course Name: Programme Elective 3
   Category: PE
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0
4. Course Name: Open Elect 1/MOOCS#
   Category: OE
   Type: Theory
   Credit: 3
   L-T-P: 3-0-0
5. Course Code: 22ECD402
   Course Name: Minor Project
   Category: PC
   Type: Project
   Credit: 3
   L-T-P: 0-0-6
6. Course Code: 22ECI401
   Course Name: Training Seminar
   Category: PC
   Type: Lab
   Credit: 2
   L-T-P: 0-0-4

   Note: Earn 6 Credits from HONS/Other Specializations.
   Total Semester Credits: 23

Eighth Semester – Department of ECE

1. **Programme Elective 4**
   - **Category: PE**
   - **Type: Theory**
   - **Credit: 3**
   - **L-T-P: 3-0-0**
2. **Programme Elective 5**
   - **Category: PE**
   - **Type: Theory**

- **Credit: 3**
- **L-T-P: 3-0-0**

3. **Programme Elective 6**
    - **Category: PE**
    - **Type: Theory**
    - **Credit: 3**
    - **L-T-P: 3-0-0**
4. **Open Elective 2 / MOOCS#**
    - **Category: OE**
    - **Type: Theory**
    - **Credit: 3**
    - **L-T-P: 3-0-0**
5. **Course Code: 22ECD403 – Major Project**
    - **Category: PC**
    - **Type: Project**
    - **Credit: 6**
    - **L-T-P: 0-0-12**
    -
    - **L-T-P: 3-0-0**
6. **Earn 6 Credits from HONS/Other Specializations**

Total Credits :24

Important Instructions

1. (*) Indicated subject can be taken in either VII/VIII Semester.
2. The department elective list is attached as a separate sheet.
3. One Semester Industrial Internship is permitted for students either in VII/VIII Semester.
4. Waiver in internship will be given only for departmental program electives and open electives for maximum 16 credits.
5. One Credit Courses will be offered by the department in addition to above credits.
6. (#) In exceptional cases, MOOCS courses can be allowed in lieu of OPEN Electives 1 and 2 with due permission from DUGC. MOOCS courses should be certified from NPTEL/SWAYAM/EDX or other reputed rating provided examination. The course approval and evaluation would be moderated by DUGC with respective faculty guide having freedom of evaluating up to 50% of the total weightage.

7. A student of plain BTech may be allowed to choose electives from any one or more of the Tables (programme electives, Honors tables)
8. A honors student can choose programme electives from any one or more Tables except his/her own Honors
9. All courses of M.Tech. would be available to students as Program Elective

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Seventh and Eighth Semester Program Elective List, Dept. of ECE

Each subject is 3 Credit (L-T-P as 3-0-0)

1. Graph Theory
2. Artificial Intelligence & Expert Systems
3. Advanced Error Control Codes
4. Image Processing
5. CAD Algorithms for VLSI Physical Design
6. CAD Algorithms for Synthesis of VLSI Systems
7. System Level Design & Modelling
8. Probability Theory & Statistics
9. Advanced Microprocessors & Micro-Controllers
10. Computer Networks
11. Adv. Microwave Engineering
12. Design of Microstrip Antenna
13. Advanced Antenna Systems
14. Microwave Integrated Circuits
15. Power Electronics
16. Semiconductor Opto-Electronics
17. Memory Design & Testing
18. Electronic Manufacturing Technology
19. Virtual Verification of Digital Hardware & Embedded Software
20. Parallel Computing Arch
21. Bio-Medical Engineering
22. Current-mode Analog Signal Processing
23. Optical Codes and Applications
24. Adaptive Signal Processing

25. VLSI Signal Processing Architectures
26. FPGA Physical Design
27. VLSI Technology
28. Information Theory & Coding
29. **System Design Using FPGAs**
30. **Instrumentation & Control**
31. **Wireless and Mobile Adhoc Networking**
32. **Cryptography**
33. **Design of MIC and MMIC's**
34. **Advanced Mobile Systems**
35. **Smart and Phased Array Antenna Design**
36. **Advanced Topics in Communication**
37. **Photonic Integrated Devices and Systems**
38. **EMI/EMC**
39. **Wireless Sensor Networks**
40. **Computational Electromagnetics**
41. **Advanced Photonic Devices and Components**
42. **Telecommunication Technology and Management**
43. **Advanced Networking Analysis**
44. **Advanced Digital Signal & Image Processing**
45. **Microelectronic Devices and Circuits**
46. **Advanced Computer Architecture**
47. **Micro and Nano Electro Mechanical Systems**
48. **Synchronous & Asynchronous Sequential Circuits**
49. **Estimation and Detection**
50. **RF Integrated Circuits**
51. **Pattern Recognition and Machine Learning**
52. **Quantum Computing**
53. **Photonic Switching**
54. **System Level Design & Modelling**
55. **Fundamentals of Photonics**

56. **Foundations of Machine Learning**
57. **Foundations of Data Science**
58. **Advanced Semiconductor Devices & Circuits**
59. **Quantum Mechanics for Electronics Engineering**
60. **Embedded SoC & Cyber Physical Systems**
61. **Medical Engineering & Systems**
62. **Mixed Signal IC Design**

Note:
All courses of M.Tech. would be available to students as Program Elective.