



## **Program Structure**

### **Bachelor of Technology**

### **Electronics and Communication Engineering**

**Duration: 04 years**

**Batch: 2026-30**

### **School of Engineering and Applied Sciences**

**Department of Electronics and Communication Engineering**

## B.Tech. Electronics and Communication Engineering (2026-2030)

### Proposed Outline of Course Curriculum and Credit Framework for UG Programmes in-line with NEP 2020 & NCrF/NHEQF/FYUP etc with Multiple Entry and Multiple Exit (MEME) options

| ENTRY-1 | Semester-I |                |                                                        |             |    |   |    |   |         |                   | Levels as per NCrF |
|---------|------------|----------------|--------------------------------------------------------|-------------|----|---|----|---|---------|-------------------|--------------------|
|         | S.No       | Type of Course | Subject                                                | Course Code | L  | T | P  | E | Credits | Course Offered By |                    |
|         | 1          | DSC            | Engineering Calculus                                   | 2026MATHXXX | 3  | 1 | 0  | 0 | 4       | SCSET             | 4.5                |
|         | 2          | DSC            | Fundamentals of Electrical and Electronics Engineering | 2026EECE100 | 2  | 1 | 2  | 0 | 4       | ECE               |                    |
|         | 3          | DSC            | Computational Thinking and Programing                  | 2026CSETXXX | 3  | 0 | 2  | 0 | 4       | SCSET             |                    |
|         | 4          | DSE            | Elements of Classical and Quantum Waves                | 2026PHYS156 | 3  | 0 | 2  | 0 | 4       | EP                |                    |
|         |            |                | Electromagnetism and Mechanics                         | 2026PHYS157 |    |   |    |   |         | EP                |                    |
|         | 5          | VAC            | TREP-I                                                 | 2026TREP101 | 1  | 0 | 0  | 3 | 2       | University        |                    |
|         | 6          | SEC            | Introduction to Engineering                            | 2026ENGG101 | 1  | 0 | 2  | 0 | 2       | SEAS              |                    |
|         | 7          | MDC            | Workshop Practice and Product Realization              | 2026MECH100 | 1  | 0 | 4  | 0 | 3       | ME                |                    |
|         | Total      |                |                                                        |             | 14 | 2 | 12 | 3 | 23      |                   |                    |

| Semester-II                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                                                   |             |   |    |   |   |         |                   | Levels as per NCrF         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------------------------------------------|-------------|---|----|---|---|---------|-------------------|----------------------------|
| S.No                                                                                                                                                                                                                                                                                                                                                                                                                                            | Type of Course | Subject                                           | Course Code | L | T  | P | E | Credits | Course Offered By |                            |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                               | DSC            | Linear Algebra and Ordinary Differential Equation | 2026MATHXXX | 3 | 1  | 0 | 0 | 4       | SCSET             | 4.5                        |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                               | DSC            | Fundamentals of Logic Design                      | 2026EECE151 | 3 | 0  | 2 | 0 | 4       | ECE               |                            |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                               | DSC            | Signals and Systems                               | 2026EECE152 | 3 | 0  | 2 | 0 | 4       | ECE               |                            |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                               | MDC            | Introductory Chemistry and Biology for Engineers  | 2026BIOT160 | 2 | 0  | 2 | 0 | 3       | BioTech           |                            |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                               | DSE            | Introduction to Linux and scripting               | 2026EECE153 | 2 | 0  | 2 | 3 | 4       | ECE               |                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                | Introduction to Data Science                      | 2026EECE154 |   |    |   |   |         | ECE               |                            |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                               | VAC            | Environmental Studies - 1                         | 2026ENVS151 | 2 | 0  | 0 | 0 | 2       | SEAS              |                            |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                               | AEC            | TREP-II                                           | 2026TREP151 | 1 | 0  | 0 | 3 | 2       | University        |                            |
| Total                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                                                   |             |   | 16 | 1 | 8 | 6       | 23                | 46                         |
| Students exiting the programme after securing 40 credits will be awarded UG Certificate in the relevant Discipline /Subject provided they secure 4 credits in work based /vocational courses (internship also) offered during summer term or internship / Apprenticeship. These students are allowed to re-enter the degree programme within THREE years and complete the degree programme within the stipulated maximum period of SEVEN years. |                |                                                   |             |   |    |   |   |         |                   | EXIT-1<br>↓<br>Certificate |

| ENTRY-2 | Semester-III |                |                                                    |             |    |   |    |   |         |                   | Levels as per NCrF |
|---------|--------------|----------------|----------------------------------------------------|-------------|----|---|----|---|---------|-------------------|--------------------|
|         | S.No         | Type of Course | Subject                                            | Course Code | L  | T | P  | E | Credits | Course Offered By |                    |
|         | 1            | MDC            | Complex Analysis and Partial Differential Equation | 2026MATHXXX | 2  | 1 | 0  | 0 | 3       | SCSET             | 5.0                |
|         | 2            | DSC            | Network Analysis and Synthesis                     | 2026EECE201 | 3  | 0 | 2  | 0 | 4       | ECE               |                    |
|         | 3            | DSC            | Linear Integrated Circuits                         | 2026EECE202 | 2  | 0 | 2  | 0 | 3       | ECE               |                    |
|         | 4            | DSC            | Object Oriented Programming                        | 2026EECE203 | 2  | 0 | 2  | 0 | 3       | ECE               |                    |
|         | 5            | DSC            | Embedded Systems - 1                               | 2026EECE204 | 1  | 0 | 2  | 0 | 2       | ECE               |                    |
|         | 6            | VAC            | AI for all                                         | 2026AINT20X |    |   |    |   | 2       | University        |                    |
|         | 7            | DSE            | Numerical Methods for Engineering                  | 2026EECE205 | 2  | 0 | 2  | 0 | 3       | ECE               |                    |
|         |              |                | Biosensing Devices                                 | 2026EECE206 |    |   |    |   |         | ECE               |                    |
|         | 8            | SEC            | TREP-III                                           | 2026TREP201 | 1  | 0 | 0  | 3 | 2       | University        |                    |
|         | Total        |                |                                                    |             | 13 | 1 | 10 | 3 | 22      |                   |                    |

| Semester-IV                                                                                                                                                                                                                                                                                                                                                                                                                                      |                |                                             |             |    |   |   |   |         |                   | Levels as per NCrF     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------------------------------------|-------------|----|---|---|---|---------|-------------------|------------------------|
| S.No                                                                                                                                                                                                                                                                                                                                                                                                                                             | Type of Course | Subject                                     | Course Code | L  | T | P | E | Credits | Course Offered By |                        |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                | DSC            | Probability Theory and Stochastic Processes | 2026EECE251 | 3  | 1 | 0 | 0 | 4       | ECE               | 5.0                    |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                | DSC            | Analog Circuits - 1                         | 2026EECE252 | 2  | 1 | 2 | 0 | 4       | ECE               |                        |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                | DSC            | HDL programming                             | 2026EECE253 | 2  | 0 | 2 | 0 | 3       | ECE               |                        |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                | DSC            | Electromagnetic Field Theory                | 2026EECE254 | 2  | 1 | 0 | 0 | 3       | ECE               |                        |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                | DSE            | Data Structures                             | 2026EECE255 | 2  | 0 | 2 | 0 | 3       | ECE               |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                | Operating Systems                           | 2026EECE256 |    |   |   |   |         | ECE               |                        |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                | MDC/GE/VAC/AEC | TREP-IV                                     | 2026TREP251 | 1  | 0 | 0 | 3 | 2       | University        |                        |
| 7                                                                                                                                                                                                                                                                                                                                                                                                                                                | DSC            | Embedded Systems - 2                        | 2026EECE257 | 1  | 0 | 2 | 0 | 2       | ECE               |                        |
| Total                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |                                             |             | 13 | 3 | 8 | 3 | 21      | 89                |                        |
| Students exiting the programme after securing 80 credits will be awarded UG Diploma in the relevant Discipline /Subject provided they secure additional 4 credit in skill based/vocational courses (internship also) offered during first year or second year summer term. These students are allowed to re-enter the degree programme within THREE years and complete the degree programme within the stipulated maximum period of SEVEN years. |                |                                             |             |    |   |   |   |         |                   | EXIT-2<br>↓<br>Diploma |

*Internal Use*

| ENTRY-3 | Semester-V |                |                                        |             |    |   |   |   |         |                   | Levels as per NCeF |
|---------|------------|----------------|----------------------------------------|-------------|----|---|---|---|---------|-------------------|--------------------|
|         | S.No       | Type of Course | Subject                                | Course Code | L  | T | P | E | Credits | Course Offered By |                    |
|         | 1          | DSC            | Analog and Digital Communications      | 2026EECE301 | 3  | 0 | 2 | 0 | 4       | ECE               | 5.5                |
|         | 2          | DSC            | Digital Signal Processing              | 2026EECE302 | 3  | 0 | 2 | 0 | 4       | ECE               |                    |
|         | 3          | DSC            | Analog Circuits - 2                    | 2026EECE303 | 2  | 1 | 2 | 0 | 4       | ECE               |                    |
|         | 4          | SEC            | Resource Management Techniques         | 2026EECE304 | 2  | 0 | 0 | 0 | 2       | ECE               |                    |
|         | 5          | DSE            | Specialization Elective-1/Elective - 1 | 2026EECEXXX |    |   |   |   | 3       | ECE               |                    |
|         | 6          | AEC            | TREP-V                                 | 2026TREP301 | 1  | 0 | 0 | 3 | 2       | University        |                    |
|         |            |                |                                        |             |    |   |   |   |         |                   |                    |
|         | Total      |                |                                        |             | 11 | 1 | 6 | 3 | 19      | 108               |                    |

| Semester-VI                                                                                                                                 |                |                                        |             |    |   |   |   |         |                   | Levels as per NCRF    |
|---------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------------------------------|-------------|----|---|---|---|---------|-------------------|-----------------------|
| S.No                                                                                                                                        | Type of Course | Subject                                | Course Code | L  | T | P | E | Credits | Course Offered By |                       |
| 1                                                                                                                                           | DSC            | Computer Networks                      | 2026EECE351 | 3  | 0 | 0 | 0 | 3       | ECE               | 5.5                   |
| 2                                                                                                                                           | DSC            | VLSI Design                            | 2026EECE352 | 2  | 0 | 2 | 0 | 3       | ECE               |                       |
| 3                                                                                                                                           | DSC            | Computer Architecture                  | 2026EECE353 | 3  | 0 | 0 | 0 | 3       | ECE               |                       |
| 4                                                                                                                                           | DSC            | Wireless Communication                 | 2026EECE354 | 3  | 0 | 0 | 0 | 3       | ECE               |                       |
| 5                                                                                                                                           | DSE            | Specialization Elective-2/Elective - 2 | 2026EECEXXX | 3  | 0 | 0 | 0 | 3       | ECE               |                       |
| 6                                                                                                                                           | DSE            | Elective - 3                           | 2026EECEXXX |    |   |   |   | 3       | ECE               |                       |
| 7                                                                                                                                           | GE/MDC/SEC/AEC | TREP-VI                                | 2026TREP351 | 1  | 0 | 0 | 3 | 2       | University        |                       |
| Total                                                                                                                                       |                |                                        |             | 15 | 0 | 2 | 3 | 20      | 128               |                       |
| Students who want to undertake 3-year UG programme will be awarded UG Degree in the relevant Discipline /Subject upon securing 120 credits. |                |                                        |             |    |   |   |   |         |                   | EXIT-3<br>↓<br>Degree |

| ENTRY-4       | Semester-VII |                 |                                        |             |   |   |    |   |         |                   | Levels as per NCRF |
|---------------|--------------|-----------------|----------------------------------------|-------------|---|---|----|---|---------|-------------------|--------------------|
|               | S.No         | Type of Course  | Subject                                | Course Code | L | T | P  | E | Credits | Course Offered By |                    |
|               | 1            | DSE             | Specialization Elective-3/Elective - 4 | 2026EECEXXX | 3 | 0 | 0  | 0 | 3       | ECE               | 6.0                |
|               | 2            | DSE             | Specialization Elective-4/Elective - 5 | 2026EECEXXX | 3 | 0 | 0  | 0 | 3       | ECE               |                    |
|               | 3            | SIP             | Summer Internship                      | 2026EECE400 | 0 | 0 | 0  | 6 | 2       | ECE               |                    |
|               | 4            | AEC             | Foreign Language                       | 2026FOLAXXX |   |   |    |   | 2       | Asynchronous      |                    |
|               | 5            | GE/MDC/VAC      | Environmental Studies - 2              | 2026ENVS401 | 2 | 0 | 0  | 0 | 2       | SEAS              |                    |
|               | 6            | DSC             | Control Systems                        | 2026EECE401 | 3 | 0 | 2  | 0 | 4       | ECE               |                    |
|               | 7            | SEC             | Design Project                         | 2026EECE449 | 0 | 0 | 4  | 0 | 2       | ECE               |                    |
|               |              |                 |                                        |             |   |   |    |   |         |                   |                    |
|               |              | Total           |                                        |             |   | 8 | 0  | 4 | 6       | 18                |                    |
| Semester-VIII |              |                 |                                        |             |   |   |    |   |         |                   | Levels as per NCRF |
|               | S.No         | Type of Course  | Subject                                | Course Code | L | T | P  | E | Credits | Course Offered By | 6.0                |
|               | 1            | GE/MDC/AEC-/SEC | NPTEL broad categories                 | 2026EECEXXX |   |   |    |   | 2       | Asynchronous      |                    |
|               | 2            | Dissertation    | Major Project                          | 2026EECE499 | 0 | 0 | 24 | 0 | 12      | ECE               |                    |
|               | 3            | DSE             | Elective - 6                           | 2026EECEXXX |   |   |    |   | 3       | ECE               |                    |
|               | Total        |                 |                                        |             | 0 | 0 | 24 | 0 | 17      | 163               |                    |

\*Subject to change post BOS approval

*Arvind Kumar*

## List of Electives

| Semester 5 Electives                                  |             |
|-------------------------------------------------------|-------------|
| Elective 1 (subject)                                  | Course Code |
| Electronic Measurement Techniques and Instrumentation | 2026EECE311 |
| Advanced Digital Circuits                             | 2026EECE312 |
| MOS Device Modelling                                  | 2026EECE313 |
| Fundamentals of Nanoelectronics                       | 2026EECE314 |
| Any other relevant courses from NPTEL/SWAYAM/Coursera |             |

| Semester 6 Electives                                  |                        |
|-------------------------------------------------------|------------------------|
| Elective 2/3                                          | Course Code            |
| Antenna and Wave propagation                          | 2026EECE361            |
| Optical Communication                                 | 2026EECE362            |
| Advanced Digital Signal Processing                    | 2026EECE363            |
| Information Theory Coding                             | 2026EECE364            |
| Image Processing                                      | 2026EECE355 (EEC Core) |
| Any other relevant courses from NPTEL/SWAYAM/Coursera |                        |

| Semester 7 Electives                                  |                         |
|-------------------------------------------------------|-------------------------|
| Elective 4/5                                          | Course Code             |
| Microwave Devices                                     | 2026EECE412             |
| High-Speed Digital Design                             | 2026EECE413             |
| 5G Mobile and Wireless Technology                     | 2026EECE414             |
| Introduction to Microelectromechanical Systems        | 2026EECE415             |
| DSP Architecture and Programming                      | 2026EECE416             |
| Mixed signal design                                   | 2026EECE404 (VLSI core) |
| Low Power VLSI Design                                 | 2026EECE407 (VLSI core) |
| Any other relevant courses from NPTEL/SWAYAM/Coursera |                         |

| Semester 8 Electives                                  |             |
|-------------------------------------------------------|-------------|
| Elective 6                                            | Course Code |
| Wireless Sensor Networks                              | 2026EECE461 |
| Detection And Estimation Theory                       | 2026EECE462 |
| Statistical Signal Processing                         | 2026EECE463 |
| Medical Imaging Systems                               | 2026EECE464 |
| Satellite Communication                               | 2026EECE465 |
| Testing And Verification                              | 2026EECE466 |
| Any other relevant courses from NPTEL/SWAYAM/Coursera |             |

*Arvind Kumar*

|                                                                                                         |                                  |   | Specialization Verticals * |                                                     |   |             |                                        |   |             |                                          |   |             |
|---------------------------------------------------------------------------------------------------------|----------------------------------|---|----------------------------|-----------------------------------------------------|---|-------------|----------------------------------------|---|-------------|------------------------------------------|---|-------------|
| Sem                                                                                                     | VLSI                             |   | Course Code                | Embedded Systems and IoT                            |   | Course Code | Data and Signal Analytics              |   | Course Code | Mechatronics                             |   | Course Code |
| V                                                                                                       | VLSI Technology [2-1-0]          | 3 | 2026EECE321                | Embedded System Hardware-Software Co-Design [2-0-2] | 3 | 2026EECE322 | Introduction to Data Analytics [2-0-2] | 3 | 2026EECE323 | Introduction to Mechatronics [2-0-2]     | 3 | 2026EECE324 |
| VI                                                                                                      | CMOS Integrated Circuits [2-0-2] | 3 | 2026EECE371                | FPGA Architecture and Programming [2-0-2]           | 3 | 2026EECE372 | Deep Learning [2-0-2]                  | 3 | 2026EECE373 | Sensors and Actuators [2-0-2]            | 3 | 2026EECE374 |
| VII                                                                                                     | System on Chip Design [2-0-2]    | 3 | 2026EECE421                | IoT Networks and Protocols [2-0-2]                  | 3 | 2026EECE423 | Natural Language Processing [2-0-2]    | 3 | 2026EECE425 | Mechatronics Control Engineering [2-0-2] | 3 | 2026EECE427 |
| VIII                                                                                                    | RF Integrated Circuits [2-0-2]   | 3 | 2026EECE422                | Real Time Operating System [2-0-2]                  | 3 | 2026EECE424 | Computer Vision [2-0-2]                | 3 | 2026EECE426 | Industrial Automation [2-1-0]            | 3 | 2026EECE428 |
| * Student must complete all 4 courses under specialization vertical to be considered for specialization |                                  |   |                            |                                                     |   |             |                                        |   |             |                                          |   |             |

\* Student must complete all 4 courses under specialization vertical to be considered for specialization

*Indranil Ghosh*