**Ref. No.: GNIT/ECE/BOS/2021/01** **Date: 08/04/2021**

# GURUNANAK INSTITUTE OF TECHNOLOGY

## Approved by A.I.C.T.E., New Delhi

## Affiliated to MAKAUT, West Bengal

## Supporting Document

## MINUTES OF THE MEETING, 2021 OF BOARD OF STUDIES OF DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

## HELD

## ON

## 08/04/2021 AT 11:00 AM

**Department of Electronics & Communication Engineering**

**Guru Nanak Institute of Technology**

**Minutes of Board of Studies Meeting**

As per the notice dated 05/04/2021 (Ref No GNIT/ECE/BOS/2021/01) a Board of Studies meeting has been arranged on 08/04/2021.

**Members present:**

| Sl. No. | Name | Designation |
|---|---|---|
| 1 | Dr. Sunipa Roy | HOD & Chairperson of BOS |
| 2 | Dr. Shekhar Ranjan Bhadra Choudhury | Faculty ECE |
| 3 | Prof. Dr. Angsuman Sarkar | Professor, Kalyani Govt. Engg. College |
| 4 | Dr. Arun Kumar Mondal | Faculty ECE |
| 5 | Dr. Pijush Kanti Bhattacharjee | Faculty ECE |
| 6 | Mr. Koushik Seth | Senior Associate Consultant at Infosys Pvt. Ltd & Industry Expert of BOS |
| 7 | Dr. Adhish Chakrabarty | Faculty ECE |
| 8 | Dr. Suparna Biswas | Faculty ECE |
| 9 | Dr. Kaushik Roy | Faculty ECE |
| 10 | Dr. Nabaneeta Banerjee | Faculty ECE |
| 11 | Dr. Soumik Podder | Faculty ECE |
| 12 | Dr. Surajit Basak | Faculty ECE |
| 13 | Dr. Avali Banerjee (Ghosh) | Faculty ECE |
| 14 | Mr. Koushik Pal | Faculty ECE |
| 15 | Ms. Swagata Bhattacharya | Faculty ECE |
| 16 | Ms. Soma Boral | Faculty ECE |
| 17 | Mr. Sayan Roy Chaudhuri | Faculty ECE |
| 18 | Ms. Palasri Dhar | Faculty ECE |
| 19 | Ms. Antara Ghosal | Faculty ECE |
| 20 | Ms. Anurima Majumdar | Faculty ECE |
| 21 | Mr. Subhabrata Dhar | Faculty ECE |
| 22 | Mr. Kaustav Madhab Chatterjee | Faculty ECE |
| 23 | Mr. Shubhadeep Biswas | Faculty ECE |

**Members Absent:**

| Sl. No. | Name | Designation |
|---|---|---|
| 1 | Dr. Shekhar Ranjan Bhadra Choudhury | Faculty ECE |
| 2 | Mr. Ritwik Gupta, | Application Development Analyst, Accenture Pvt. Ltd & Alumni Representative of BOS |
| 4 | Ms. Suranjana Saha | Faculty ECE |
| 5 | Mr. Shouvik Sarkar | Faculty ECE |
| 7 | Ms. Enakshi Basak | Faculty ECE |

Meeting started with the welcome address by Dr. Sunipa Roy, Chairperson of BOS and all the leave of absence was granted. Then the meeting continued with agenda wise discussion.

The following resolutions were adopted after detail deliberation.

Meeting ended with adopting the minutes of last meeting and thanks by the Convener (Swagata Bhattacharya) of BOS.

**Agenda 1: To confirm and approve the minutes of the last BOS meeting held on 18/11/2020.**

**Resolution 1:** The minutes of last BOS meeting were duly confirmed and approved.

**Agenda 2: To note and ratify the action taken report (ATR) of the last meeting.**

**Resolution 2***:* The action taken report was presented before BOS members.

| Item | Resolution | Action Taken |
|---|---|---|
| **Agenda 3: Approval of 6th sem B.tech syllabus for R18.** | **Resolution 3:** The R18 6th Sem syllabus was discussed in details by Board Members. The board members concluded that no major changes are required. In | Approved |

| | | |
|---|---|---|
| | EC702 the subject teacher Swagata Bhattacharya discussed about teaching two stage op amp portion may be omitted or can be taught in a nutshell. | |
| **Agenda 5: Essential preperation of uhv for conducting student induction program mentoring/UHV-1** | **Resolution 5:** The mentors discussed about on going orientation program for 1st year students. An orientation program is also conducted for 2nd Year students this year | Conducted |
| **Agenda 6: Online open book exam** | **Resolution 6:**Swagata Bhattacharya discussed that for conducting open book exam Unit Test Papers were moderated by Dr. Bhadra Roy Choudhury and online tests conducted with specified time limit by the Department. Dr. Angsuman Sarkar questioned about question pattern adopted. It was explained that question pattern is numerical, design oriented and conceptual. Pros and cons of online exam discussed | Conducted |
| **Agenda 7: Learning difficulties and adressing them online.** | **Resolution 7:** Board members discussed on clearing online problems and doubts in tutorial classes and the initiatives taken from faculties and JTA sides on uploading video tutorials in Hash Portal.BOS members recommended the video tutorial format and | Video tutorials uploaded |
| **Agenda 10: Online** | **Resolution 10:** It was | Online |

| | | |
|---|---|---|
| **attendance monitoring** | discussed in the meeting that faculty members are regularly monitoring online attendance for their subjects | attendance recorded |
| **Agenda 11: 4th year project in COVID situation** | **Resolution 11:** Dr. Anshuman Sarkar and all other members discussed about 4th year project conduction. The mentors decided to choose project area where software oriented projects can be done | 4th Year project alloted |
| **Agenda 12: MOU with industry** | **Resolution 12:** Dr. Sunipa Roy discussed that MOU with industries like Ardent, Reunited Solutions and Trident Techlab are done. | MoU signed with Ardent |

**Agenda 3: Discussion on course which strengthen employability, entrepreneurship and skill development in Regulation 21 (R 21) Curriculum and Syllabus of Electronics & Communication Engineering w.e.f. 2021- 22 admission batches.**

**Resolution 3:** The list of tentative courses that strengthen employability, entrepreneurship and skill development was discussed in previous BOS meeting. All experts agreed with the list of courses which strengthen employability, entrepreneurship and skill development (Vide Annexure I).

**Agenda 4: Finalization of Elective Courses added in R21 Curriculum and Syllabus.**

**Resolution 4:** 36 Elective courses were selected after taking Stakeholder's feedback. Further, these 36 elective courses were finalized by the BOS Members (Vide Annexure II). All BOS approved that the final R21 Curriculum and Syllabus was revised by increasing the percentage of Open Elective courses for multidisciplinary holistic development which is as per National Education Policy.

**Agenda 5: New Course Added in R 21 Curriculum**

**Resolution 5:** As per suggestions of all stakeholders some new courses were introduced in R21 curriculum. As per suggestion of external BOS expert Dr. Anshuman Sarkar new courses were added in R 21 Curriculum.
Finally, the list of new courses added in R 21 curriculum was approved by all BOS members (Vide Annexure III).

**Agenda 6: Finalization of Regulation 21 (R 21) Curriculum and Syllabus of Electronics & Communication Engineering wef. 2021-22 admission batches under autonomy.**

**Resolution 6:** Chairperson of BOS Committee presented stakeholders feedback analysis on curriculum in front of all BOS members. Finally, the curriculum and syllabus of Electronics & Communication Engineering discipline was finalized and approved by BOS members (Vide Annexure IV). All BOS members commented that the final R21 Curriculum is well organized and linked with departmental vision, mission, PEOs and PSOs.

**Agenda 7: Discussion on Coursera incorporation for Faculty development.**

**Resolution 7:** Dr. Sunipa Roy discussed the Coursera incorporation and requested all faculties to complete the courses under JIS group initiative.

**Agenda 8: Internship opportunity for students Discussion**

**Resolution 8:** Hi Radius internship was encouraged for students.

**Agenda 9: Enhancement of R&D activity of the department**

**Resolution 9:** Faculties were encouraged to write book chapters and take up projects by experts.

The meeting ended with vote of thanks.

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Signature of the Convener
BOS, ECE Department

Signature of the Chairperson
BOS, ECE Department

**Attendance of BOS Held on 08.04.2021**

| Sl. No. | Name | Signature |
|---|---|---|
| 1 | Dr. Sunipa Roy | |
| 2 | Dr. Shekhar Ranjan Bhadra Choudhury | |
| 3 | Prof. Dr. Angsuman Sarkar | |
| 4 | Dr. Arun Kumar Mondal | |
| 5 | Dr. Pijush Kanti Bhattacharjee | |
| 6 | Mr. Supriyo Chanda | |
| 7 | Dr. Adhish Chakrabarty | |
| 8 | Dr. Suparna Biswas | |
| 9 | Dr. Kaushik Roy | |
| 10 | Dr. Nabaneeta Banerjee | |
| 11 | Dr. Soumik Podder | |
| 12 | Dr. Surajit Basak | |
| 13 | Dr. Avali Banerjee (Ghosh) | |
| 14 | Mr. Koushik Pal | |
| 15 | Ms. Swagata Bhattacharya | |
| 16 | Ms. Soma Boral | |
| 17 | Mr. Sayan Roy Chaudhuri | |
| 18 | Ms. Palasri Dhar | |
| 19 | Ms. Antara Ghosal | |
| 20 | Ms. Anurima Majumdar | |
| 21 | Mr. Subhabrata Dhar | |
| 22 | Mr. Kaustav Madhab Chatterjee | |
| 23 | Mr. Shubhadeep Biswas | |

## Annexure-I

| Name of the Course | Course Code | Activities/Content with direct bearing on Employability/ Entrepreneurship/ Skill development |
|---|---|---|
| Professional Communication | HSMC 101 | Skill development and employability |
| Theme based Project I | PR191 | Skill Development , Entrepreneurship |
| Programming for Problem Solving | CS 201 | Employability |
| Professional Communication LAB | HSMC 291 | Employability, Skill Development |
| Workshop & Manufacturing Practices Lab | ME 291 | Employability, Skill Development |
| Programming for Problem Solving Lab | CS 291 | Skill development and employability |
| Theme based Project II | PR291 | Skill Development , Entrepreneurship |
| Skill Development II: Life Skill | PR292 | Skill development |
| Data Structure | EC 301 | Employability |
| Universal Human Values 2: Understanding Harmony | HSMC 303 | Skill development |
| Data Structure Lab | EC391 | Skill development and employability |
| Theme based Project III | PR391 | Skill Development , Entrepreneurship |
| Skill Development III: Technical Seminar Presentation | PR392 | Employability, Skill Development |
| Theme based Project IV | PR 491 | Skill Development , Entrepreneurship |

| | | |
|---|---|---|
| **Skill Development IV: Soft Skill & Aptitude** | **PR492** | **Skill development** |
| **Principles of Management** | **HSMC 505** | **Employability, Entrepreneurship** |
| **Computer Network** | **EC503** | **Employability** |
| **Mobile Communication & Network** | **PEC 501 A** | **Employability** |
| **Fiber Optic Communication** | **PEC 501 B** | **Employability** |
| **Electronics Measurement & Instrumentation** | **PEC 501 C** | **Employability** |
| **Satellite Communication** | **PEC 501 D** | **Employability** |
| **Computer Architecture** | **PEC 502 A** | **Employability** |
| **Digital Image & Video Processing** | **PEC 502 B** | **Employability** |
| **Embedded System** | **PEC 502 C** | **Employability** |
| **Advanced Python Programming** | **PEC 502 D** | **Employability** |
| **Mobile Communication & Network Lab** | **PEC 591 A** | **Employability, Skill Development** |
| **Fiber Optic Communication Lab** | **PEC 591 B** | **Employability, Skill Development** |
| **Electronics Measurement & Instrumentation Lab** | **PEC 591 C** | **Employability, Skill Development** |
| **Satellite Communication Lab** | **PEC 591 D** | **Employability, Skill Development** |
| **Computer Architecture Lab** | **PEC 592 A** | **Employability, Skill Development** |
| **Digital Image & Video Processing Lab** | **PEC 592 B** | **Employability, Skill Development** |
| **Embedded System Lab** | **PEC 592 C** | **Employability, Skill Development** |
| **Advanced Python Programming Lab** | **PEC 592 D** | **Employability, Skill Development** |
| **Minor Project I** | **PR 591** | **Skill Development, Entrepreneurship** |
| **Skill Development V: Soft Skill & Aptitude-II** | **PR 592** | **Skill development** |
| **Economics for Engineers** | **HSMC 604** | **Employability, Entrepreneurship** |

| | | |
|---|---|---|
| Renewable Energy Sources & Applications | PEC602 B | Employability |
| Nano Technology | PEC602 C | Employability |
| Remote Sensing & GIS | PEC602 D | Employability |
| Object Oriented Programming using JAVA | OEC 601 A | Employability |
| Fundamentals of Sensors & Transducers | OEC 601 B | Employability |
| Introduction to Quantum Computing | OEC 601 C | Employability |
| Database Management System | OEC 602 A | Employability |
| 3D Printing and Design | OEC 602 B | Employability |
| Intelligent wave & Big Data | OEC 602 C | Employability |
| Scientific Computing | OEC 602 D | Employability |
| Object Oriented Programming using JAVA Lab | OEC 691 A | Employability, Skill Development |
| Fundamentals of Sensors & Transducers Lab | OEC 691 B | Employability, Skill Development |
| Quantum Computing Lab | OEC 691 C | Employability, Skill Development |
| Fundamentals of Operating System Lab | OEC 691 D | Employability, Skill Development |
| Database Management System Lab | OEC 692 A | Employability, Skill Development |
| 3D Printing and Design Lab | OEC 692 B | Employability, Skill Development |
| Intelligent wave & Big Data Lab | OEC 692 C | Employability, Skill Development |
| Scientific Computing Lab | OEC 692 D | Employability, Skill Development |
| Minor Project II | PR 691 | Skill Development, Entrepreneurship |
| Skill Development VI: Soft Skill & Aptitude-III | PR 692 | Skill development |
| Internet of Things | PEC701 A | Employability |

| | | |
|---|---|---|
| **Artificial Intelligence** | **PEC701 B** | **Employability** |
| **Digital Control System** | **PEC701 C** | **Employability** |
| **Cloud Computing (AWS)** | **PEC701 D** | **Employability** |
| **Biomedical Electronics & Imaging** | **PEC702 A** | **Employability** |
| **Introduction to EDA tool** | **PEC702 B** | **Employability** |
| **Radar & Missile Communication** | **PEC702 C** | **Employability** |
| **Introduction to MEMS** | **PEC702 D** | **Employability** |
| **Data Science** | **OEC 702 A** | **Employability** |
| **Machine Learning** | **OEC 702 B** | **Employability** |
| **Cyber Security & Cryptography** | **OEC 702 C** | **Employability** |
| **Advanced Bio Signal Processing** | **OEC 702 D** | **Employability** |
| **Mixed signal Design** | **OEC 702 E** | **Employability** |
| **Internet of Things Lab** | **PEC791 A** | **Employability, Skill Development** |
| **Artificial Intelligence Lab** | **PEC791 B** | **Employability, Skill Development** |
| **Digital Control System Lab** | **PEC791 C** | **Employability, Skill Development** |
| **Cloud Computing (AWS) Lab** | **PEC791 D** | **Employability, Skill Development** |
| **Data Science Lab** | **OEC 792 A** | **Employability, Skill Development** |
| **Machine Learning Lab** | **OEC 792 B** | **Employability, Skill Development** |
| **Cyber Security & Cryptography Lab** | **OEC 792 C** | **Employability, Skill Development** |
| **Advanced Bio Signal Processing Lab** | **OEC 792 D** | **Employability, Skill Development** |
| **Mixed signal Design Lab** | **OEC 792 E** | **Employability, Skill Development** |
| **Major Project-I** | **PR 791** | **Skill development** |
| **Skill Development VII: Seminar & Group Discussion** | **PR 792** | **Skill development** |
| **Entrepreneurship & Innovation Skill** | **MC 701** | **Employability, Skill Development, Entrepreneurship** |

| | | |
|---|---|---|
| **Industrial Automation & Robotics** | **PEC 801 A** | **Employability** |
| **Electronic System Design** | **PEC 801 B** | **Employability** |
| **Automotive Electronics** | **PEC 801 C** | **Employability** |
| **Adaptive Signal Processing** | **PEC 801 D** | **Employability** |
| **Block Chain** | **OEC 801 A** | **Employability** |
| **Deep Learning** | **OEC 801 B** | **Employability** |
| **Biology for Engineers** | **OEC 801 C** | **Employability** |
| **Foreign Language** | **OEC 801 D** | **Employability** |
| **Product Design & Manufacturing Processes** | **OEC 801 E** | **Employability** |
| **Business Research Method** | **OEC 801 F** | **Employability** |
| **Major Project-II** | **PR 891** | **Skill development** |
| **Grand Viva** | **PR 892** | **Skill development** |
| **Essence of Indian Knowledge Tradition** | **MC 801** | **Skill development** |

**ANNEXURE -II**

| Sl. No. | Category | Course Code | Course Title | Hours per week | | | | Credits/ Unit |
|---|---|---|---|---|---|---|---|---|
| | | | | **L** | **T** | **P** | **Total** | |
| **Professional Elective Courses relevant to chosen specialization/Branch (PE)** | | | | | | | | |
| 1 | PE | PEC501 | Professional Elective-I<br>A:Mobile Communication & Network<br>B:Fiber Optic Communication<br>C: Electronics Measurement & Instrumentation<br>D:Satellite Communication | 3 | 0 | 0 | 3 | 3 |
| 2 | PE | PEC502 | Professional Elective-II<br>A:Computer Architecture<br>B:DigitalImage & Video Processing<br>C:Embedded System<br>D:Advanced Python Programming | 3 | 0 | 0 | 3 | 3 |
| 3 | PE | PEC591 | Professional Elective-I Lab<br>A: Mobile Communication & Network Lab<br>B:Fiber Optic Communication Lab<br>C: Electronics Measurement & Instrumentation Lab<br>D:Satellite Communication Lab | 0 | 0 | 3 | 3 | 1.5 |
| 4 | PE | PEC592 | Professional Elective-II Lab<br>A:Computer Architecture Lab<br>B:DigitalImage & Video Processing Lab<br>C:Embedded System Lab<br>D:Advanced Python Programming Lab | 0 | 0 | 3 | 3 | 1.5 |
| 5 | PE | PEC602 | Professional Elective-III<br>A:Information Theory & Coding<br>B: Renewable Energy Sources & Applications<br>C:Nano Technology<br>D:RemoteSensing & GIS | 3 | 0 | 0 | 3 | 3 |
| 6 | PE | PEC701 | Professional Elective-IV<br>A: Internet of Things<br>B: Artificial Intelligence<br>C:Digital Control System<br>D:Cloud Computing (AWS) | 3 | 0 | 0 | 3 | 3 |
| 7 | PE | PEC702 | Professional Elective-V<br>A:Biomedical Electronics & Imaging<br>B:Introduction to EDA tool<br>C: Radar & Missile Communication<br>D:Introduction to MEMS | 3 | 0 | 0 | 3 | 3 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 8 | PE | PEC791 | Professional Elective-IV lab<br>A:Internet of Things Lab<br>B: Artificial Intelligence Lab<br>C:Digital Control System Lab<br>D:Cloud Computing (AWS )Lab | 0 | 0 | 0 | 3 | 1.5 |
| 9 | PE | PEC801 | Professional Elective-VI<br>A:Industrial Automation & Robotics<br>B:Electronic System Design<br>C:Automotive Electronics<br>D:Adaptive Signal Processing | 3 | 0 | 0 | 3 | 3 |
| **TOTAL CREDIT** | | | | | | | | 22.5 |

| Sl. No. | Category | Course Code | Course Title | Hours per week | | | | Credits/ Unit |
|---|---|---|---|---|---|---|---|---|
| | | | | **L** | **T** | **P** | **Total** | |
| **Open Elective Courses relevant to chosen specialization/Branch (OE)** | | | | | | | | |
| 1 | OE | OEC601 | Open Elective-I<br>A: Object Oriented Programming using JAVA.<br>B: Fundamentals of Sensors &Transducers<br>C:Introduction to Quantum Computing<br>D:Fundamentals of Operating System | 3 | 0 | 0 | 3 | 3 |
| 2 | OE | OEC602 | Open Elective-II<br>A:Database Management System<br>B:3D Printing and Design<br>C:Web Intelligence & Big Data<br>D:Scientific Computing | 3 | 0 | 0 | 3 | 3 |
| 3 | OE | OEC691 | Open Elective-I Lab<br>A: Object Oriented Programming using JAVA Lab<br>B:Fundamentals of Sensors & Transducers Lab<br>C:Quantum Computing Lab<br>D:Fundamentals of Operating System Lab | 0 | 0 | 3 | 3 | 1.5 |
| 4 | OE | OEC692 | Open Elective-II Lab<br>A:Database Management System Lab<br>B:3DPrinting and Design Lab<br>C: Intelligent wave & Big Data Lab<br>D:Scientific Computing Lab | 0 | 0 | 3 | 3 | 1.5 |
| 5 | OE | OEC702 | Open Elective-III<br>A:Data Science<br>B:Machine Learning<br>C:Cyber Security & Cryptography<br>D:Advanced Bio Signal Processing<br>E:Mixed signal Design | 3 | 0 | 0 | 3 | 3 |
| 6 | OE | OEC792 | Open Elective-III Lab<br>A:Data Science Lab<br>B:Machine Learning Lab<br>C: Cyber Security & Cryptography Lab<br>D:Advanced Bio Signal Processing Lab<br>E:Mixed signal Design Lab | 0 | 0 | 3 | 3 | 1.5 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 7 | OE | OEC801 | Open Elective-IV<br>A:Block Chain<br>B:Deep Learning<br>C: Biology for Engineers<br>D:Foreign Language<br>E:Product Design & Manufacturing Processes<br>F:Business Research Method | 3 | 0 | 0 | 3 | 3 |
| **TOTAL CREDIT** | | | | | | | | 16.5 |

## Annexure III

| Semester | Course Code | Course Name |
|---|---|---|
| 2 | PR192 | Skill Development – I: Soft Skill |
| 2 | PR292 | Skill Development – II: Life Skill |
| 3 | HSMC 303 | Universal Human Values 2: Understanding Harmony |
| 3 | EC393 | Electronic Devices Lab |
| 3 | PR392 | Skill Development III: Technical Seminar Presentation |
| 4 | HSMC 402 | Gender Culture and Development |
| 4 | PR492 | Skill Development IV: Soft Skill & Aptitude |
| 4 | MC 481 | Learning an Art Form [vocal or instrumental, dance, painting, clay modeling, etc.] OR Environmental Protection Initiatives |
| 5 | PEC 501 B | Fiber Optic Communication |
| 5 | PEC 501 C | Electronics Measurement & Instrumentation |
| 5 | PEC 501 D | Satellite Communication |
| 5 | PEC 502 A | Computer Architecture |
| 5 | PEC 591 B | Fiber Optic Communication Lab |
| 5 | PEC 591 C | Electronics Measurement & Instrumentation Lab |
| 5 | PEC 591 D | Satellite Communication Lab |
| 5 | PEC 592 A | Computer Architecture Lab |
| 5 | PR 592 | Skill Development V: Soft Skill & Aptitude-II |
| 6 | OEC 601 B | Fundamentals of Sensors & Transducers |

| | | |
|---|---|---|
| 6 | OEC 601 C | Introduction to Quantum Computing |
| 6 | OEC 601 D | Fundamentals of Operating System |
| 6 | OEC 602 B | 3D Printing and Design |
| 6 | OEC 602 C | Intelligent wave & Big Data |
| 6 | OEC 602 D | Scientific Computing |
| 6 | OEC 691 B | Fundamentals of Sensors & Transducers Lab |
| 6 | OEC 691 C | Quantum Computing Lab |
| 6 | OEC 691 D | Fundamentals of Operating System Lab |
| 6 | OEC 692 B | 3D Printing and Design Lab |
| 6 | OEC 692 C | Intelligent wave & Big Data Lab |
| 6 | OEC 692 D | Scientific Computing Lab |
| 6 | PR 692 | Skill Development VI: Soft Skill & Aptitude-III |
| 6 | MC 601 | Intellectual Property Right |
| 7 | PEC701 C | Digital Control System |
| 7 | PEC702 B | Introduction to EDA tool |
| 7 | PEC702 C | Radar & Missile Communication |
| 7 | PEC702 D | Introduction to MEMS |
| 7 | OEC 702 C | Cyber Security & Cryptography |
| 7 | OEC 702 D | Advanced Bio Signal Processing |
| 7 | OEC 702 E | Mixed signal Design |
| 7 | PEC791 C | Digital Control System Lab |
| 7 | PEC791 D | Cloud Computing (AWS) Lab |
| 7 | OEC 792 A | Data Science Lab |
| 7 | OEC 792 C | Cyber Security & Cryptography Lab |
| 7 | OEC 792 D | Advanced Bio Signal Processing Lab |
| 7 | OEC 792 E | Mixed signal Design Lab |
| 7 | PR 792 | Skill Development VII: Seminar & Group Discussion |
| 7 | PR 793 | Industrial Training / Internship |
| 7 | MC 701 | Entrepreneurship & Innovation Skill |
| 8 | PEC 801 B | Electronic System Design |

| | | |
|---|---|---|
| 8 | OEC 801 B | Deep Learning |
| 8 | OEC 801 C | Biology for Engineers |
| 8 | OEC 801 D | Foreign Language |
| 8 | OEC 801 E | Product Design & Manufacturing Processes |
| 8 | OEC 801 F | Business Research Method |
| 8 | PR 892 | Grand Viva |

## Annexure IV

**Curriculum for B.Tech**
**Under Autonomy**
**Electronics & Communication Engineering**
**(Effective From 2021-22 admission Batch)**
**L–Lecture; T-Tutorial; P-Practical [1L=1Cr, 1T=1Cr, 1P=0.5Cr]**

## 1st Year 1st Semester

| Sl. No. | Category | Course Code | Course Title | Hours per week | | | | Credits |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Total | |
| **A. THEORY** | | | | | | | | |
| 1 | Basic Science course | CH101 | Chemistry-I | 3 | 0 | 0 | 3 | 3 |
| 2 | Basic Science course | M101 | Mathematics–I | 4 | 0 | 0 | 4 | 4 |
| 3 | Engineering Science Courses | EE101 | Basic Electrical Engineering | 3 | 0 | 0 | 3 | 3 |
| 4 | Humanities and Social Sciences including Management courses | HSMC101 | Professional Communication | 2 | 0 | 0 | 2 | 2 |
| **B. PRACTICAL** | | | | | | | | |
| 5 | Basic Science course | CH191 | Chemistry-I Lab | 0 | 0 | 3 | 3 | 1.5 |
| 6 | Engineering Science Courses | EE191 | Basic Electrical Engineering Lab | 0 | 0 | 3 | 3 | 1.5 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 7 | Engineering Science Courses | ME 192 | Engineering Graphics & Design Lab | 0 | 0 | 3 | 3 | 1.5 |
| 8 | PROJECT | PR191 | Theme based Project I | 0 | 0 | 1 | 1 | 0.5 |
| 9 | PROJECT | PR192 | Skill Development I:Soft Skill | 0 | 0 | 1 | 1 | 0.5 |
| **C.MANDATORY ACTIVITIES/COURSES** | | | | | | | | |
| 10 | Mandatory Course | MC181 | Induction Program | 0 | 0 | 0 | 0 | 2 |
| | **TOTAL CREDIT** | | | | | | | 17.5 |

## 1st Year 2nd Semester

| Sl. No. | Category | Course Code | Course Title | Hours per week | | | | Credits |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Total | |
| **A. THEORY** | | | | | | | | |
| 1 | Basic Science courses | PH201 | Physics-I | 3 | 0 | 0 | 3 | 3 |
| 2 | Basic Science courses | M 201 | Mathematics–II | 4 | 0 | 0 | 4 | 4 |
| 3 | Engineering Science Courses | CS 201 | Programming for Problem Solving | 3 | 0 | 0 | 3 | 3 |
| **B. PRACTICAL** | | | | | | | | |
| 4 | Basic Science course | PH291 | Physics-I Lab | 0 | 0 | 3 | 3 | 1.5 |
| 5 | Humanities and Social Sciences including Management courses | HSMC291 | Professional Communication LAB | 0 | 0 | 3 | 3 | 1 |
| 6 | Engineering Science Courses | ME 291 | Workshop & Manufacturing Practices Lab | 0 | 0 | 3 | 3 | 1.5 |
| 7 | Engineering Science Courses | CS 291 | Programming for Problem Solving Lab | 0 | 0 | 3 | 3 | 1.5 |
| 8 | PROJECT | PR291 | Theme based Project II | 0 | 0 | 1 | 1 | 0.5 |
| 9 | PROJECT | PR292 | Skill Development II: Life Skill | 1 | 0 | 0 | 1 | 0.5 |
| **C. MANDATORY ACTIVITIES/COURSES** | | | | | | | | |
| 10 | MC | MC281 | NSS/ Physical Activities /Meditation & Yoga /Photography/Nature Club | 0 | 0 | 3 | 3 | 3 |
| | **TOTAL CREDIT** | | | | | | | 16.5 |

## 2nd Year 1st Semester: 3rd Semester

| Sl. No. | Category | Course Code | Course Title | Hours per week | | | | Credits/ Unit |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Total | |
| **A. THEORY** | | | | | | | | |
| 1 | BS | M 301 | Mathematics III | 3 | 0 | 0 | 3 | 3 |
| 2 | ES | EC301 | Data Structure | 3 | 0 | 0 | 3 | 3 |
| 3 | ES | EC302 | Circuit Theory &Network | 3 | 0 | 0 | 3 | 3 |
| 4 | PC | EC303 | Electronic Devices | 3 | 0 | 0 | 3 | 3 |
| 5 | PC | EC304 | Signal& Systems | 3 | 0 | 0 | 3 | 3 |
| 6 | HSMC | HSMC303 | Universal Human Values 2: Understanding Harmony | 3 | 0 | 0 | 3 | 3 |
| **B. PRACTICAL** | | | | | | | | |
| 7 | ES | M(CS)391 | Numerical Methods Lab | 1 | 0 | 3 | 3 | 2.5 |
| 8 | ES | EC391 | Data Structure Lab | 0 | 0 | 3 | 3 | 1.5 |
| 9 | ES | EC392 | Circuit Theory & Network Lab | 0 | 0 | 3 | 3 | 1.5 |
| 10 | PC | EC393 | Electronic Devices Lab | 0 | 0 | 3 | 3 | 1.5 |
| 11 | PROJECT | PR391 | Theme based Project III | 0 | 0 | 1 | 1 | 0.5 |
| 12 | PROJECT | PR392 | Skill Development III: Technical Seminar Presentation | 0 | 0 | 1 | 1 | 0.5 |
| **C. MANDATORY ACTIVITIES/COURSES** | | | | | | | | |
| 13 | MC | MC301 | Environmental Science | 3 | 0 | 0 | 3 | 0 |
| | **TOTAL CREDIT WITHOUT MOOCS COURSES** | | | | | | | 26.0 |
| **D. MOOCS COURSES**** | | | | | | | | |
| 14 | MOOCS COURSES | HM301 | MOOCS COURSE-II | 1 | 3 | 1 | 4 | 4 |
| **TOTAL CREDIT WITH MOOCS COURSES** | | | | | | | | **30** |

****MOOCS COURSES for HONOURS/MINOR Degree are Program specific and to be taken from MOOCS BASKET**

## 2nd Year 2nd Semester: 4th Semester

| Sl. No. | Category | Course Code | Course Title | Hours per week | | | | Credits /Unit |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Total | |
| **A. THEORY** | | | | | | | | |
| 1 | PC | EC401 | EM Theory & Antenna | 3 | 0 | 0 | 3 | 3 |
| 2 | PC | EC402 | Analog Circuits | 3 | 0 | 0 | 3 | 3 |
| 3 | PC | EC403 | Digital Electronics | 3 | 0 | 0 | 3 | 3 |
| 4 | PC | EC404 | Analog& Digital Communication | 3 | 0 | 0 | 3 | 3 |
| 5 | PC | EC405 | Digital Signal Processing | 3 | 0 | 0 | 3 | 3 |
| 6 | HSMC | HSMC 402 | Gender Culture and Development | 2 | 0 | 0 | 2 | 2 |
| **B. PRACTICAL** | | | | | | | | |
| 6 | PC | EC491 | EM Theory& Antenna Lab | 0 | 0 | 3 | 3 | 1.5 |
| 7 | PC | EC492 | Analog Circuits Lab | 0 | 0 | 3 | 3 | 1.5 |
| 8 | PC | EC493 | Digital Electronics Lab | 0 | 0 | 3 | 3 | 1.5 |
| 9 | PC | EC494 | Analog& Digital Communication Lab | 0 | 0 | 3 | 3 | 1.5 |
| 10 | PC | EC495 | Digital Signal Processing Lab | 0 | 0 | 3 | 3 | 1.5 |
| 11 | PROJECT | PR491 | Theme based Project IV | 0 | 0 | 1 | 1 | 0.5 |
| 12 | PROJECT | PR492 | Skill Development IV: Soft Skill& Aptitude | 0 | 0 | 1 | 1 | 0.5 |
| **C. MANDATORY ACTIVITIES/COURSES** | | | | | | | | |
| 13 | MC | MC481 | Learning an Art Form [vocal or instrumental, dance, painting, clay modeling etc.] OR Environmental Protection Initiatives | 0 | 0 | 3 | 3 | 0 |
| | **TOTAL CREDIT WITHOUT MOOCS COURSES** | | | | | | | 25.5 |
| **D. MOOCS COURSES** | | | | | | | | |
| 14 | MOOCS COURSES | HM401 | MOOCS COURSE-III | 3 | 1 | 0 | 4 | 4 |
| **TOTAL CREDIT WITH MOOCS COURSES (FOR** CSE, ECE, EE, EIE) | | | | | | | | **29.5** |

****MOOCS COURSES for HONOURS/MINOR Degree are Program specific and to be taken from MOOCS BASKET**

## 3rd Year 1st Semester: 5th Semester

| Sl. No. | Category | Course Code | Course Title | Hours per week | | | | Credits/ Unit |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Total | |
| **A. THEORY** | | | | | | | | |
| 1 | HSMC | HSMC505 | Principles of Management | 2 | 0 | 0 | 2 | 2 |
| 2 | PC | EC501 | Microprocessor & Micro Controller | 3 | 0 | 0 | 3 | 3 |
| 3 | PC | EC502 | RF & Microwave Engineering | 3 | 0 | 0 | 3 | 3 |
| 4 | PC | EC503 | Computer Network | 3 | 0 | 0 | 3 | 3 |
| 5 | PE | PEC501 | Professional Elective-I<br>A:MobileCommunication&Network<br>B:Fiber Optic Communication<br>C: Electronics Measurement & Instrumentation<br>D:SatelliteCommunication | 3 | 0 | 0 | 3 | 3 |
| 6 | PE | PEC502 | Professional Elective-II<br>A:Computer Architecture<br>B:Digital Image & Video Processing<br>C:Embedded System<br>D:Advanced Python Programming | 3 | 0 | 0 | 3 | 3 |
| **B. PRACTICAL** | | | | | | | | |
| 7 | PC | EC591 | Microprocessor & Micro Controller Lab | 0 | 0 | 3 | 3 | 1.5 |
| 8 | PC | EC592 | RF & Microwave Engineering Lab | 0 | 0 | 3 | 3 | 1.5 |
| 9 | PE | PEC591 | Professional Elective-I Lab<br>A: Mobile Communication & Network Lab<br>B:Fiber Optic Communication Lab<br>C: Electronics Measurement & Instrumentation Lab<br>D:SatelliteCommunicationLab | 0 | 0 | 3 | 3 | 1.5 |
| 10 | PE | PEC592 | Professional Elective-II Lab<br>A:ComputerArchitectureLab<br>B:DigitalImage&VideoProcessingLab<br>C:EmbeddedSystemLab<br>D:Advanced Python Programming Lab | 0 | 0 | 3 | 3 | 1.5 |
| 11 | PROJECT | PR591 | Minor Project I | 0 | 0 | 3 | 2 | 1 |
| 12 | PROJECT | PR592 | Skill Development V:Soft Skill & Aptitude-II | 0 | 0 | 1 | 1 | 0.5 |
| **C. MANDATORY ACTIVITIES/COURSES** | | | | | | | | |
| 13 | MC | MC 501 | Constitution of India | 2 | 0 | 0 | 2 | 0 |
| | **TOTAL CREDIT WITHOUT MOOCS COURSES** | | | | | | | 24.5 |
| **D. MOOCS COURSES** [For Honors/Minor]** | | | | | | | | |
| 14 | MOOCS COURSES | HM501 | MOOCS COURSE-IV | 3 | 1 | 0 | 4 | 4 |
| **TOTAL CREDIT WITH MOOCS COURSES** | | | | | | | | **28.5** |

****MOOCS COURSES for HONOURS/MINOR Degree are Program specific and to be taken from MOOCS BASKET**

## 3rd Year 2nd Semester: 6th Semester

| Sl. No. | Category | Course Code | Course Title | Hours per week | | | | Credits /Unit |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Total | |
| **A. THEORY** | | | | | | | | |
| 1 | HSMC | HSMC604 | Economics for Engineers | 2 | 0 | 0 | 2 | 2 |
| 2 | PC | EC601 | VLSI& Microelectronics | 3 | 0 | 0 | 3 | 3 |
| 3 | PC | EC602 | Control System | 3 | 0 | 0 | 3 | 3 |
| 4 | PE | PEC602 | Professional Elective-III<br>A:InformationTheory&Coding<br>B: Renewable Energy Sources & Applications<br>C:NanoTechnology<br>D:RemoteSensing& GIS | 3 | 0 | 0 | 3 | 3 |
| 5 | OE | OEC601 | Open Elective-I<br>A:Object Oriented Programming using JAVA.<br>B: Fundamentals of Sensors &Transducers<br>C:IntroductiontoQuantumComputing<br>D:FundamentalsofOperatingSystem | 3 | 0 | 0 | 3 | 3 |
| 6 | OE | OEC602 | Open Elective-II<br>A:DatabaseManagementSystem<br>B:3DPrinting and Design<br>C:Web Intelligence & Big Data<br>D:ScientificComputing | 3 | 0 | 0 | 3 | 3 |
| **B. PRACTICAL** | | | | | | | | |
| 7 | PC | EC691 | VLSI& Microelectronics Lab | 0 | 0 | 3 | 3 | 1.5 |
| 8 | PC | EC692 | Control System Lab | 0 | 0 | 3 | 3 | 1.5 |
| 9 | OE | OEC691 | Open Elective-I Lab<br>A: Object Oriented Programming using JAVA Lab<br>B:FundamentalsofSensors&Transducers Lab<br>C:Quantum Computing Lab<br>D:FundamentalsofOperatingSystemLab | 0 | 0 | 3 | 3 | 1.5 |
| 10 | OE | OEC692 | Open Elective-II Lab<br>A:DatabaseManagementSystemLab<br>B:3DPrinting and Design Lab<br>C: Intelligent wave & Big Data Lab<br>D:ScientificComputing Lab | 0 | 0 | 3 | 3 | 1.5 |
| 11 | PROJECT | PR691 | Minor Project II | 0 | 0 | 3 | 2 | 1 |
| 12 | PROJECT | PR692 | Skill Development VI: Soft Skill & Aptitude-III | 0 | 0 | 1 | 1 | 0.5 |
| **C. MANDATORY ACTIVITIES/COURSES** | | | | | | | | |
| 13 | MC | MC601 | Intellectual Property Right | 2 | 0 | 0 | 2 | 0 |
| | **TOTAL CREDIT WITHOUT MOOCS COURSES** | | | | | | | 24.5 |
| **D. MOOCS COURSES**** | | | | | | | | |
| 14 | MOOCS COURSES | HM601 | MOOCSCOURSE-V | 3 | 1 | 0 | 4 | 4 |
| **TOTAL CREDIT WITH MOOCS COURSES** | | | | | | | | **28.5** |

****MOOCS COURSES for HONOURS/MINOR Degree are Program specific and to be taken from MOOCS BASKET**

## 4th Year 1st Semester: 7th Semester

| Sl. No | Course Code | Paper Code | Theory | Contact Hours /Week | | | | Credits /Unit |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Total | |
| **A. THEORY** | | | | | | | | |
| 1 | PE | PEC701 | Professional Elective-IV<br>A: Internet of Things<br>B: Artificial Intelligence<br>C:Digital Control System<br>D:Cloud Computing (AWS) | 3 | 0 | 0 | 3 | 3 |
| 2 | PE | PEC702 | Professional Elective-V<br>A:BiomedicalElectronics & Imaging<br>B:Introduction to EDA tool<br>C: Radar & Missile Communication<br>D:Introduction to MEMS | 3 | 0 | 0 | 3 | 3 |
| 3 | OE | OEC702 | Open Elective-III<br>A:Data Science<br>B:MachineLearning<br>C:Cyber Security & Cryptography<br>D:Advanced Bio Signal Processing<br>E:Mixed signal Design | 3 | 0 | 0 | 3 | 3 |
| **B. PRACTICAL** | | | | | | | | |
| 4 | PE | PEC791 | Professional Elective-IV lab<br>A:Internet of Things Lab<br>B:Artificial Intelligence Lab<br>C:Digital Control System Lab<br>D:Cloud Computing (AWS) Lab | 0 | 0 | 0 | 3 | 1.5 |
| 5 | OE | OEC792 | Open Elective-III Lab<br>A:Data Science Lab<br>B:Machine Learning Lab<br>C:Cyber Security & Cryptography Lab<br>D:Advanced Bio Signal Processing Lab<br>E:Mixed signal Design Lab | 0 | 0 | 3 | 3 | 1.5 |
| 6 | PROJECT | PR791 | Major Project-I | 0 | 0 | 0 | 4 | 2 |
| 7 | PROJECT | PR792 | Skill Development VII: Seminar & Group Discussion | 0 | 0 | 1 | 1 | 0.5 |
| 8 | PROJECT | PR793 | Industrial Training/Internship | 0 | 0 | 0 | 0 | 1 |
| **C. MANDATORY ACTIVITIES/COURSES** | | | | | | | | |
| 9 | MC | MC701 | Entrepreneurship & Innovation Skill | 2 | 0 | 0 | 2 | 0 |
| **TOTAL CREDIT WITHOUT MOOCS COURSES** | | | | | | | | 15.5 |
| **D. MOOCS COURSES**** | | | | | | | | |
| 10 | MOOCS COURSES | HM701 | MOOCS COURSE-VI | 3 | 1 | 0 | 4 | 4 |
| **TOTAL CREDIT WITH MOOCS COURSES** | | | | | | | | **19.5** |

****MOOCS COURSES for HONOURS/MINOR Degree are Program specific and to be taken from MOOCS BASKET**

## 4th Year 2nd Semester: 8thSemester

| Sl. No | Course Code | Paper Code | Theory | Contact Hours /Week | | | | Credits /Unit |
|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | Total | |
| **A. THEORY** | | | | | | | | |
| 1 | PE | PEC801 | Professional Elective-VI<br>A:Industrial Automation & Robotics<br>B:Electronic System Design<br>C:Automotive Electronics<br>D:Adaptive Signal Processing | 3 | 0 | 0 | 3 | 3 |
| 2 | OE | OEC801 | Open Elective-IV<br>A:Block Chain<br>B:Deep Learning<br>C: Biology for Engineers<br>D:Foreign Language<br>E:Product Design & Manufacturing Processes<br>F:Business Research Method | 3 | 0 | 0 | 3 | 3 |
| **B. PRACTICAL** | | | | | | | | |
| 4 | PROJECT | PR891 | Major Project-II | 0 | 0 | 0 | 12 | 6 |
| 5 | PROJECT | PR892 | Grand Viva | 0 | 0 | 0 | 0 | 1 |
| **C. MANDATORY ACTIVITIES/COURSES** | | | | | | | | |
| 6 | MC | MC801 | Essence of Indian Knowledge Tradition | 3 | 0 | 0 | 3 | 0 |
| **TOTAL CREDIT** | | | | | | | | 13 |