



# **Dr. AMBEDKAR INSTITUTE OF TECHNOLOGY**

(An Autonomous Institute affiliated to VTU, Accredited by NAAC with 'A' grade)

BDA Outer Ring Road, Mallathalli, Bengaluru-56

**Board Of Studies 2023-24**



## **Approved Scheme and Syllabus of I & II Semester For 2023 Batch**

Submitted by  
**Department of Electronics and Communication  
Engineering**

To  
**DEAN (Academic)**

**Dr. Ambedkar Institute of Technology, Bengaluru-560056**  
**Scheme of Teaching and Examination for I/II Semester B.E. CBCS 2022, Academic Year-2023-24**  
**2022 Scheme for ECE/EI/ET**

(Applicable to 2023 batch)

Chemistry Cycle														SEMESTER: I	
Sl. No.	Course Category	Course Code	Course Title	Teaching Department	Teaching Hours/Week					Examination				Credits	
					L	T	P	SDA	Total	Duration(Hrs)	CIE Marks	SEE Marks	Total Marks		
1	ASC(IC)	22MAU101D	Mathematics- I	Maths	2	2	2	0	4+2	03	50	50	100	04	
2	ASC(IC)	22CHU102B	Applied Chemistry	Chemistry	3	0	2	0	3+2	03	50	50	100	04	
3	ESC	22MED103	Computer Aided Engineering Drawing	Civil/Mech.	2	2	0	0	3	03	50	50	100	03	
4	ESC-1	22ESX104x	Engineering Science Course-I	Respective Engg. dept	3	0	0	0	3	03	50	50	100	03	
5	ETC-1	22ETT105x	Programming Language Course - I	Any Engg. Dept	3	0	0	0	3	03	50	50	100	03	
6	AEC	22ENT106	Communicative English	Humanities	1	0	0	0	1	02	50	50	100	01	
7	HSS	22CIT107	Constitution of India	Humanities	1	0	0	0	1	02	50	50	100	01	
8	HSS	22SFH108	Scientific Foundation of Health	Any dept.	1	0	0	0	1	02	50	50	100	01	
9	MC	22CDN109	Career Development skill-I	Placement cell	2	0	0	0	2	-	50	---	---	NP/PP	
<b>Total</b>									<b>25</b>		<b>450</b>	<b>400</b>	<b>800</b>	<b>20</b>	

**D/PSB-** Teaching Department / Paper Setting Board, **SS-**Self Study, **ASC-**Applied Science Course, **ESC-** Engineering Science Courses, **ETC-** Emerging Technology Course, **AEC-** Ability Enhancement Course, **HSS-**Humanity and Social Science Course, **CIE** –Continuous Internal Evaluation, **SEE-** Semester End Examination, **IC** – Integrated Course (Theory Course Integrated with Practical Course)

**Credit Definition:**

1-hour Lecture **(L)** per week=**1Credit**  
 2-hours Tutorial**(T)** per week=**1Credit**  
 2-hours Practical / Drawing **(P)** per week=**1Credit**

04- Credits courses are to be designed for 50 hours of Teaching-Learning Session  
 04- Credits (IC) are to be designed for 40 hours' theory and 12-14 hours of practical sessions  
 03- Credits courses are to be designed for 40 hours of Teaching-Learning Session  
 02- Credits courses are to be designed for 25 hours of Teaching-Learning Session  
 01- Credit courses are to be designed for 12-15 hours of Teaching-Learning sessions

**Student's Induction Program:** Motivating (Inspiring) Activities under the Induction program – The main aim of the induction program is to provide newly admitted students a broad understanding of society, relationships, and values. Along with the knowledge and skill of his/her study, students' character needs to be nurtured as an essential quality by which he/she would understand and fulfill the responsibility as an engineer. The following activities are to be covered in 21 days. Physical Activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to Local areas, Familiarization with Department/Branch and Innovation, etc. For details, refer the ANNEXURE I of Induction Programs notification of the University published at the beginning of the 1<sup>st</sup> semester.

**AICTE Activity Points** to be earned by students admitted to B.E. day college program (For more details refer to Chapter 6, AICTE Activity Point Program, Model Internship Guidelines): Over and above the academic grades, every regular student admitted to the 4 years Degree program and every student entering 4 years Degree programs through lateral entry, shall earn 100 and 75 Activity Points respectively for the award of degree through AICTE Activity Point Program. Students transferred from other Universities to the fifth semester are required to earn 50 Activity Points from the year of entry to VTU. The Activity Points earned shall be reflected on the student's eighth semester Grade Card. The activities can be spread over the years, any time during the semester weekends, and holidays, as per the liking and convenience of the student from the year of entry to the program. However, the minimum hour's requirement should be fulfilled. Activity Points (non-credit) do not affect SGPA/CGPA and shall not be considered for vertical progression. In case students fail to earn the prescribed activity Points, an Eighth Semester Grade Card shall be issued only after earning the required activity points. Students shall be admitted for the award of the degree only after the release of the Eighth semester Grade Card.

**22MAU101D** Shall have the 03 hours of theory examination(SEE), however, practical sessions question shall be included in the theory question papers #-  
**22CHU102B** SEE shall have the 03 hours of theory examination ), however, practical sessions question shall be included in the theory question papers.  
**ESC or ETC, of 03 credits Courses** shall have only a theory component (L:T :P:S=3:0:0:0) or if the nature the of course required practical learning then the syllabus shall be designed as an Integrated course (L:T:P:S= 2:0:2:0 ). All **PLC** courses are Integrated courses.  
**All 01 Credit-** courses shall have the SEE **of 02 hours duration and the pattern of the question paper shall be MCQ**

(ESC-I) Engineering Science Courses-I					(ETC-I) Emerging Technology Courses-I				
Code 22ESX104x	Title	L	T	P	Code 22ETT105x	Title	L	T	P
22EST104A	Introduction to Civil Engineering	3	0	0	22ETT1051	Introduction to Cyber Security	3	0	0
22EST104B	Introduction to Electrical Engineering	3	0	0	22ETT1052	Introduction to Internet of Things (IOT)	3	0	0
22EST104C	Introduction to Electronics Engineering	3	0	0	22ETT1053	Renewable Energy Sources	3	0	0
22EST104D	Introduction to Mechanical Engineering	3	0	0	22ETT1054	Waste Management	3	0	0
22ESU104E	Introduction to C Programming	2	0	2	22ETT1055	Green Buildings	3	0	0
					22ETT1056	Smart Materials and Systems	3	0	0
					22ETT1057	Introduction to Nano Technology	3	0	0
					22ETT1058	Introduction to Sustainable Engineering	3	0	0
					22ETT1059	Introduction to Embedded System	3	0	0
<b>(PLC-I) Programming Language Courses-I</b>					<b>Applied Science Course(ASC)</b>				
Code 22PLU105x	Title	L	T	P	Code	Title			
22PLU105A	Introduction to Web Programming	2	0	2	<b>22MAU101D</b>	Mathematics – I for EE stream			
22PLU105B	Introduction to Python Programming	2	0	2	<b>22CHU102B</b>	Applied Chemistry for EE stream			
22PLU105C	Basics of JAVA programming	2	0	2					
22PLU105D	Introduction to C++ Programming	2	0	2					
<b>The course 22ESU104E: Introduction to C Programming, and all courses under PLC and ETC groups can be taught by faculty of ANY DEPARTMENT</b>									

- The student has to select one course from the ESC-I group.
- ME/AE/IEM stream Engineering Students shall opt for any one of the courses from the ESC-I group except, **22ESU104C - Introduction to Electronics Engineering**
- The students must opt for the courses from ESC group without repeating the course either 1st or 2nd semester
- The students must select one course from either ETC-I or PLC-I group.
- If students study the subject from ETC-I in 1st semester he/she has to select the course from PLC-II in the 2nd semester and vice-versa.

**Dr. Ambedkar Institute of Technology, Bengaluru-560056**  
**Scheme of Teaching and Examination for I/II Semester B.E. CBCS 2022, Academic Year-2023-24**  
**2022 Scheme: ECE/EI/ET**  
(Applicable to 2023 batch)

Physics Cycle														SEMESTER : II	
Sl. No.	Course Category	Course Code	Course Title	Teaching Department	Teaching Hours/Week					Examination				Credits	
					L	T	P	SD A	Total	Duration (Hrs)	CIE Marks	SEE Marks	Total Marks		
1	ASC(IC)	22MAU201D	Mathematics	Maths	2	2	2	0	4+2	3	50	50	100	4	
2	ASC(IC)	22PHU202D	Applied Physics	Physics	3	0	2	0	3+2	3	50	50	100	4	
3	ESC	22ECT203	Basic Electronics	EEE	3	0	0	0	3	3	50	50	100	3	
4	ESC-II	22ESX204x	Engineering Science Course-II	Respective Enggdept	3	0	0	0	3	3	50	50	100	3	
5	ETC-II	22ETT205X	Emerging Technology Course - II	Any Engg. Dept	2	0	2	0	4	3	50	50	100	3	
6	AEC	22ENT206	Professional writing skill	Humanities	1	0	0	0	1	2	50	50	100	1	
7	HSS	22SKT207/ 22BKT207	Sanskrutika/ Balake Kannada	Humanities	1	0	0	0	1	2	50	50	100	1	
8	HSS	22IDT208	Innovation and Design Thinking	Humanities	1	0	0	0	1	2	50	50	100	1	
9	MC	22CDN209	Career Development skill-II	Humanities	2	0	0	0	2	-	50	---	---	NP/ PP	
<b>Total</b>									<b>26</b>		<b>450</b>	<b>400</b>	<b>800</b>	<b>20</b>	

**TD/PSB**- Teaching Department / Paper Setting Board, **SS**-Self Study, **ASC**-Applied Science Course, **ESC**- Engineering Science Courses, **ETC**- Emerging Technology Course, **AEC**- Ability Enhancement Course, **HSS**-Humanity and Social Science Course, **CIE** –Continuous Internal Evaluation, **SEE**- Semester End Examination, **IC** – Integrated Course (Theory Course Integrated with Practical Course)

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04- Credits courses are to be designed for 50 hours of Teaching-Learning Session  
 04- Credits (IC) are to be designed for 40 hours' theory and 12-14 hours of practical sessions  
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 02- Credits courses are to be designed for 25 hours of Teaching-Learning Session  
 02- Credit courses are to be designed for 12-15 hours of Teaching-Learning sessions

**Student's Induction Program:** Motivating (Inspiring) Activities under the Induction program – The main aim of the induction program is to provide newly admitted students a broad understanding of society, relationships, and values. Along with the knowledge and skill of his/her study, students' character needs to be nurtured as an essential quality by which he/she would understand and fulfill the responsibility as an engineer. The following activities are to be covered in 21 days. Physical Activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to Local areas, Familiarization with Department/Branch and Innovation, etc. For details, refer the ANNEXURE I of Induction Programs notification of the University published at the beginning of the 1<sup>st</sup> semester.

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**22MAU101D** Shall have the 03 hours of theory examination(SEE), however, practical sessions question shall be included in the theory question papers  
 #- **22PHU202D** SEE shall have the 03 hours of theory examination ), however, practical sessions question shall be included in the theory question papers.  
**ESC or ETC, of 03 credits Courses** shall have only a theory component (L:T :P:S=3:0:0:0) or if the nature the of course required practical learning then the syllabus shall be designed as an Integrated course (L:T:P:S= 2:0:2:0 ). All **PLC** courses are Integrated courses.  
**All 01 Credit-** courses shall have the SEE of **02 hours duration and the pattern of the question paper shall be MCQ**

<b>(ESC-II) Engineering Science Courses-II</b>					<b>(ETC-II ) Emerging Technology Courses-II</b>				
<b>Code</b> <b>22ESX104x</b>	<b>Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Code</b> <b>22ETT105x</b>	<b>Title</b>	<b>L</b>	<b>T</b>	<b>P</b>
22EST204A	Introduction to Civil Engineering	3	0	0	22ETT2051	Introduction to Cyber Security	3	0	0
22EST204B	Introduction to Electrical Engineering	3	0	0	22ETT2052	Introduction to Internet of Things (IOT)	3	0	0
22EST204C	Introduction to Electronics Engineering	3	0	0	22ETT2053	Renewable Energy Sources	3	0	0
22EST204D	Introduction to Mechanical Engineering	3	0	0	22ETT2054	Waste Management	3	0	0
22ESU204E	Introduction to C Programming	2	0	2	22ETT2055	Green Buildings	3	0	0
					22ETT2056	Smart Materials and Systems	3	0	0
					22ETT2057	Introduction to Nano Technology	3	0	0
					22ETT2058	Introduction to Sustainable Engineering	3	0	0
					22ETT2059	Introduction to Embedded System	3	0	0
<b>(PLC-I) Programming Language Courses-I</b>					<b>Applied Science Course(ASC)</b>				
<b>Code</b> <b>22PLU105x</b>	<b>Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Code</b>	<b>Title</b>			
22PLU205A	Introduction to Web Programming	2	0	2	<b>22MAU201D</b>	Mathematics – I for EE/EC/EI/ET			
22PLU205B	Introduction to Python Programming	2	0	2	<b>22PHU202D</b>	Applied Physics for EE/EC/EI/ET			
22PLU205C	Basics of JAVA programming	2	0	2					
22PLU205D	Introduction to C++ Programming	2	0	2					
<b>The course 22ESU104E: Introduction to C Programming, and all courses under PLC and ETC groups can be taught by faculty of ANY DEPARTMENT</b>									

- The student has to select one course from the ESC-II group.
- ME/AE/IEM stream Engineering Students shall opt for any one of the courses from the ESC-II group except, **22ESU204C - Introduction to Electronics Engineering**
- The students have to opt for the courses from ESC group without repeating the course either 1st or 2nd semester
- The students must select one course from either ETC-II or PLC-II group.
- If students study the subject from ETC-I in 1st semester he/she has to select the course from PLC-II in the 2nd semester and vice-versa.

## Assessment and Evaluation method

### Chemistry Cycle:

- **22MAU101D/22MAU201D Shall** have the 03 hours of theory examination (SEE), however, practical sessions question shall be included in the theory question papers
- **22CHU102D/22CHU202D SEE** shall have the 03 hours of theory examination), however, practical sessions question shall be included in the theory question papers.
- **ESC or ETC, of 03 credits Courses** shall have only a theory component (L: T :P:S=3:0:0:0) or if the nature the of course required practical learning then the syllabus shall be designed as an Integrated course (L: T:P:S= 2:0:2:0). All **PLC** courses are Integrated courses.
- **All 01 Credit** courses shall have the SEE of 02 hours duration and the pattern of the question paper shall be MCQ
- **Integrated courses** will have 50 marks CIE and 50 Marks SEE.
- **Non-integrated courses** have 50 marks CIE (including 5 marks Assignment and 5 marks Group Activity) and 50 Marks SEE.

### Physics Cycle:

- **22MAU101D/22MAU201D Shall** have the 03 hours of theory examination (SEE), however, practical sessions question shall be included in the theory question papers
- **22PHU102D/22PHU202D SEE** shall have the 03 hours of theory examination), however, practical sessions question shall be included in the theory question papers.
- **ESC or ETC, of 03 credits Courses** shall have only a theory component (L: T :P:S=3:0:0:0) or if the nature the of course required practical learning then the syllabus shall be designed as an Integrated course (L: T:P:S= 2:0:2:0). All **PLC** courses are Integrated courses.
- **All 01 Credit-** courses shall have the SEE of 02 hours duration and the pattern of the question paper shall be MCQ
- **Integrated courses** will have 50 marks CIE and 50 Marks SEE.
- **Non-integrated courses** have 50 marks CIE (including 5 marks Assignment and 5 marks Group Activity) and 50 Marks SEE.



I/II Semester

<b>BASIC ELECTRONICS</b>			
<b>Course Code:</b>	22ECT103/203	<b>CIE Marks:</b>	50
<b>Teaching Hours/Week (L:T:P:S):</b>	3:0:0:0	<b>SEE Marks:</b>	50
<b>Total Hours of Pedagogy:</b>	40	<b>Total Marks:</b>	100
<b>Credits:</b>	03	<b>Exam Hours:</b>	03
<b>Course objectives:</b>			
1. Operation of Semiconductor diode, Zener diode and Special purpose diodes and their applications. 2. Biasing circuits for transistor (BJT) as an amplifier. 3. Study of linear Op-amps and its applications. 4. Logic circuits and their optimization. 5. Principle of basic communication system.			
<b>Module-1</b>			<b>08 Hrs</b>
<b>Semiconductor Diodes:</b> Introduction, PN Junction diode, Characteristics and Parameters- Forward and Reverse Characteristics, Diode Parameters, Diode Approximations-Ideal Diodes and Practical Diodes, Piecewise Linear Characteristics, DC Equivalent Circuits, DC Load Linear analysis-DC load line- Q-Point, Calculating Load Resistance and Supply Voltage (Text 1) <b>Diode Applications:</b> Introduction, Half-Wave Rectification-Positive Half-Wave Rectifier, Negative Halfwave Rectifier, Full-Wave Rectification-Two-Diode Full-Wave Rectifier, Bridge Rectifier. Rectifier circuit with RC and LC Filters. (Text 1) (Simple Numerical Examples excluding Derivations) <b>Zener Diodes:</b> Zener diode Characteristics and Parameters, Equivalent Circuit, Zener Diode Voltage Regulators, Regulator Circuit with No Load, Loaded Regulator, Regulator Performance (Text 1) (Simple Numerical Examples excluding Derivations)			
<b>Teaching Learning Method:</b>	Chalk and Talk, power point presentation, animations, videos		
<b>RBT Level:</b>	L1, L2		
<b>Module-2</b>			<b>08 Hrs</b>
<b>Bipolar Junction Transistors:</b> Introduction, BJT Operation- PNP and NPN Transistors and Operation, Bipolar Devices, BJT Voltages and Currents, Terminal Voltages, Transistor Currents. BJT Amplification-Current Amplification, Voltage Amplification. Common Base, Common-Emitter and Common Collector Characteristics- Circuit, Input and output characteristics, Current Gain Characteristics. (Text 1) <b>Field Effect Transistor:</b> Junction Field Effect Transistor - n-channel and p-channel FET, JFET Characteristics-Depletion regions, Drain Characteristics, Transfer Characteristics, MOSFETs Enhancement and Depletion MOSFETs (Text 1)			
<b>Teaching Learning Method:</b>	Chalk and Talk, power point presentation, animations, videos		
<b>RBT Level:</b>	L1, L2		
<b>Module-3</b>			<b>08 Hrs</b>
<b>Signal Generators:</b> BJT Phase Shift Oscillator, BJT Colpitts Oscillator, BJT Hartley Oscillator. (Text 1) <b>Operational Amplifiers:</b> Introduction, The Operational Amplifier, Block Diagram Representation of Typical Op-Amp, Schematic Symbol. (Text 2) <b>Op-Amp Parameters:</b> Gain, input resistance, Output resistance, CMRR, slew rate, Bandwidth, input offset voltage, input bias Current and Input Offset Current, The Ideal Op-Amp, Equivalent Circuit of Op-Amp, Open Loop Op-Amp configurations- Inverting Amplifiers, Non-Inverting Amplifiers, Differential			

Amplifiers. (Text 2)	
<b>Teaching Learning Method:</b>	Chalk and Talk, power point presentation, animations, videos
<b>RBT Level:</b>	L1, L2
<b>Module-4</b>	
<b>08 Hrs</b>	
<p><b>Boolean Algebra and Logic Circuits:</b> Binary Systems – Binary numbers, Number Base Conversion, octal &amp; Hexa Decimal Numbers, Complements, Basic definitions, Axiomatic Definition of Boolean Algebra, Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Other Logic Operations, Digital Logic Gates (Text 3)</p> <p><b>Combinational logic:</b> Introduction, Design procedure, Adder, Subtractor (Text 3)</p>	
<b>Teaching Learning Method:</b>	Chalk and Talk, power point presentation, animations, videos
<b>RBT Level:</b>	L1, L2
<b>Module-5</b>	
<b>08 Hrs</b>	
<p><b>Synchronous Sequential Logic:</b> Introduction, Flip-flops (SR, D, JK, T): working and Truth Table, Counters (JK) and Memory Unit Introduction, Registers, Shift registers (SISO), MOD-4 Ripple Counters. (Text 3)</p> <p><b>Communications:</b> Introduction to communication, Block Diagram of Communication System, Modulation-Description, Need for modulation, Amplitude Modulation – Amplitude Modulation theory, Representation of AM, Frequency Modulation - Theory of Frequency and Phase Modulation. (Text 4)</p>	
<b>Teaching Learning Method:</b>	Chalk and Talk, power point presentation, animations, videos
<b>RBT Level:</b>	L1, L2
<p><b>Course outcomes:</b></p> <p><b>At the end of the course the student will be able to:</b></p> <p><b>CO1.</b> Summarize the operation, characteristics of diodes, diode application, zener diode Characteristics and its applications.</p> <p><b>CO2.</b> Explain the operation of BJT and JFET with their characteristics and applications.</p> <p><b>CO3.</b> Interpret oscillators and operational amplifiers.</p> <p><b>CO4.</b> Analyze and simplify digital circuits or digital gates.</p> <p><b>CO5.</b> Illustrate the concepts of various sequential logic circuits and their working principles; explain the different modulation schemes.</p>	
<p><b>Suggested Learning Resources:</b></p> <p><b>Text Books:</b></p> <p><b>1:</b> Electronic Devices and Circuits, David A Bell, 5th Edition, Oxford, 2016.</p> <p><b>2:</b> Op-amps and Linear Integrated Circuits, Ramakanth A Gayakwad, Pearson Education, 4th Edition.</p> <p><b>3:</b> Digital Logic and Computer Design, M. Morris Mano, PHI Learning, 2008, ISBN-978-81-203-0417-8</p> <p><b>4:</b> Electronic Communication Systems, George Kennedy, 4th Edition, TMH</p> <p><b>Reference Books (if required)</b></p> <p><b>1:</b> Mitchel E. Schultz, ‘Grob’s Basic Electronics’, 11th Edition, McGraw-Hill, 2011.</p> <p><b>2:</b> Electronic Instrumentation and Measurements (3rd Edition) – David A. Bell, Oxford University Press, 2013.</p> <p><b>Web Links:</b> <a href="https://onlinecourses.nptel.ac.in/noc21_ee55/preview">https://onlinecourses.nptel.ac.in/noc21_ee55/preview</a></p>	
<b>Activity Based Learning (Suggested Activities in Class)/ Practical Based learning</b>	

### CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2		1	2				1			1	2	
CO2	3	2	3		2	1				1			1	2	
CO3	3	2	3		3				1	1			1	2	
CO4	3	1	1		2	1			1	1		1	1	2	
CO5	3	1	1		2	1			1	1		1	1	2	

High-3, Medium-2, Low-1

I/II Semester

<b>INTRODUCTION TO ELECTRONICS ENGINEERING</b>			
<b>Course Code:</b>	22EST104C/204C	<b>CIE Marks:</b>	50
<b>Teaching Hours/Week (L:T:P:S):</b>	3:0:0:0	<b>SEE Marks:</b>	50
<b>Total Hours of Pedagogy:</b>	40	<b>Total Marks:</b>	100
<b>Credits:</b>	03	<b>Exam Hours:</b>	03
<b>Course objectives:</b>			
<p>1.To prepare students with fundamental knowledge/ overview in the field of Electronics and Communication Engineering.</p> <p>2. To equip students with a basic foundation in electronic engineering required for comprehending the operation and application of electronic circuits, logic design, embedded systems, and communication systems.</p> <p>3. Professionalism &amp; Learning Environment: To inculcate in first-year engineering students an ethical and professional attitude by providing an academic environment inclusive of effective communication, teamwork, ability to relate engineering issues to a broader social context, and life-long learning needed for a successful professional career.</p>			
<b>Module-1</b>			<b>08 hrs</b>
<p><b>Power Supplies</b> –Block diagram, Half-wave rectifier, Full-wave rectifiers and filters, Voltage regulators, Voltage multipliers. (Numerical on Rectifiers &amp; Regulators)</p> <p><b>Amplifiers</b> – Bipolar Junction Transistor-Current components and Voltages, Amplifying action, BJT as a switch: Cut-off and saturation modes. (Text 1)</p>			
<b>Teaching Learning Method:</b>	Chalk and Talk, power point presentation, animations, videos		
<b>RBT Level:</b>	L1, L2		
<b>Module-2</b>			<b>08 hrs</b>
<p><b>Operational amplifiers</b> - Ideal op-amp; characteristics of ideal and practical op-amp; Practical op- amp circuits: Inverting and non-inverting amplifiers, voltage follower, summer, Subtractor, integrator, differentiator. (Text 1) Numerical</p> <p><b>Oscillators</b> – Barkhausen criterion, Ladder network oscillator, Wein bridge oscillator, Crystal controlled oscillators</p> <p>(Only Concepts, working, and waveforms. No mathematical derivations) Numerical</p>			
<b>Teaching Learning Method:</b>	Chalk and Talk, power point presentation, animations, videos		
<b>RBT Level:</b>	L1, L2		
<b>Module-3</b>			<b>08 hrs</b>
<p><b>Binary Systems:</b> Binary numbers, Number Base Conversion, octal &amp; Hexa Decimal Numbers, Complements (1's, 2's, 9's and 10's complements).</p> <p><b>Boolean Algebra and Logic Circuits:</b> Basic definitions, Axiomatic Definition of Boolean Algebra, Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Digital Logic Gates (Text 2)</p> <p><b>Combinational logic:</b> Introduction, Design procedure, Adders- Half adder, Full adder (Text 2)</p>			
<b>Teaching Learning Method:</b>	Chalk and Talk, power point presentation, animations, videos		
<b>RBT Level:</b>	L1, L2		
<b>Module-4</b>			<b>08 hrs</b>

<p><b>Embedded Systems:</b> Definition, Embedded systems vs general computing systems, Classification of Embedded Systems, Major application areas of Embedded Systems, Elements of an Embedded System, Core of the Embedded System, Microprocessor vs Microcontroller, RISC vs CISC (Text 3)</p> <p><b>Sensors and Interfacing:</b> Instrumentation and control systems, Transducers, Sensors, Actuators, LED, 7-Segment LED Display. (Text 3)</p>	
<p><b>Teaching Learning Method:</b></p> <p><b>RBT Level:</b></p>	<p>Chalk and Talk, power point presentation, animations, videos</p> <p>L1, L2</p>
<p><b>Module-5</b></p>	
<p><b>Analog Communication Schemes:</b> Modern communication system scheme, Information source and input transducer, Transmitter, Channel or Medium – Hardwired and Soft wired, Noise, Receiver, Types of communication systems. Types of modulation (only concepts) – AM, FM, PM. Concept of Radio wave propagation (Ground, space, sky).</p> <p><b>Digital Modulation Schemes:</b> Advantages of digital communication over analog communication, ASK, FSK, PSK, Multiple access techniques: TDMA, FDMA, CDMA. (Text 4)</p>	
<p><b>Teaching Learning Method:</b></p> <p><b>RBT Level:</b></p>	<p>Chalk and Talk, power point presentation, animations, videos</p> <p>L1, L2</p>
<p><b>Course outcomes:</b></p> <p><b>At the end of the course the student will be able to:</b></p> <p><b>CO1.</b> Understand the diode based and transistor-based circuits like Power supplies and Amplifiers.</p> <p><b>CO2.</b> Analyse and design transistor-based Oscillators and Operational amplifiers.</p> <p><b>CO3.</b> Apply the digital electronics knowledge to build arithmetic blocks for digital systems.</p> <p><b>CO4.</b> Understand the basics of microprocessor, microcontroller, RISC, CISC and Sensors based circuits.</p> <p><b>CO5.</b> Explain the operation and applications of modern communication systems.</p>	
<p><b>Suggested Learning Resources:</b></p> <p><b>Text Books:</b></p> <p><b>1:</b> Mike Tooley, ‘Electronic Circuits, Fundamentals &amp; Applications’, 4th Edition, Elsevier, 2015. DOI <a href="https://doi.org/10.4324/9781315737980">https://doi.org/10.4324/9781315737980</a>.</p> <p><b>2:</b> Digital Logic and Computer Design, M. Morris Mano, 2<sup>nd</sup> Edition, PHI Learning, 2008. ISBN-978-81-203-0417-84.</p> <p><b>3:</b> K V Shibu, ‘Introduction to Embedded Systems’, 2nd Edition, McGraw Hill Education (India) Private Limited, 2016.</p> <p><b>4:</b> S L Kakani and Priyanka Punglia, ‘Communication Systems’, New Age International Publisher, 2017. <a href="https://elib4u.ipublishcentral.com/pdfreader/communication-systems">https://elib4u.ipublishcentral.com/pdfreader/communication-systems</a></p> <p><b>Reference Books:</b></p> <p><b>1:</b> Mitchel E. Schultz, ‘Grob’s Basic Electronics’, 11th Edition, McGraw-Hill, 2011.</p> <p><b>Web Links:</b> <a href="https://onlinecourses.nptel.ac.in/noc21_ee55/preview">https://onlinecourses.nptel.ac.in/noc21_ee55/preview</a></p>	
<p><b>Activity Based Learning (Suggested Activities in Class)/ Practical Based learning</b></p>	

### CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2		1			1	1	1		3	1	2	
CO2	3	2	2		1			1	1	1		3	1	2	
CO3	3	2	2		1			1	1	1		3	1	2	
CO4	3		1		1			1	1	1		3	1	2	
CO5	3		1		1			1	1	1		3	1	2	

High-3, Medium-2, Low-1

Semester: I/II

<b>INTRODUCTION TO EMBEDDED SYSTEMS</b>			
<b>Course Code:</b>	22ETT1059/22ETT2059	<b>CIE Marks:</b>	50
<b>Teaching Hours/Week (L:T:P:S):</b>	3:0:0:0	<b>SEE Marks:</b>	50
<b>Total Hours of Pedagogy:</b>	39	<b>Total Marks:</b>	100
<b>Credits:</b>	03	<b>Exam Hours:</b>	03
<b>Course objectives:</b>			
1. Understand the basic concepts of Embedded Systems.			
2. Identify a typical Embedded System building blocks and describe role of embedded firmware.			
3. Familiarize the characteristics and quality attributes of Embedded Systems.			
4. Introduction of Embedded System Software and Hardware development.			
5. Exposure to trends of embedded industry.			
<b>Module-1</b>			<b>07 hrs</b>
<b>Introduction to Embedded Systems:</b> Definition of Embedded System, Embedded Systems v/s General Computing Systems, History, Classification, Major Application areas, Purpose of Embedded Systems. Application specific embedded system: Washing machine, Domain specific: Embedded system in the automotive domain, Wearable devices: The Innovative bonding of lifestyle with embedded technologies. <b>TEXT 1</b>			
<b>Teaching Learning Method:</b>	Chalk & white board, PowerPoint presentation		
<b>RBT Level:</b>	L1, L2		
<b>Module-2</b>			<b>10 hrs</b>
<b>Typical Embedded System:</b> Core of the Embedded System, Memory, Sensors and Actuators – Light Emitting Diode (LED), 7-Segment LED Display, Keyboard, Communication Interface – Inter Integrated Circuit ( I2C) Bus, Serial Peripheral Interface ( SPI) Bus, Universal Serial Bus (USB), Infrared (IrDA), Bluetooth (BT), Wi-Fi, Embedded Firmware, Other System Components, PCB and Passive Components. <b>TEXT 1</b>			
<b>Teaching Learning Method:</b>	Chalk & white board, PowerPoint presentation		
<b>RBT Level:</b>	L1, L2		
<b>Module-3</b>			<b>07 hrs</b>
<b>Characteristics and Quality Attributes of Embedded Systems:</b> Characteristics and Quality attributes of Embedded Systems.			
<b>Hardware Software Co-Design and Program Modelling:</b>			
Hardware Software Co-Design concept, Typical Embedded product design and development approach, Computational Models in Embedded Design. Electronic Design Automation (EDA) Tools. <b>TEXT 1</b>			
<b>Teaching Learning Method:</b>	Chalk & white board, PowerPoint presentation		
<b>RBT Level:</b>	L1, L2		
<b>Module-4</b>			<b>07 hrs</b>
<b>Embedded Firmware Design and Development:</b> Embedded Firmware Design Approaches, Embedded Firmware Development Languages, Integration of Hardware and Firmware, The embedded system development environment, The Integrated Development Environment (IDE). <b>TEXT 1</b>			
<b>Teaching Learning Method:</b>	Chalk & white board, PowerPoint presentation		
<b>RBT Level:</b>	L1, L2		

<b>Module-5</b>	<b>07 hrs</b>
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**Trends in the Embedded Industry:** Processor trends in embedded system, Embedded OS trends, Development Language Trends, Open Standards, Frameworks and Alliances, Bottlenecks, Development Platform Trends, Cloud, Internet of Things (IoT) and Embedded Systems – The Next Big Thing.  
**Design Case Studies:** Digital camera, Smart Card Reader, Automated Meter Reading System. **TEXT 1**

<b>Teaching Learning Method:</b>	Chalk & white board, PowerPoint presentation, seminars
<b>RBT Level:</b>	L1, L2

**Course outcomes:**  
**At the end of the course the student will be able to:**  
**CO1.** understand the basic concepts of embedded systems.  
**CO2.** identify different elements of a typical embedded system.  
**CO3.** acquire knowledge about characteristics, quality enhancing factors of Embedded system.  
**CO4.** highlight different concepts of Embedded Firmware Design and Development.  
**CO5.** analyse different trends followed in embedded industry and conduct case studies.

**Suggested Learning Resources:**  
**Text Books:**  
**1:** Shibu K V, “Introduction to Embedded Systems”, First Edition, Tata McGraw Hill Education Private Limited, 2017.

**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**  
**1:** Conduction of Case studies  
**2:** Presentation about current trends in Embedded industries.

<b>CO-PO Mapping</b>															
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>
<b>CO1</b>	3	2	1			1									
<b>CO2</b>	3	2	1			1									
<b>CO3</b>	3	2	1			1									
<b>CO4</b>	3	2	1			1									
<b>CO5</b>	3	2	1			1									

**High-3, Medium-2, Low-1**



I/II Semester

<b>Introduction to Internet of Things (IOT)</b>			
<b>Course Code:</b>	22ETC10511/22ETC20511	<b>CIE Marks:</b>	50
<b>Teaching Hours/Week (L:T:P:S):</b>	3: 0: 0: 0	<b>SEE Marks:</b>	50
<b>Total Hours of Pedagogy:</b>	40	<b>Total Marks:</b>	100
<b>Credits:</b>	03	<b>Exam Hours:</b>	03
<b>Course objectives:</b>			
<ol style="list-style-type: none"> <li>1. Understand the fundamentals of IoT and its building blocks along with their characteristics.</li> <li>2. Gain knowledge of various sensors and actuators for IoT applications.</li> <li>3. Understand the IoT protocols for processing and communication.</li> <li>4. Gain insights about current trends of associated IoT technologies and IoT Analytics.</li> <li>5. Insight into the recent application domains of IoT in everyday life.</li> </ol>			
<b>Module-1</b>			<b>08 hrs</b>
<b>Basics of Networking:</b> Introduction, Network Types, Layered network models, Addressing. <b>Emergence of IoT:</b> Introduction, Evolution of IoT, Enabling IoT and the Complex Interdependence of Technologies, IoT Networking Components, Addressing Strategies in IoT. <b>Textbook 1:</b> Chapter 1- 1.1 to 1.4 Chapter 4 – 4.1 to 4.5.			
<b>Teaching Learning Method:</b>	Chalk and Talk, PowerPoint Presentation		
<b>RBT Level:</b>	L1, L2		
<b>Module-2</b>			<b>08 hrs</b>
<b>IoT Sensing and Actuation:</b> Introduction, Sensors, Sensor Characteristics, Sensorial Deviations, Sensing Types, Sensing Considerations, Actuators, Actuator Types, Actuator Characteristics. <b>Textbook 1:</b> Chapters 5–5.1 to 5.9.			
<b>Teaching Learning Method:</b>	Chalk and Talk, PowerPoint Presentation		
<b>RBT Level:</b>	L1, L2, L3		
<b>Module-3</b>			<b>08 hrs</b>
<b>IoT Processing Topologies and Types:</b> Data Format, Importance of Processing in IoT, Processing Topologies, IoT Device Design and Selection Considerations, Processing Offloading. <b>IoT Connectivity technologies:</b> IEEE 802.15.4, ZigBee, RFID, NFC, LoRa, Wi-Fi, Bluetooth. <b>Textbook 1:</b> Chapter 6–6.1 to 6.5, Chapter 7–7.2,7.3,7.7, 7.8, 7.13, 7.15,7.16			
<b>Teaching Learning Method:</b>	Chalk and Talk, PowerPoint Presentation		
<b>RBT Level:</b>	L1, L2		
<b>Module-4</b>			<b>08 hrs</b>
<b>Associated IoT Technologies:</b> Cloud Computing: Introduction, Virtualization, Cloud Models, Service-Level Agreement in Cloud Computing, Cloud Implementation, Sensor-Cloud: Sensors-as-a-Service. <b>Textbook 1:</b> Chapter 10–0.1 to 10.6.			
<b>Teaching Learning Method:</b>	Chalk and Talk, PowerPoint Presentation		
<b>RBT Level:</b>	L1, L2		
<b>Module -5</b>			<b>08 hrs</b>
<b>IOT Case Studies and Future Trends:</b> Vehicular IoT and IoT Analytics – Introduction. Agricultural IoT and Healthcare IoT – Introduction and Case studies. <b>Textbook 1:</b> Chapter 12-12.1-12.2, 13– 13.1, 14- 14.1-14.2, 17- 17.1.			
<b>Teaching Learning Method:</b>	Chalk and Talk, Power Point Presentation		
<b>RBT Level:</b>	L1, L2, L3		
<b>Course outcomes:</b>			

**At the end of the course, the student will be able to:**

**CO1.** Describe the evolution of IoT, IoT networking components, and addressing strategies in IoT.

**CO2.** Classify various sensing devices and actuator types.

**CO3.** Illustrate the architecture of IoT applications and communication

**CO4.** Explain associated IoT Technologies.

**CO5.** Demonstrate the processing in IoT.

**Suggested Learning Resources:**

**Text Books:**

**1:** Sudip Misra, Anandarup Mukherjee, Arijit Roy, “Introduction to IoT”, Cambridge University Press 2021.

**Reference Book:**

**1:** S. Misra, C. Roy, and A. Mukherjee, 2020. Introduction to Industrial Internet of Things.and Industry 4.0.CRC Press.

**2:** Vijay Madisetti and Arshdeep Bahga, “Internet of Things (A Hands-on-Approach)”,1<sup>st</sup> Edition, VPT, 2014.

**3:** Francis daCosta, “Rethinking the Internet of Things: A Scalable Approach to Connecting Everything”, 1st Edition, Apress Publications, 2013.

**Online Resources:** <https://nptel.ac.in/noc/courses/noc19/SEM1/noc19-cs31/>

**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

**Activity 1:** Group activity for a group of 4 or 5 students -5 marks

**Activity 2:** Two assignments are evaluated for 5 marks: Assignment1 – From Unit 1 and 2, Assignment2 from units 3,4 and 5

### CO-PO Mapping

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	PS01	PS02	PS03
C01	3	3											1	2	
C02	3	2	2	2									1	2	
C03	3	2	2										1	2	
C04	3	2	2	2									1	2	
C05	3	2	2	2		2	1	1	2	3			1	2	

**High-3, Medium-2, Low-1**



# **Dr. AMBEDKAR INSTITUTE OF TECHNOLOGY**

(An Autonomous Institute affiliated to VTU, Accredited by NAAC with 'A' grade)

BDA Outer Ring Road, Mallathalli, Bengaluru-56

**Board Of Studies 2023-24**



## **BASIC IoT SKILL LAB**

**For 2023 Batch**

Submitted by  
**Department of Electronics and Communication  
Engineering**

To  
**DEAN (Academic)**

**SEM : I****Basic IOT Lab**

SL.NO	CONTENT	DURATION	BTL
1	Introduction to Different Sensors working principle	6 hrs	L1,L2,
2	Introduction to Output devices (Actuators) working principle	6 hrs	L1,L2
3	Role of sensors and output devices(Actuators) in IOT,	6 hrs	L1,L2
4	Introduction to classification of processors and 8051 Microcontroller.Hands on Kiel version-3 software	6 hrs	L1,L2,L3
5	Role of Processors and Microcontrollers in IOT.Hands on using Tinkercad Tool	6 hrs	L1,L2,L3
<b>Total</b>		<b>30 hrs</b>	

**SEM : II****Basic IOT Lab**

SL.NO	CONTENT	DURATION	BTL
1	Introduction to Embedded system	6 hrs	L1,L2
2	Types of memory and memory organization	6 hrs	L1,L2
3	Simulation programs using Kiel version-3 software	6 hrs	L1,L2,L3
4	Simulation programs using Kiel version-5 software	6 hrs	L1,L2,L3
5	Hands on interfacing programs using LPC 1768 MCB	6 hrs	L1,L2,L3
<b>Total</b>		<b>30 hrs</b>	

**HOD,ECE**

**SEM : III****Basic IOT Lab**

<b>SL.NO</b>	<b>CONTENT</b>	<b>DURATION</b>	<b>BTL</b>
1	Introduction to IOT	6 hrs	L1,L2
2	Basics of IOT networking	6 hrs	L1,L2
3	Connectivity Technology	6 hrs	L1,L2
4	Sensor networks	6 hrs	L1,L2
5	Hands on using Tinker cad tool	6 hrs	L1,L2,L3
	<b>Total</b>	<b>30 hrs</b>	

**SEM : IV****Basic IOT Lab**

<b>SL.NO</b>	<b>CONTENT</b>	<b>DURATION</b>	<b>BTL</b>
1	Interoperability on Internet of Things	6 hrs	L1,L2
2	Introduction to Arduino	6 hrs	L1,L2
3	Integration of Sensors with Arduino	6 hrs	L1,L2,L3
4	Integration of Actuators with Arduino	6 hrs	L1,L2,L3
5	Hands on using Tinker cad tool	6 hrs	L1,L2,L3
	<b>Total</b>	<b>30 hrs</b>	

**HOD,ECE**

**SEM : V**

**Basic IOT Lab**

<b>SL.NO</b>	<b>CONTENT</b>	<b>DURATION</b>	<b>BTL</b>
1	Introduction to Raspberry Pi	6 hrs	L1,L2
2	Implementation of IoT with Raspberry Pi	6 hrs	L1,L2,L3
3	Cloud Computing- Fundamentals	6 hrs	L1,L2
4	Sensor - Cloud	6 hrs	L1,L2,L3
5	Hands on using Thing Speak tool	6 hrs	L1,L2,L3
	<b>Total</b>	<b>30 hrs</b>	

**SEM : VI**

**Basic IOT Lab**

<b>SL.NO</b>	<b>CONTENT</b>	<b>DURATION</b>	<b>BTL</b>
1	Data Handling and Analytics	6 hrs	L1,L2
2	Case Study: Agriculture	6 hrs	L1,L2
3	Case Study: Healthcare	6 hrs	L1,L2
4	Activity Monitoring (Case Study)	6 hrs	L1,L2,L3
5	Activity Monitoring (Case Study)	6 hrs	L1,L2,L3
	<b>Total</b>	<b>30 hrs</b>	

**HOD,ECE**



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Department of Electronics & Communication Engineering

Ref. No: AIT /EC /BOS / 467 /2023-24  
3

Date: 12-08-2023

To  
Dean (Academic)  
Dr Ambedkar Institute of Technology  
Bengaluru-56

Sir,

**Sub:** Regarding the details of the BOS meeting held on 12-08-2023

The External BOS 2023-24 meeting was held in blended mode in the department of the Electronics and communication Engineering and through Google meet link: <https://meet.google.com/iun-vhbc-tfs> on Saturday, 12-08-2023 10:30 am.

The BOS committee has approved the following:

1. NEP based Scheme and I & II semester syllabus of UG Courses of the 2023 Batch Students.
2. NEP based Scheme and III & IV semester syllabus of UG Courses of the 2022 Batch Students.
3. NEP Based Scheme and V & VI semester Syllabus of UG Courses of the 2021 Batch Students.
4. VII & VIII semester Syllabus of UG Courses of the 2020 Batch Students.
5. Skill Lab for 2023 batch students.
6. Scheme and Syllabus of I and II-year PG course.
7. The List of BOE members.
8. The list of Valuers / Examiners.

Thanking you

*Narayan V. Nand*  
CHAIRMAN BOS  
Dept. of ECE  
HOD

Dept. of Electronics and Communication Engg.  
Dr. Ambedkar Institute of Technology  
Bengaluru - 560056

Enclosures:

1. List of Members of BOS.
2. Curriculum Design –UG
3. Minutes of the BOS Meeting.
4. Scheme & Syllabus of I/II Semester Basic Electronics and Communication Engineering for the academic year 2023-24.
5. Scheme & Syllabus of 3<sup>rd</sup> and 4<sup>th</sup> Semesters for the academic year 2023-24.
6. Scheme & Syllabus of 5<sup>th</sup> and 6<sup>th</sup> Semesters for the academic year 2023-24.
7. Scheme & Syllabus of 7<sup>th</sup> and 8<sup>th</sup> Semesters for the academic year 2023-24.
8. List of BOE Members.
9. List of valuers / Examiners.



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Department of Electronics & Communication Engineering

Members of BOS:

<i>Sl No.</i>	<i>CATEGORY</i>	<i>Nomination of the Committee</i>	<i>Name of the Person with Designation</i>
1	Head of the Department	<b>Chairperson</b>	Dr. Mahalinga V Mandi, Dean (P&D), Professor & Head, Department of ECE, Dr. AIT, Bengaluru-56
2	Faculty Members at Different Levels Bearing Different Specializations	<b>Member 1.</b>	Dr. Umadevi H. Professor, Department of ECE, Dr. AIT, Bengaluru-56
		<b>Member 2.</b>	Dr. Ramesh S, Dean (Exam), Professor, Department of ECE, Dr. AIT, Bengaluru-56
		<b>Member 3.</b>	Smt. Sudha B S. Associate Professor, Department of ECE, Dr. AIT, Bengaluru-56
		<b>Member 4.</b>	Dr. Shivaputra Assistant Professor Department of ECE, Dr. AIT, Bengaluru-56
		<b>Member 5.</b>	Dr. Meenakshi.L.R. Assistant Professor, Department of ECE, Dr. AIT, Bengaluru-56
		<b>Member 6.</b>	Mr. Mohan Kumar V Assistant Professor, Department of ECE, Dr. AIT, Bengaluru-56
		<b>Member 7.</b>	Dr. Jambunath S Baligar Associate Professor Department of ECE, Dr. AIT, Bengaluru-56
		<b>Member 8.</b>	Dr. Chetan. S Assistant Professor, Department of ECE, Dr. AIT, Bengaluru-56
3	Subject Experts from outside the College Nominated by Academic Council	<b>Member 1.</b>	Dr. Devendra Jalihal Professor, EEE department IIT Madras, Chennai-600 036





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Department of Electronics & Communication Engineering

		<b>Member 2.</b>	Prof. Santanu Mahapatra Professor, Department of Electronic Systems Engineering, Indian Institute of Science Bangalore, Bengaluru- 560012
		<b>Member 3.</b>	Dr. Mandeep Singh Professor, Department of ECE, NITK, Surathkal
		<b>Member 4.</b>	Prof. P.Nagaraju Associate Professor, Dept. of TCE, RVCE, Bengaluru-560 059
4	Expert from outside College, Nominated by Vice Chancellor (VTU)	<b>VTU Nominee</b>	Dr. Manajanaik N Professor, Department of ECE, UBDT, Davangere, Karnataka
5	Representative from Industry /Corporate Sector/Allied area related to Placement Nominated by Academic council	<b>Member 1.</b>	Mr. Kubendra.K Senior Design Engineer VLSI Group, Samsung India, Outer ring Road, Near Marathahalli, Bengaluru
		<b>Member 2.</b>	Mr. Somshekar H Mobileum India Pvt Ltd., Director of Engineering.
		<b>Member 3.</b>	Mr. Sampath Kumar Srinivas Mitel, Senior Staff Software Engineer Manyata Tech Park, Bangalore
6	Post Graduate Meritorious alumnus nominated by Principal	<b>Member</b>	Mr. Premkumar M N Senior Manager, Intel, India Bengaluru

*D. Kalpa V. Nand*

CHAIRMAN

BOS Dept. of ECE

**HOD**

Dept. of Electronics and Communication Engg.,  
Dr. Ambedkar Institute of Technology  
Bengaluru - 560056



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Department of Electronics & Communication Engineering

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# MINUTES OF THE MEETING OF THE BOARD OF STUDIES 2023-24

**DATED: Saturday, 12<sup>th</sup> August 2023**



**Dr. AMBEDKAR INSTITUTE OF TECHNOLOGY, BEGALURU –  
560056.**

(An Autonomous Institution Affiliated to Visvesvaraya Technological University, Belgaum)

**Department of Electronics & Communication Engineering**

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**BOS Meeting Notice**

**Sub:** Board of Studies Meeting is convened on 12-08-2023

With reference to the above subject, External Board of Studies Meeting of the department is convened on Saturday, the 12<sup>th</sup> August 2023 at 10:30 a.m. in Department of ECE for finalizing the scheme and syllabus of UG in B.E. (E & C) and PG, M.Tech in VLSI Design and Embedded Systems for the academic year 2023-24 with the following agenda.

**Agenda:**

1. Approval of the NEP Scheme and Syllabus of 1<sup>st</sup> to 8<sup>th</sup> Semesters B.E (E & C) for the Batch-2023
2. Approval of the NEP Scheme and Syllabus of 3<sup>rd</sup> to 8<sup>th</sup> Semester B.E(E & C) for the Batch -2022
3. Approval of the NEP Scheme and Syllabus of 5<sup>th</sup> to 8<sup>th</sup> Semester B.E(E & C) for the Batch-2021
4. Approval of the Scheme and Syllabus of 7<sup>th</sup> to 8<sup>th</sup> Semester B.E(E & C) for the Batch-2020
5. Approval of Basic IoT Skill Lab for the Batch-2023 students.
6. Approval of the Scheme and Syllabus for the 1<sup>st</sup> and 2<sup>nd</sup> Semester PG for the Batch-2023
7. Approval of the Scheme and Syllabus for the 3<sup>rd</sup> and 4<sup>th</sup> Semester PG for the Batch-2022.
8. Approval of the courses for the Major, Minor Degree
9. Approval of List of Examiners



**Department of Electronics & Communication Engineering**

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**Minutes of Board of Studies (BOS) Meeting:**

The Meeting of Board of Studies (BOS) for Department of Electronics and Communication Engineering was held on 12-08-2023 at 10:30 a.m. under the Chairmanship of the Dr. Mahalinga V. Mandi, Dean (P&D), Professor and Head, Department of Electronics and Communication Engineering in the department of Electronics and Communication engineering and through Google meet link: <https://meet.google.com/iun-vhbc-tfs>.

At the very outset, the Chairman welcomed all the Internal and External members of BOS to the meeting and gave a preliminary presentation on the agenda items with reference to the scheme and syllabus of UG and PG for the academic year 2023-24

The chairman along with BOS coordinators gave a detailed presentation of the courses to be offered to the students in both Core and Elective subjects in semester wise at the Under Graduate level and Post Graduate level, also briefed the members about the Curriculum Design of the Department for the UG and PG Courses.

**PROCEEDINGS/RESOLUTIONS:**

**The following are the Suggestions of the members of BOS with reference to the presentations:**

**I and II semester for 2023 batch:**

- Subject Expert Devendra Jalihal Suggested to reduce the syllabus for “Basic electronics” (Module 1) for ECE  
**Sol.** Internal BOS members clarified that most of the topics will be dealt up to Remembering & Understand level (L1, L2)
- Subject Expert Mandeep Singh suggested to include recent edition text books for the course Introduction to Electronics Engineering (22EST104C/204C).  
**Sol.** Recent edition text books prescribed for subject Introduction to Electronics Engineering (22EST104C/204C).

**III and IV Semesters for 2022 batch:**

- Subject Expert Devendra Jalihal suggested to rearrange the contents of the topic Fourier Transforms in the subject “Signals and Systems”.  
**Sol.** Topic Fourier Transforms in the subject “Signals and Systems” is rearranged as per the suggestions.



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- Subject Expert Dr. Nagaraju P remarked regarding the IPCC subject Analog Electronic Circuits (21ECT303) that JFET experiment was added in practical component while only concepts of MOSFET were dealt in theory.  
Sol. JFET experiments in practical component is replaced by MOSFET experiments.
- Subject Expert Dr. Nagaraju P suggested to reduce the contents of 7<sup>th</sup> and 8<sup>th</sup> experiments in Analog and Digital Electronics Lab (22ECL305).  
Sol. Redundant experiments are removed as per suggestions.
- Subject Expert Dr. Nagaraju P suggested to include Proportional controller concept in module 3 in the IPCC subject Modern Control Systems as these concepts were included in practical component.  
Sol. Proportional Controller Concepts included in module 3.

### V and VI Semesters for 2021 batch:

- Industry Expert Sampath Kumar Srinivas seek clarification regarding the duration for mini project.
- Industry Expert Sampath Kumar Srinivas suggested to include IPV6 concept in **Computer Communication Networks (21ECT503)**.  
Sol. IPV6 concept included as per suggestion.
- Subject Expert Dr. Nagaraju P suggested to include recent edition books for the subject Microwave and Antenna.  
Sol. Prescribed Textbooks updated to recent editions.
- Industry Expert Kubendra suggested to include RISC V concepts in Microprocessor and Microcontroller subject.  
Sol. RISC V concepts included as Module 4 and Module 5 in Microprocessor and Microcontroller subject.
- Subject Expert Dr. Nagaraju P suggested to include Embedded C experiments instead of Assembly Programs in the subject CO & ARM Processor.  
Sol. Assembly Programs replaced with embedded C programs.
- Subject Expert Dr. Nagaraju P suggested to update prescribed text books for the subject ANN  
Sol. Prescribed text books updated to recent editions.
- Discussed about the Scheme and syllabus of 7<sup>th</sup> and 8<sup>th</sup> semester for 2020 batch
- No comments on final year subjects, so retained same syllabus.
- Discussed about the Scheme and syllabus of 1<sup>st</sup> and 2<sup>nd</sup> year PG program.
- Subject Expert Devendra Jalihal remarked that the number of electives are more.  
Sol. PG coordinator clarified that scheme and syllabus is framed as per VTU guidelines.
- Subject Expert Dr. Nagaraju P suggested to include recent edition text books.  
Sol. Recent edition text books are prescribed.



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- The meeting was ended with vote of thanks by Dr. Mahalinga V. Mandi, Dean (P&D), Professor and Head, Department of ECE.

Finally, the BOS members approved the following after incorporating the suggested modifications

- Approved the Curriculum Design for the semesters I to VIII of UG Course for the students of the Batch 2023
- Approved the NEP Based Syllabus of Basic Electronics and Communication Engineering for the semesters I/II of UG Course for the academic year 2023-24.
- Approved the NEP Based Scheme and syllabus for semesters III and IV of UG Course for the academic year 2023-24.
- Approved the NEP Based Scheme and syllabus for semesters V and VI of UG Course for the academic year 2023-24.
- Approved the Scheme and syllabus for semesters VII and VIII of UG Course for the academic year 2023-24.
- Approved Basic IoT Skill Lab for 2023 batch students.
- Approved I and II-year scheme and syllabus of PG Course for academic year 2023-24.
- Approved the courses for the Major, Minor Degree
- Approved the List of BOE members.
- Approved the list of Valuers / Examiners.

*Mahalinga V. Mandi*  
**CHAIRMAN**

**BOS Dept. of ECE**

**BOS Coordinators**

1. Prof. B. S. Sudha
2. Mr. Anand H D

**Signatures**

*Sudha B S*  
*12/10/2021*  
*AM*



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**Department of Electronics & Communication Engineering**

**List of BOE Members:**

SL. NO.	NAME AND ADDRESS
1.	Dr. Mahalinga V. Mandi, Dean (P & D), Professor and Head, Department of ECE
<b><u>External BOE members:</u></b>	
1.	Dr. Dinesh P., Professor and Dean, Department of ECE, DSCE, Bengaluru
2.	Prof. Nagraju P, Associate Professor, Department of TCE, RVCE, Bengaluru
3.	Dr. Rajeshwari Hegade, Professor and Head, Department of TCE, BMSCE, Bengaluru-19
4.	Dr. Revanna, Associate Professor, Department of ECE, Govt. Engineering College, Ramanagara
<b><u>Internal BOE Members:</u></b>	
1.	Dr. Umadevi H., Professor
2.	Smt. Sudha B. S., Associate Professor
3.	Dr. Shivaputra, Assistant Professor
4.	Smt. Meenakshi L. Rathod, Assistant Professor
5.	Mr. Mohankumar V., Assistant Professor
6.	Smt. Girija S., Assistant Professor

*Mahalinga V. Mandi*

CHAIRMAN

BOE Dept. of ECE

**HOD**

Dept. of Electronics and Communication Engg.,  
Dr. Ambedkar Institute of Technology  
Bengaluru - 560056



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**Department of Electronics & Communication Engineering**

12-08-2023

**Attendance list:**

Sl. No	Position	Name	Signature with date
1.	Chairman	<b>Dr. Mahalinga V. Mandi</b> Professor and Head Department of ECE, Dr. AIT, Bengaluru-56	<i>Mahalinga V. Mandi</i> 12/8/23
2.	VTU Nominee	<b>Dr. Manajanaik N</b> Professor, Department of ECE, UBDT, Davangere, Karnataka	ABSENT
3.	External Subject Experts	1. <b>Dr. Devendra Jalihal</b> Professor, EEE department IIT Madras, Chennai-600 036	<i>Present Online.</i>
		2. <b>Dr. Santanu Mahapatra</b> Professor, Department of Electronic Systems Engineering, Indian Institute of Science Bangalore, 560012	ABSENT
		3. <b>Dr. Mandeep Singh</b> Professor, Department of ECE, NITK, Surathkal	<i>Present Online.</i>
		4. <b>Dr. P. Nagaraju</b> Associate Professor, Dept. of TCE, RVCE, Bengaluru-560 059	<i>P. Nagaraju</i> 12/08/2023
4.	Industry Expert	1. <b>Mr. Kubendra K</b> Senior Design Engineer VLSI Group, Samsung India, Outer ring Road, Near Marathahalli, Bengaluru	<i>Present Online.</i>
		2. <b>Mr. Somshekar H</b> Mobileum India Pvt Ltd., Director of Engineering.	ABSENT
		3. <b>Mr. Sampath Kumar Srinivas</b> Mitel, Senior Staff Software Engineer Manyata Tech Park, Bangalore	<i>S. Sampath Kumar</i> 12/8/2023



5.	Alumni with PG Degree	Mr. Premkumar M N Senior Manager, Intel, India Bengaluru	ABSENT
6.	Internal Members	1. Dr. Umadevi H. Professor, Department of ECE, Dr.AIT, Bengaluru-56	<i>H Umadevi</i> 12/8/2023
		2. Dr. Ramesh S. Professor, Dean (E) Department of ECE, Dr. AIT, Bengaluru-56	<i>Ramesh</i> 12-8-23
		3. Smt. Sudha B. S. Associate Professor, Department of ECE, Dr. AIT, Bengaluru-56	<i>Sudha B.S.</i> 12/8/2023
		4. Dr. Shivaputra Assistant Professor Department of ECE, Dr. AIT, Bengaluru-56	on leave
		5. Dr. Meenakshi L. R. Assistant Professor, Department of ECE, Dr. AIT, Bengaluru-56	<i>Meenakshi</i> 12/08/2023
		6. Mr. Mohan Kumar V. Assistant Professor, Department of ECE, Dr. AIT, Bengaluru-56	<i>Mohan</i> 12/08/2023
		7. Dr. Jambunath S. Baligar Associate Professor Department of ECE, Dr. AIT, Bengaluru-56	<i>Jhr</i> 12/8/23
		8. Dr. Chetan S. Assistant Professor, Department of ECE, Dr. AIT, Bengaluru-56	<i>Chetan</i> 12/8/23
7.	Student Representatives:	1. Yogesh-N-V IDA21EC170	<i>Yogeshu</i>
		2. Yalavathi.v IDA21EC168	<i>Yalavathi V</i>
		3. Bhulini RR IDA22EC426	<i>Bhulini RR</i>
		4. LIKHITHA . B IDA20 EC066	<i>Likhitha</i>
		5. Divyashree.k IDA20EC041	<i>Divya</i>

		6.	Jaguthi.S IDA20EC053	Jaguthi
		7.	Spndhu.Hosamari IDA22LV303	Sp
		8.	Rachmi.R IDA22LV302	Rchi

Daulipati.V. Nandi  
Signature 12/8/23

HOD, Dept. of ECE

BOS Chairman

**HOD**

Dept. of Electronics and Communication Engg

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