



Karmaveer Bhaurao Patil University, Satara

Syllabus for

B. Sc. I Electronics

Under

Faculty of Science and Technology

(As per NEP 2020)

With effect from Academic Year 2024-2025

PREAMBLE:

Bachelor of Science is an integrated academic degree in the faculty of science. The faculty is not ignoring the developments in the field of Electronics. The students from science faculty should also be competent for this change in technology.

The programme will help to make students aware of professional ethics of the industry, prepare them with basic soft skills essential for working in community, professional teams and prepare them for competitive examinations, enabling them to reach higher echelons of excellence and Exploring world with Entrepreneurship approach.

The competitive curriculum has prepared at par as per needs of industries and research fields. The topics of the curriculum are well defined, taking into consideration the level and capacity of students.

The revision of the existing curriculum of the Electronics subject in science faculty is essential. This is a humble endeavor to initiate the process towards an era of knowledge.

A. GENERAL OBJECTIVES OF THE PROGRAM:

The Bachelor of Science (B.Sc.) Programme in Electronics aims to:

1. To nurture academics with a focus commitment to higher subjects.
2. To shape good and informed citizens from the students entering into Programme.
3. To create a skilled workforce to match the requirements of the society.
4. To impart knowledge of science is the basic objective of this Programme.
5. To develop scientific attitude is the major objective so as to make the students open minded, critical and curious.
6. To develop skill in practical work, experiments and laboratory materials and equipment's along with the collection and interpretation of scientific data to contribute to science.

B. PROGRAMME OBJECTIVES (POs):

Within a few years after graduation, the graduates of the B.Sc. Electronics Programme will be able to:

1. The students are expected to understand the fundamentals, principles, concepts and recent developments in the Electronics.
2. The practical course is framed in relevance with the theory courses to improve the understanding of the various concepts in Electronics.
3. It is expected to inspire and boost interest of the students in Electronics.
4. To develop the power of appreciations, the achievements in science and role in nature and society.
5. To enhance student sense of enthusiasm for science and to involve the intellectually stimulating experience of course in a supportive environment.

C. PROGRAM OUTCOMES (POs):

Within a few years after graduation, the graduates of the B.Sc. Electronics Programme will be able to:

1. The students will graduate with proficiency in the subject of their choice.
2. The students will be eligible to continue higher studies in their subject.
3. The students will be eligible to pursue higher studies abroad.
4. The students will be eligible to appear for the examinations for job in government organizations and cope up with industry, research fields.
5. The students will be eligible to apply for jobs with minimum requirements of B.Sc. Programme.

D. PROGRAM SPECIFIC OUTCOMES (PSOs):

After successful completion of the Bachelor of Science (B.Sc.) programme in Electronics, students will be able to:

1. Excel in postgraduate programs or to succeed in industry/technical profession through global and comprehensive education.
2. Provide students with a solid foundation in scientific and quantitative electronics fundamentals required to solve technical problems and also to pursue higher studies.
3. Train students with good technical and scientific breadth so as to comprehend, analyze, design and create novel products and solutions for real life problems.
4. Inculcate in students professional and ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach and an ability to relate Science and engineering issues to broader social context.
5. Prepare with an academic environment aware of excellence, leadership, written ethical codes and guidelines and the life-long learning needed for a successful professional career.

1. **Title:** Electronics

2. **Year of Implementation:** The syllabus will be implemented from June, 2024 onwards.

3. **Duration:** The course shall be a full time.

4. **Pattern:** Semester examination. (NEP 2020).

5. **Eligibility of Students:** 12th Pass with Science, or equivalent.

Any other eligibility prescribed by UGC, Government of Maharashtra, Karmaveer Bhaurao Patil University, Satara.

6. **Medium of Instruction:** The medium of instructions shall be in English.

Batch Size: B.Sc. I -20 students per batch.

B.Sc. II -16 students per batch.

B.Sc. III-12 students per batch.

B.Sc. IV Honors -20 students per batch.

B.Sc. IV Honors with Research - 5 students per guide.

7. Eligibility of the Core Faculty:

- Assistant Professor: Master of Science with specialization in Physics and NET/ SET/ Ph.D.
- Associate Professor: Master of Science in Physics with NET/ SET/Ph.D.
- Professor: Master of Science in Physics with NET/ SET/Ph.D.

Eligibility for Professor of Practice or Professional Trainer:

Any other eligibility as per the Guidelines and Regulations Passed by the Board of Concerned Studies, Academic Council of the College / University and Rules and Regulations of Karmaveer Bhaurao Patil University, Satara, Government of Maharashtra, and UGC norms.

Eligibility for Adjunct Professor of Practice or Professional Trainer:

As per eligibility prescribed by UGC.

8. Course Structure: NEP (2.0)

Sem. (Level)	Course I	Course II	Course III	OE	VSC /SEC	AEC/ VEC/ IKS	OJT/FP/ CEP/CC/ RP	Total Credits	Degree/ Cum.Cr. MEME	
Sem I 4.5	DSC I (2)	DSC I (2)	DSC I (2)	OE I (2) (P)	-	IKS I (2) (Generic)	-	22	UG Certificate: 44	
	DSC II (2)	DSC II (2)	DSC II (2)							
	DSC P I (2)	DSC P I (2)	DSC P I (2)							
Sem II 4.5	DSC III (2)	DSC III (2)	DSC III (2)	OE II (2) (P)	-	VEC I (2) DEGG and IIC	-	22		
	DSC IV (2)	DSC IV (2)	DSC IV (2)							
	DSC P II (2)	DSC P II (2)	DSC P II (2)							
Credits	12	12	12	4	-	4	-	44	Exit option: 4 Cr NSQF/Internship/Skill Courses	

Level 4.5 Semester I

Course Title	Theory			Practical		
	Course Code	Credits	Lecture per week	Course Code	Credits	Lecture per week
Fundamental of Electronics and Network Analysis	BET 111	2	4	BEP113: Based on BET 111 and BET 112	2	4
Digital Electronics-I	BET 112	2				
Open Elective Course	--	--	--	BEPOE 1	2	4
Introduction to Indian Knowledge System (IKS)	BETIKS I (Generic)	2	2	--	--	--

Level 4.5 Semester II

Course Title	Theory			Practical		
	Course Code	Credits	Lecture per week	Course Code	Credits	Lecture per week
Semiconductor Devices	BET 121	2	4	BEP123: Based on BET 121 and BET 122	2	4
Digital Electronics-II	BET 122	2				
Open Elective Course	--	--	--	BEPOE 2	2	4
Introduction to Indian Knowledge System (IKS)	BETIKS I (Generic)	2	2	--	--	--

OE: Open Elective, SEC: Skill Enhancement Course, IKS: Indian Knowledge System, VEC: Value Education Course

Evaluation Structure**Semester I**

Course Name	Course Code	Internal Evaluation			ESE	Total Marks	Credits
		CCE-I	CCE-II	CCE-III			
Fundamental of Electronics and Network Analysis	BET 111	10	10	10	30	50	02
Digital Electronics-I	BET 112	10	10	10	30	50	02
Electronics Practical Course-I	BEP 113	20			30	50	02

Semester II

Course Name	Course Code	Internal Evaluation			ESE	Total Marks	Credits
		CCE-I	CCE-II	CCE-III			
Semiconductor Devices	BET 121	10	10	10	30	50	02
Digital Electronics-II	BET 122	10	10	10	30	50	02
Electronics Practical Course-II	BEP 123	20			30	50	02

CCE*- Out of three CCE marks best of two CCE marks consider



Karmaveer Bhaurao Patil University, Satara

(A State Public University Est. u/s 3(6) of MPUA 2016)

Faculty of Science and Technology

Yashavantrao Chavan Institute of Science, Satara

Board of Studies in Electronics

Programme: B.Sc.

Semester – I

Type: DSC I

Marks: 50

Credits: 2

From: A. Y. 2024-25

Name of the Course: BET 111, Fundamental of Electronics and Network Analysis

Course Objectives: Student will able to...

1. understand the fundamentals of electronic components and electrical circuits.
2. study network theorems to analyze electrical and electronic circuits.
3. explain the characteristics and applications of two-port networks.
4. analyze AC and DC circuits, including resonance phenomena.

Course Outcomes: Students should be able to...

1. identify electronic components and explain the fundamentals of electrical circuits.
2. apply network theorems to solve electrical network problems.
3. analyze two-port networks and perform parameter conversions.
4. design a resonance circuit.

Module	Title and Contents	Hrs.
Module -1:	Circuit Elements 1.1 Introduction, Classification, Resistors, Capacitor, Inductor, Application's, color coding of resistor, series and parallel connections, numerical problems. 1.2 Transformer and Relays: Principle and construction, Types, Applications. 1.3 Switches: SPDT, DPDT etc. (Explanation using Symbols) 1.4 Introduction to SMD component.	7
Module -2:	Network Theorems 2.1 Ohm's Law, Kirchhoff's Laws (KCL and KVL), and Numerical problems. 2.2 Theorems: Thevenin's Theorem, Norton's Theorem, Superposition Theorem, Maximum Power Transfer Theorem. 2.3 Numerical problems based on these network theorems.	8
Module -3	Network Analysis 3.1 Two Port Networks: z, y and h parameters and their conversion, Numerical problems. 3.2 Introduction of Star and Delta network. 3.3 Star to Delta Conversion, and Delta to Star Conversion. 3.4 Numerical problems.	7
Module -4:	Fundamental of AC Circuits 4.1 Introduction: AC, DC Sources, Voltage and Current Sources, Direction of current and voltage, Comparison AC and DC Sources. 4.2 Concept of Power, Instantaneous value, Peak, Peak to Peak, Root Mean Square and Average Values, Phase Difference. 4.3 Voltage-Current Relationship: Resistor, Inductor and Capacitor 4.4 Sinusoidal Circuit Analysis for RC circuit. 4.5 Resonance: Series and Parallel RLC Circuits, Frequency Response, Quality (Q) Factor and Bandwidth.	8

Reference Books :-

1. R. S. Sedha, A Textbook of applied electronics, S. Chand Publication, (2003).
2. Sudhkar and S. P. Shyamman, Circuits and Networks Analysis and Synthesis, Tata McGraw-Hill

Publishing Company Limited, 3rd Edition, (2006).

3. B. L. Thereja, Basic Electronics Solid State, S. Chand & Company LTD, 4th Edition, (2004).
4. M. L. Soni & J. C. Gupta, A course in Electrical Circuits Analysis, Delhi Dhanpat Rai & Sons, (1979).
5. Charles K. Alexander, Matthew N. O. Sadiku, Fundamentals of Electric Circuits, McGraw-Hill Education (INDIA) PVT. LTD, (2008).
6. B. L. Thereja, A. K. Thereja, A Textbook of Electrical Technology Volume 1 Basic Electrical Engineering, S. Chand & Company LTD, 1st Multicolor Edition, (2005).
7. M. Nahvi and J. Edminister, Theory and Problems of Electric Circuits, Schaum's outline series, McGraw-Hill Book Company, 1st Edition, (2005).

Evaluation Pattern: 60:40

Total Marks: 50

Internal Continuous Evaluation (20 Marks):

- CCE-I: 10 Marks: Compulsory Home Assignment
- CCE - II: 10 Marks: Short and Long Answer Question Test
- CCE - III: 10 Marks: Compulsory MCQ Test

Note: Internal Evaluation (Best of two CCE marks will be considered)

End Semester Examination (50 Marks):

- Question -1: Solve the following questions (Five questions of 2 Marks)
- Question -2: Attempt any two questions (Three questions of 10 Marks)
- Question -3: Attempt any four questions (Five questions of 5 Marks)

Note: Conversion of 50 marks of ESE evaluation to 30 Marks

	Karmaveer Bhaurao Patil University, Satara (A State Public University Est. u/s 3(6) of MPUA 2016) Faculty of Science and Technology	
	Yashavantrao Chavan Institute of Science, Satara	
	Board of Studies in Electronics	
	Programme: B.Sc.	Semester – I
	Type: DSC II	Marks: 50
	Credits: 2	From: A. Y. 2024-25
Name of the Course: BET 112, Digital Electronics-I		
Course Objectives: The Student will able to... 1. understand different number systems and binary codes. 2. study logic gates and Boolean algebra. 3. explain the characteristics of various digital logic families. 4. describe the concept of combinational logic circuits.		
Course Outcomes: The student should be able to... 1. perform number system conversions and binary arithmetic operations 2. simplify Boolean expressions and implement logic circuits. 3. analyze different logic families. 4. design combinational logic circuits.		
Module	Title and Contents	Hrs.
Module -1:	Number System and Binary Codes 1.1 Number System: Introduction, Decimal, Binary, Octal and Hexadecimal number systems, and there interconversion. 1.2 One's and two's complements, Rules of Binary Addition, Subtraction. 1.3 Signed and Unsigned numbers. 1.4 Binary Codes: BCD, Excess-3 Code, Gray, ASCII code, Parity Code, Hamming Code.	7
Module -2:	Logic Gates and Boolean Algebra 2.1 Study of Basic Gates, Study of Derived Gates, Universal gates (NOR and NAND), De-Morgan's Theorems. 2.2 Boolean algebra and Logic Gates: Introduction to Boolean Algebra and Boolean operators. 2.3 Standard representation of logic functions (SOP and POS), simplification of logic equation using Boolean algebra. 2.4 Karnaugh map Techniques.	8
Module -3:	Digital Logic Families 3.1 Bipolar and MOS Integrated circuits: Characteristics, limitations and applications. 3.2 Analysis of digital logic families: TTL, MOS, CMOS Inverters. 3.3 Interfacing between logic families, various logic functions and their implementation. 3.4 Comparison of CMOS and TTL logic families.	7
Module -4:	Combinational Logic Design 4.1 Multiplexers: Introduction, 4 to 1, 8 to1, Study of IC 74151/74153, Application 4.2 Demultiplexer: Introduction, 1 to 4, 1 to 8, Study of IC 74139, Application 4.3 Code Convertor: Introduction, Encoder, Decimal to Binary/BCD encoder, Octal to Binary/BCD encoder, Decoder, BCD to 7 Segment decoder, Study of IC 7446/47 Application. 4.4 Arithmetic Circuits: Adder, Subtractor, ALU.	8
Reference Books: - 1. M. Morris Mano, Digital System Design, Pearson Education Asia, 4th Edition, (2001). 2. Thomas L. Flyod, Digital Fundamentals, Pearson Education Asia, 5th Edition, (1994). 3. W. H. Gothmann, Digital Electronics: An Introduction to Theory and Practice, Prentice Hall of India, (2000). 4. S Salivahan, S Arivazhagan, Digital Circuit and Design, Vikas publishing house PVT Limited, (2000).		

Evaluation Pattern: 60:40	
Total Marks: 50	
Internal Continuous Evaluation (20 Marks): • CCE-I:10Marks:Compulsory Home Assignment • CCE - II: 10 Marks: Short and Long Answer Question Test • CCE - III: 10 Marks: Compulsory MCQ Test Note: Internal Evaluation (Best of two CCE marks will be considered)	End Semester Examination (50 Marks): • Question -1: Solve the following questions (Five questions of 2 Marks) • Question -2: Attempt any two questions (Three questions of 10 Marks) • Question -3: Attempt any four questions (Five questions of 5 Marks) Note: Conversion of 50 marks of ESE evaluation to 30 Marks

	Karmaveer Bhaurao Patil University, Satara (A State Public University Est. u/s 3(6) of MPUA 2016)		
	Faculty of Science and Technology		
	Yashavantrao Chavan Institute of Science, Satara		
	Board of Studies in Electronics		
	Programme: B.Sc.	Semester - I	
	Type: DSC P(I)	Marks: 50	
	Credits: 2	From: A. Y. 2024-25	
Name of the Course: BEP 113, Practical Based on BET 111 and BET 112			
Course Objectives: Students will be able to...			
1. familiarize with basic electronics components, instruments and circuits. 2. study different laws and theorems for solving complex circuit to simplified circuit. 3. simplify the expressions using Boolean algebra and Learn logic gates. 4. construct sequential and combinational logic circuits.			
Course Outcomes: Students should be able to...			
1. utilize basic electronics components and circuits. 2. apply the basic theory & mathematical relationships in electronic circuits. 3. design, construct and verify logic circuits. 4. develop combinational and sequential logic circuits.			
Module	Title and Contents (Any 15)		Hrs.
	List of Practical 1. Study of Electronics components and tools. 2. Study of Voltage sources in series and parallel. 3. Study of Voltage and Current dividers. 4. Study of CRO: Measurement of Amplitude, frequency, and phase difference. 5. Verify Kirchhoff's Voltage and Current law. 6. Study and verification Thevenin's Theorem. 7. Study and verification Superposition Theorem. 8. Study and verification Norton's Theorem. 9. Study Code converters Binary to Gray and Gray to Binary. 10. Study Logic gates. (IC 7400,7402,7404,7408,7432,7486). 11. Verify the NAND and NOR gates as universal logic gates. 12. Study Demorgan's theorem using gates. 13. Design and verification of the truth tables of Half and Full adder circuits. 14. Verify the truth table of the Multiplexer 74150. 15. Verify the truth table of the De-Multiplexer 74154. 16. Study BCD to 7 Segment Decoder.		60
Reference Books: - 1. R. S. Sedha, Textbook of Applied Electronics, S. Chand Publication, (2003). 2. S. M. Sze, Semiconductor Devices: Physics and Technology, Wiley India edition, 2nd Edition, (2002). 3. Ben G Streetman and S. Banerjee, Solid State Electronic Devices, Pearson Education, 6th Edition, (2006). 4. M. Morris Mano, Digital System Design, Pearson Education Asia, 4th Edition, (2001). 5. Thomas L. Flyod, Digital Fundamentals, Pearson Education Asia, 5th Edition, (1994). 6. W. H. Gothmann,Digital Electronics: An Introduction to Theory and Practice, Prentice Hall of India, (2000). 7. S. Salivahan, S Arivazhagan, Digital Circuit and Design, Vikas publishing house PVT Limited, (2000).			

Evaluation Pattern:60:40	
Total Marks: 50	
Journal, Students' Performance Viva, Project (20 Marks): • Journal: 10 Marks • Students' Performance: 05 Marks • Viva: 05 Marks.	Practical Exam Paper (30 Marks): • Perform one experiment for each student. (30 Marks).

	Karmaveer Bhaurao Patil University, Satara (A State Public University Est. u/s3(6)ofMPUA2016) Faculty of Science	
	Yashavantrao Chavan Institute of Science, Satara	
	Board of Studies in Electronics	
	Programme: B.Sc	Semester- II
	Type: DSC III	Marks: 50
	Credits: 2	From: A. Y.2024-25
Name of the Course: BET 121: Semiconductor Devices		
Course Objectives: Students will be able to... 1. learn the basics of a semiconductor material. 2. interpret rectifiers and regulators. 3. understand the basics of transistors and various configurations. 4. explain the field effect transistor.		
Course Outcomes: Students should be able to... 1. verify and interpret basics of semiconductor materials. 2. inspect rectifiers and regulators. 3. analyze and interpret the characteristics of transistors. 4. determine characteristics and performance of field effect transistor.		
Module	Semiconductor Devices	Hrs
Module-1:	Fundamentals of Semiconductor 1.1 Introduction, Types of material, Energy Band diagram, Fermi Level, Types of Semiconductors, Intrinsic & Extrinsic Semiconductors. 1.2 Constructions and working of PN junction diode, Formation of Depletion Layer, I-V characteristics, Applications. 1.3 Zener and avalanche breakdown mechanism, Zener diode. 1.4 I-V characteristics, Applications. 1.5 Photo diode. Light Emitting Diode (LED), 7-segment display, Organic LED. Applications.	8
Module-2:	Rectifiers and Regulators 2.1 Introduction, AC and DC Signal conditioning, A.C and D.C Bridges, Pre-amplifiers. 2.2 Concept of Filters. 2.3 Principles and working of different types of ADC and DAC. 2.4 Comparators, Instrumentation Amplifier, Differential Bridge Amplifier.	7
Module-3:	Bipolar Junction Transistors (BJT) 3.1 Introduction, Types, Transistor working, CE, CB, CC configurations. 3.2 Characteristics of CB and CE configurations, Regions of operation (active, cut off and saturation). 3.3 Current gains α and β. Relations between α and β. dc load line and Q point. 3.4 Applications: Transistor as Amplifier, Transistor as a switch.	8
Module-4:	Field Effect Transistors 4.1 JFET: Introduction, Types of FET, Symbol, Construction, working and I-V characteristics (output and transfer), Pinch-Off and Saturation Voltage. 4.2 MOSFET: Terminals, Symbol, Basic operation. 4.3 characteristics and MOSFET as switch.	7

Reference Books:-

1. R.S. Sedha, Textbook of Applied Electronics, S. Chand Publication, (2003).
2. Robert Boylestad and Louis Nashelsky, Electronics Devices and Circuits Theory, PHI 9th Edition, (2013).
3. Allen Mottershead, Electronic Devices and Circuits, Goodyear Publishing Corporation, (2003).
4. Donald Neamen, Electronic Circuit Analysis and Design, Tata McGraw Hill, 3rd Edition, (2002).
5. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill, (2001).

Evaluation Pattern:60:40**Total Marks:50****Internal Continuous Evaluation (20 Marks):**

- CCE-I:10Marks: Compulsory Home Assignment
- CCE - II: 10 Marks: Short and Long Answer Question Test
- CCE - III: 10 Marks: Compulsory MCQ Test

Note: Internal Evaluation (Best of two CCE marks will be considered)

End Semester Examination (50 Marks):

- Question -1: Solve the following questions (Five questions of 2 Marks)
- Question -2: Attempt any two questions (Three questions of 10 Marks)
- Question -3: Attempt any four questions (Five questions of 5 Marks)

Note: Conversion of 50 marks of ESE evaluation to 30 Marks

	Karmaveer Bhaurao Patil University, Satara (A State Public University Est. u/s3(6)ofMPUA2016) Faculty of Science	
	Yashavantrao Chavan Institute of Science, Satara	
	Board of Studies in Electronics	
	Programme: B.Sc	Semester- II
	Type: DSC IV	Marks: 50
	Credits: 2	From: A. Y.2024-25
Name of the Course: BET 122: Digital Electronics-II		
Course Objectives: Students will be able to... 1. learn sequential logic circuits. 2. study counter circuits. 3. understand the concept of Shift register and Programmable Logic Device. 4. explain computer memory organization.		
Course Outcomes: Students should be able to... 1. design sequential logic circuits. 2. develop a counter circuit. 3. demonstrate shift register circuit. 4. describe computer memory organization.		
Module	Title and Contents	Hrs
Module-1:	Sequential Logic Design 1.1 Introduction Sequential Logic Design. 1.2 Latches and Flip flops. 1.3 Edge triggered and Level triggered Flipflops. 1.4 S-R Flip flop, J-K Flip flop, J-K Master Slave flip flop, T and D type Flip flop.	8
Module-2:	Counters 2.1 Introduction Counters, Classification. 2.2 Synchronous and Asynchronous Counter, Up/down counter, Decade Counter, Ring Counter, Johnson Counter, Modulo-N Counter. 2.3 Study of IC 7490, Application of counter.	7
Module-3:	Shift Register 3.1 Introduction of Shift registers. 3.2 Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers. 3.3 Study of IC 7495.Applications of Shift Register.	8
Module-4:	Computer Memory Organization 4.1 Introduction Computer Memory Organization. 4.2 Classification of Memory, Memory Characteristics. 4.3 RAM, SRAM, DRAM, ROM, PROM, EPROM, UV-EPROM,EEPROM, FLASH. 4.4 Introduction to cache memory, Memory Hierarchy.	7
Reference Books:- 1. M. Morris Mano, Digital System Design, Pearson Education Asia, 4th Edition,(2001). 2. Thomas L. Flyod, Digital Fundamentals, Pearson Education Asia ,5th Edition,(1994). 3. W. H. Gothmann,Digital Electronics: An Introduction to Theory and Practice, Prentice Hall of India, (2000). 4. S Salivahan, S Arivazhagan, Digital Circuit and Design, Vikas publishing house PVT Limited, (2000).		

Evaluation Pattern: 60:40	
Total Marks:50	
Internal Continuous Evaluation (20 Marks): • CCE-I:10Marks: Compulsory Home Assignment • CCE - II: 10 Marks: Short and Long Answer Question Test • CCE - III: 10 Marks: Compulsory MCQ Test Note: Internal Evaluation (Best of two CCE marks will be considered)	End Semester Examination (50 Marks): • Question -1: Solve the following questions (Five questions of 2 Marks) • Question -2: Attempt any two questions (Three questions of 10 Marks) • Question -3: Attempt any four questions (Five questions of 5 Marks) Note: Conversion of 50 marks of ESE evaluation to 30 Marks

	Karmaveer Bhaurao Patil University, Satara (A State Public University Est. u/s 3(6) of MPUA 2016) Faculty of Science and Technology		
	Yashavantrao Chavan Institute of Science, Satara		
	Board of Studies in Electronics		
	Programme: B.Sc.	Semester - II	
	Type: DSC P	Marks: 50	
	Credits: 2	From: A. Y. 2024-25	
	Name of the Course: BEP 123: Based on BET 121 and BET 122		
Course Objectives: Students will be able to... 1. learn half wave and full wave rectifier circuits. 2. study fixed and variable IC regulators. 3. understand Flip-flop circuits. 4. explain the counter and shift register circuit.			
Course Outcomes: Students should be able to... 1. design and verify half wave and full wave rectifier circuit. 2. develop fixed and variable IC regulators. 3. construct flip flop circuits. 4. describe the counter and shift register circuit.			
Module	Title and Contents (Any 15)		Hrs.
	List of Practical 1. Study of I-V Characteristics of PN Junction Diode. 2. Study of I-V Characteristics of Zener Diode. 3. Study of Transistor as a switch (LED ON/OFF). 4. Study of Three terminal voltage regulators. 5. Study of Half Wave Rectifier with and without capacitor filter. 6. Study of Full Wave Rectifier with and without capacitor filter. 7. Study of input and output I-V Characteristics of BJT in Common Emitter configuration. 8. Study of input and output I-V Characteristics of BJT in Common Base configuration. 9. Design and test of an S-R flip-flop using NOR/NAND gates. 10. Verify the truth table of a J-K flip-flop (7476). 11. Verify the truth table of a D flip-flop (7474). 12. Study of Divide by 2/5/10 counter using IC 7490. 13. Study of asynchronous counter. (4-bit / 8 bit). 14. Study of shift register. (4-bit / 8 bit). 15. Study of Ring Counter using IC 7495. 16. Study of computer architecture.		60
Reference Books: - 1. Robert Boylestad and Louis Nashelsky,Electronic Devices and Circuit Theory, PHI,9th Edition, (2013). 2. L. Schilling and C. Belove, Electronic Circuits: Discrete and Integrated, Tata McGraw Hill, (2002). 3. Donald A. Neamen, Electronic Circuit Analysis and Design, Tata McGraw Hill,3rdEdition, (2002). 4. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill, (2001).			

Evaluation Pattern:60:40	
Total Marks: 50	
Journal, Students' Performance Viva, Project (20 Marks): • Journal: 10 Marks • Students' Performance: 05 Marks • Viva: 05 Marks	Practical Exam Paper (30 Marks): • Perform one experiment for each student. (30 Marks).