

**JSS COLLEGE FOR WOMEN
(AUTONOMOUS)
SARASWATHIPURAM, MYSURU-09**



**VALUE ADDED PROGRAM ON
“BASIC ELECTRONICS”
I TO IV SEMESTER SYLLABUS
2026-27 ONWARDS**

DEPARTMENT OF PHYSICS

Course Structure

Sem	Course Type	Paper	Title of paper	Instructions per week (Hrs)	Theory IA Marks	Practical IA Marks	Sub Total Marks	Grand Total Marks	Exam Duration (Hrs)
I	Certificate Course	Theory	Basic Electronics	03	20	50	70	100	03
		Practicals	Basic Electronics	03	10	20	30		03
II		Theory	Basic Electronics	03	20	50	70	100	03
		Practicals	Basic Electronics	03	10	20	30		03
III	Diploma Course	Theory	Basic Electronics	03	20	50	70	100	03
		Practicals	Basic Electronics	03	10	20	30		03
IV		Theory	Basic Electronics	03	20	50	70	100	03
		Practicals	Basic Electronics	03	10	20	30		03

JSS College for Women (Autonomous), Saraswathipuram, Mysuru-09 PROCEEDINGS

Proceedings of the of the **Board of Studies in Physics** meeting held on 12th July 2025.

The meeting of Board of Studies in Physics was convened at 11.30AM on 12th July 2025 in the Department of Physics, JSS College for Women (Autonomous), Saraswathipuram, Mysuru-09

The Chairman welcomed the esteemed members of the board and requested to give their valuable suggestions to incorporate in the syllabus which is implemented from the academic year 2025-26.

The following members were Present in the meeting

1. Smt.Sowmya B, Assistant Professor, JSS College for Women (Autonomous), Mysuru - Chairman
2. Dr.S R Kumaraswamy, Associate Professor, GFGC, Kabini Colony, T N Pura - Principal Nominee
3. Dr.Mahadevaprasad T N, Associate Professor, GFGC, Gundlupet, Chamarajanagara - AC Nominee
4. Dr.Chandra, Assistant Professor, NIE College, Manathavadi Road, Mysuru- Principal Nominee
5. Mr.Amoghavarsha N, Project Associate-1, COSMOS Mysuru, Indian Institute of Astrophysics
Vijnana Bhavan, Manasagangotri, Mysuru - Principal Nominee
6. Sri.Umesh V, Assistant Professor, JSS College for Women (Autonomous), Mysuru – Senior Faculty
- 7.Sri.Yashwanth D B, Assistant Professor, JSS College for Women (Autonomous),Mysuru–Senior Faculty
8. Kum.Divya A, Assistant Professor, MMS & SDM Mahila Vidyalaya, Mysuru.- Alumni- Principal Nominee

The following member took leave of Absence

1. Prof. Sridhar M A, Professor, DoS in Physics, Manasagangotri, Mysuru

With subject to the Syllabus provided by the University of Mysore, all the members of the Board discussed in length and made a deep analysis on various topics and recommended valuable suggestions to frame the Theory part and Practical part for the new **RNEP Scheme** Syllabus for Third and Fourth semesters and a Value Added Program/COP on the title “**Basic Electronics**” for the Academic year 2025-2026 and onwards.

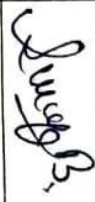
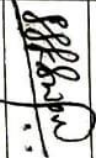
Resolutions:

The Board of studies approved both theory and practical syllabus for III semester and IV semester with minor changes in theory part along with the addition of few experiments in the Practical segments. The Board members also approved the course frame work, examination pattern, department regulations, the panel of examiners and question paper pattern.

This Approved RNEP scheme syllabus should be effective from the academic year 2025-2026.

The copy of the B.Sc Physics Syllabus under RNEP Scheme is annexed herewith.

JSS COLLEGE FOR WOMEN (AUTONOMOUS), SARASWATHIPURAM MYSURU
DEPARTMENT OF PHYSICS
COMPOSITION OF BOARD OF STUDIES 2025-26

Sl. No.	Name	Designation & Position	Category	Address	Phone No	Signature
1	Smt.Sowmya B.	Assistant Professor & Chairman	AC Nominee	JSS College for Women Saraswathipuram Mysuru	9886161982	
2.	Prof. Sridhar M A	Professor & Member	University (VC Nominee)	DoS in Physics University of Mysuru.	9448048645	
3.	Dr. Kumaraswamy S R	Associate Professor & Member	Principal Nominee	GFGCW, Kabini Colony, T N Pura, Mysuru	9845718972	
4.	Dr.Mahadevaprasad T N	Associate Professor & Member	AC Nominee	Dept. of Physics GFGC, Gundlupete Chamarajanagara University	9880361234	
5.	Dr.Chandra	Assistant Professor & Member	AC Nominee	Dept. of Physics The NIE College (VTU) Mananthavadi Road, Mysuru	9980209605	
6.	Mr.Amoghavarsha N	Member (Industrialist)	Principal Nominee	Project Associate-1 COSMOS Mysuru Indian Institute of Astrophysics Vijnana Bhavan, Manasagangotri Mysuru	6362159474	
7.	Kum.Divya A.	Lecturer & Member (Alumni)	Principal Nominee	MMS & SDM Mahila Vidyalaya, Mysuru	8050433575	
8.	Sri.Umesh V.	Assistant Professor & Senior faculty	Principal Nominee	Dept. of Physics JSSCW, Saraswathipuram, Mysuru-09	8453471291	
9.	Sri Yashwanth D B	Assistant Professor & Senior faculty	Principal Nominee	Dept. of Physics JSSCW, Saraswathipuram, Mysuru-09	9844404904	

BASIC ELECTRONICS

(Teaching Hours = 30 Hours: THEORY: 3Hrs / Week & Practical: 2Hrs/Week)

SEMESTER-1

UNIT-1: Electrical and Electronic Symbol, Electrical Safety Precautions, Identify various Types of Safety Signs and what they mean.

UNIT-2: PPE- Uses, Types, how to free a person from Electrocution, Fire safety, causes and precautionary activities, Use of appropriate fire extinguishers on different types of fires.

UNIT-3: Earthing or Grounding, Types of Earthing- Electrical Fundamentals. Sources of Electrical Energy, Electrical Current, Voltage, emf, Potential Difference, Resistance with their SI Units. Meters used to Measure Different Electrical Quantities.

UNIT-4: Supply Systems like AC and DC, Relationship between V, I and R (Ohms Law), Behaviour of V, I in Series and Parallel DC Circuits. Describe Open Circuit, Close Circuit and Short Circuit, Equation to Find the Effective Resistances Connected in Series, Equation to Find Effective Resistances Connected in Parallel, Resistances Connected Series and Parallel Combinations.

Practical Experiments:

1. Identification of circuit components.
2. Use of general tool in lab.
3. Use of DMM in measurement of V, I and R.
4. Connect voltmeter and ammeter in a simple circuit.
5. Demonstrate effects of shorts and opens in a circuit
6. Practice of soldering and de-soldering the circuit components.
7. Determine the equivalent Resistance of Series connected resistances.
8. Determine the equivalent Resistance of parallel connected resistances

Reference Books:

1. Basic Electronics-Solid State – B L Theraja - S Chand And Company Ltd
2. Electronic Devices And Circuit Theory – Robert L Boylestad And Louis Nashelsky (PHI)
3. Fundamentals of electrical & Electronics engineering – Vittalkumar K. Vagga & Murugesh P.D.

BASIC ELECTRONICS

(Teaching Hours = 30 Hours: THEORY: 3Hrs / Week & Practical: 2Hrs/Week)

SEMESTER-2

UNIT-1: AC Sine Wave: Sinusoidal Voltage, Current, Amplitude, Time-period, Cycle, Frequency, Phase, Phase Difference, and their Units, Electrical Work, Power and Power Factor: Corresponding SI Units and Meters used to Measure them.

UNIT-2: Electrical Energy, SI Units and Meters used to Measure them, Single Phase and Three Phase Supply.

UNIT-3: Necessity of Protecting Devices, Various Types of Protective Devices, Fuse Wire or Fuse, Glass Cartridge Fuse, HRC Fuse, Kit-Kat Fuse.

UNIT-4: Electrical Machines, Batteries, UPS-Types and Cell, Transformer Working Principle, Transformation Ratio, Types of Transformers, Applications of Transformers, Working of Induction Motor, Types of Induction Motors.

Practical Experiments:

1. Study the generation of Sine wave, Square wave and triangular wave using CRO and function generator.
2. Generate and measurement of amplitude of AC quantity using CRO and function Generator.
3. Generate and measurement of time period of AC quantity using CRO and function generator.
4. Generate and measurement of frequency of AC quantity using CRO and function Generator.
5. Practice of soldering and de-soldering resistors in Series.
6. Practice of soldering and de-soldering resistors in Parallel.

Reference Books:

1. Basic Electronics-Solid State – B L Theraja - S Chand And Company Ltd
2. Electronic Devices And Circuit Theory – Robert L Boylestad And Louis Nashelsky (PHI)
3. Fundamentals of electrical & Electronics engineering – Vittalkumar K. Vagga & Murugesh P.D.

BASIC ELECTRONICS

(Teaching Hours = 30 Hours: THEORY: 3Hrs / Week & Practical: 2Hrs/Week)

SEMESTER-3

UNIT-1: Conductors, Insulators and Semiconductors, Identification of Types and Values of Resistors-Color Codes, PN Junction Diode: Symbol, Characteristics, Diode as Switch, Types, Ratings and Applications.

UNIT-2: Rectifier: Need for AC to DC Conversion, Bridge Rectifier with and without C Filter, Rectifier IC

UNIT-3: Transistor: Symbol, Structure and Working Principle, Comparison of Analog and Digital Signal with Examples. Binary Numbers, Boolean Identities and Laws, Digital System Building Blocks: Basic Logic Gates, Symbols and Truth Tables.

UNIT-4: Sensors Concept, Types of Sensors: Temperature, Pressure, Water, Light, Sound, Smoke, Proximity Sensors, Flow, Humidity, Voltage, Vibration, IR , (Principle/Working).

Practical Experiments:

1. Practice of soldering and de-soldering Capacitors in Series.
2. Practice of soldering and de-soldering Capacitors in Parallel.
3. Use of DMM in measurement of capacitors
4. Use of DMM in measurement of AC and DC voltages using DMM

Reference Books:

1. Basic Electronics-Solid State – B L Theraja - S Chand And Company Ltd
2. Electronic Devices And Circuit Theory – Robert L Boylestad And Louis Nashelsky (PHI)
3. Fundamentals of electrical & Electronics engineering – Vittalkumar K. Vagga & Murugesh P.D.

BASIC ELECTRONICS

(Teaching Hours = 30 Hours: THEORY: 3Hrs / Week & Practical: 2Hrs/Week)

SEMESTER-4

Unit-1: Bipolar Junction Transistor , Current operating device, Different types of transistors: PNP, NPN, Transistor configurations: CB, CE, CC, Transistor characteristics (input, and output curves and resistance formulas) in different transistor configuration. Relation between α , β , γ . Comparison between CB, CC and CE.

UNIT-2: BJT biasing: Need of DC load Line, Operating point, stabilization, thermal runaway, heat sink. Types of biasing: fixed biasing, base bias with emitter feedback, voltage divider.

Unit -3: BJT Amplifiers, Classification of amplifier, Single Stage Amplifier: Working , various currents (I_b , I_c , I_e formulas), Voltage gain of CE amplifier (no derivations required), Frequency response of CE amplifier.

UNIT-4: Multistage amplifiers: General Multistage BJT based amplifiers, Types of BJT amplifier coupling: Circuit diagram, operation frequency response and applications of Direct coupled, RC coupled ,BJT as a Switch.

Practical Experiments:

1. Transistor as a switch.
2. Input characteristics of BJT
3. Output Characteristics of BJT

Reference Books:

1. Basic Electronics-Solid State – B L Theraja - S Chand And Company Ltd
2. Electronic Devices And Circuit Theory – Robert L Boylestad And Louis Nashelsky (PHI)
3. Fundamentals of electrical & Electronics engineering – Vittalkumar K. Vagga & Murugesh P.D.

QUESTION PAPER PATTERN & MARKS DISTRIBUTION

Total marks = Theory Main Exam + IA marks

$$100 = 70 + 30$$

1. IA – 30 marks

(i) Theory test = 10 marks

(ii) Practical Record = 10 marks

(iii) Assignment = 10 marks

Total = 30 marks

2. Theory Exam - 50 marks.

I. Answer all the questions.

(2 marks – 10 multiple choice questions)

$$10 \times 2 = 20$$

II. Answer any FIVE of the Following.

(3 marks - 7 questions – total 5 to be answered)

$$5 \times 2 = 15$$

III. Answer any THREE of the Following.

(5 marks – 5 questions – total 3 to be answered.)

$$3 \times 5 = 15$$

3. Practical Exam - 20 marks.