

Sri Venkateswara University, Tirupati

Model Syllabus for 4-Year UG Honours in B.Sc. (Electronics) as Major in
consonance with Curriculum framework w.e.f. AY 2025-26

COURSE STRUCTURE (for Semester I to VI)

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
I	I	1	Fundamental of Electricity and Electronics	3	3
			Fundamental of Electricity and Electronics Practical Course	2	1
		2	Circuit theory and Electronic Devices	3	3
			Circuit theory and Electronic Devices Practical Course	2	1
	II	3	Semiconductor Devices and Materials	3	3
			Semiconductor Devices and Materials Practical Course	2	1
		4	Digital Electronics	3	3
			Digital Electronics Practical Course	2	1
II	III	5	Analog Circuits and Communication	3	3
			Analog Circuits and Communication Practical Course	2	1
		6	Microprocessor System	3	3
			Microprocessor System Practical Course	2	1
		7	Electrical and Electronics Instrumentation	3	3
			Electrical and Electronics Instrumentation Practical Course	2	1
	IV	8	Electronic Communication System	3	3
			Electronic Communication System Practical Course	2	1
		9	Microcontroller and Interfacing	3	3
			Microcontroller and Interfacing Practical Course	2	1
		10	Computer Network	3	3

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
			Computer Network Practical Course	2	1
III	V	11	Cellular Mobile Communication	3	3
			Cellular Mobile Communication Practical Course	2	1
		12 A	Industrial Electronics	3	3
			Industrial Electronics Practical Course	2	1
		OR			
		12 B	Embedded System Design	3	3
			Embedded System Design Practical Course	2	1
		13 A	Digital System Design	3	3
			Digital System Design Practical Course	2	1
		OR			
		13 B	Consumer Electronics	3	3
			Consumer Electronics Practical Course	2	1
	VI	14 A	Power Electronics	3	3
			Power Electronics Practical Course	2	1
		OR			
		14 B	VLSI Design	3	3
			VLSI Design Practical Course	2	1
		15 A	Principles and Utility of Electronic Domestic Applications	3	3
			Principles and Utility of Electronic Domestic Applications Practical Course	2	1
		OR			
		15 B	Digital Signal Processing	3	3
			Digital Signal Processing Practical Course	2	1

Note: In the III Year (during the V and VI Semesters), students are required to select a pair of electives from one of the Two specified domains. For example: if set 'A' is chosen, courses 12 to 15 to be chosen as 12 A, 13 A, 14 A and 15 A or if set 'B' is chosen, It is to be chosen as 12 B, 13 B, 14 B and 15 B to ensure in-depth understanding and skill development in the chosen domain, students must continue with the same domain electives in both the V and VI Semesters.

T. Ashuraman

SEMESTER - I

COURSE 1: FUNDAMENTALS OF ELECTRICITY AND ELECTRONICS

Theory

Credits: 3

3 hrs/week

Course Objectives:

The students will learn:

- 1) Basics of electrostatics, Gauss theorem and its applications, concept of a capacitor, various types of capacitors and dielectric constant, magnetic effects of current, cells and the measuring instruments like ammeter and voltmeter,
- 2) Basics of p-n junction, rectifying action of a diode, regulated power supplies and wave shaping circuits, and
- 3) Transistor and its three modes of operation, h-parameter model of a transistor and the frequency response of an amplifier.

UNIT-I (9 Hrs)

Electrostatics: Electric charges - Coulomb's law - Electric field - Electric intensity and electric potential - Relation between electric potential and intensity - Electric intensity and potential due to a uniform charged conducting sphere at a point outside and inside the conductor.

Electric dipole - Dipole moment - Intensity and potential due to a dipole - Statement and proof of Gauss law - Application of Gauss law to uniformly charged solid sphere.

UNIT-II (9 Hrs)

Capacitors: Definition and unit of capacity - Capacitance of a parallel plate capacitor - Effect of dielectric on capacity - Capacitors in series and parallel - Energy stored in a charged capacitors - Loss of energy on sharing of charges between two capacitors - Force of attraction between plates of charged parallel plate capacitor - Kelvin's attracted disc electrometer - Measurement of potential and dielectric constant.

Type of capacitors - Mica capacitor, Electrolytic capacitors, Variable air capacitor - Uses of capacitors.

UNIT-III (9 Hrs)

Electrical Measurements: Carey-Foster bridge - Determination of specific resistance - Potentiometer - Calibration of low and high range voltmeters - Calibration of Low range ammeter.

Magnetic Effect of Current: Biot-Savart's law - Force on a conductor carrying current placed in a magnetic field - Ampere's Law - Principle, construction and theory of a moving coil ballistic galvanometer.

UNIT-IV (9 Hrs)

Diode circuits and power Supplies: Junction diode characteristics - Half and full wave rectifiers - Expression for efficiency and ripple factor - Construction of low range power peak using diodes - Bridge rectifier - Filter circuits - Zener Diode - Characteristics - Regulated power supply using Zener diode -

UNIT-V (9 Hrs)

Transistor circuits: Characteristics of a transistor in CB, CE modes - Relative merits Graphical analysis in CE configuration - Transistor as an amplifier - RC coupled amplifier - Frequency response - h parameters.

Basis logic gates AND, OR, and NOT - Construction of basic logic gates.

Text Books :

1. Electricity and Magnetism - *M. Narayana moorthi and Others*, National Publishing Co., Chennai.
2. Electricity and Magnetism - *R. Murugesan*, S. Chand & Co. Ltd., New Delhi, Revised Edition, 2006.
3. Principles of Electronics - *V.K. Mehta*, S. Chand & Co., 4/e, 2001.
4. Basic Electronics - *B.L. Theraja*, S. Chand & Co., 4/c, 2001.

Reference Books :

1. Electricity and Magnetism - *Brijlal & Subrahmanyam*, Ratan Prakashan Mandir, Agra.
2. Fundamentals of Electricity and Magnetism - *B.D. Duggal & C.L. Chhabra*, Shoban Lal Nagin Chand & Co., Jallundur.
3. Physics, Vol. II - *Resnick, Halliday & Krane*, 5/e, John Wiley & Sons, Inc.,
4. Basic Electronics - *B. Groh*, McGraw - hill, 6/e, NY, 1989.
5. Elements of Electronics - *Bagde & Singh*, S. Chand

SEMESTER - I

COURSE 1: FUNDAMENTALS OF ELECTRICITY AND ELECTRONICS

Practical

Credits: 1

2 hrs/week

Course Objectives:

The students will learn:

- 1) Basics of electrostatics, Gauss theorem and its applications, concept of a capacitor, various types of capacitors and dielectric constant, magnetic effects of current, cells and the measuring instruments like ammeter and voltmeter,
- 2) Basics of p-n junction, rectifying action of a diode, regulated power supplies and wave shaping circuits, and
- 3) Transistor and its three modes of operation, h-parameter model of a transistor and the frequency response of an amplifier.

List of Experiments:

1. Kirchoff's verification
2. Logic Gates – Verification of Truth Tables
3. PN Junction Diode – V-I Characteristics
4. Zener Diode – V-I Characteristics
5. Zener Diode as a Voltage Regulator
6. Carey-Foster's Bridge.
7. Series and Parallel Combination of Resistors and Capacitors
8. Bridge Rectifier – L and π filters

T. Raghuraman

4- Year UG Honours, Major
Syllabus
(2025-26)
Semester-I

Model Question Paper

Time : 3hrs

Marks:75

Part-A

Answer any Five Questions. Each Question carries 3 Marks.

5x3=15

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

Answer the following questions. Each question carries 12 Marks

5x12=60

11. a) Unit-I
(Or)
b) Unit-I

12. a) Unit-II
(Or)
b) Unit-II

13. a) Unit-III
(Or)
b) Unit-III

14. a) Unit-IV
(Or)
b) Unit-IV

15. a) Unit-V
(Or)
b) Unit-V