

**SCHEME OF EXAMINATION
COURSE STRUCTURE & SYLLABUS
CHOICE BASED CREDIT SYSTEM (CBCS)
IN
M.Sc. ELECTRONICS PROGRAMME
with
Learning Outcomes based Curriculum Framework
(LOCF)
(Academic Year 2023-25)**



FACULTY OF SCIENCE

For Approval of Board of Studies in Electronics

Effective from Academic Session

JULY 2023

School of Studies in Electronics and Photonics
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Ramesh

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School of Studies in Electronics & Photonics
Pt. Ravishankar Shukla University, Raipur

CBCS in M. Sc. Electronics

Scheme & Syllabus

Session 2023-25

Course Code	Name of Course	Semester	Marks			Credit
			External	Internal	Total	
EL1	Basics of Electronics	CBCS II Semester	80	20	100	3
EL2	Fundamentals of Biomedical Equipments	CBCS III Semester	80	20	100	3

- Each elective paper comprises of three units and carries a total of 3 credits.
- Note: Student can earn maximum of 6 credits or minimum of 3 credits out of the aforesaid elective papers.
- The courses will be offered either during the second and the third semester.

CBCS II Semester

Session January-June 2024

EL1 Basics of Electronics

Course Objective:-This course introduces students to the basic components of electronics: diodes, transistors, op amps and Optoelectronics devices. It covers the basic operation and some common applications.

Course Outcomes:

- Student will able to develop a basic understanding in the area of electronics.
- Student will become aware about the electronics components and devices used in the daily life.

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Activities with direct bearing on Employability/ Entrepreneurship/ Skill development:

It helps to understand the Basics of Electronics.

Syllabus

Basic Electronics:

Introduction, Applications, Concepts of charge, potential, voltage, current, power and their units, Active and passive components,

Basic concepts and resistor circuits: Resistor and its color codes, AC signals

AC circuits: Introduction, Capacitors, Inductors RC circuits, Response to a sine wave.

Overview of Analog circuitry:

Introduction to semiconductors, Conductors, Insulators, Diode and its type, Transistor and its types- NPN & PNP, Transistor as an amplifier and switch. Introduction to MOSFETS, Operational Amplifiers and Integrated Circuits

Optoelectronic Devices: LED, Solar cell, Photo diode

Digital Electronics- Analog vs digital signals, Concept of amplitude and frequency, Number system and their conversions, Boolean arithmetic, De – Morgan laws, basic logic gates: their realization, Universal gates, Exclusive – OR and Exclusive NOR-gates, half adder, full adder, half subtractor

Text Books

- [1] Basic Electronics for Scientists and Engineers, Dennis L. Eggleston, Cambridge University Press.
- [2] Basic Electronics and Linear Circuit by N. N. Bhargava, DC Kulshreshtha and S. C. Gupta, Tata McGraw-Hill
- [3] Electronic Devices and Circuit Theory, 9th ed. Boylestad&Nashelsky, PHI
- [4] Digital Principal and Application - Malvino Leach, Tata Macgraw Hill
- [5] Modern Digital Electronics - R.P. Jain, Tata Mcgraw

References

- [6] Basic Electronics Solid State by B. L. Thereja, S Chand
- [7] Electronic Devices & Circuit Analysis – K Lal Kishore, BS Publications

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CBCS III Semester
Session July-Dec 2024

EL2 Fundamentals of Biomedical Equipments

Course Objective:-This course constructs the foundation of concept to introduce the biomedical instruments. It will also familiarize the students with some biomedical diagnostic and treatment instruments.

Course Outcomes:

- Student will able to develop a basic understanding of biomedical equipment.
- Student will become aware about the working of some human organs as well as devices used in the diagnostic and treatment.

Activities with direct bearing on Employability/ Entrepreneurship/ Skill development:

It helps to understand the Fundamentals of Biomedical Equipments

Syllabus

Basics of measuring instruments of electronics:

Overview of electricity, Circuit basics, Concept of various measuring parameters- voltage, current, power, ohm's law, Kirchhoff's law.

Network Theorems: Thevenin's theorem, Norton's theorem, maximum power transfer

Biomedical equipment overview:

Electronics and Medicine, medical electronics, Importance of measuring instruments in Biomedical, Overview of Electrocardiograph- operation, origin of the ECG waveform

Electroencephalography (EEG) - Signal sources, Recording modes, Applications of the

EEG; Techniques to Aid observation- X-ray and Radiography, Diagnostic Ultrasound

Measuring Instrument- Oximeters, Blood flowmeters

Text Books-

- Principles of Medical Electronics and Biomedical Instrumentation- C. Raja Rao, S. K. Guha, Universities Press (India Limited)
- Introduction to Biomedical Instrumentation- Mandeep Singh, PHI Learning Pvt. Ltd.

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Reference Books-

- Biomedical instrumentation and measurements – Leslie Cromwell, Fred J. Weibell, Erich A. Pfeiffer
- Measurements And Instrumentation- A.V.Bakshi U.A.Bakshi, Technical publication, Pune
- Biomedical Instrumentation and Measurement- R. Anandanatarajan, PHI
- Handbook of Biomedical Instrumentation, 3rd Edition by R. S. Khandpur, McGraw Hill Publication

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