



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore
Shri Vaishnav Institute of Paramedical Science
Choice-Based Credit System (CBCS) in Light of NEP-2020
General Electives (UG 2024 – 25), III SEM

Subject Code	Category	Subject Name	Teaching and Evaluation Scheme								
			Theory			Practical		L	T	P	CREDITS
			End Sem University Exam	Two Term Exam	Teachers Assessment	End Sem University Exam	Teachers Assessment				
GUPMS301	GE	Biomedical Instrumentation	60	20	20	-	-	4	0	0	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; *

Teacher Assessment shall be based on the following components: Quiz/Assignment/Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs): The students will:

CEOs 1: Understand the importance of Biomedical instruments in the medical field.

CEOs 2: Know about principles and working procedures of medical instruments.

Course Outcomes (COs): Students should be able to:

COs 1: Understand the concept of basic principles of Biomedical instruments.

COs 2: Learn different methods for determination of pathophysiological parameters.

UNIT- 1

General Introduction to Biomedical Instruments:

- Overview of the field, importance, and applications in healthcare.
- Basic principles and objectives of biomedical instrumentation.

UNIT -2

Imaging Techniques in Biomedical Instrumentation:

- X-ray imaging principles and applications.
- Ultrasound imaging: principles, transducers, Doppler effect.
- MRI (Magnetic Resonance Imaging) basics and safety considerations.

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UNIT-3

Medical Instrumentation Standards and Safety:

- Regulatory standards (e.g., FDA regulations).
- Safety considerations in medical device design and use.
- Risk management and quality assurance in instrumentation.

UNIT-4

Emerging Technologies in Biomedical Instrumentation:

- Wearable health devices.
- Bioinformatics and medical informatics.
- Nanotechnology applications in medicine.

UNIT-5

Ethical and Social Implications:

- Ethical considerations in biomedical research and device development.
- Privacy issues in biomedical data management.
- Social impact of biomedical instrumentation on healthcare delivery.

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Suggested Books:

1. **"Biomedical Instrumentation and Measurements"** by R. Ananda Natarajan, Tata McGraw Hill Education, 2012
2. **"Biomedical Instrumentation: Technology and Applications"** by R.S. Khandpur, Tata McGraw Hill Education, 2004 (Latest edition may have been updated since then)
- 3 **"Biomedical Instrumentation: Principles and Applications"** by V.G. Soman and S.V. Mani, Tata McGraw Hill Education, 2001
- 4 **"Biomedical Instrumentation and Measurements"** by A.J. Ezhil Vilian and S. Rajkumar, PHI Learning Private Limited, 2013
5. **"Biomedical Instrumentation and Measurements"** by Leslie Cromwell, Fred J. Weibell, and Erich A. Pfeiffer, Prentice Hall, 2011 (8th edition)

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