

Biomaterials [BM]

S.E. Sem. III [BIOM]

EVALUATION SYSTEM

	Time	Marks
Theory Exam	3 Hrs.	100
Practical & Oral Exam	–	–
Oral Exam	2 Hrs.	25
Term Work	–	25

SYLLABUS

1. Introduction

Introduction of Biomaterials, Classification of Biomaterials.

2. Properties and Applications of Metallic Biomaterials

Stainless steel, Titanium, Titanium based alloys, Cobalt – Chromium alloys in fabrication of biodevices and implants.

3. Properties and Applications of Polymeric Biomaterials

Classification, polyurethanes, PTFE, Polyethylene, Polypropylene, Polyacrylates, PMMA, PHEMA, Hydrogel, Silicone rubber, Biopolymer in fabrication of biodevices and implants.

4. Properties and Applications of Ceramic Biomaterials

Bioceramics-classifications, Alumina, Zirconia and types, Bioglass. Hydroxyapatite, Tricalcium phosphate in fabrication of biodevices and implants.

5. Composite Biomaterials

Properties and Applications of Composite Biomaterials in fabrication of biodevices and implants.

6. Properties and Applications of Degradable Biomaterials

Polymers and Ceramics in fabrication of biodevices and implants.

7. Biomaterials for Soft Tissue Replacements

Properties and Applications of biomaterials for Soft Tissue Replacements.

8. Properties and Applications of Materials used in Prosthetics

The Indigenous metals and their alloys, Different types of leather, Types of rubber, Thermoplastic and thermosetting resins, Wood and binding materials.

9. Surface properties of Biomaterials

Surface properties of Biomaterials and their testing with reference to biological safety.

10. Testing of Biomaterials

Biological Testing of Biomaterials, Biocompatibility of Materials, Biomaterials corrosion and wear.

Reference :

1. Biomaterial Science and Engineering (*J.V. Park*) Planum Press-New York.
2. Fundamentals of Biomedical engineering (*G.S. Sawhney*) New Age International Publication.
3. Biomaterial Science : An Introduction to Materials in Medicine (*Rotner & Hoffmann*).
4. Encyclopaedia of Medical Devises and Instrumentation (*John G. Webster*) Vol. 1, 2, 3, 4; Marcel Dekkar Publication.

5. Encyclopaedia – Handbook of Biomaterials and Bioengineering : Part–A : Materials Vol. 1, 2; Part–B : Applications Vol.1, 2; Marcel Dekkar Publication.
6. Design Engineering on Biomaterials for Medical Devices (*David Hill*) John Willey Publication.
7. Biomaterials & Bioengineering Handbook (*Donald L. Wise*).
8. Biological Performance of Materials (*Jonathan Black*) Marcel Dekkar Inc. New York, Basel, Hong Kong.

