



**VEL TECH MULTI TECH
Dr RANGARAJAN Dr.SAKUNTHALA
ENGINEERING COLLEGE**

(An ISO 9001: 2008 Certified Institution)
(Owned by 'VEL Shree R. Rangarajan
Dr. Sakunthala Rangarajan Educational Academy)
(Approved by AICTE, New Delhi &
Govt. of Tamil Nadu and affiliated to Anna University)



SYLLABUS

WEEKLY SCHEDULE

VIII SEMESTER

2014 - 2015

DEPARTMENT OF BIO MEDICAL

IV DEGREE COURSE

42, Avadi – Alamathi Road,
Chennai – 600062
Telefax – 044-26841061
E-mail: veltech@md3.vsnl.net.in
Website : www.vel-tech.org



SEM : VIII

YEAR : IV

ACADEMIC YEAR: 2014 – 2015

| Sl.No | WEEKS | DATE | |
|--------------|--------------|-------------|-----------|
| | | FROM | TO |
| 1 | WEEK1 | 02.01.15 | 09.01.15 |
| 2 | WEEK2 | 12.01.15 | 16.01.15 |
| 3 | WEEK3 | 19.01.15 | 23.01.15 |
| 4 | WEEK4 | 27.01.15 | 30.01.15 |
| 5 | WEEK5 | 02.02.15 | 06.02.15 |
| 6 | WEEK6 | 09.02.15 | 13.02.15 |
| 7 | WEEK7 | 16.02.15 | 20.02.15 |
| 8 | WEEK8 | 23.02.15 | 27.02.15 |
| 9 | WEEK9 | 02.03.15 | 06.03.15 |
| 10 | WEEK10 | 09.03.15 | 13.03.15 |
| 11 | WEEK11 | 16.03.15 | 20.03.15 |
| 12 | WEEK12 | 23.03.15 | 27.03.15 |
| 13 | WEEK13 | 30.03.15 | 01.04.15 |
| 14 | WEEK14 | 06.04.15 | 10.04.15 |
| 15 | WEEK 15 | 13.04.15 | 17.04.15 |
| 16 | WEEK16 | 20.04.15 | 24.04.15 |
| 17 | WEEK17 | 27.04.15 | 30.04.15 |

CONTENTS

| THEORY | | |
|------------------|-----------------|----------------------------|
| SI.NO | SUB.CODE | SUBJECT |
| 1 | BM2025 | Assist Devices |
| 2 | BM2026 | Medical Imaging Techniques |
| PRACTICAL | | |
| 3 | BM2451 | Project Work |

TEST SCHEDULE

| SL.NO | SUBJECT CODE | SUBJECT NAME | UNIT TEST I | UNIT TEST II | UNIT TEST III | UNIT TEST IV | UNIT TEST V |
|--------------|---------------------|----------------------------|--------------------|---------------------|----------------------|---------------------|--------------------|
| 1 | BM2025 | Assist Devices | 22.01.15 FN | 11.02.15 FN | 03.03.15 FN | 23.03.15 FN | 13.04.15 FN |
| 2 | BM2026 | Medical Imaging Techniques | 22.01.15 AN | 11.02.15 AN | 03.03.15 AN | 23.03.15 AN | 13.04.15 AN |

MODEL EXAM

| SI.NO | DATE | SUB.CODE | SUBJECT |
|--------------|-------------|-----------------|----------------------------|
| 1 | 20.04.2015 | BM2025 | Assist Devices |
| 2 | 21.04.2015 | BM2026 | Medical Imaging Techniques |

BM2025 ASSIST DEVICES

UNIT I CARDIAC ASSIST DEVICES

WEEK1:

Principle of External counter pulsation techniques, intra aortic balloon pump,

WEEK2:

Auxillary ventricle and schematic for temporary bypass of left ventricle,

WEEK3:

Prosthetic heart valves.

UNIT II HEMODIALYSERS

WEEK4: UNIT TEST-1

Artificial kidney, Dialysis action, hemodialyser unit, membrane dialysis,

WEEK 5:

Portable dialyser monitoring and functional parameters

UNIT III HEARING AIDS

WEEK6: UNIT TEST-2

Common tests – audiograms, air conduction, bone conduction, masking techniques, SISI

WEEK7:

Hearing aids – principles, drawbacks in the conventional unit, DSP based hearing aids.

UNIT IV PROSTHETIC AND ORTHODIC DEVICES

WEEK8: UNIT TEST-3

WEEK9:

Hand and arm replacement – different types of models

WEEK10:

Externally powered limb prosthesis, feedback in orthodic system

WEEK11:

Functional electrical stimulation, sensory assist devices.

WEEK 12:**UNIT TEST-4****UNIT V RECENT TRENDS****WEEK 13:**

Transcutaneous electrical nerve stimulator, bio-feedback.

WEEK14:**UNIT TEST-5 & REVISION FOR FIVE UNITS****WEEK 15:****MODEL EXAM****WEEK16:****MODEL EXAM****TEXT BOOKS**

1. Levine S.N. (ed), “Advances in Bio-medical engineering and Medical physics”, Vol. I, II, IV, inter university publications, New York, 1968 (Unit I, IV, V).
2. Kolff W.J, “Artificial Organs”, John Wiley and sons, New York, 1976. (Unit II).
3. Albert M.Cook and Webster J.G, “Therapeutic Medical Devices”, Prentice Hall Inc., New Jersey, 1982 (Unit III).

BM2026 MEDICAL IMAGING TECHNIQUES

UNIT I ULTRASOUND IN MEDICINE

WEEK1:

Production of ultrasound – properties and principles of image formation, capture and display

WEEK2:

Principles of A-mode, B-mode and M-mode display –

WEEK3:

Doppler ultra sound and colour flow mapping – applications of diagnostic ultra sound.

UNIT II X-RAY COMPUTED TOMOGRAPHY

WEEK4: UNIT TEST-1

Principles of sectional imaging – scanner configuration – data acquisition system – image formation principles

WEEK 5:

Conversion of x-ray data in to scan image – 2-D image reconstruction techniques –Iteration and Fourier method – types of CT scanners

UNIT III MAGNETIC RESONANCE IMAGING

WEEK6: UNIT TEST-2

Principles of MRI pulse sequence – image acquisition and reconstruction techniques

WEEK7:

MRI instrumentation magnetic gradient system RF coils

WEEK8:

Receiver system functional

WEEK 9:

MRI – Application of MRI

UNIT IV RADIO ISOTOPIC IMAGING

WEEK10: UNIT TEST-3

Rectilinear scanners – linear scanners – SPECT

WEEK11:

PET Gamma camera radio nuclides for imaging – emission computed CT

UNIT V INFRA RED IMAGING

Physics of thermography – imaging systems

WEEK12:

UNIT TEST-4

WEEK13:

–pyroelectric vidicon camera clinical thermography – liquid crystal thermography.

WEEK14:

UNIT TEST-5 & REVISION FOR FIVE UNITS

WEEK 15:

MODEL EXAM

WEEK16:

MODEL EXAM

TEXT BOOK:

1. Steve Webb, “The physics of medical imaging”, Adam Hilger, Bristol, England, Philadelphia, USA, 1988.

REFERENCES:

1. A. C. Kak, “principles of computed tomography”, IEEE press, Newyork
2. G. A. Hay, “Medical Image formation perception and measurement”,
3. Divyendu Sinha & Edward R.Dougherty, “Introduction to Computer Based Imaging Systems”, PHI, 2003.