1. Title of the Courses offered in Allied Health Sciences:

1. Bachelor of Science in Medical Laboratory Technology [B.Sc. (M.L.T.)]
2. Bachelor of Science in Operation Theatre Technology [B.Sc. O.T. Technology]
3. Bachelor of Science in Cardiac Care Technology [B.Sc Cardiac Care Technology]
4. Bachelor of Science in Perfusion Technology [B.Sc. Perfusion Technology]
5. Bachelor of Science in Neuro Science Technology [B.Sc. Neuro Science Technology]
6. Bachelor of Science in Renal Dialysis Technology [B.Sc. Renal Dialysis Technology]
7. Bachelor of Science in Respiratory Care Technology [B.Sc. Respiratory Care Technology]
8. Bachelor of Science in Anaesthesia Technology [B.Sc. Anaesthesia Technology]
9. Bachelor of Science in Imaging Technology [B.Sc. Imaging Technology]
10. Bachelor of Science in Radiotherapy Technology [B.Sc. Radiotherapy Technology]

2. Eligibility for admission:

A candidate seeking admission to the Bachelor of Science Degree Courses in the Allied Health Sciences course from Sl.No. 1 to 10 shall have studied English as one of the principal subject during the tenure of the course and for those seeking admission to the Bachelor of Science Degree Courses in the Allied Health Sciences courses from Sl.No. 1 to 8 mentioned above except for B.Sc. Imaging Technology and B.Sc. Radiotherapy Technology shall have passed:

1. Two year Pre-University examination or equivalent as recognized by Rajiv Gandhi University of Health Sciences with, Physics, Chemistry and Biology as principle subjects of study.

   OR

2. Pre-Degree course from a recognized University considered as equivalent by RGUHS, (Two years after ten years of schooling) with Physics, Chemistry and Biology as principal subjects of study.

   OR
3. Any equivalent examination recognized by the Rajiv Gandhi University of Health Sciences, Bangalore for the above purpose with Physics, Chemistry and Biology as principal subjects of study.

OR

4. The vocational higher secondary education course conducted by Vocational Higher Secondary Education, Government of Kerala with five subjects including Physics, Chemistry, Biology and English in addition to vocational subjects conducted is considered equivalent to plus TWO examinations of Government of Karnataka Pre University Course.

OR

5. Candidates with two years diploma from a recognized Government Board in a subject for which the candidate desires to enroll, in the respective Allied Health Sciences course mentioned in Sl. No. 1 to 10 shall have passed plus 12 [10+2] with Physics, Chemistry and Biology, as principal subjects or candidates with 3 years diploma from a recognized Government Board in a subject for which the candidate desires to enroll, in the respective Allied Health Sciences course mentioned in Sl. No. 1 to 10 should have studied Physics, Biology and Chemistry as principal subjects during the tenure of the course.

OR

Lateral entry to second year for allied health science courses for candidates who have passed diploma program from the Government Boards and recognized by RGUHS and these students are eligible to take admission on lateral entry system only in the same subject studied at diploma level from the academic year 2008-09 vide RGUHS Notification no. AUTH/AHS/317/2008-09 dated 01.08.2008.

6. Lateral entry to second year for allied health science courses for candidates who have passed diploma program from the Government Boards and recognized by RGUHS, fulfilling the conditions specified above under sl. No. 5 and these students are eligible to take admission on lateral entry system only in the same subject studied at diploma level from the academic year 2008-09 vide RGUHS Notification no. AUTH/AHS/317/2008-09 dated 01.08.2008.

7. In case of admission to B.Sc. Imaging Technology or B.Sc. Radiotherapy Technology the candidate should have passed Pre-University or equivalent examination with Physics, Chemistry, Biology and Mathematics, as principal subjects of study.

Note:

a. The candidate shall have passed individually in each of the principal subjects.

b. Candidates who have completed diploma or vocational course through Correspondence shall not be eligible for any of the courses mentioned above.
3. Duration of the course:
   Duration shall be for a period of three and half years including six months of Internship.

4. Medium of instruction:
   The medium of instruction and examination shall be in English.

5. Scheme of examination:
   There shall be three examinations one each at the end of 1st, 2nd and 3rd year.

6. Attendance
   Every candidate should have attended at least 80% of the total number of classes conducted in an academic year from the date of commencement of the term to the last working day as notified by university in each of the subjects prescribed for that year separately in theory and practical. Only such candidates are eligible to appear for the university examinations in their first attempt. Special classes conducted for any purpose shall not be considered for the calculation of percentage of attendance for eligibility. A candidate lacking in prescribed percentage of attendance in any subject either in theory or practical in the first appearance will not be eligible to appear for the University Examination in that subject.

7. Internal Assessment (IA):
   Theory - 20 marks.
   Practical - 20 marks. [Lab work-12 marks and Record-8 marks]

   There shall be a minimum of two periodical tests preferably one in each term in theory and practical of each subject in an academic year. The average marks of the two tests will be calculated and reduced to 20. The marks of IA shall be communicated to the University at least 15 days before the commencement of the University examination. The University shall have access to the records of such periodical tests.

   The marks of the internal assessment must be displayed on the notice board of the respective colleges within a fortnight from the date test is held.

   If a candidate is absent for any one of the tests due to genuine and satisfactory reasons, such a candidate may be given a re-test within a fortnight.

   * There shall be no University Practical Examination in First year.

8. Subject and hours of teaching for Theory and Practicals
   The number of hours of teaching theory and practical subject wise in first year, second year and third year are shown in Table-I, Table-II and Table-III

   Main and Subsidiary subjects are common in first year for all the courses in Allied Health Science.
The number of hours for teaching theory and practical for main subjects in first, second and third year are shown in Table-I, II and III.

**Table - I Distribution of Teaching Hours in First Year Subjects**

<table>
<thead>
<tr>
<th>Main Subjects</th>
<th>Theory No. of Hours</th>
<th>Practical No. of Hours</th>
<th>Total No. of Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>S L No</td>
<td>Subject</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Human Anatomy</td>
<td>70</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>Physiology</td>
<td>70</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Biochemistry</td>
<td>70</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>Pathology-[Clinical pathology, Haemotology &amp; Blood - Banking]</td>
<td>70</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>Microbiology</td>
<td>70</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>350</td>
<td>100</td>
</tr>
</tbody>
</table>

The classes in main and subsidiary subjects are to be held from Monday to Thursday. On Fridays and Saturdays students shall work in hospitals in the respective specialty or department chosen by them.

**Subsidiary Subjects**

- **English**: 25 Hours
- **Kannada**: 25 Hours
- **Health-Care**: 40 Hours
- **Hospital posting –470 Hours**: Fri day 9am – 1pm and 2pm - 4-30 pm, Saturday 9am - 1pm
### Table - II Distribution of Teaching Hours in Second Year Subjects

<table>
<thead>
<tr>
<th>S L No</th>
<th>Subject</th>
<th>Theory No. of Hours</th>
<th>Practical No. of Hours</th>
<th>Clinical posting</th>
<th>Total No. of Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Medicine relevant cardiac care to technology</td>
<td>50</td>
<td>--</td>
<td>--</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>Section A Applied Pathology</td>
<td>30</td>
<td>30</td>
<td>--</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>Section B Applied Microbiology</td>
<td>30</td>
<td>30</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Applied Pharmacology</td>
<td>50</td>
<td>--</td>
<td>--</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>Introduction to Cardiac care Technology</td>
<td>80</td>
<td>100</td>
<td>650</td>
<td>830</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>240</strong></td>
<td><strong>160</strong></td>
<td><strong>650</strong></td>
<td><strong>1050</strong></td>
</tr>
</tbody>
</table>

**Subsidiary Subjects**

- Sociology: 20 Hours
- Constitution of India: 10 Hours
- Environmental Science & Health: 10 Hours

### Table –III Distribution of Teaching Hours in Third Year Subjects

<table>
<thead>
<tr>
<th>S L No</th>
<th>Subject</th>
<th>Theory No. of Hours</th>
<th>Practical No. of Hours</th>
<th>Clinical posting</th>
<th>Total No. of Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cardiac care Technology – Clinical</td>
<td>50</td>
<td>50</td>
<td>250</td>
<td>350</td>
</tr>
<tr>
<td></td>
<td>Cardiac care Technology – Applied</td>
<td>50</td>
<td>50</td>
<td>250</td>
<td>350</td>
</tr>
<tr>
<td>---</td>
<td>----------------------------------</td>
<td>----</td>
<td>----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>2</td>
<td>Cardiac care Technology – Advanced</td>
<td>50</td>
<td>50</td>
<td>250</td>
<td>350</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>150</td>
<td>150</td>
<td>750</td>
<td>1050</td>
</tr>
</tbody>
</table>

**Subsidiary Subjects**

- Ethics, Database Management 50 Hours
- Research & Biostatistics 20 Hours
- Computer application 10 Hours

9. **Schedule of Examination**:  
The university shall conduct two examinations annually at an interval of not less than 4 to 6 months as notified by the university from time to time. A candidate who satisfies the requirement of attendance, progress and conduct as stipulated by the university shall be eligible to appear for the university examination. Certificate to that effect shall be produced from the Head of the institution along with the application for examination and the prescribed fee.

10. **Scheme of Examination**

There shall be three examinations, one each at the end of I, II and III year. The examination for both main and subsidiary subjects for all courses in Allied Health Sciences shall be common in the first year. Distribution of Subjects and marks for First Year, Second year & Third year University theory and practical Examinations are shown in the Table – IV, V & VI.

The University examination for 1st year shall consist of only theory examination and there shall be no University Practical Examination.

The University examination for 2nd and 3rd year shall consist of
- Written Paper & Practicals
- Written Examinations consists of 4 papers in the 2nd Year
- 3 papers in the 3rd Year.

Practical examination:
- Two practical examination at the end 2nd Year and one practical examination at the end of the 3rd year.
# TABLE-IV

Distribution of Subjects and marks for First Year University theory Examination

<table>
<thead>
<tr>
<th>A</th>
<th>Main Subjects*</th>
<th>Written Paper</th>
<th>I.A Theory</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Duration</td>
<td>Marks</td>
<td>Marks</td>
</tr>
<tr>
<td>1</td>
<td>Basic Anatomy</td>
<td>3 hours</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>[Including Histology]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Physiology</td>
<td>3 hours</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Biochemistry</td>
<td>3 hours</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>Pathology</td>
<td>3 hours</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>Microbiology</td>
<td>3 hours</td>
<td>80</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B</th>
<th>Subsidiary Subject**</th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>English</td>
<td>3 hours</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>Kannada</td>
<td>3 hours</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Health Care</td>
<td>3 hours</td>
<td>80</td>
<td>20</td>
</tr>
</tbody>
</table>

Note: * I.A = Internal Assessment  
Main Subjects shall have University Examination.  
There Shall be no University Practical Examination.  
** Subsidiary subjects: Examination for subsidiary subjects shall be conducted by respective colleges.
TABLE – V
Distribution of Subjects and marks for Second Year Examination.

<table>
<thead>
<tr>
<th>Paper</th>
<th>Subjects</th>
<th>Theory</th>
<th>Viva-voca</th>
<th>IA</th>
<th>Sub Total</th>
<th>Practicals</th>
<th>I.A.</th>
<th>Sub Total</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Section A - Applied Pathology</td>
<td>50</td>
<td>30</td>
<td>20</td>
<td>150</td>
<td>40</td>
<td>10</td>
<td>50</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td>Section B - Applied Microbiology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Introduction to Cardiac care Technology</td>
<td>100</td>
<td>30</td>
<td>20</td>
<td>150</td>
<td>40</td>
<td>10</td>
<td>50</td>
<td>200</td>
</tr>
<tr>
<td>III</td>
<td>Applied Pharmacology</td>
<td>80</td>
<td>--</td>
<td>20</td>
<td>100</td>
<td>No Practicals</td>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>IV</td>
<td>Medicine relevant to technology</td>
<td>80</td>
<td>--</td>
<td>20</td>
<td>100</td>
<td>No Practicals</td>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Distribution of Subsidiary Subjects and marks for Second Year Examination

<table>
<thead>
<tr>
<th>B</th>
<th>Subsidiary Subject**</th>
<th>Duration</th>
<th>Marks</th>
<th>I.A. Theory Marks</th>
<th>Total Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sociology</td>
<td>3 hours</td>
<td>80</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Constitution of India</td>
<td>3 hours</td>
<td>80</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Environmental Science &amp; Health</td>
<td>3 hours</td>
<td>80</td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

** Subsidiary subjects : Examination for subsidiary subjects shall be conducted by respective colleges
TABLE – VI
Distribution of Subjects and marks for Third Year Examination.

<table>
<thead>
<tr>
<th>Paper</th>
<th>Subjects</th>
<th>Theory</th>
<th>Viva- voca</th>
<th>IA</th>
<th>Sub Total</th>
<th>Practicals</th>
<th>I.A.</th>
<th>Sub Total</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Cardiac care Technology – Clinical</td>
<td>100</td>
<td>30</td>
<td>20</td>
<td>150</td>
<td>120 (40+40+40)</td>
<td>30</td>
<td>150</td>
<td>600</td>
</tr>
<tr>
<td>II</td>
<td>Cardiac care Technology – Applied</td>
<td>100</td>
<td>30</td>
<td>20</td>
<td>150</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Cardiac care Technology – Advanced</td>
<td>100</td>
<td>30</td>
<td>20</td>
<td>150</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Practicals-One common practical for all the three papers with equal weight age of marks i.e. 40 practical mark and 10 I.A. marks for each paper.

Distribution of Subsidiary Subjects and marks for Second Year Examination

<table>
<thead>
<tr>
<th>B</th>
<th>Subsidiary Subject**</th>
<th>Duration</th>
<th>Marks</th>
<th>I .A Theory Marks</th>
<th>Total Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ethics, Database Management</td>
<td>3 hours</td>
<td>80</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Research &amp; Biostatistics</td>
<td>3 hours</td>
<td>80</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Computer application</td>
<td>3 hours</td>
<td>80</td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

** Subsidiary subjects : Examination for subsidiary subjects shall be conducted by respective colleges

11. Pass criteria
11.1. First year examination.
   a. Main Subjects: A candidate is declared to have passed in a subject, if he/she secures, 50% of marks in University Theory exam and internal assessment added together.

   b. Subsidiary Subjects: The minimum prescribed marks for a pass in subsidiary subject shall be 35% of the maximum marks prescribed for a subject. The marks obtained in the subsidiary subjects shall be communicated to the University before the Commencement of the University examination.
11.2. Second and Third year Examination

a. Main Subjects: A candidate is declared to have passed the Examination in a subject if he/she secures 50% of the marks in theory and 50% in practical separately. For a pass in theory, a candidate has to secure a minimum of 40% marks in the University conducted written examination, and 50% in aggregate in the University conducted written examination, internal assessment and Viva-Voce added together and for pass in Practical, a candidate has to secure a minimum of 40% marks in the university conducted Practical/Clinical examination and 50% in aggregate i.e. University conducted Practical/Clinical and Internal Assessment.

b. Subsidiary Subjects: The minimum prescribed marks for a pass in subsidiary subject shall be 35% of the maximum marks prescribed for a subject. The marks obtained in the subsidiary subjects shall be communicated to the University before the commencement of the University examination.

12. Carry over benefit

12.1 First year examination:
A candidate who fails in any two of the five main subjects of first year shall be permitted to carry over those subjects to second year. However, he/she must pass the carry over subjects before appearing for second year examination; otherwise he/she shall not permitted to proceed to third year.
12.2. Second year examination.
A candidate is permitted to carry over any one main subject to the third year but shall pass this subject before appearing for the third year examination.

13. Eligibility for the award of Degree:
A candidate shall have passed in all the subjects of first, second and third year to be eligible for award of degree.

14. Distribution of Type of Questions and Marks for Various Subjects

<table>
<thead>
<tr>
<th>THEORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUBJECTS HAVING MAXIMUM MARKS = 100</td>
</tr>
<tr>
<td>TYPE OF QUESTION</td>
</tr>
<tr>
<td>ESSAY TYPE</td>
</tr>
<tr>
<td>SHORT ESSAY TYPE</td>
</tr>
<tr>
<td>SHORT ANSWER TYPE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUBJECTS HAVING MAXIMUM MARKS = 80</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE OF QUESTION</td>
</tr>
<tr>
<td>ESSAY TYPE</td>
</tr>
<tr>
<td>SHORT ESSAY TYPE</td>
</tr>
<tr>
<td>SHORT ANSWER TYPE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUBJECTS HAVING MAXIMUM MARKS = 60</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE OF QUESTION</td>
</tr>
<tr>
<td>ESSAY TYPE</td>
</tr>
<tr>
<td>SHORT ESSAY TYPE</td>
</tr>
<tr>
<td>SHORT ANSWER TYPE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUBJECTS HAVING MAXIMUM MARKS = 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE OF QUESTION</td>
</tr>
<tr>
<td>ESSAY TYPE</td>
</tr>
<tr>
<td>SHORT ESSAY TYPE</td>
</tr>
<tr>
<td>SHORT ANSWER TYPE</td>
</tr>
</tbody>
</table>
RAJIV GANDHI UNIVERSITY OF HEALTH SCIENCES, KARNATAKA, BANGALORE.

SYLLABUS FOR FIRST YEAR DEGREE COURSES IN ALLIED HEALTH SCIENCE

B.Sc Cardiac Care Technology

ANATOMY

No. of theory classes: 70 hours
No. of practical classes: 20 hours

Introduction: human body as a whole
Theory:
Definition of anatomy and its divisions
Terms of location, positions and planes
Cell and its organelles
Epithelium-definition, classification, describe with examples, function
Glands-classification, describe serous & mucous glands with examples
Basic tissues – classification with examples
Practical: Histology of types of epithelium
Histology of serous, mucous & mixed salivary gland

Locomotion and support
Theory:
Cartilage – types with example & histology
Bone – Classification, names of bone cells, parts of long bone, microscopy of compact bone, names of all bones, vertebral column, intervertebral disc, fontanelles of fetal skull
Joints – Classification of joints with examples, synovial joint (in detail for radiology)
Muscular system: Classification of muscular tissue & histology
Names of muscles of the body
Practical: Histology of the 3 types of cartilage
Demo of all bones showing parts, radiographs of normal bones & joints
Histology of compact bone (TS & LS)
Demonstration of all muscles of the body
Histology of skeletal (TS & LS), smooth & cardiac muscle

3. Cardiovascular system

Theory:
Heart-size, location, chambers, exterior & interior
Blood supply of heart
Systemic & pulmonary circulation
Branches of aorta, common carotid artery, subclavian artery, axillary artery, brachial artery, superficial palmar arch, femoral artery, internal iliac artery
Peripheral pulse
Inferior venacava, portal vein, portosystemic anastomosis
Great saphenous vein
Dural venous sinuses
Lymphatic system- cisterna chyli & thoracic duct
Histology of lymphatic tissues
Names of regional lymphatics, axillary and inguinal lymph nodes in brief
Practical:
Demonstration of heart and vessels in the body
Histology of large artery, medium sized artery & vein, large vein
Microscopic appearance of large artery, medium sized artery & vein, large vein pericardium
Histology of lymph node, spleen, tonsil & thymus
Normal chest radiograph showing heart shadows
Normal angiograms

4. Gastro-intestinal system
Theory:
Parts of GIT, Oral cavity (lip, tongue (with histology), tonsil, dentition, pharynx, salivary glands, Waldeyer’s ring)
Oesophagus, stomach, small and large intestine, liver, gall bladder, pancreas
Radiographs of abdomen

5. Respiratory system
Parts of RS, nose, nasal cavity, larynx, trachea, lungs, bronchopulmonary segments
Histology of trachea, lung and pleura
Names of paranasal air sinuses
Practical: Demonstration of parts of respiratory system.
Normal radiographs of chest
Histology of lung and trachea

6. Peritoneum
Theory: Description in brief
Practical: Demonstration of reflections

7. Urinary system
Kidney, ureter, urinary bladder, male and female urethra
Histology of kidney, ureter and urinary bladder
Practical: demonstration of parts of urinary system
Histology of kidney, ureter, urinary bladder
Radiographs of abdomen-IVP, retrograde cystogram

8. Reproductive system
Theory:
Parts of male reproductive system, testis, vas deferens, epididymis, prostate (gross & histology)
Parts of female reproductive system, uterus, fallopian tubes, ovary (gross & histology)
Mammary glad – gross
Practical: demonstration of section of male and female pelves with organs in situ
Histology of testis, vas deferens, epididymis, prostate, uterus, fallopian tubes, ovary
Radiographs of pelvis – hysterosalpingogram
9. **Endocrine glands**
   **Theory:**
   Names of all endocrine glands in detail on pituitary gland, thyroid gland, parathyroid gland, suprarenal gland – (gross & histology)
   **Practical:** Demonstration of the glands
   Histology of pituitary, thyroid, parathyroid, suprarenal glands

10. **Nervous system**
    **Theory:**
    Neuron
    Classification of NS
    Cerebrum, cerebellum, midbrain, pons, medulla oblongata, spinal cord with spinal nerve (gross & histology)
    Meninges, Ventricles & cerebrospinal fluid
    Names of basal nuclei
    Blood supply of brain
    Cranial nerves
    Sympathetic trunk & names of parasympathetic ganglia
    **Practical:** Histology of peripheral nerve & optic nerve
        Demonstration of all plexuses and nerves in the body
        Demonstration of all part of brain
        Histology of cerebrum, cerebellum, spinal cord

**Sensory organs:**
    **Theory:**
    Skin: Skin-histology
        Appendages of skin
    Eye: parts of eye & lacrimal apparatus
        Extra-ocular muscles & nerve supply
    Ear: parts of ear- external, middle and inner ear and contents
    **Practical:** Histology of thin and thick skin
        Demonstration and histology of eyeball
        Histology of cornea & retina

**Embryology**
   **Theory:**
   Spermatogenesis & oogenesis
   Ovulation, fertilization
   Fetal circulation
   Placenta
   **Internal Assessment**
   Theory - Average of two exams conducted. 20
   Practicals: Record & Lab work* 10
* There shall be no University Practical Examination and internal assessment marks secured in Practicals need not be sent to the University.

**Scheme of Examination Theory**

14
There shall be one theory paper of three hours duration carrying 80 marks. Distribution of type of questions and marks for Anatomy shall be as given under.

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NO PRACTICAL EXAMINATION

REFERENCE BOOKS

Anatomy
1. William Davis (P) understanding Human Anatomy and Physiology MC Graw Hill
2. Chaursia –A Text book of Anatomy
   T.S. Ranganathan – A text book of Human Anatomy
3. Fattana, Human anatomy
   (Description and applied)
4. ESTER . M. Grishcimer,
   Physiology & Anatomy with Practical Considerations, J.P. Lippin Cott. Philadelphia

SYLLABUS FOR FIRST YEAR ALLIED SCIENCE COURSES - RGUHS

B.Sc Cardiac Care Technology

PHYSIOLOGY

Theory 70 hours
Practical 20hours

Introduction – composition and function of blood
Red blood cells – Erythropoiesis, stages of differentiation function, count physiological Variation.
Haemoglobin – structure, functions, concentration physiological variation
Methods of Estimation of Hb
White blood cells – Production, function, life span, count, differential count
Platelets – Origin, normal count, morphology functions.
Plasma Proteins – Production, concentration, types, albumin, globulin, Fibrinogen,
Prothrombin functions.
Haemostasis & Blood coagulation
Haemostasis – Definition, normal haemostasis, clotting factors, mechanism of clotting, disorders of clotting factors.

Blood Bank
Blood groups – ABO system, Rh system
Blood grouping & typing
Crossmatching
Rh system – Rh factor, Rh in compatibility.
Blood transfusion – Indication, universal donor and recipient concept.
Selection criteria of a blood donor. transfusion reactions
Anticoagulants – Classification, examples and uses

Anaemias : Classification – morphological and etiological. effects of anemia on body
Blood indices – Colour index, MCH, MCV, MCHC
Erythrocyte sedimentation Rate (ESR) and Paced cell volume
Normal values, Definition, determination,
Body fluid – pH, normal value, regulation and variation
Lymph – lymphoid tissue formation, circulation, composition and function of lymph

Cardiovascular system
Heart – Physiological Anatomy, Nerve supply
Properties of Cardiac muscle,
Cardiac cycle-systole, diastole. Intraventricular pressure curves.
Cardiac Output – only definition
Heart sounds Normal heart sounds Areas of auscultation.
Blood Pressure – Definition, normal value, clinical measurement of blood pressure.
Physiological variations, regulation of heart rate, cardiac shock, hypotension, hypertension.
Pulse – Jugular, radial pulse, Triple response
Heart sounds – Normal heart sounds, cause characteristics and signification. Heart rate
Electrocardiogram (ECG) – significance.

Digestive System - Physiological anatomy of Gastro intestinal tract, Functions of digestive system
Salivary glands Structure and functions. Deglutination – stages and regulation
Stomach – structure and functions
Gastric secretion – Composition function regulation of gastric juice secretion
Pancrease – structure, function, composition, regulation of pancreatic juice
Liver – functions of liver
Bile secretion, composition, function regulation of bile secretion. Bilirubin metabolism types of bilirubin, Vandernberg reaction, Jaundice- types, significance.
Gall bladder – functions
Intestine – small intestine and large intestine
Small intestine – Functions Digestive, absorption, movements.
Large intestine – Functions, Digestion and absorption of Carbohydrates, Proteins, Fats, Lipids. Defecation
Respiratory system
Functions of Respiratory system, Physiological Anatomy of Respiratory system, Respiratory tract, Respiratory Muscles, Respiratory organ-lungs, Alveoli, Respiratory membrane, stages of respiration.
Mechanism of normal and rigorous respiration. Forces opposing and favouring expansion of the lungs. Intra pulmonary pleural pressure, surface tension, recoil tendency of the wall. H

Transportation of Respiratory gases:

Lung volumes and capacities

Applied Physiology and Respiration: Hypoxia, Cyanosis, Asphyxia, Dyspnea, Dysbarism, Artificial Respiration, Apnoea.

Endocrine System - Definition Classification of Endocrine glands & their Hormones
Properties of Hormones.
Thyroid gland hormone - Physiological, Anatomy, Hormone secreted, Physiological function, regulation of secretion. Disorders - hypo and hyper secretion of hormone
Adrenal gland, Adrenal cortex physiologic anatomy of adrenal gland,
Adrenal cortex, cortical hormones - functions and regulation
Adrenal medulla - Hormones, regulation and secretion. Functions of Adrenaline and nor adrenaline

Pituitary hormones - Anterior and posterior pituitary hormones, secretion, function
Pancreas - Hormones of pancreas
Insulin - secretion, regulation, function and action
Diabetes mellitus - Regulation of blood glucose level
Parathyroid gland - function, action, regulation of secretion of parathyroid hormone.
Calcitonin - function and action

Special senses
Vision - structure of eye. Function of different parts.
Structure of retina
Hearing structure and function of ear, mechanism of hearing
Taste - Taste buds functions. Smell physiology, Receptors.
Nervous system

Cerebro Spinal Fluid (CSF): formation, circulation, properties, composition and functions lumbar puncture.

Autonomic Nervous System: Sympathetic and parasympathetic distribution and functions and comparison of functions.

Excretory System
Excretory organs

Mechanism of Urine formation: Ultrafiltration criteria for filtration GFR, Plasma fraction, EFP, factors effecting EFR. Determination of GFR selective reabsorption – sites of reabsorption, substance reabsorbed, mechanisms of reabsorption Glucose, urea, H + Cl amino acids etc. TMG, Tubular lead, Renal threshold % of reabsorption of different substances, selective e secretion.

Properties and composition of normal urine, urine output. Abnormal constituents in urine, Mechanism of urine concentration.


Reproductive system

Muscle nerve physiology

Skin - structure and function
Body temperature measurement, Physiological variation, Regulation of body Temperature by physical chemical and nervous mechanisms. Role of Hypothalamus, Hypothermia and fever.

Practicals
Haemoglobinometry
White Blood Cell count
Red Blood Cell count
Determination of Blood Groups
Leishman’s staining and Differential WBC count
Determination of packed cell Volume
Erythrocyte sedimentation rate [ESR]
Calculation of Blood indices
Determination of Clotting Time, Bleeding Time
Blood pressure Recording
Auscultation for Heart Sounds
Artificial Respiration
Determination of vital capacity
Internal Assessment

Theory - Average of two exams conducted. 20
Practicals: Record & Lab work* 10

* There shall be no University Practical Examination and internal assessment marks secured in Practicals need not be sent to the University.

Scheme of Examination Theory
There shall be one theory paper of three hours duration carrying 80 marks. Distribution of type of questions and marks for Physiology shall be as given under.

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**NO PRACTICAL EXAMINATION**

**REFERENCE BOOKS**

**Physiology**

2. Chatterjee(CC) Human Physiology Latest Ed. Vol-1, Medical Allied Agency
3. Choudhari (Sujith K) Concise Medical Physiology Latest Ed. New Central Book,
B.Sc Cardiac Care Technology
BIOCHEMISTRY

No. Theory classes : 70 hours
No. of practical classes : 20 hours

Theory:
Specimen collection : Pre-analytical variables
Collection of blood
Collection of CSF & other fluids
Urine collection
Use of preservatives
Anticoagulants

Introduction to Laboratory apparatus
Pipettes- different types (Graduated, volumetric, Pasteur, Automatic etc.,)
Calibration of glass pipettes
Burettes, Beakers, Petri dishes, depression plates.
Flasks - different types )Volumetric, round bottmed, Erlemeyer conical etc.,)
Funnels – different types (Conical, Buchner etx.,)
Bottles – Reagent bottles – graduated and common, Wash bottles – different type
Specimen bottles etc.,
Measuring cylinders, Porcelain dish
Tubes – Test tubes, centrifuge tubes, test tube draining rack
Tripod stand, Wire gauze, Bunsen burner.
Cuvettes, significance of cuvettes in colorimeter, cuvettes for visible and UV range, cuvette holders
Racks – Bottle, Test tube, Pipette
Dessicator, Stop watch, rimers, scissors
Dispensers – reagent and sample
Any other apparatus which is important and may have been missed should also be covered

Maintenance of lab glass ware and apparatus:
Glass and plastic ware in Laboratory

*use of glass: significance of boro silicate glass ; care and cleaning of glass ware, different cleaning solutions of glass
* care and cleaning of plastic ware, different cleaning solutions

3. Instruments (Theory and demonstration) Diagrams to be drawn
Water bath: Use, care and maintenance

Oven & Incubators : Use, care and maintenance.
Water Distillation plant and water deionisers. Use, care and maintenance
Refrigerators, cold box, deep freezers – Use, care and maintenance
Reflux condenser : Use, care and maintenance
Centrifuges (Theory and demonstration) Diagrams to be drawn
Definition, Principle, svedberg unit, centrifugal force, centrifugal field rpm, ref.Conversion of G to rpm and vice versa.
Different types of centrifuges
Use care and maintenance of a centrifuge
Laboratory balances (Theory & Practicals) Diagrams to be drawn
Manual balances: Single pan, double pan, trip balance
Direct read out electrical balances.
  Use care and maintenance. Guideline to be followed and precautions to be taken while weighing
  Weighing different types of chemicals, liquids. Hygroscopic compounds etc.
Colorimeter and spectrophotometer (Theory and Practicals) Diagrams to be drawn
  Principle, Parts Diagram.
  Use, care and maintenance.
pH meter (Theory & practicals) Diagrams to be drawn
  principle, parts, Types of electrodes, salt bridge solution.
  Use, care and maintenance of pH meter and electrodes
Guidelines to be followed and precautions to be taken while using pH meter
4. Safety of measurements
5. Conventional and SI units
6. Atomic structure
  Dalton’s theory, Properties of electrons, protons, neutrons, and nucleus, Rutherford’s model of atomic structure, Bohr’s model of atomic structure, orbit and orbital, Quantum numbers, Heisenberg’s uncertainly principle.
  Electronic configuration – Aufbau principle, Pauli’s exclusion principle, etc.,m
  Valency and bonds – different types of strong and weak bonds in detail with examples
  Theory & Practicals for all the following under this section
  Molecular weight, equivalent weight of elements and compounds, normality molarity
Preparation of molar solutions (mole/litre solution) eg: 1 M Nacl, 0.15 M NaCL
1 M NaOH, 0.1 M HCl, 0.1 M H 2S04 etc.,

preparation of normal solutions. eg., IN Na2CO3, O IN Oxalic acid, 0.1 N HCl, 0.1N H2504,
0.66 N H2S04 etc.,
Percent solutions. Preparation of different solutions – v/v w/v (solids, liquids and acids)
Conversion of a percent solution into a molar solution
Dilutions
Diluting solutions: eg. Preparation of 0.1 N NaCl from 1 N NaCl from 2 NHCl etc., Preparing working standard from stock standard, Body fluid dilutions, Reagent dilution techniques, calculating the dilution of a solution, body fluid reagent etc.,
  Saturated and supersaturated solutions.
Standard solutions. Technique for preparation of standard solutions eg: Glucose, urea, etc.,
Significance of volumetric flask in preparing standard solutions. Volumetric flasks of different sizes, Preparation of standard solutions of deliquescent compounds (CaCl2, potassium carbonate, sodium hydroxide etc.,)
Preparation of standards using conventional and SI units
Acids, bases, salts and indicators.
  Acids and Bases: Definition, physical and chemical properties with examples.
  Arrhenius concept of acids and bases, Lowery – Bronsted theory of acids and bases classification of acids and bases. Different between bases and alkali, acidity and basicity, monoprotonic and polyprotic acids and bases
  Concepts of acid base reaction, hydrogen ion concentration, Ionisation of water, buffer, Ph value of a solution, preparation of buffer solutions using Ph meter.
  Salts: Definition, classification, water of crystallization – definition and different types, deliquescent and hygroscopic salts
  Acid- base indicators: (Theory and Practicals)
Theory – Definition, concept, mechanism of dissociation of an indicator, colour change of an indicator in acidic and basic conditions, use of standard buffer solution and indicators for pH determinations, preparation and its application, list of commonly used indicators and their pH range, suitable pH indicators used in different titrations, universal indicators

Practicals – Titration of a simple acid and a base (Preparation of standard solution of oxalic acid and using this solution finding out the normality of a sodium hydroxide solution. Acid to be titrated using this base) Calculation of normality of an acid or a base after titration, measurement of hydrogen ion concentration

Quality control:
- Accuracy
- Precision
- Specificity
- Sensitivity
- Limits of error allowable in laboratory
- Percentage error

Normal values and Interpretations

Special Investigations:
- Serum Electrophoresis
- Immunoglobulins
- Drugs: Digitoxin, Theophyllines

Regulation of Acid Base status:
- Henderson Hasselback Equations
- Buffers of the fluid

pH Regulation
Disturbance in acid Base Balance
Anion Gap
Metabolic acidosis
- Metabolic acidosis
Metabolic alkalosis
- Respiratory acidosis
- Respiratory alkalosis

Basic Principles and estimation of Blood Gases and pH
Basic principles and estimation of Electrolytes
- Water Balance

Sodium regulation
Bicarbonate buffers
Nutrition, Nutritional support with special emphasis on parental nutrition.
- Calorific Value
- Nitrogen Balance
- Respiratory Quotient

Basal metabolic rate
Dietary Fibers
Nutritional importance of lipids, carbohydrates and proteins
Vitamins

PRACTICALS
Analysis of Normal Urine
Composition of urine
Procedure for routine screening
Urinary screening for inborn errors of metabolism
Common renal disease
Urinary calculus

Urine examination for detection of abnormal constituents
Interpretation and Diagnosis through charts
Liver Function tests
Lipid Profile
Renal Function test
Cardiac markers
Blood gas and Electrolytes

4. Estimation of Blood sugar, Blood Urea and electrolytes
5. Demonstration of Strips
Demonstration of Glucometer

Internal Assessment
Theory - Average of two exams conducted. 20
Practicals: Record & Lab work* 10
* There shall be no University Practical Examination and internal assessment marks secured in Practicals need not be sent to the University.

Scheme of Examination Theory

There shall be one theory paper of three hours duration carrying 80 marks. Distribution of type of questions and marks for Biochemistry shall be as given under.

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NO PRACTICAL EXAMINATION

REFERENCE BOOKS

Biochemistry
1. Varley – Clinical chemistry
2. TEITZ – Clinical chemistry
3. Kaplan – Clinical chemistry
4. Ramakrishna(S) Prasanna(KG), Rajna ® Text book of Medical Biochemistry Latest Ed Orient longman Bombay –1980
5. Vasudevan (DM) Sreekumari(S) Text book of Biochemistry for Medical students ,Latest Ed
6. DAS(Debajyothi) Biochemistry
Syllabus for first year Allied science courses  RGUHS
B.Sc Cardiac Care Technology
PATHOLOGY

Histopathology, Clinical Pathology, Haematology and Blood Banking
Theory –  70 hours
Practical –  20 hours
- HistoPathology - Theory
  - Introduction to Histo Pathology
  - Receiving of Specimen in the laboratory
  - Grossing Techniques
  - Mounting Techniques – various Mountants
  - Maintenance of records and filing of the slides.
  - Use & care of Microscope
  - Various Fixatives, Mode of action, Preparation and Indication.
  - Bio-Medical waste management
- Section Cutting
- Tissue processing for routine paraffin sections
- Decalcification of Tissues.
- Staining of tissues - H & E Staining
- Bio-Medical waste management

Clinical Pathology – Theory
- Introduction to Clinical Pathology
- Collection, Transport, Preservation, and Processing of various clinical specimens
- Urine Examination – Collection and Preservation of urine.

Physical, chemical, Microscopic Examination
- Examination of body fluids.
- Examination of cerebro spinal fluid (CSF)
- Sputum Examination.
- Examination of feces

Haematology – Theory
- Introduction to Haematology
- Normal constituents of Blood, their structure and function.
- Collection of Blood samples
- Various Anticoagulants used in Haematology
- Various instruments and glassware used in Haematology, Preparation and use of glassware
- Laboratory safety guidelines
- SI units and conventional units in Hospital Laboratory
- Hb, PCV
- ESR
- Normal Haemostasis
Bleeding Time, Clotting Time, Prothrombin Time, Activated Partial Thromboplastin
Time.

Blood Bank
Introduction
Blood grouping and Rh Types
Cross matching

PRACTICALS
- Urine Examination.
  - Physical
  - Chemical
  - Microscopic
  - Blood Grouping, Rh typing.
  - Hb Estimation, Packed Cell Volume [PCV], Erythrocyte Sedimentation rate [ESR]
  - Bleeding Time, Clotting Time.
- Histopathology – Section cutting and H & E Staining. [For BSc MLT only]

Internal Assessment
Theory - Average of two exams conducted. 20
Practicals: Record & Lab work* 10
* There shall be no University Practical Examination and internal assessment marks secured in
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Scheme of Examination Theory
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NO PRACTICAL EXAMINATION

REFERENCE BOOKS
Pathology –
1. Culling Histopathology techniques
2. Bancroft Histopathology techniques
3. Koss – cytology
4. Winifred greg – Diagnostic cytopathology
5. Orell – Cyto Pathology
6. Todd & Sanford Clinical Diagnosis by laboratory method
7. Dacie & Lewis – Practical Haematology
8. Ramanic Sood, Laboratory Technology (Methods and interpretation) 4th Ed.
   J.P. Bros, New Delhi – 1996)
9. Satish Gupta Short text book of Medical Laboratory for technician
   J.P. Bros, New Delhi – 1998
10. Sachdev K.N. Clinical Pathology and Bacteriology 8th Ed, J.P. Bros,
Objective: This course introduces the principles of Microbiology with emphasis on applied aspects of Microbiology of infectious diseases particularly in the following areas:

Collection and despatch of specimens for routine microbiological investigations.

Interpretation of commonly done bacteriological and serological investigations.

Control of Hospital infections

Biomedical waste management

Immunization schedule

Theory - 70 hours

1. Morphology 4 hours
   Classification of microorganisms, size, shape and structure of bacteria. Use of microscope in the study of bacteria.

2. Growth and nutrition 4 hours
   Nutrition, growth and multiplications of bacteria, use of culture media in diagnostic bacteriology.

3. Sterilisation and Disinfection 4 hours
   Principles and use of equipments of sterilization namely Hot Air oven, Autoclave and serum inspissrator. Pasteurization, Anti septic and disinfectants. Antimicrobial sensitivity test

4. Immunology 6 hours
   Immunity Vaccines, Types of Vaccine and immunization schedule
   Principles and interpretation of commonly done serological tests namely Widal, VDRL, ASLO, CRP, RF & ELISA. Rapid tests for HIV and HbsAg (Technical details to be avoided)

5. Systematic Bacteriology 20 hours
   Morphology, cultivation, diseases caused, laboratory diagnosis including specimen collection of the following bacteria (the classification, antigenic structure and pathogenicity are not to be taught)
   Staphylococci, Streptococci, Pneumococci, Gonococci, Menigococci, C diphtheriae, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, Esch coli, Klebsiella, Proteus, vibrio cholerae, Pseudomonas & Spirochetes

6. Parasitology 10 hours
   Morphology, life cycle, laboratory diagnosis of following parasites E. histolytica, Plasmodium, Tape worms, Intestinal nematodes

7. Mycology 4 hours
   Morphology, diseases caused and lab diagnosis of following fungi. Candida, Cryptococcus, Dermatophytes, opportunistic fungi.

8. Virology 10 hours
   General properties of viruses, diseases caused, lab diagnosis and prevention of following viruses, Herpes, Hepatitis, HIV, Rabies and Poliomyelitis.

9. Hospital infection 4 hours
   Causative agents, transmission methods, investigation, prevention and control Hospital infection.
10. Principles and practice Biomedical waste management 4 hours

Practical 20 hours

Compound Microscope.
Demonstration and sterilization of equipments – Hot Air oven, Autoclave, Bacterial filters.
Demonstration of commonly used culture media, Nutrient broth, Nutrient agar, Blood agar, Chocolate agar, Mac conkey medium, LJ media, Robertson Cooked meat media, Potassium tellurite media with growth, Mac with LF & NLF, NA with staph
Antibiotic susceptibility test
Demonstration of common serological tests – Widal, VRDL, ELISA.
Grams stain
Acid Fast staining
Stool exam for Helminthic ova
Visit to hospital for demonstration of Biomedical waste mangement.
Anaerobic culture methods.

Internal Assessment
Theory - Average of two exams conducted. 20
Practicals: Record & Lab work* 10
* There shall be no University Practical Examination and internal assessment marks secured in Practicals need not be sent to the University.

Scheme of Examination

Theory
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REFERENCE BOOKS

Microbiology
1. Anathanarayana & Panikar Medical Microbioloty
2. Roberty Cruckshank – Medical Microbiology – The Practice of Medical Microbiology
3. Chatterjee – Parasitology – Interpretation to Clinical medicine.
4. Rippon – Medical Mycology
5. Emmons – Medical mycology
6. Basic laboratory methods in Parasitology, 1st Ed, J P Bros, New Delhi – 199
7. Basic laboratory procedures in clinical bacteriology, 1st Ed, J P Brothers,
New Delhi
8. Medical Parasitology – Ajit Damle
Teaching Hours : 20

Course Description
This course will introduce student to the basic sociology concepts, principles and social process, social institutions [in relation to the individual, family and community and the various social factors affecting the family in rural and urban communities in India will be studied.

Introduction :
Meaning – Definition and scope of sociology
Its relation to Anthropology, Psychology, Social Psychology
Methods of Sociological investigations – Case study, social survey, questionnaire, interview and opinion poll methods.
Importance of its study with special reference to health care professionals

Social Factors in Health and Disease:
Meaning of social factors
Role of social factors in health and disease

Socialization :
Meaning and nature of socialization
Primary, Secondary and Anticipatory socialization
Agencies of socialization

Social Groups:
1. Concepts of social groups, influence of formal and informal groups on health and sickness.
The role of primary groups and secondary groups in the hospital and rehabilitation setup.

Family :
The family, meaning and definitions
Functions of types of family
Changing family patterns
Influence of family on individual’s health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their importance to physiotherapy

Community :
Rural community: Meaning and features – Health hazards to rural communities, health hazards to tribal community.
Urban community – Meaning and features – Health hazards of urbanities

Culture and Health :
Concept of Health
Concept of culture
Culture and Health
Culture and Health Disorders
Social Change:
Meaning of social changes
Factors of social changes
Human adaptation and social change
Social change and stress
Social change and deviance
Social change and health programme
The role of social planning in the improvement of health and rehabilitation

Social Problems of disabled:
Consequences of the following social problems in relation to sickness and disability remedies
to prevent these problems
Population explosion
Poverty and unemployment
Beggary
Juvenile delinquency
Prostitution
Alcoholism
Problems of women in employment

Social Security:
Social Security and social legislation in relation to the disabled

Social Work:
Meaning of Social Work
The role of a Medical Social Worker
COURSE OUTLINE

COURSE DESCRIPTION: This course is designed to help the student acquire a good command and comprehension of the English language through individual papers and conferences.

BEHAVIOURAL OBJECTIVES:
The student at the end of training is able to
1. Read and comprehend English language
2. Speak and write grammatically correct English
3. Appreciates the value of English literature in personal and professional life.

UNIT - I: INTRODUCTION:
Study Techniques
Organisation of effective note taking and logical processes of analysis and synthesis
Use of the dictionary
Enlargement of vocabulary
Effective diction

UNIT - II: APPLIED GRAMMAR:
Correct usage
The structure of sentences
The structure of paragraphs
Enlargements of Vocabulary

UNIT - III: WRITTEN COMPOSITION:
Precise writing and summarising
Writing of bibliography
Enlargement of Vocabulary

UNIT - IV: READING AND COMPREHENSION:
Review of selected materials and express oneself in one's words. Enlargement of Vocabulary.

UNIT - V: THE STUDY OF THE VARIOUS FORMS OF COMPOSITION:
Paragraph, Essay, Letter, Summary, Practice in writing

UNIT - VI: VERBAL COMMUNICATION:
Discussions and summarization, Debates, Oral reports, use in teaching

Scheme of Examination
No Practical or Viva voce examination
This is a subsidiary subject, examination to be conducted by respective colleges. Marks required for a pass is 35%
REFERENCE
2. Wren and Martin - Grammar and Composition, 1989, Chanda & Co, Delhi
5. Journalism Made Simple D Wainwright
6. Writers Basic Bookself Series, Writers Digest series
7. Interviewing by Joan Clayton Platkon
BIO STATISTICS

Time Allotted: 20 Hours

Course Description:
Introduction to basic statistical concepts: methods of statistical analysis; and
interpretation of data

Behavioural Objectives:
Understands statistical terms.
Possesses knowledge and skill in the use of basic statistical and research methodology.

Unit – I : Introduction
Meaning, definition, characteristics of statistics.
Importance of the study of statistics.
Branches of statistics.
Statistics and health science including nursing.
Parameters and estimates.
Descriptive and inferential statistics.
Variables and their types.
Measurement scales

Unit – II : Tabulation of Data
Raw data, the array, frequency distribution.
Basic principles of graphical representation.
Types of diagrams - histograms, frequency polygons, smooth frequency polygon, cumulative
frequency curve, ogive.
Normal probability curve.

Unit - III : Measure of Central Tendency
Need for measures of central tendency
Definition and calculation of mean - ungrouped and grouped
Meaning, interpretation and calculation of median ungrouped and grouped.
Meaning and calculation of mode.
Comparison of the mean, and mode.
Guidelines for the use of various measures of central tendency.

Unit - IV : Measure of Variability
Need for measure of dispersion.
The range, the average deviation.
The variance and standard deviation.
Calculation of variance and standard deviation ungrouped and grouped.
Properties and uses of variance and SO

Unit - V : Probability and Standard Distributions.
Meaning of probability of standard distribution.
The Binominal distribution.
The normal distribution.
Divergence from normality - skewness, kurtosis.

Unit - VI : Sampling Techniques
Need for sampling - Criteria for good samples.
Application of sampling in Community.
Procedures of sampling and sampling designs errors.
Sampling variation and tests of significance.

Unit - VII : Health Indicator
Importance of health Indicator.
Indicators of population, morbidity, mortality, health services.
Calculation of rates and rations of health.

Recommended Books.
HEALTH CARE

Teaching Hours : 40

Introduction to Health

Definition of Health, Determinants of Health, Health Indicators of India, Health Team Concept.

National Health Policy
National Health Programmes (Briefly Objectives and scope)
Population of India and Family welfare programme in India

Introduction to Nursing

What is Nursing ? Nursing principles. Inter-Personnel relationships. Bandaging : Basic turns; Bandaging extremities; Triangular Bandages and their application.

Nursing Position, Bed making, prone, lateral, dorsal, dorsal re-cumbent, Fowler's positions, comfort measures, Aids and rest and sleep.

Lifting And Transporting Patients: Lifting patients up in the bed. Transferring from bed to wheel chair. Transferring from bed to stretcher.

Bed Side Management: Giving and taking Bed pan, Urinal : Observation of stools, urine. Observation of sputum, Understand use and care of catheters, enema giving.

Methods Of Giving Nourishment: Feeding, Tube feeding, drips, transfusion

Care Of Rubber Goods

Recording of body temperature, respiration and pulse,

Simple aseptic technique, sterilization and disinfection.

Surgical Dressing: Observation of dressing procedures

First Aid :
Syllabus as for Certificate Course of Red Cross Society of St. John's Ambulance Brigade.
INDIAN CONSTITUTION

Prescribed for the First Year students of all degree classes

Unit-I: Meaning of the team ‘Constitution’ making of the Indian Constitution 1946-1940.
Unit-II: The democratic institutions created by the constitution Bicameral system of Legislature at the Centre and in the States.
Unit-III: Fundamental Rights and Duties their content and significance.
Unit-VI: Doctrine of Separation of Powers legislative, Executive and Judicial and their functioning in India.
Unit – VII: The Election Commission and State Public Service commissions.
Unit – VIII: Method of amending the Constitution.
Unit – IX: Enforcing rights through Writs:
Unit – X: Constitution and Sustainable Development in India.

ENVIRONMENT SCIENCE AND HEALTH

Introduction to Environment and Health
Sources, health hazards and control of environmental pollution
Water
The concept of safe and wholesome water.
The requirements of sanitary sources of water.
Understanding the methods of purification of water on small scale and large scale.
Various biological standards, including WHO guidelines for third world countries.
Concept and methods for assessing quality of water.
Domestic refuse, sullage, human excreta and sewage their effects on environment and health,
methods and issues related to their disposal.
Awareness of standards of housing and the effect of poor housing on health.
Role of arthropods in the causation of diseases, mode of transmission of arthropods borne
diseases, methods of control

Recommended Books.

1. Text Book of Environmental Studies for under gradute courses By Erach Bharucha
BASICS IN COMPUTER APPLICATIONS

The course enables the students to understand the fundamentals of computer and its applications.

Introduction to Data processing:
Features of computers, Advantages of using computers. Getting data into / out of computers. Role of computers. What is Data processing? Application areas of computers involved in Data processing. Common activities in processing. Types of Data processing, Characteristics of information. What are Hardware and Software?

Hardware Concepts:

Concept of Software.

Basic Anatomy of Computers

Principles of programming
Computer application - principles in scientific research; work processing, medicine, libraries, museum, education, information system.

Data processing
Computers in physical therapy - principles in EMG, Exercise testing equipment, Laser.

Scheme of Examination for MEDICAL ELECTRONICS including COMPUTER APPLICATIONS

One Written (Theory) paper: Maximum Marks: –80 marks.
No Practical or Viva voce examination
COURSE: II YEAR B.Sc Allied Health Sciences
B.Sc Cardiac Care Technology

APPLIED PHARMACOLOGY

- General concepts about pharmacodynamic and Pharmacokinetic Principles involved in drug activity.

I. **Autonomic nervous system.**

- Anatomy & functional organisation.
- List of drugs acting an ANS including dose, route of administration, indications, contra indications and adverse effects.

II. **Cardiovascular drugs- Enumerate the mode of action, side effects And therapeutic uses of the following drugs.**

a. Antihypertensives
   - Beta Adrenergic antagonists
   - Alpha Adrenergic antagonists
   - Peripheral Vasodilators
   - Calcium channel blockers
b. Antiarrhythmic drugs
c. Cardiac glycosides
d. Sympathetic and nonsympathetic inotropic agents.
e. Coronary vasodilators.
f. Antianginal and anti failure agents
g. Lipid lowering & anti atherosclerotic drugs.
h. Drugs used in Haemostais – anticoagulants Thrombolytics and antithrombolytics.
i. Cardioplegic drugs- History, Principles and types of cardioplagia.
j. Primary solutions – History, principles & types.
k. Drugs used in the treatment of shock.

III. **Anaesthetic agents.**

- Definition of general and local anaesthetics.
- Classification of general anaesthetics.
- Pharmacokinetics and Pharmacodynamics of inhaled anaesthetic agents.
- Intravenous general anaesthetic agents.
- Local anaesthetics – classification mechanism of action, duration of action and methods to prolong the duration of action. Preparation, dose and routes of administration.
IV Analgesics
- Definition and classification
- Routes of administration, dose, frequency of administration, Side effects and management of non opioid and opioid analgesics

V. Antihistamines and antiemetics-
- Classification, Mechanism of action, adverse effects, Preparations, dose and routes and administration.

VI. CNS stimulants and depressants
- Alcohol
- Sedatives, hypnotics and narcotics
- CNS stimulants
- Neuromuscular blocking agents and muscle relaxants.

VII. Pharmacological protection of organs during CPB

VIII. Inhalational gases and emergency drugs.

IX. Pharmacotherapy of respiratory disorders
- Introduction – Modulators of bronchial smooth muscle tone and pulmonary vascular smooth muscle tone
- Pharmacotherapy of bronchial asthma
- Pharmacotherapy of cough
- Mucokinetic and mucolytic agents
- Use of bland aerosols in respiratory care.

X. Corticosteroids – Classification, mechanism of action, adverse effects and complications. Preparation, dose and routes of administration.

XI Diuretics
- Renal physiology
- Side of action of diuretics
- Adverse effects
- Preparations, dose and routes of administrion.

XII. Chemotherapy of infections
- Definition
- Classification and mechanism of action of antimicrobial agents
- Combination of antimicrobial agents
- Chemoperophylaxis.
• Classification, spectrum of activity, dose, routes of administration and adverse effects of penicillin, cephalosporins, aminoglycosides, tetracyclines, chloramphenicol, antitubercular drugs.

XIII. Miscellaneous.

• IV fluids- various preparations and their usage.
• Electrolyte supplements
• Immunosuppressive agents
• New drugs included in perfusion technology.
• Drugs used in metabolic and electrolyte imbalance.

PRACTICALS:

1. Preparation and prescription of drugs of relevance.
2. Experimental pharmacology directed to show the effects of commonly used drugs of relevance and interpretation of few charts.

**Scheme of Examination**

**Theory**

There shall be one theory paper of three hours duration carrying 80 marks. Distribution of type of questions and marks for applied Pharmacology shall be as given under.

<table>
<thead>
<tr>
<th>Type of Questions</th>
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<th>Marks</th>
<th>Sub-total</th>
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<td>2 x 10</td>
<td>20</td>
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<tr>
<td>Short Essay (SE)</td>
<td>8 (To attempt 6)</td>
<td>6 x 5</td>
<td>30</td>
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<tr>
<td>Short Answer (SA)</td>
<td>12 (To Attempt 10)</td>
<td>10 x 3</td>
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<tr>
<td>Total Marks</td>
<td></td>
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<td>80</td>
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</table>

**NO PRACTICAL EXAMINATION**

Recommended Books.

   350, Madan Mohan Marg, Tardeo, Bombay – 400 034.
I. CARDIOVASCULAR SYSTEM

- Atherosclerosis - Definition, risk factors, briefly Pathogenesis & morphology, clinical significance and prevention.
- Hypertension - Definition, types and briefly Pathogenesis and effects of Hypertension.
- Aneurysms – Definition, classification, Pathology and complications.
- Pathophysiology of Heart failure.
- Cardiac hypertrophy – causes, Pathophysiology & Progression to Heart Failure.
- Ischaemic heart diseases- Definition, Types. Briefly Pathophysiology, Pathology & Complications of various types of IHD.
- Cardiomyopathy – Definition, Types, causes and significance.
- Pericardial effusion- causes, effects and diagnosis.
- Congenital heart diseases – Basic defect and effects of important types of congenital heart diseases.

II. HAEMATOLOGY

- Anaemia – Definition, morphological types and diagnosis of anaemia.
  Brief concept about Haemolytic anaemia and polycythaemia.
- Leukocyte disorders- Briefly leukaemia, leukocytosis, agranulocytosis etc.,
- Bleeding disorders- Definition, classification, causes & effects of important types of bleeding disorders. Briefly various laboratory tests used to diagnose bleeding disorders.
III. RESPIRATORY SYSTEM

- Chronic obstructive airway diseases – Definition and types. Briefly causes, Pathology and complications of each type of COPD.
- Briefly concept about obstructive versus restrictive pulmonary disease.
- Pneumoconiosis- Definition, types, Pathology and effects in brief.
- Pulmonary congestion and edema.
- Pleural effusion – causes, effects and diagnosis.

IV. RENAL SYSTEM

- Clinical manifestations of renal diseases. Briefly causes, mechanism, effects and laboratory diagnosis of ARF & CRS. Briefly Glomerulonephritis and Pyelonephritis.
- End stage renal disease – Definition, causes, effects and role of dialysis and renal transplantation in its management.
- Brief concept about obstructive uropathy.

PRACTICALS

1. Description & diagnosis of the following gross specimens.
   a. Atherosclerosis.
   b. Aortic aneurysm.
   c. Myocardial infarction.
   d. Emphysema
   e. Chronic glomerulonephritis.
   f. Chronic pyelonephritis.

2. Interpretation & diagnosis of the following charts.
   a. hematology Chart - AML, CML, Hemophilia, neutrophilia, eosinophilia.
   b. Urine Chart - ARF, CRF, Acute glomerulonephritis.

4. Estimation Bleeding & Clotting time.

Scheme of Examination

Theory
There shall be one theory paper of three hours duration carrying 50 marks. Distribution of type of questions and marks for *Applied Pathology* shall be as given under.

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<thead>
<tr>
<th>Type of Questions</th>
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<th>Sub-total</th>
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<td>2 x 10</td>
<td>20</td>
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<tr>
<td>Short Essay (SE)</td>
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<td>3 x 5</td>
<td>15</td>
</tr>
<tr>
<td>Short Answer (SA)</td>
<td>7 (To Attempt 5)</td>
<td>5 x 3</td>
<td>15</td>
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<tr>
<td>Total Marks</td>
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<td>50</td>
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</table>

**PRACTICAL EXAMINATION** - 40 Marks.
There will be a Combined Practical examination for Applied Pathology & Applied Microbiology.
1. Health care associated infections and Antimicrobial resistance: Infections that patients acquire during the course of receiving treatment for other conditions within a healthcare setting like Methicillin Resistant Staphylococcus aureus infections, Infections caused by Clostridium difficile, Vancomycin resistant enterococci etc. Catheter related blood stream infections, Ventilator associated pneumonia, Catheter Related urinary tract infections, Surveillance of emerging resistance and changing flora. The impact and cost attributed to Hospital Associated infection. 6 Hours

2. Disease communicable to Healthcare workers in hospital set up and its preventive measure: Occupationally acquired infections in healthcare professionals by respiratory route (tuberculosis, varicella-zoster, respiratory syncytial virus etc), blood borne transmission (HIV, Hepatitis B, Hepatitis C, Cytomegalovirus, Ebola virus etc), oro faecal route (Salmonella, Hepatitis A etc), direct contact (Herpes Simplex Virus etc). Preventive measures to combat the spread of these infections by monitoring and control. 6 Hours

3. Microbiological surveillance and sampling: Required to determine the frequency of potential bacterial pathogens including Streptococcus pneumoniae, Haemophilus influenzae, and Moraxella catarrhalis and also to assess the antimicrobial resistance. Sampling: rinse technique, direct surface agar plating technique. 6 Hours

4. Importance of sterilization:
   a. Disinfection of instruments used in patient care: Classification, different methods, advantages and disadvantages of the various methods.
   b. Disinfection of the patient care unit
   c. Infection control measures for ICU’s 10 Hours

5. Sterilization:
   a. Rooms: Gaseous sterilization, one atmosphere uniform glow discharge plasma (OAUGDP).
   b. Equipments: classification of the instruments and appropriate methods of sterilization.
   c. Central supply department: the four areas and the floor plan for instrument cleaning, high-level disinfecting and sterilizing areas. 8 Hours

6. Preparation of materials for autoclaving: Packing of different types of materials, loading, holding time and unloading. 4 Hours
2. Collection of specimen from outpatient units, inpatient units, minor operation theater and major operation theater for sterility testing.
3. The various methods employed for sterility testing.
4. Interpretation of results of sterility testing.
5. Disinfection of wards, OT and Laboratory.

Scheme of Examination

Theory

There shall be one theory paper of three hours duration carrying 50 marks. Distribution of type of questions and marks for Applied Microbiology shall be as given under.

<table>
<thead>
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<td>Long Essay (LE)</td>
<td>2</td>
<td>2 x 10</td>
<td>20</td>
</tr>
<tr>
<td>Short Essay (SE)</td>
<td>6 (To attempt 4)</td>
<td>4 x 5</td>
<td>20</td>
</tr>
<tr>
<td>Short Answer (SA)</td>
<td>7 (To Attempt 5)</td>
<td>5 x 2</td>
<td>10</td>
</tr>
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</table>

PRACTICAL EXAMINATION - 40 Marks.

There will be a Combined Practical examination for Applied Pathology & Applied Microbiology.
COURSE: II YEAR B.Sc Allied Health Sciences
B.Sc Cardiac Care Technology
Medicine Relevant To Cardiac Care Technology

Cardiovascular System

Ischaemic heart diseases
Rheumatic heart disease
Congenital heart disease
Hypertension
Aortic Aneurysms
Cardiomyopathy
Peripheral vascular disease
Pulmonary edema and LV failure

Hematology

Anaemia
Bleeding disorders
Laboratory tests used to diagnose bleeding disorders (in brief)

Respiratory System

Chronic obstructive airway diseases (COPD)
Concept of obstructive versus restrictive pulmonary disease
PFT and its interpretation

Renal System

ARF & CRF
End stage renal disease
Role of dialysis and renal transplantation in its management

CNS

Automatic nervous system
(Sympathetic & Parasympathetic system)
Brief mention of CNS disorders & their etiology

Others

DM
Obesity
Pregnancy
Paediatric Patient (neonate/Infant)
Elderly patient
**Scheme of Examination**

**Theory**

There shall be one theory paper of three hours duration carrying 80 marks. Distribution of type of questions and marks for *Medicine relevant to Cardiac Care Technology* shall be as given under.

<table>
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<th>Type of Questions</th>
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<td>2 x 10</td>
<td>20</td>
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<tr>
<td>Short Essay (SE)</td>
<td>10 (To attempt 8)</td>
<td>8 x 5</td>
<td>40</td>
</tr>
<tr>
<td>Short Answer (SA)</td>
<td>12 (To Attempt 10)</td>
<td>10 x 2</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total Marks</strong></td>
<td></td>
<td></td>
<td><strong>80</strong></td>
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</table>

**NO PRACTICAL EXAMINATION**
I. Electrocardiography (ECG)

1. Basic Principles
   - The Electrocardiographic paper
   - The Electrocardiograph
   - The Electrical field of Heart
   - The leads: Standard limb, Precardial lead, ‘V’ lead & ‘AV’ lead
   - Basic ECG deflections
   - Basic action of electrocardiograph

2. Normal EG
   - The ‘P’ wave
   - The ‘qrs’ complex
   - The genesis of ‘qrs’ complex
   - T wave; the S-T segment
   - The ‘U’ wave
   - Rate & rhythm
   - So called rotation of the heart – The Q-T interval

3. The Electrical axis
4. Precardial pattern of ECG
5. Chamber enlargement – atrial enlargement, LV hypertrophy & RV hypertrophy
6. Sundle branch block
   - General principles
   - Right Bundle branch block
   - Left bundle branch block
   - The Hemi blocks (Fasicular block)
II. Exercise stress Testing
1. Exercise
2. Exercise protocols
3. Electrocardiography measurements
4. Exercise testing – Indication and techniques

III. Echocardiography
1. Principles of Echocardiography
   - Basic principles of ultrasound
   - M-Mode of Echocardiography
   - Two dimensional Echocardiography
   - Doppler Echocardiography; color flow
   - Transoesophageal Echocardiography
2. Instrumentation
   - Basic pulse Echo system
   - Transducers
   - Pulse generation
   - Echo detection
   - A mode, B-Mode, M-Mode
   - Display & recording
3. Echocardiographic Examination
   - Selecting transducers
   - Position of the patient
   - Placement of the transducer
   - Setting control
   - M-Mode labelling
   - 2 D Echo
   - Normal variants
   - Terminology
   - Identification of segments
4. Doppler Echocardiography
   a. Introduction to Doppler color Echocardiography
      The Doppler principles
      Doppler ultrasound techniques
      Color Doppler flow imaging
      Clinical application of Doppler Echocardiograph
   b. Physical principles & instrumentation in spectral & color Doppler flow imaging
   c. Physical principles and Doppler effect. The Doppler Echocardiography system display
   d. Blood flow pattern – Laminar & non-laminar flow
   e. Doppler Echo cardiograph modes
      • Continuous wave Doppler system
      • Pulsed Doppler system
      • High pulse repetition frequency
      • Problems of color imaging

5. Contrast Echo

6. Echo measurements–‘ASE’ recommendation

Scheme of Examination

Theory
There shall be one theory paper of three hours duration carrying 100 marks. Distribution of type of questions and marks for Introduction to Cardiac Care Technology shall be as given under.

<table>
<thead>
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<th>Type of Questions</th>
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<td>20</td>
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<tr>
<td>Short Essay (SE)</td>
<td>14 (To attempt 12)</td>
<td>12 x 5</td>
<td>60</td>
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<tr>
<td>Short Answer (SA)</td>
<td>12 (To Attempt 10)</td>
<td>10 x 2</td>
<td>20</td>
</tr>
<tr>
<td>Total Marks</td>
<td></td>
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<td>100</td>
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</tbody>
</table>

PRACTICAL EXAMINATION - 40 Marks.
Paper-I Cardiac Care Technology - Clinical

1. Interpretation of Normal ECG and Basic abnormalities of ECG in RHD, IHD & CHD


3. Echo in congenital heart disease – Echo in ASD, VSD, PDA pulmonary stenosis, aortic stenosis, coarctation of aorta, TOF. dextrocardia.

4. Echo in ischemic heart disease – Echo in acute myocardial infarction, old myocardial infarction and other ischemic heart disease related conditions, LV aneurysm

5. Echo in other cardiovascular disease- Echo in various types of cardio myopathy infective endocardities diseases of aorta, mitral valve prolapse, myxoma and other cardio vascular diseases.

6. Assessment of Cardiac function- measurements of all cardiac chambers and assessment of cardiac function

7. Echo in pericardial disease- pericardial effusion, cardiac tamponade, constructive pericarditis

8. Cardiac catheterisation laboratory – general details of cardiac catheterisation equipment, how to handle the machine, common problems one may come across and how to over come it, radiation hazards

9. Materials used in the cathlab- all catheters, balloons, guidewires, pacemakers contrast material and other material used in the cardiac catheterisation laboratory an sterilization of all these materials

10. Right heart catheterisation – procedure, cath position, oxymetry at various levels, angios done and its interpretation

11. Left heart catheterisation – procedure, cath position, oxymetry at various levels, angios done and its interpretation
12. Coronary angiogram – procedure, materials used, type and amount dye used, indications and contraindications, various pictures recorded in various angles and gross interpretation.

13. Peripheral angiogram – procedure, indication and contraindication

**Scheme of Examination**

**Theory**
There shall be one theory paper of three hours duration carrying 100 marks. Distribution of type of questions and marks for Paper-I Cardiac Care Technology - Clinical shall be as given under.

<table>
<thead>
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<tr>
<td>Short Essay (SE)</td>
<td>14 (To attempt 12)</td>
<td>12 x 5</td>
<td>60</td>
</tr>
<tr>
<td>Short Answer (SA)</td>
<td>12 (To Attempt 10)</td>
<td>10 x 2</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total Marks</strong></td>
<td></td>
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<td>100</td>
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</table>

**PRACTICAL EXAMINATION**

One common practical for all the three papers with equal weight age of marks i.e. 40 practical marks for each paper.
Paper –II  Cardiac Care Technology - Applied

1. ECG in myocardial infarction- definition of myocardial infarction, diagnosis of myocardial infarction, ECG criteria for myocardial infarction, ECG in anterior wall, inferior wall, true posterior wall and sub endocardial infarction and RV infarction

2. ECG in rheumatic heart disease – definition of rheumatic heart disease, valvular involvement in rheumatic heart disease, ECG in mitral stenosis, mitral incompetence, aortic stenosis and aortic incompetence

3. ECG in hypertension- definition of hypertension, how to record blood pressure, ECG in hypertension

4. ECG in congenital heart disease- common congenital heart disease ASD, VSD, PDA, pulmonary stenosis, aortic stenosis, coarctation of aorta, TOF, definition of all these conditions , ECG changes in all these conditions

5. ECG in other conditions – ECG in various types of cardiomyopathy, myxoedema, pericardial effusion, acute pericardities and other vascular diseases. Bundle branch block, WPW syndrome, dextrocardia

6. Trans esophageal echocardiogram – indications, procedure, usefulness and complications one may encounter and its management

7. Stress Echo- procedure and indications

8. Peripheral Doppler – Procedure and usefulness of peripheral Doppler

9. Coronary angioplasty–procedure, materials used, complication one may encounter and how to manage it

10. Peripheral angioplasty – materials used and procedure. Angioplasty of coarctation of aorta

11. Fetal echocardiogram – Procedure, basic interpretation
12. Contrast echocardiogram – procedure and usefulness of contrast echocardiogram

13. Myocardial contrast echo- Basic knowledge

**Scheme of Examination**

**Theory**
There shall be one theory paper of three hours duration carrying **100** marks. Distribution of type of questions and marks for Paper –II Cardiac Care Technology - Applied shall be as given under.

<table>
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</tr>
<tr>
<td>Short Essay (SE)</td>
<td>14 (To attempt 12)</td>
<td>12 x 5</td>
<td>60</td>
</tr>
<tr>
<td>Short Answer (SA)</td>
<td>12 (To Attempt 10)</td>
<td>10 x 2</td>
<td>20</td>
</tr>
<tr>
<td>Total Marks</td>
<td></td>
<td></td>
<td><strong>100</strong></td>
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</table>

**PRACTICAL EXAMINATION**

One common practical for all the three papers with equal weight age of marks i.e. 40 practical marks for each paper.
COURSE: III YEAR B.Sc Allied Health Sciences
B.Sc Cardiac Care Technology

Paper –III  Cardiac Care Technology - Advanced

1. Cardiac monitoring – definition, purpose of cardiac monitoring, how to Recognise various arrhythmias how to set up a intensive coronary care unit and usefullness of ICCU

2. Interpretation of TMT, report – criteria for TMT positive test contraindication for TMT conditions where TMT is not useful, complications that may occur in TMT room and its management

3. Use of defibrillator- indications, how to use the defibrillator, complications during the procedure and its management

4. Management of cardiac arrest – definition, causes external cardiac massage, artificial respiration and other drugs and procedures used in the management of Cardiac arrest

5. Myocardial perfusion scan – procedures and usefullness of myocardial perfusion scan

6. Cardiac arrhythmias – bradyarrhythmia and tachy arrhythmias and ECG diagnosis of all rhythm disturbances. Sinus arrhythmia, APC, FPC, VPC, VF, VT, AF, SVT, IHB, IIHB, complete heart block

7. Electrolyte disturbances – ECG in hypokelemia, hyperkelemia etc.,

8. Holter monitoring – procedure and usefullness


10. Coil closure and device closure of PDA – procedure, indications and materials used for coil and device closure of PDA

11. Device closure of ASD – procedure, indications and materials used for device closure of ASD

12. Device closure of VSD – procedure, indications and materials used for device closure of VSD
13. Electrophysiological studies – basic knowledge of EP studies mapping and ablation

14. Oxymetry – handling of the instrument and usefulness of the instrument, normal and abnormal values.

15. Pressure recording- handling of the instrument and pressures in various chambers, normal and abnormal values

16. Temporary and permanent pacing – materials used, procedure, complications one may encounter and management. Implantable Cardioverter defibrillator devices

17. CD recording and storage- recording and storage of all the procedures over CD

18. Procedure during pregnancy- precautions to be followed.


**Scheme of Examination**

**Theory**

There shall be one theory paper of three hours duration carrying 100 marks. Distribution of type of questions and marks for **Paper –III Cardiac Care Technology - Advanced** shall be as given under.

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<table>
<thead>
<tr>
<th>Type of Questions</th>
<th>No. of Questions</th>
<th>Marks</th>
<th>Sub-total</th>
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<tbody>
<tr>
<td>Long Essay (LE)</td>
<td>2</td>
<td>2 x 10</td>
<td>20</td>
</tr>
<tr>
<td>Short Essay (SE)</td>
<td>14 (To attempt 12)</td>
<td>12 x 5</td>
<td>60</td>
</tr>
<tr>
<td>Short Answer (SA)</td>
<td>12 (To Attempt 10)</td>
<td>10 x 2</td>
<td>20</td>
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<tr>
<td>Total Marks</td>
<td></td>
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**PRACTICAL EXAMINATION**

One common practical for all the three papers with equal weight age of marks i.e. 40 practical marks for each paper.