B.Sc Intensive Care Technology

Our A Multi Campus University with ‘A’ Grade Accreditation by NAAC

AMRITA SCHOOL OF MEDICINE
Amrita Centre for Allied Health Sciences

AIMS Ponekkara PO, Kochi – 682 041
Tel: 0484 – 2858131, 2858375, 2858845
Fax: 0484-2858382
Email: ahs@aims.amrita.edu
Web: www.amrita.edu

CURRICULUM
B.Sc Intensive Care Technology

A Super Specialty Tertiary Care Hospital Accredited by ISO 9001-2008, NABL & NABH
SPIRITUAL PRINCIPLES IN EDUCATION

“In the gurukulas of ancient rishis, when the master spoke it was love that spoke; and at the receiving end disciple absorbed of nothing but love. Because of their love for their Master, the disciples’ hearts were like a fertile field, ready to receive the knowledge imparted by the Master. Love given and love received. Love made them open to each other. True giving and receiving take place where love is present. Real listening and ‘sraddha’ is possible only where there is love, otherwise the listener will be closed. If you are closed you will be easily dominated by anger and resentment, and nothing can enter into you”.

“Satguru Mata Amritanandamayi Devi”
Introducing AIMS

India is the second most populous nation on earth. This means that India’s health problems are the world’s health problems. And by the numbers, these problems are staggering 41 million cases of diabetes, nearly half the world’s blind population, and 60% of the world’s incidences of heart disease. But behind the numbers are human beings, and we believe that every human being has a right to high-quality healthcare.

Since opening its doors in 1998, AIMS, our 1,200 bed tertiary care hospital in Kochi, Kerala, has provided more than 4 billion rupees worth of charitable medical care; more than 3 million patients received completely free treatment. AIMS offers sophisticated and compassionate care in a serene and beautiful atmosphere, and is recognized as one of the premier hospitals in South Asia. Our commitment to serving the poor has attracted a dedicated team of highly qualified medical professionals from around the world.

The Amrita Institute of Medical Sciences is the adjunct to the term “New Universalism” coined by the World Health Organization. This massive healthcare infrastructure with over 3,330,000 sq. ft. of built-up area spread over 125 acres of land, supports a daily patient volume of about 3000 outpatients with 95 percent inpatient occupancy. Annual patient turnover touches an incredible figure of almost 800,000 outpatients and nearly 50,000 inpatients. There are 12 super specialty departments, 45 other departments, 4500 support staff and 670 faculty members.

With extensive facilities comprising 28 modern operating theatres, 230 equipped intensive-care beds, a fully computerized and networked Hospital Information System (HIS), a fully digital radiology department, 17 NABL accredited clinical laboratories and a 24/7 telemedicine service, AIMS offers a total and comprehensive healthcare solution comparable to the best hospitals in the world. The AIMS team comprises physicians, surgeons and other healthcare professionals of the highest caliber and experience.

AIMS features one of the most advanced hospital computer networks in India. The network supports more than 2000 computers and has computerized nearly every aspect of patient care including all patient information, lab testing and radiological imaging. A PET (Positron Emitting Tomography) CT scanner, the first of its kind in the state of Kerala and which is extremely useful for early detection of cancer, has been installed in AIMS and was inaugurated in July 2009 by Dr. A. P. J. Abdul Kalam, former President of India. The most recent addition is a 3 Tesla Silent MRI.

The educational institutions of Amrita Vishwa Vidya Peetham, has its Health Sciences Campus in Kochi, the Amrita School of Medicine, the Amrita Centre for Nanosciences, the Amrita School of Dentistry, the Amrita College of Nursing, and the Amrita School of Pharmacy, committed to being centers of excellence providing value-based medical education, where the highest human qualities of compassion, dedication, purity and service are instilled in the youth. Amrita School of Ayurveda is located at Amritapuri, in the district of Kollam. Amrita University strives to help all students attain the competence and character to humbly serve humanity in accordance with the highest principles and standards of the healthcare profession.
## Table of Contents
### Part I – Rules and Regulations

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Contents</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Under Graduate Programs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Details of Under Graduate Courses</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>2. Medium of Instruction</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>3. Eligibility</td>
<td>8</td>
</tr>
<tr>
<td>II</td>
<td>General Rules</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Duration of the course</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>2. Discontinuation of Studies</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>3. Educational Methodology</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>4. Academic Calendar</td>
<td>9</td>
</tr>
<tr>
<td>III</td>
<td>Examination Regulations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Attendance</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>2. Internal Assessment</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>3. University Examination</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>4. Eligibility to appear for University Examination</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>5. Valuation of Theory – Written Paper</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>6. Supplementary Examination</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>7. Rules regarding Carryover subjects</td>
<td>12</td>
</tr>
<tr>
<td>IV</td>
<td>Criteria for Pass in University Examination – Regulations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Eligibility criteria for pass in University Examinations</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>2. Evaluation and Grade</td>
<td>13</td>
</tr>
<tr>
<td>V</td>
<td>Internship</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Eligibility for Internship – Regulations</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>2. Attendance and leave details during Internship</td>
<td>14</td>
</tr>
<tr>
<td>VI</td>
<td>General considerations and Teaching/Learning Approach</td>
<td>14</td>
</tr>
<tr>
<td>VII</td>
<td>Project</td>
<td>14</td>
</tr>
<tr>
<td>VIII</td>
<td>Maintenance of Log book</td>
<td>14</td>
</tr>
<tr>
<td>SL No:</td>
<td>Contents</td>
<td>Page No</td>
</tr>
<tr>
<td>-------</td>
<td>----------</td>
<td>---------</td>
</tr>
<tr>
<td>1</td>
<td>Introduction and Advancement of the program</td>
<td>16</td>
</tr>
<tr>
<td>2</td>
<td>Main Objective of the program</td>
<td>17</td>
</tr>
<tr>
<td>3</td>
<td>Course Structure</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td><strong>First Year</strong></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Anatomy – Paper I</td>
<td>19</td>
</tr>
<tr>
<td>5</td>
<td>Physiology – Paper II</td>
<td>22</td>
</tr>
<tr>
<td>6</td>
<td>Biochemistry – Paper III</td>
<td>24</td>
</tr>
<tr>
<td>7</td>
<td>Microbiology – Paper IV</td>
<td>26</td>
</tr>
<tr>
<td>8</td>
<td>Introduction to Computer Application (Section A) – Paper V</td>
<td>28</td>
</tr>
<tr>
<td>9</td>
<td>Quality Assurance &amp; Accreditation (Section B) – Paper V</td>
<td>28</td>
</tr>
<tr>
<td>10</td>
<td>English &amp; Soft Skills – Paper VI</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td><strong>Second Year</strong></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Pharmacology – Paper VII</td>
<td>33</td>
</tr>
<tr>
<td>12</td>
<td>Pathology – Paper VIII</td>
<td>35</td>
</tr>
<tr>
<td>13</td>
<td>Applied Basic Sciences – Paper IX</td>
<td>37</td>
</tr>
<tr>
<td>14</td>
<td>Basics of Intensive Care Technology – Paper X</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td><strong>Third Year</strong></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Intensive Care Technology - Clinical – Paper XI</td>
<td>42</td>
</tr>
<tr>
<td>16</td>
<td>Intensive Care Technology – Applied – Paper XII</td>
<td>46</td>
</tr>
<tr>
<td>17</td>
<td>Intensive Care Technology – Advanced – Paper XIII</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td><strong>Fourth Year</strong></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Internship</td>
<td>54</td>
</tr>
<tr>
<td>19</td>
<td>Scheme of Examination</td>
<td>55</td>
</tr>
<tr>
<td>20</td>
<td>Pattern of Question Paper</td>
<td>56</td>
</tr>
</tbody>
</table>
Part I
Rules and Regulations
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Course</th>
<th>Duration</th>
<th>Conditions of Eligibility for admission to the course</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Medical Laboratory Technology (MLT)</td>
<td>4 years</td>
<td>Pass in plus Two with 50% marks with Physics, chemistry and Biology</td>
</tr>
<tr>
<td>2</td>
<td>Medical Radiologic Technology (MRT)</td>
<td>4 Years</td>
<td>First class in plus two with Mathematics, Physics, Chemistry, and Biology</td>
</tr>
<tr>
<td>3</td>
<td>Emergency Medical Technology</td>
<td>3 Years + One year internship</td>
<td>Pass in plus two with 50% marks in Physics, Chemistry and Biology.</td>
</tr>
<tr>
<td>4</td>
<td>Anaesthesia Technology</td>
<td>3 Years + One year internship</td>
<td>Pass in plus two with 50% marks in Physics, Chemistry and Biology.</td>
</tr>
<tr>
<td>5</td>
<td>Respiratory Therapy (RT)</td>
<td>3 Years + One year Internship</td>
<td>Pass in plus two with 50% marks in Physics, Chemistry and Biology.</td>
</tr>
<tr>
<td>6</td>
<td>Dialysis Therapy</td>
<td>3 Years + One year internship</td>
<td>Pass in plus two with 50% marks in Physics, Chemistry and Biology.</td>
</tr>
<tr>
<td>7</td>
<td>Physician Assistant</td>
<td>3 years + one year internship</td>
<td>Pass in plus two with 50% marks in Physics, Chemistry and Biology.</td>
</tr>
<tr>
<td>8</td>
<td>Cardio Vascular Technology (CVT)</td>
<td>3 Years + One year internship</td>
<td>Pass in plus two with 50% marks in Physics, Chemistry and Biology.</td>
</tr>
<tr>
<td>9</td>
<td>Echocardiography Technology</td>
<td>3 Years + One year internship</td>
<td>Pass in plus two with 50% marks in Physics, Chemistry and Biology.</td>
</tr>
<tr>
<td>10</td>
<td>Cardiac Perfusion Technology (CPT)</td>
<td>3 Years + One year internship</td>
<td>Pass in plus two with 50% marks in Physics, Chemistry and Biology.</td>
</tr>
<tr>
<td>11</td>
<td>Diabetes Sciences</td>
<td>3 years + One year internship</td>
<td>Pass in plus two with 50% marks in Physics, Chemistry and Biology.</td>
</tr>
<tr>
<td>12</td>
<td>Optometry</td>
<td>3 Years + One year Internship</td>
<td>Pass in plus two with 50% marks in Physics, Chemistry and Biology.</td>
</tr>
<tr>
<td>13</td>
<td>Bachelor of Audiology &amp; Speech Language Pathology (BASLP)</td>
<td>3 years + One year internship</td>
<td>Pass in plus two with 50% marks in Physics, Chemistry and Biology.</td>
</tr>
<tr>
<td>14</td>
<td>Neuroelectro-physiology</td>
<td>3 years + One year internship</td>
<td>Pass in plus two with 50% marks in Physics, Chemistry and Biology.</td>
</tr>
<tr>
<td>15</td>
<td>Operation Theatre Technology</td>
<td>3 years + One year internship</td>
<td>Pass in plus two with 50% marks in Physics, Chemistry and Biology.</td>
</tr>
<tr>
<td>16</td>
<td>Intensive Care Technology</td>
<td>3 years + One year internship</td>
<td>Pass in plus two with 50% marks in Physics, Chemistry and Biology.</td>
</tr>
</tbody>
</table>
I.2. Medium of Instruction:
English shall be the medium of instruction for all subjects of study and for examinations.

I.3. Eligibility:
Generally Science Graduates with Physics, Chemistry, and Biology are eligible for admission to the Under Graduate Courses except in respect of certain specialties for which other qualification or subjects are specifically called for. Essential qualifications for eligibility are mentioned under clause I.1

II. General Rules:
Admissions to the courses will be governed by the conditions laid down by the University from time to time and as published in the Regulations for admissions each year.

II.1. Duration of the Course
Duration details are mentioned under clause No.I.1 of this booklet.

- Duration of the course: 4 Years (3 years + 1 year Internship except for courses at serial number 1 and 2 in clause I.1)
- Weeks available per year: 52 weeks
- Vacation / holidays: 5 weeks (2 weeks vacation + 3 weeks calendar holidays)
- Examination (including preparatory): 6 weeks
- Extra curricular activities: 2 weeks
- Weeks available: 39 weeks
- Hours per week: 40 hours
- Hours available per academic year: 1560 (39 weeks x 40 hours)

Internship wherever specified are integral part of the course and needs to be done in Amrita Institute of Medical Sciences, Kochi itself.

II.2. Discontinuation of studies
Rules for discontinuation of studies during the course period will be those decided by the Chairman /Admissions, Amrita School of Medicine, and Published in the “Rules and Regulations” every year.

II.3. Educational Methodology
Learning occurs by attending didactic lectures, as part of regular work, from co-workers and senior faculty, through training offered in the workplace, through read-
ing or other forms of self-study, using materials available through work, using mate-
rials obtained through a professional association or union, using materials obtained
on students own initiative, during working hours at no cost to the student.

II.4. Academic Calendar

Course will follow an annual scheme as per details mentioned under:

**FIRST YEAR**

Commencement of classes – August 2019
First sessional exam – November 2019
Second sessional exam – February 2020
Model Exam (with practical) – May - June 2020 (one week study leave)
University exam (with practical) – June - July 2020 (10 days study leave)
Annual Vacation – 3 weeks after the University examination.

**SECOND YEAR**

Commencement of classes – August 2020
First sessional exam – January 2021
Model Exam (with practical) – May - June 2021 (one week study leave)
University exam (with practical) – June - July 2021 (10 days study leave)
Annual Vacation – 2 weeks after the University examination

**THIRD YEAR**

Commencement of classes – August 2021
First sessional exam – January 2022
Model Exam (with practical) – May 2022 (one week study leave)
University exam (with practical) – June 2022 (10 days study leave)
Annual Vacation – 1 week after the University examination.
Date of completion of third academic year – 31st July 2022

**INTERNSHIP**

Commencement of internship – 01 August 2022
Completion of internship – 31 July 2023
III. Examination Regulations:

III.1. Attendance:

75% of attendance (physical presence) is mandatory. Medical leave or other types of sanctioned leaves will not be counted as physical presence. Attendance will be counted from the date of commencement of the session to the last day of the final examination in each subject.

III.2. Internal Assessment:

For the first year at least three sessional examinations in theory and preferably one practical examination should be conducted in each subject. The following second/third year shall have one sessional and one model examination.

1. The period for sessional examinations of first academic year are as follows:

   First Sessional Exam : November
   Second Sessional Exam : February
   Model Exam : May /June

2. The period for sessional examinations of second and third academic year are as follows:

   Sessional Exam : January
   Model Exam : May /June

3. The last internal assessment examination will be the model examination which shall follow the pattern of the University Examination. Average of best of two examinations and the marks obtained in assignments/viva/practical also shall be taken to calculate the internal assessment.

4. A candidate should secure a minimum of 50% marks in the internal assessment in each subject (separately in theory and practical) to be eligible to appear for the University examination.

5. Each student should maintain a logbook and record the procedures they do and the work patterns they are undergoing. It shall be based on periodical assessment, evaluation of student assignment, preparation for seminar, clinical case presentation, assessment of candidate’s performance in the sessional examinations, routine clinical works, logbook and record keeping etc.

6. Day to day assessment will be given importance during internal assessment, Weightage for internal assessment shall be 20% of the total marks in each subject.
7. Pre-University examinations (model exam) shall be held three to four weeks prior to the University Examination. Final internal assessment report shall be made available to the Principal ten days prior to the commencement of the university examination.

III.3. University Examinations:

i. University Examination shall be conducted at the end of every academic year. A candidate who satisfies the requirement of attendance and internal assessment marks, as stipulated by the University shall be eligible to appear for the University Examination.

ii. One academic year will be twelve months including the days of the University Examination. Year will be counted from the date of commencement of classes which will include the inauguration day.

iii. The minimum pass marks for internal assessment is 50% and for the University Examination is 50%. However the student should score a total of 50% (adding the internal and external examination (University Examination)) to pass in each subject (separately for theory and practical)

iv. If a candidate fails in either theory or practical paper, he/she has to re-appear for both the papers (theory and practical)

v. Maximum number of attempts permitted for each paper is five (5) including the first attempt.

vi. The maximum period to complete the course shall not exceed 6 years from the date of enrollment for the course.

vii. All practical examinations will be conducted in the respective clinical areas.

viii. Number of candidates for practical examination should be maximum 12 to 15 per day

ix. One internal and one external examiner will jointly conduct the theory evaluation and practical examination for each student during the final year.

III.4. Eligibility to appear university Examination:

A student who has secured 50% marks for Internal Assessment is qualified to appear for University Examination provided he/she satisfies percentage of attendance requirement as already mentioned at the III (1).

III.5. Valuation of Theory – Revaluation Papers:

1. Valuation work will be undertaken by the examiners in the premises of the Examination Control Division in the Health Sciences Campus.

2. Failed candidates will have the option of revaluation for all the University examinations. Fees for revaluation will be decided by the Principal from time to time.
3. Application for revaluation should be submitted within 5 days (or the time as decided by the Principal) from date of result of examination declared and it should be submitted to the office with payment of fees as decided by the Principal.

III.6. Supplementary Examinations:

Every main University examination will be followed by a supplementary examination which will normally be held within four to six months from the date of completion of the main examination.

As stipulated under clause No. III.2 under Internal Assessment, HOD will hold an internal examination three to four weeks prior to the date of the University Examination. Marks secured in the said examination or the ones secured in the internal examination held prior to the earlier University Examination whichever is more only will be taken for the purpose of internal assessment. HODs will send such details to the Principal at least ten days prior to the date of commencement of University examination.

Same attendance and internal marks of the main examination will be considered for the supplementary examination, unless the HOD furnishes fresh internal marks and attendance after conducting fresh examination.

Students who have not passed / cleared any subjects in the first University examination will be permitted to attend the second year classes and also eligible to appear for second year university examination along with first year supplementary examination. However, he / she can appear for the third (final) year university examination, only if he / she clear all the subjects in the first as well as in the second year examinations.

Students of supplementary batches are expected to prepare themselves for the University Examinations. No extra coaching is expected to be provided by the Institution. In case at any time the Institution has to provide extra coaching, students will be required to pay fees as fixed by the Principal for the said coaching.

III.7. Rules regarding carryover subjects:

A candidate will not be permitted to continue the second and third year respectively of the course if he/she has failed in more than 3 subjects in the first or second year university examinations.

A candidate must have passed in all subjects of all the three years to become eligible to undergo compulsory internship of one year. For the candidates who have not passed all the subjects the duration of the third year shall be extended until they become eligible to undergo compulsory internship subject of course to the conditions mentioned under III.3.v &vi of these Rules.
IV. Criteria for Pass in University Examination - Regulations:

IV.1. Eligibility criteria for pass in University Examination:

In each of the subjects, a candidate must obtain 50% in aggregate for a pass and the details are as follows:

- A separate minimum of 50% for Internal Assessment.
- 50% in Theory & 50% in Viva.
- A separate minimum of 50% in aggregate for Practicals / Clinics (University Examinations).
- Overall 50% is the minimum pass in subject aggregate (University Theory + Viva + Practicals + Internal Assessment).

IV.2. Evaluation and Grade:

1. Minimum mark for pass shall be 50% in each of the theory and practical papers separately (including internal assessment) in all subjects except English.
2. A candidate who passes the examination in all subjects with an aggregate of 50% marks and above but less than 65% shall be declared to have passed the examination in the second class.
3. A candidate who passes the examination in all subjects in the first attempt obtaining not less than 65% of the aggregate marks for all the three years shall be declared to have passed the examination with First Class.
4. A candidate who secures an aggregate of 75% or above marks is awarded distinction. A candidate who secures not less than 75% marks in any subject will be deemed to have passed the subject with distinction in that subject provided he / she passes the whole examination in the first attempt.
5. A candidate who takes more than one attempt in any subject and pass subsequently shall be ranked only in pass class.
6. A Candidate passing the entire course is placed in Second class / First class / Distinction based on the cumulative percentage of the aggregate marks of all the subjects in the I, II and III (Final) university examinations
7. Rank in the examination: - Aggregate marks of all three year regular examinations will be considered for awarding rank for the B.Sc Graduate Examination.

V. Internship:

V.1. Eligibility for Internship - Regulations:

Wherever internship is a part of the curriculum, students will have to do the internship in Amrita Institute of Medical Sciences, Kochi itself. A candidate must have passed in all subjects to become eligible to undergo compulsory internship of one year or a period fixed in the curriculum.
“Internship has to be done continuously for a period provided in the syllabus except in extraordinary circumstances where subject to the approval of the Principal the same may be done in not more than two parts with an interruption not exceeding six months. In any case Internship shall be completed within 18 months from the date of acquiring eligibility to do the internship.

The students will be posted in Amrita Institute of Medical Sciences, Kochi and Amrita Institute of Medical Sciences, Faridabad, if necessary, during final year and internship period.

**V.2. Attendance and leave details during Internship:**

For 30 days of duty an intern will be eligible for casual leave and weekly off. A Student will become eligible to receive his/her degree only after completion of internship to the complete satisfaction of the Principal.

**VI. General considerations and teaching / learning approach:**

There must be enough opportunities to be provided for self learning. The methods and techniques that would ensure this must become a part of teaching-learning process.

Proper records of the work should be maintained which will form the basis for the students assessment and should be available to any agency who is required to do statutory inspection of the school of the course.

**VII. Project:**

Each student should submit a project in consultation with HOD and guidance under Project Guide, 3 months prior to their final year university exam. The student will be eligible to appear for the final year examination only after submission of the project.

**VIII. Maintenance of Log Book**

- Every graduate student shall maintain a record of skills he/she has acquired during the training period certified by the various Heads of Departments/Program Coordinator under whom he/she has undergone training.
- In addition, the Head of the Department shall involve their graduate students in Seminars, Journal Club, Group Discussions and participation in Clinical, Clinical-Pathological meetings.
- The Head of the Departments/Program coordinator shall scrutinize the log-book in every month.
- At the end of the course, the student should summarize the contents and get the log book certified by the Head of the Department.

The log book should be submitted at the time of practical examination for the scrutiny of the Board of Examiners.
Part II
Syllabus
INTRODUCTION AND ADVANCEMENT

B.Sc Intensive Care Technology is a well in demand course. Services of an intensive care technologist are highly desired in every hospital and healthcare unit. Here in this course you will be learning all about intensive care given to the ICU patients. You learn monitoring the equipment, recording the data and providing these data to the physicians. You will be also learning providing first-aid to patients in the absence of suitable medical aid.

Job opportunities and prospects
On finishing this course you are easily placed in the hospitals. You work in hospitals in ICUs, emergency rooms, trauma centres and similar healthcare settings requiring emergency and critical care. Hospitals working in both the private and public sector will be in need of your services. Other places to look for employment are government hospitals, military hospitals, railway hospitals and so on. You can undertake a post graduate program like M.Sc in Intensive care technology. You may also get to do research work in the field by opting for a doctoral program.

MAIN OBJECTIVES OF THE COURSE

To provide an extensive training in the field of Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Blood Transfusion technology, Pharmacology, common infective and non-infective disorders, common renal disorders, ICU, medical records and medico-legal aspects, etc. to the students so that they are not only able to assist their clinicians in critical care units but also able to effectively manage the hospital affairs. The candidate will be competent enough to provide all type of assistance to his clinician in running and managing an intensive care unit.

Employment:
Those who successfully complete the course will have very good opportunities in all leading hospitals in India and abroad.
COURSE STRUCTURE

First year

Theory classes and practical of following subjects:

- Anatomy
- Physiology
- Biochemistry
- Microbiology
- Introduction to Computer application
- Quality Assurance & Accreditation
- English & Soft Skills

Second year

Theory class and posting in the clinical area:

- Pathology
- Pharmacology
- Applied Basic Sciences
- Basics of Intensive Care Technology

Third year

Theory class and posting in the clinical area:

- Intensive Care Technology – Clinical
- Intensive Care Technology – Applied
- Intensive Care Technology – Advanced

Fourth Year

Fourth year is internship in the clinical area.
FIRST YEAR

During the first year the students will have didactic lecture in the medical college from 9 am to 4 pm

Internal Assessment

Three sessional examinations will be conducted in this year. Average marks of these sessional examinations will be counted as internal marks.

Paper I – ANATOMY

COURSE OBJECTIVE:
An outline of anatomy with special emphasis on applied aspects is provided to the students for better understanding of the technical and diagnostic procedure.

1. The human body as a whole 1 hour
   Definition
   Sub divisions of anatomy
   Terms of location and positions
   Fundamental planes, Vertebrate structure of man
   Organization of body cells and tissues

2. Locomotion and Support 8 hours
   The Skeletal System
   Types of bones
   Structure and growth of bones
   Divisions of the skeleton
   Appendicular skeleton, Axial skeleton
   Name of all the bones and their parts
   Joints: Classification, Types of movements with examples
   **Muscles:** Structure, classification, muscles of abdominal wall, muscles of respiration, pelvic diaphragm, muscles of head and neck
   **Practicals:** 2 hours
   Demonstrations of all bones:
   Showing parts
   Joints, X-rays of all normal bones and joints
   Muscles: Classification of muscle

3. Anatomy of nervous system 6 hours
   Introduction and divisions of nervous system
   Central nervous system: Spinal chord, Anatomy, and functions, Reflex arc
   **The Brain:**
   Location, gross features, parts, functional areas
   Hindbrain, Midbrain, fore brain
Coverings of brain and peripheral nervous system
Anatomy of cerebral blood supply & coverings
Spinal cord – gross features, extent, blood supply and coverings
Injuries to spinal cord and brain
Peripheral nervous system – organization & structure of a typical spinal nerve

Practicals: 1 hour
Demonstration of brain and spinal chord

4. Anatomy of Cardiovascular system
Gross anatomy & Structural features of the Heart and Great vessels:
Heart 2 hours
Location, size, surface features, pericardium & valves
Right Atrium: structural features
Venous area, Septum and atrial appendage
Right Ventricle: structural features, inflow & out flow characteristics
Left Atrium: structural features, venous area, Septum and appendage
Left ventricle: structural features, inflow & out flow characteristics
Valves: valve apparatus, location
Structure & functions of each valve
Blood Supply of heart: coronary arteries, cardiac cycle
Innervations: sympathetic and parasympathetic sensory
Pulmonary circuit: names of the arteries and veins & positions
Lymphatic drainage of the Heart

Great Vessels 2 hours
Structure of blood vessels and its organization
Aorta
Pulmonary artery & pulmonary vein
General plan of systemic circulation
Pulmonary circulation

PRACTICALS 2 hours
Demonstration to illustrate normal angiograms
Demonstration of surface features & interior of the heart
Demonstration of aorta and its branches
Histology of cardiac muscles and artery

5. Anatomy of the Respiratory system 4 hours
Organs of Respiratory System:
Conducting portion, respiratory portion
(Nose – nasal cavity, paranasal air sinuses
Larynx, trachea, bronchial tree)
Muscles of Respiration
Cross structure and the interior features of nose & nasal cavity
Para nasal air sinuses
Cross structure and interior features of the pharynx and larynx
Cross structures and interior features of the trachea and bronchial tree
Gross structure, histology, position and coverings of the lungs
Pulmonary circulation – pulmonary arteries pulmonary veins & bronchial arteries
Nerve supply to the respiratory system

**Practicals**

<table>
<thead>
<tr>
<th>2 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstration of the parts and function</td>
</tr>
<tr>
<td>Demonstration of the different parts of the respiratory system with special emphasis</td>
</tr>
<tr>
<td>On lungs</td>
</tr>
<tr>
<td>Histology of lungs</td>
</tr>
</tbody>
</table>

6. **Anatomy of the digestive system**

<table>
<thead>
<tr>
<th>1 hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Components of the digestive system</td>
</tr>
<tr>
<td>Alimentary tube</td>
</tr>
<tr>
<td>Mouth, tongue, tooth</td>
</tr>
<tr>
<td>Salivary gland, liver, biliary apparatus and its secretion, pancreas and pancreatic secretion, movements of intestine defecation, GI hormones, malabsorption and</td>
</tr>
</tbody>
</table>

**Practicals**

<table>
<thead>
<tr>
<th>1 hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrations of the parts and functions</td>
</tr>
<tr>
<td>Normal x-rays</td>
</tr>
</tbody>
</table>

7. **Anatomy of excretory system & Reproductive system**

<table>
<thead>
<tr>
<th>1 hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization of the renal system</td>
</tr>
<tr>
<td>Kidneys: location, gross features, structure, blood supply and nerve supply</td>
</tr>
<tr>
<td>Excretory ducts, ureters, urinary bladder, urethra location gross features and structure</td>
</tr>
</tbody>
</table>

**Male reproductive system:**

<table>
<thead>
<tr>
<th>2 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Testis, Duct system, Prostate</td>
</tr>
</tbody>
</table>

**Female Reproductive system:**

<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ovaries, duct system, accessory organs</td>
</tr>
</tbody>
</table>

**Practicals**

<table>
<thead>
<tr>
<th>1 hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstration of Kidneys, ureter, bladder</td>
</tr>
<tr>
<td>Histology of kidney</td>
</tr>
</tbody>
</table>

8. **Anatomy of endocrine system**

<table>
<thead>
<tr>
<th>1 hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of all endocrine glands and their positions</td>
</tr>
<tr>
<td>Hormones and their functions</td>
</tr>
</tbody>
</table>

9. **Histology**

<table>
<thead>
<tr>
<th>6 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Slides:</td>
</tr>
</tbody>
</table>

**Systemic Slides**

1. G.I.T
2. Lung-Trachea
3. Kidney, Ureter, Urinary bladder
4. Endocrine- Adrenal, pancreas, pituitary, thyroid and parathyroid
5. Uterus, Ovary, testis

**Reference books:**

- Human Anatomy- Regional and Applied Volume
  - B.D Chaurasia
- Clinical Anatomy For Medical Students
  - Richard S.Snell

********************************************************************

**Paper II – PHYSIOLOGY**

1. **INTRODUCTION TO PHYSIOLOGY AND GENERAL PHYSIOLOGY** - 1 hr

2. **MUSCLE and NERVE** - 3 hrs
   - Neurons and glial cells - Structure, function, Types, electrical property, degeneration and regeneration.
   - Muscle- Structure & Functions of skeletal muscle & smooth muscle
   - Neuromuscular transmission – Functional anatomy, Transmission & Clinical importance.

3. **HAEMATOLOGY** - 9 hrs
   - Fluid compartments, Composition & functions of blood, Plasma protein – names, functions.
   - Leucocytes - Morphology, Types, Properties & Functions, variations in count.
   - Thrombocytes- Morphology, Count, Function, Variations.
   - Blood groups and its importance, Blood transfusion.
   - Tissue fluid and Lymph
   - Immunity.

4. **CARDIOVASCULAR SYSTEM** - 10 hrs
   - Organisation of CVS, Properties of Cardiac Muscle, Origin and spread of cardiac impulse
   - Cardiac Cycle – Electrical (ECG)and mechanical events,
• Cardiac output, Measurement, (Fick’s Principle) regulation
• Blood pressure, measurement & variation, determinants, regulation, Shock.
• Regional circulation.(Salient features only)-coronary, Pulmonary, Cerebral, Cutaneous

5. RESPIRATORY SYSTEM - 8 hrs
• Introduction. Functional anatomy, Mechanics of ventilation, Pressure changes, volume changes, Surfactant, Compliance, Airway resistance.
• Alveolar ventilation, Dead space, Ventilation perfusion ratio and its significance,
• Spirogram
• Diffusion of gases, O₂ transport, CO₂ transport.
• Regulation of respiration – Voluntary, Neural, Chemical.
• Abnormalities of respiration Hypoxia, Cyanosis, Dyspnea, Asphyxia, High altitude,
• Dysbarism.

6. DIGESTIVE SYSTEM - 7 hrs
• Functional anatomy of GI tract,
• Secretions - Salivary secretion & its regulation, Gastric secretion and its regulation,
• Peptic ulcer, Pancreatic secretion and its regulation, Functions of liver. Bile – storage and functions. Intestinal juice
• Movements - Mastication, Deglutition, Movements of stomach, Small intestine, Large intestine. vomiting, Defecation.
• GI Hormones,
• Digestion & Absorption of carbohydrates, Proteins, Fat & vitamins

7. Excretion - 7 hrs
• Functional anatomy of kidney, Structure and function of kidney and nephron
• Renal blood flow, Glomerular filtration rate, Definition, Measurement and factors
• affecting Tubular functions – Reabsorption, Secretion, Acidification, concentration and abnormalities.
• Micturition – Bladder innervation, Micturition reflex.
• Functions of skin

8. ENDOCRINOLOGY - 6 hrs
  a) Introduction to endocrinology (Different glands, hormones)
  b) Pituitary gland (Anterial and posterior glands, actions and applied aspects.
  c) Thyroid gland (Actions and applied aspects)
  d) Calcium homeostasis (Parathyroid, Vitamin D, Calcitonin, actions and applied aspects
  e) Pancreas (Endocrine part – insulin, glucagon – actions and applied aspects
  f) Adrenal cortex and medulla (Actions and applied aspects)

9. REPRODUCTIVE SYSTEM - 3 hrs
• Male Reproductive System- Different parts, spermatogenesis, hormones
• Female reproductive system – Different parts, Sexual cycles – Menstrual cycles – Ovarian, endometrium
• Lactation, Pregnancy & Contraception (Basics only)
10. CENTRAL NERVOUS SYSTEM (Basics only) - 10 hrs
   a) Organization of Nervous system.
   b) Synapse, Properties & Function
   c) Reflexes, Reflex action, Property ,Function.
   d) Sensory system – Receptor, Ascending sensory pathway (basics only), Thalamus, sensory cortex
   e) Motor System – Spinal control of Motor activity, Motor areas in Cerebral Cortex,
   f) Pyramidal & extra pyramidal tracts (basics only),
   g) Basal ganglia & Cerebellum.
   h) Hypothalamus
   i) Autonomous nervous system
   j) Cerebro spinal fluid- formation and functions.

11. SPECIAL SENSES (Basics only) - 4 hrs
   • Audition
   • Vision

Revision and evaluation session – 4-5 hours

Reference books:

Essentials of Medical Physiology
Anil Baran Singha Mahapatra

******************************************************************************

Paper III – BIOCHEMISTRY

I. CELL STRUCTURE & FUNCTIONS 1hr
   • Mitochondria
   • Endoplasmic reticulum, Lysosomes
   • Fluid mosaic model for membrane structure

II. DIGESTION AND ABSORPTION OF NUTRIENTS 2hrs
   • Digestion of carbohydrates
   • Fats
   • Enzymes in digestion of proteins

III. ENZYMES 1hr
   • Normal serum range and diagnostic importance of serum AST, ALP,ALT,CK,GGT and AMYLASE.

IV. PROTEINS 1hr
   • Essential amino acids
   • Plasma proteins
   • Immunoglobulins
V. CARBOHYDRATES 2hr
- Diabetes mellitus - symptoms and complications
- Glucose tolerance test
- Action of insulin and glucagon on carbohydrate metabolism

VI VITAMINS 2hrs
- Deficiency manifestations of Vitamin A, C, D, E, K
- Vit B Complex

VII MINERALS 1hr
1. Factors maintaining serum calcium level and important functions of calcium
2. Importance of trace elements

VIII HEMOGLOBIN 1hr
- Hemoglobin metabolism

IX LIVER FUNCTION TESTS 1hr
- Jaundice and types of jaundice
- Enzymes in liver disease

X RENAL FUNCTION TESTS 1hr
- Serum Creatinine

XI SPECIALIZED LABORATORY INVESTIGATIONS 1hr
Principle and applications of
- Radioimmunoassay (RIA)
- ELISA
- Colorimetry

XII LIPIDS 1hr
- Essential fatty acids (EFA)
- Poly unsaturated fatty acids (PUFA)
- Phospholipids

XIII METABOLISM 1hr
- TCA cycle (steps only)

XIV MAINTENANCE OF HOMEOSTASIS 1hr
- Plasma buffers
- Renal mechanisms in pH regulation
- Anion gap
- Metabolic acidosis,

XV NUCLEIC ACIDS 1hr
- DNA and RNA
- Purine and pyrimidine bases,
XVI CANCER

- Chemical and physical carcinogens
- Tumor markers.

Reference books:

The Text Book of Biochemistry
Dr. D.M.Vasudevan, Sreekumari.S

Text Book of Biochemistry
T.N.Pattabhiraman

Essentials of Biochemistry
U.Sathyanarayanan

********************************************************************

Paper IV – MICROBIOLOGY

Introduction to medical microbiology - 1 hr
Morphology and physiology of bacteria - 1 hr
Sterilization and disinfection - 2 hrs
Normal Microbial flora of the human body - 1 hr
Infection - 2 hrs
Antibiotics - 1 hr
Hospital infections and prevention - 2 hrs
Immunity - 1 hr
Antigen, Antibody, Antigen-antibody reactions - 1 hr
Immune response - 1 hr
Hypersensitivity - 1 hr
Immunoprophylaxis - 1 hr
Tuberculosis - 1 hr
Typhoid - 1 hr
Virus infections - 1 hr
HIV/AIDS - 1 hr
Hepatitis viruses - 1 hr
Medical Mycology - 1 hr
Medical Parasitology - 1 hr
Malaria - 1 hr
Urinary Tract Infections - 1 hr
Respiratory Tract Infections - 1 hr
Gastrointestinal Infections - 1 hr
Sexually Transmitted Disease - 1 hr
Infections of the nervous system - 1 hr

Practical Demonstrations
Gram Staining - ½ hr
<table>
<thead>
<tr>
<th>Activity</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acid Fast Staining</td>
<td>0.5 hr</td>
</tr>
<tr>
<td>Antibiotic Susceptibility Testing</td>
<td>0.5 hr</td>
</tr>
<tr>
<td>CSSD Visit</td>
<td>0.5 hr</td>
</tr>
<tr>
<td>Theory Class Hours</td>
<td>28 hrs</td>
</tr>
<tr>
<td>Practical Demonstration hours</td>
<td>2 hrs</td>
</tr>
<tr>
<td><strong>Total hours</strong></td>
<td><strong>30 hrs</strong></td>
</tr>
</tbody>
</table>

**Reference books:**

- **Text Book of Medical Parasitology**  
  C.K. Jayaram Panicker
- **Text Book of Microbiology**  
  Anand Narayan

*******************************************************************************
# Paper V – Section A: INTRODUCTION TO COMPUTER APPLICATION

**Course Description:** This course is designed for students to develop basic understanding of use of computer and its applications in Clinical Departments

<table>
<thead>
<tr>
<th>Unit</th>
<th>Time (hours)</th>
<th>Th.</th>
<th>Pr.</th>
<th>Learning Objective</th>
<th>Content</th>
<th>Teaching Learning activities</th>
<th>Assessment Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>10</td>
<td>5</td>
<td></td>
<td>Identify &amp; define various concepts used in computer Identify application of computer</td>
<td>Introduction * Concepts of computers * Hardware and Software * Trends and Technology * Application of Computers</td>
<td>* Lecture cum discussion * Explain using charts * Panel discussion</td>
<td>* Short answer questions * Objective Type</td>
</tr>
<tr>
<td>II</td>
<td>5</td>
<td>10</td>
<td></td>
<td>Describe and use of Disk Operating System (DOS) Demonstrate skill in the use of MS Office</td>
<td>Introduction to Disk Operating System * DOS * Windows (all version) * MS Word * MS Excel with Pictorial Presentation * MS - Access * MS-Power Point</td>
<td>* Lecture * Discussion * Demonstration * Practice session</td>
<td>* Short answers * Objective Type * Practical Exam and Viva voice</td>
</tr>
<tr>
<td>III</td>
<td>10</td>
<td>5</td>
<td></td>
<td>Demonstrate skill in using multimedia Identify features of computer aided teaching and testing</td>
<td>* Multimedia : types &amp; uses * Computer aided teaching &amp; testing</td>
<td>* Lecture * Discussion * Demonstration</td>
<td>* Short answers * Objective Type * Practical Exam and Viva voice</td>
</tr>
</tbody>
</table>
IV 10 5 Describe and use of the statistical packages
* Statistical packages: Types and their features
* Lecture
* Discussion
* Demonstration
* Practice Session
* Short answers
* Objective Type
* Practical Exam and Viva voice

V 5 5 Describe the use of Hospital Management System
* Hospital Management System: Types and uses
* Electronic patient records
* Lecture
* Discussion
* Demonstration
* Short answers
* Objective Type
* Practical Exam and Viva voice

********************************************************************

Paper V – Section B: QUALITY ASSURANCE AND ACCREDITATION

Course Objectives:

Modernization and its brand conscious make an organization thrive towards perfection in the comparative world of business. The underlying factor that allows an organization to stand the test of time is quality. The students are given the working knowledge of the subject.

Course Content:
Introduction to quality - 2 hrs
Definition, Concept, Benefits - 2 hrs
Function - 2 hrs
Design - 2 hrs
Formulation - 2 hrs
Standardization - 2 hrs
Implementation - 2 hrs
Factors affecting quality - 2 hrs
Need for quality - 2 hrs
Quality cycle - 2 hrs
Quality objectives - 2 hrs
Quality policy - 2 hrs
Quality measurable - 2 hrs
Quality Control, Quality Standards, Q C Tools - 6 hrs
Quality Documents, QC Records, Kaizen techniques - 2 hrs
Such as Market-in, TQC, Q C Circles, - 2 hrs
Suggestion scheme, TPM, Kanban, JIT, Zero defect programme
ISO
Quality management system Quality manual
Quality procedures
Quality records
Quality audit
Corrective and preventive action
SQC (Statistical Quality Control techniques)
Cost effectiveness
Cost of quality system
Benefit in total cost
Cost measuring system
TQM- Concept, awareness, aspects training

- 2 hrs
- 2 hrs
- 4 hrs
- 4 hrs
- 4 hrs
- 4 hrs
- 4 hrs
- 2 hrs
- 2 hrs
- 2 hrs
- 2 hrs
- 2 hrs
- 2 hrs
- 4 hrs
- 4 hrs
- 4 hrs
- 4 hrs

**Total** - 80hrs

**Detailed Course Plan**

**Unit- I**
Introduction to quality – Definition, concept, Benefits-Functions-Design- Formulation- Standardization

**Unit-II**
Implementation – Factors affecting quality – Need for Quality Cycle – Quality objectives- Quality policy

**Unit-III**

**Unit-IV**
ISO- Quality management system- Quality manual-Quality procedure- Quality records- Quality audit

**Unit- V**
Corrective and preventive action – SQC (Statistical Quality Control technique)
Cost effectiveness- Cost of quality system- Benefit in total cost – Cost
Measuring system- TOM- concept, awareness, aspects training

**Reference Text:**
1. Dale H Bester field, Carol Bester field, Glen H Bester field, Mary Bester field – Scare, Total Quality Management .Wesley Logman (Singapore)Pte.Ltd. Indian Branch, 482F.I.E, Patparganj, Delhi 110092, India

******************************************************************************
**Paper VI: ENGLISH**

**Course Description**: The course is designed to enable students to enhance ability to comprehend spoken and written English (and use English) required for effective communication in their professional work. Students will practice their skills in verbal and written.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Time (Hours)</th>
<th>Learning Objective</th>
<th>Content</th>
<th>Teaching Learning activities</th>
<th>Assessment Methods</th>
</tr>
</thead>
</table>
| I.   | 10           | Speak and write grammatically correct English | * Review of grammar  
* Remedial study of grammar  
* Building vocabulary  
* Phonetics  
* Public speaking | * Demonstrate use of dictionary  
* Class Room conversation  
* Exercise on use of grammar  
* Practice in public speaking | * Objective type  
* Fill in the blanks  
* Para Phrasing |

| II   | 10           | Develop ability to read, understand and express meaning fully, the prescribed text | * Read and comprehend prescribed course books | Exercise on: * Reading  
* Summarizing  
* Comprehension | * Short answers  
* Essay Type |

| III  | 8            | Develop writing skills | * Various forms of Composition  
* Letter writing  
* Note taking  
* Precise writing  
* Anecdotal records  
* Diary writing  
* Reports on health Problems etc.  
* Resume / CV | Exercise on writing: * Letter  
* Note  
* Precise  
* Diary  
* Anecdote  
* Health problems  
* Story writing  
* Resume / CV  
* Essay Writing  
* Discussion on written reports / documents | * Assessment of the skills based on the check list |
| IV  | 6   | **Develop skill in spoken English** | Spoken English  
* Oral report  
* Discussion  
* Debate  
* Telephone conversation | Exercise on:  
* Debating  
* Participating in Seminar, panel, Symposium  
* Telephonic Conversation | * Assessment of the skills based on the check list |
|-----|-----|-------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
| V   | 2   | **Develop skill in listening comprehension** | Listening Comprehension  
* Media, audio, video, Speeches etc. | Exercise on:  
* Listening to audio, video, tapes and identify the key points | * Assessment of the skills based on the check list |
| VI  | 4   | **Develop skill in Grammar** | Grammar  
* Transformation of Sentences  
* Correction of sentence  
* Vocabulary Building  
* Composition  
* Essay writing  
  on topics of every day life | Exercise on:  
* Voice  
* The Sentence  
* Parts of Speech  
* Direct and Indirect Speech  
* Affirmative and Negative  
* Change the Question Tag  
* Correction of Syllabus  
* Idioms  
* Letter writing – Personal, Official matters connection with daily life | * Assessment of the skills based on the check list |

**Soft Skills**

1. **Introduction to Soft Skills**
   - What are Soft Skills?
   - Why is Soft Skills necessary in the modern age?
   - Significance of Soft Skills in the medical profession.
 Topics to be covered in the Soft Skills training program.

2. Interpersonal Skill
   - What is an Interpersonal Skill?
   - What is the significance of having a good Interpersonal Skill in a medical profession?
   - How can we develop our Interpersonal Skills through Empathic listening and building trust?

3. Communication Skill
   - The process of communication
   - Barriers to communication
   - Verbal communication and Non-verbal communication
   - Role of perception in communication

4. Time Management
   - Value of time, setting goals/planning and prioritization.
   - Check the time killing habits
   - Procrastination
   - Tools of time management – Time Management Matrix as explained by Dr. Stephen R Covey

5. Goal Setting
   - Concept of goal setting
   - Personal values and Personal goals
   - Six areas of goal setting
   - The process of goal setting : SMART goals
   - How to set SMART goals

6. Stress Management
   - What are the causes of stress and different types of stressors
   - Identifying the stressors in an individual
   - Process of stress
   - What are the effective ways of managing stress?

7. Emotional Intelligence
   - The concept of Emotional Intelligence
   - The components of Emotional Intelligence
   - The different models of Emotional Intelligence
   - Emotional Intelligence for leadership.
8. **Listening skill**  
- The concept of listening and its significance in the communication process  
- Why listening skill is important in the medical profession  
- Different types of listening  
- How to become an effective listener

9. **Being Proactive**  
- The concept of being proactive  
- The Importance of being proactive in life  
- The stimulus – response model of being proactive – Dr. Stephen R Covey  
- Circle of concern and Circle of Influence – Dr. Stephen R Covey  
- Developing the Proactive language in life

10. **Presentation Skill**  
- The process of presentation skill  
- Adult learning principles  
- Preparation and planning for presentation  
- How to effectively deliver a presentation  
- Effective use of voice and body language  
- Effective use of visual aids,  
- Do’s and Don’ts of presentation

11. **Group discussion**  
- The significance of a group discussion round in an interview – Different skills of an individual that are tested in a group discussion.  
- Do’s and Don’ts in a group discussion.

12. **Interview Skills**  
- What is the purpose of Job Interview?  
- What are the different types of Job Interview?  
- Do’s and Don’ts of an Interview  
- Effective Resume preparation  
- Dressing and Grooming for an Interview  
- Self Introduction  
- Extempore practice

********************************************************************
SECOND YEAR

During the second year the students will be posted in the clinical area from 8 am to 5 pm (Depending on the OT schedule) and regular didactic lectures.

Internal Assessment

One sessional examination and one model examination will be conducted in this year. Average marks of these two examinations will be counted as internal marks along with performance in the clinical posting.

********************************
************************************

Paper VII – PHARMACOLOGY

- General Pharmacology – 4 hours
- Evaluation of drugs in man, drug prescribing and drug interactions – 3 hours
- Sedatives, hypnotics and pharmacotherapy of insomnia – 1 hour
- Drugs effective in convulsive disorders – 1 hour
- Opioid analgesics – 1 hour
- Analgesic – antipyretics and non-steroidal anti-inflammatory drugs – 1 hour
- Psychopharmacology – 1 hour
- Drug therapy of parkinsonism and other degenerative disorders of the brain – 1 hour
- Local anesthetics – 1 hour
- Adrenergic and adrenergic blocking drugs – 1 hour
- Histamine and anti histamic drugs – 1 hour
- Pharmacotherapy of cough – 1 hour
- Pharmacotherapy of bronchial asthma and rhinitis – 1 hour
- Digitalis and pharmacotherapy of cardiac failure – 1 hour
- Vasodilator drugs and pharmacotherapy of angina pectoris – 1 hour
- Pharmacotherapy of hypertension – 1 hour
- Drugs and blood coagulation – 1 hour
- Drugs effective in iron deficiency and other related anemias – 1 hour
- Diuretics – 1 hour
- Emetics, drug therapy of vomiting, vertigo and diarrhea – 1 hour
- Pharmacotherapy of constipation – 1 hour
- Pharmacotherapy of peptic ulcer – 1 hour
- Sulfonamides, Trimethoprim, cortimoxazole, nitrofurans and quinolones – 1 hour
- Penicillins and antibiotics effective mainly against gram positive organisms – 1 hour
- Aminoglycosides and other antibiotics effective mainly against gram negative organisms – 1 hour
- Antibiotics effective against both gram positive and gram negative organisms – 1 hour
- General principles of chemotherapy of infections – 1 hour
- Chemotherapy of urinary tract infections – 1 hour
- Antiseptics, disinfectants and insecticides – 1 hour
- Thyroid and antithyroid drugs – 1 hour
- Insulin and antidiabetic drugs – 1 hour
- Adrenal cortical steroids – 1 hour
- Vitamins and antioxidants – 1 hour
- Drugs, pregnancy and the newborn – 1 hour

Reference books:

Essentials of Medical Pharmacology
Tripathi
Basics and Clinical Pharmacology
Katzung

******************************************************************************

Paper VIII – PATHOLOGY

1. Introduction to Pathology 3 hrs
   - Histopathology- Methods and techniques
   - Cytology-FNAC,Exfoliative advantages and limitations of cytology
   - Hematology-Sample collection.
   - Immunohistochemistry,Immunofluorescence, Electron microscopy, Flow cytometry

2. Cell injury & adaptations 1 hr
   - Etiology
   - Reversible & - Irreversible cell injury
   - Necrosis & Apoptosis
   - Gangrene - Dry - Wet
   - Atrophy, Hypertrophy, Hyperplasia, Metaplasia, Dysplasia.
   Fatty change

3. Inflammation & Repair 2hrs
   - What is inflammation
   - Signs of inflammation, Acute and chronic inflammation, Types of inflammation, Giant cells, Macrophages, Ulcer, abscess, Acute inflammation, Systemic effects of acute inflammation
   - Factors affecting healing- Complications of healing
4. Hemodynamic Disorders 2 hrs
   - Definition of edema and causes of edema
   - Exudate and transudate
   Shock – Definition and types of shock
   Thrombosis
   Embolism - Definition and types of emboli, - Pulmonary thromboembolism

5. Neoplasia 2 hrs
   - Definition
   - Difference between benign and malignant cells, Nomenclature of tumors
   - Routes of metastasis of tumours, - Staging of tumour, - Etiology of cancers -
   Diagnosis of cancer, including tumour markers

6. CVS 1 hr
   - Definition of Ischaemia, Infarction, Aneurysm
   - Rheumatic heart disease, Infective endocarditis, Atherosclerosis
   - Myocardial infarction, Hypertension and pericardial effusion

7. Respiratory system 1 hr
   - Tuberculosis, Pleural effusion, Pneumonia, COPD and tumours

8. GIT 1 hr
   - Peptic ulcer, - Carcinoma of oesophagus, Stomach & Colon,
   - Inflammatory bowel disease (UC & Crohns)

9. Liver and GB 1 h
   - Hepatitis. Cirrhosis, Tumours of liver
     - Cholecystitis and GB calculi

10. Renal 1 hr
    - Glomerulonephritis & Pyelonephritis
    - Renal calculi - Nephrotic syndrome, Renal tumors, Polycystic renal dis-
      eases-

Internal assessment  Exam -1 ½ hrs
11. MGS

- Cryptorchidism, Orchitis, epididymitis, Prostatic hyperplasia
  - Carcinoma penis, Testicular tumors

12. FGS & Breast

Ovarian tumours, - Fibroid - Carcinoma cervix - Carcinoma endometrium pap smear
  - Fibroadenoma breast, Carcinoma Breast - Predisposing factors & TNM

13. CNS

- Meningitis & encephalitis, Alzheimer’s disease,
  - Tumours - Meningioma, Gliomas, Metastasis
  - CSF collection, indication and contraindication, tests performed, cytocentrifuage

14. Skin & soft tissue

Skin - SCC, Melanoma, BCC inflammatory lesions, lipoma,

15. Bone

Osteoporosis, Osteomyelitis, Rickets, Osteomalacia
  - Tumours – Osteosarcoma, Osteoclastoma, Ewings sarcoma & Arthritis

16. Endocrine

Organs, Pituitary, Adrenal brief; Thyroid – Goitre thyroiditis and tumours
  - Diabetes and its complications

17. Anaemias

- Types of anaemia

18. WBC disorders

Non neoplastic and neoplastic

19. Lymphoreticular system

- Lymphadenitis, Lymphomas

20. **Platelet and coagulation abnormalities** - Primary & Secondary Hemostasis  

21. **Clinical Pathology I**  
   Blood collection, anticoagulants used, vacuettes and their color code. Complete hemogram and the various parameters, Bone marrow – Indication of BM study & collection procedure, PT, APTT sample collection  

22. **Clinical Pathology II**  
   Urine analysis – Physical, Chemical, microscopic, Dipstick parameters  

23. **Transfusion Medicine**  
   Blood grouping, cross matching, Screening of donor, Precautions to take when you start blood transfusion, Monitoring during transfusion, Transfusion reactions, Blood components.  

**Internal assessment**  
Exam - 1 1/2 hrs  

Lab visit:  
- Histopathology lab - 1 hr  
- Hematology lab & blood bank - 1 hr  
- Cytology lab - 1 hr  

Total Hours: 29 hrs lecture + 3 hrs exam + 3 hrs lab visit = 35 hrs  

**Reference Books:**  
Basic Pathology: An introduction to the mechanisms of disease  
Sunil R Lakhani, Susan A Dilly, Caroline J Filayson  

Paper IX - APPLIED BASIC SCIENCES  

**Applied Anatomy related to critical care**  
I RESPIRATORY SYSTEM  
- Introduction  
- Medical Terminology  
- Anatomical terms, planes, relations
I. RESPIRATORY SYSTEM

- Physiology of breathing
- Homeostasis
- Mechanics of breathing, Muscle action
- Regulation of breathing
- Lung Volumes & Capacity
- Gas exchange & transport - oxygen, carbon dioxide
  - Diffusion
  - O2 Transport and abnormalities
  - CO2 Transport and abnormalities
- Pressure, Volume
- Resistance, Compliance
- Ventilation and Perfusion, V/Q ratio
- Gas exchange, mechanism of diffusion
• Work of breathing
• Transport of O2 and CO2; factors affecting oxygen transport
• Acid - base balance
• Pulmonary Function Tests
• Arterial Blood Gas
• Types of respiratory failure - causes and treatment

II CARDIOVASCULAR SYSTEM

• Cardiac cycle
• Cardiac output - factors affecting cardiac output
• Cardiac conducting system
• Regulation of rate, basic arrhythmias
• Principles of ECG, Normal ECG
• Blood pressure
• maintenance of normal blood pressure and factors affecting it
• systolic, diastolic, pulse pressure, mean

• Oxygen delivery, uptake to tissues
• Central venous pressure
• Cardiac output, Stroke volume contractility
• Preload, After load
• Interpretation of common haemodynamic parameters.
• Assessment of hemodynamic parameters
• Recognise the following regarding arterial cannulation
• Indications

• Cannulation sites
• Possible complications
• Normal pressures and their significance
• Pressure wave forms
• Significance of respiratory variation in the pressure wave forms

CVP Monitoring
• Indications
• Factors affecting measurement
• Insertion sites
• Types of catheters
• Correct technique of pressure measurement.
III CENTRAL NERVOUS SYSTEM
• Metabolic requirements of the brain
• Consciousness, Coma, Brain injury
• Sedation
• Brain Death

Clinical Pharmacology:
- Drugs - Nomenclature
- Modes of action of drugs
- Routes of administration
- Drug dose calculation - Dilution, infusion rate
- Medical gases: O2 ; N20
- Bronchodilators
- Mucokinetic agents
- Antihistamines
- Steroids
- Drugs affecting autonomic nervous system
- Inotropic agents, Chronotropic agents,
- Vasopressors & Vasodilators
- Anti-hypertensives
- Analgesics; sedatives
- Neuromuscular blocking agents
- Antimicrobial drugs, antiviral and anti fungal agents - basic concepts
- Antimicrobial Resistance - Basic concepts
- Antiseptic agents

Clinical Microbiology And Infection Control
INTRODUCTION - Importance of infection in an ICU
Agents causing Infection
SPREAD OF INFECTION Source; host; transmission
Biohazardous materials
INFECTION CONTROL & UNIVERSAL PRECAUTIONS
- Sterilisation & Disinfection - concepts
- Methods of sterilization
- Spread of infection
- Elimination of source - Cleaning and sterilizing equipment
- Interrupting transmission of infection - role of health care workers
- Disposal of infection wastes
- Surveillance; quality control

SPECIFIC INFECTIONS
Nosocomial Infections: Types - Prevention .
  - HIV-AIDS .
  - Hepatitis A, B, C
Tropical Infections - Tetanus, Malaria, Leptospirosis, Dengue, Rickettsial, Amoebiasis Sepsis

********************************************************************************

** Paper X - BASICS OF INTENSIVE CARE TECHNOLOGY **

Airway Care

**INDICATIONS FOR ARTIFICIAL AIRWAYS**
- Relieving airway obstruction
- Secretion removal
- Protecting the airway
- Positive Pressure Ventilation

**SELECTING AND ESTABLISHING AN ARTIFICIAL AIRWAY**
- Nasal airways
- Pharyngeal airways
- Tracheal airways

**AIRWAY CLEARANCE TECHNIQUES**
- Airway suctioning
- Bronchoscopy

**AIRWAY MAINTENANCE**
- Securing the airway and confirming placement
- Providing adequate humidification
- Minimizing nosocomial infections
- Providing cuff care
- Facilitating clearance of secretions
- Troubleshooting airway emergencies

**EXTUBATION**
- Indications
- Procedure
- Post extubation care & complications

**Oxygen Therapy**
- Sources of oxygen for therapy
- Storage of oxygen
- Oxygen delivery systems
- Hazards of oxygen
- Modes of O2 therapy
- Monitoring O2 delivery systems (in vitro)
  Blood gases in patient (in vitro.)
- Pulse oximetry
- Economic issues

**CHEST XRAY**

**NORMAL CHEST X-RAY**

- Normal anatomy
- Basic physics of X-ray and assessment of film quality

- Cardiac configuration.
  - Lung fields and airway
  - Optimum position of - ET, NG, Central Lines

**ABNORMAL CXR:**

- Trauma:
  - Pneumothorax
  - Hemothorax

- Lung contusion
  - Pulmonary oedema
- CCF
- ARDS
  - Pneumonia: - Bronchopneumonia
  - Lobar pneumonia

- Aspiration pneumonia

**Fundamentals of Electricity and Electronics:**

Resistance: Symbol, units, colour coding equivalent resistance with 'connection in series and parallel.

Capacitance: Symbol, units, series and parallel connection

Inductance and transformers

Parameters of electricity power - voltage, current frequency, power.

Differences between AC and DC - .

  - AC and DC power supplies, Phase, neutral and earth - conventional colour coding

Ohms law and Kirchoff’s law - Electrical Circuits.

Earth and grounding - Symbol, importance in patient care.

AC and DC power supplies- Phase, neutral and earth - conventional colour coding

Classification of medical equipment

1. According to type of protection: B C F etc.
2. According to mode of protection: Class I - III.

9. Clinical Scenarios

RESPIRATORY SYSTEM

- Respiratory Failure
- Acute Respiratory Distress Syndrome
- Pneumonia, Tuberculosis
- Opportunistic infections
- Bronchial asthma
- Chronic obstructive airways disease
- Chronic bronchitis
- Emphysema
- Chronic Suppurative Lung Disease Bronchiectasis
- Lung Abscess

- Atelectasis I Collapse
- Pleural diseases: pneumothorax, pleural effusions

CARDIOVASCULAR SYSTEM

- Shock - hypovolemic, cardiogenic, obstructive, septic
- Congestive cardiac failure; Acute-left ventricle failure
- Pulmonary oedema
- Pulmonary hypertension
- Pulmonary embolism
- Ischemic heart disease; Myocardial infarction

NERVOUS SYSTEM:

- Cerebrovascular Disease
- Neurological Failure:
  - Coma
  - Delirium
- Neuromuscular disease
- Myasthenia gravis
- Guillain Barre Syndrome
- Cerebrovascular disease, stroke
- Brain Death
- Persistent Vegetative State
- Trauma

- Head injury
- Unstable spine & protection

GASTROINTESTINAL, HEPATIC, PANCREAS:

- Upper GI Bleed
- Hepatic Coma
- Pancreatitis

RENAL:
Renal Failure in ICU

ENDOCRINE & METABOLIC:
- Hypoglycemia
- Hyperglycemia

HAEMATOLOGY:
- Haemaological Malignancies
- Neutrapenia
- Coagulopathy

MISCELIANEOUS:
- Envenomation - snake bite, scorpion sting
- Poisoning - general supportive care, common poisons
THIRD YEAR

During the third year the students will be posted in the clinical area with regular didactic lectures.

Internal Assessment

One sessional examination and one model examination will be conducted in this year. Average marks of these two examinations will be counted as internal marks along with performance in the clinical posting.

********************************************************************

Paper XI - INTENSIVE CARE TECHNOLOGY - CLINICAL

1. ARTERIAL BLOOD GASES
   - Procedure, puncture sites
   - Sampling techniques
   - Using an ABG machine,
     - Different types of ABG machines - advantages and disadvantages, cost considerations
   - Transportation of sample
     - Interpretation of values
   - Appropriate Interventions

2. MECHANICAL VENTILATION - NON INVASIVE AND INVASIVE
   - Basic concepts: - Mechanics of ventilation
   - Work of breathing
   - Indications
   - Humidification of gas
   - Ventilator settings
   - Timings - Inspiratory, Expiratory, Inspiratory hold
   - Flow
   - Tidal volume
   - Pressure - Peak
   - plateau
   - PEEP
   - "PEEP-"OFF"
   - Pressure support
   - Proximal airway vs distal
   - Fi02
   - Modes of ventilation
     Non Invasive, CPAP, BiPAP
     Invasive modes - Controlled, Assisted, SIMV, APRV, Pressure Support
- Alarm settings
- Care of ventilator & tubings- -Sterility
- Weaning – concepts
- Humidifier - types
- advantages and disadvantages
- Inhaled drug therapy
- nebulisation - different types, advantages & disadvantages
- MDI with Spacer

3. CARE OF PATIENTS ON VENTILATOR
   - Ensuring proper placement of tube
   - Cuff pressure ,
   - Tracheobronchial hy~ne, suctioning
   - Humidification, Chest physio
   - Ventilator settings
   - Monitoring ventilatory parameters

4. CARE OF CHEST TUBE
   Drainage systems of pleural air, fluid

5. CARDIOVASCULAR SUPPORT:
   A. Assisting in .
      1. Arterial and central venous cannulation
      2. Peripheral venous cannulation
      3. PiCCO I Pulmonary artery catheter insertion - measuring cardiac output by
         thermodulation
      4. Pericardiocentesis
      5. Transvenous pacemaker
   B. Placement of ECG leads taking 12-lead dynamic ECG.
   C. Use of infusion devices for vasoactive medications.
   D. Assisting in electrical cardioversion and defibrillation. Placement of transcutaneous pacemaker.
   E. Setting up invasive pressure monitoring - levelling, calibration, zeroing; measuring pressures
      • MONITORING CARDIOVASCULAR SUPPORT:
         Zeroing, calibration and trouble- shooting of pressure transducers.
Troubleshooting invasive blood pressure monitoring and central venous pressure monitoring. Setting up and trouble shooting invasive cardiac output monitoring - PICCO, PA catheter

- INVASIVE PRESSURE MONITORING
  - arterial & venous
  - care & maintenance
  - transducers, dome, zeroing, calibration

- BASICS OF FLUID RESUSCITATION & INOTROPIC SUPPORT

********************************************************************

Paper XII - INTENSIVE CARE TECHNOLOGY - APPLIED

6. RESPIRATORY SUPPORT:

1. Maintaining an open airway.
2. Assisting in
   i. Tracheal intubation (oral, nasal)
   ii. Cricothyrotomy, tracheostomy, trans tracheal catheters
   iii. Mechanical ventilatory support

   Monitoring airway pressures
   iv. Topical use of respiratory medication (inhalers and nebulisers)
   v. Suctioning: Chest physiotherapy and incentive spirometry.
   vi. Weaning techniques.
   vii. Assisting in fibroptic bronchoscopy.
   viii. Oxygen therapy devices and their limitations
   ix. Assisting in chest tube insertion and chest drainage systems
       x. Bed side pulmonary function tests
       xi. Arterial blood gas sampling; Using the ABG machine
       xii. CPAP & BI PAP circuit

RESPIRATORY THERAPY:

Setting up & Troubleshooting:

Oxygen administration
Non invasive Ventilation - NIV on standard ventilator, BiPAP, CPAP
Imiasive Ventilation
Setting up the ventilator
  Oxygenation
  Ventilation
  Alarms

Trigger
  Evaluate and trouble shoot the patient- ventilator system
  Interpret ventilator graphic waveform
  Detect and measure auto-peep
  Monitoring of patients who are assisted by mechanical ventilation and are in sudden distress

MONITORING RESPIRATORY SUPPORT
Monitoring of patients who are assisted by mechanical ventilation and are in sudden distress
Recognise the methods and significance of measuring the following lung volumes and flows in the ICU.
  a. Tidal volume
  b. Vital capacity
  c. Peak Flow Rate
  d. Negative Inspiratory Pressure
  e. Respiratory Graphics Analysis

7. RECOGNITION OF CARDIORESPIRATORY ARREST

8. BASIC LIFE SUPPORT (Hands on Training)
   - Ventilation, Use of Ambu bag
   - Cardiac massage

9. CONCEPTS IN ADVANCED LIFE SUPPORT
   - Drugs
   - Defibrillator

PROLONGED LIFE SUPPORT
- Concept of the "ICU" and team work

10. CARE OF THE UNCONSCIOUS PATIENT

- Comfort, orientation, pain control
- Skin integrity assessment and care
- Physiotherapy - Chest & Limbs
- Nutritional needs and supply
- Basic care of surgical wounds and fractures
- Psychological assessment and support in an ICU.

11. BASIC ADMINISTRATION:

Economic Issues.

- Raising purchase orders for equipment
- Maintaining consumables stock

Maintaining equipment - repair and troubleshooting

12. CSSD PROCEDURES

1. Waste disposal collection of used items from user area, reception protective clothing and disinfections sage gaurds,

2. use of disinfectants sorting and classification of equipment for cleaning purposes, sharps, blunt lighted etc. contaminated high risk baby care - delicate instruments or hot care instruments,

3. cleaning process - use of detergents. Mechanical cleaning apparatus, cleaning instruments, cleaning jars, receivers bowls etc. trays, basins and similar hand ware utensils. Cleaning of catheters and tubings, cleaning glass ware, cleaning syringes and needles.

4. Materials used for wrapping and packing assembling pack contents. Types of packs prepared. Inclusion of trays and gallparts in packs. Method of wrapping and making use of indications to show that a pack of container has been through a sterilization process date stamping.


13. EQUIPMENT MAINTENANCE & BASIC TROUBLESHOOTING:

- Ventilators, CPAP, BiPAP machines
- Pumps - Infusion, Syringe
Monitors - Stand alone & multiparameter
ECG Machine
ABG Machine
Defibrillator

14. MEDICAL ETHICS
1. Medical ethics - Definition - Goal - Scope
2. Code of conduct - Introduction –
3. Basic principles of medical ethics – Confidentiality
4. Malpractice and negligence - Rational and irrational drug therapy
5. Autonomy and informed consent - Right of patients
6. Care of the terminally ill- Euthanasia
8. Organ transplantation

9. Medico legal aspects of medical records - Medicolegal case and type- Records and document related to MLC - ownership of medical records - Confidentiality Privilege communication - Release of medical information - Unauthorized disclosure - rentention of medical records - other various aspects

15. PROCEDURAL SKILLS

EMERGENCY LIFE SUPPORT:
Basic Life Support - Keeping Airway open, Use of Ambu bag and mask ventilation, Cardiac massage
Advanced Life Support
Use of Defibrillator

Emergency Management of Trauma

GASTROINTESTINAL; GENITOURINARY AND OBSTETRIC AND GYNAECOLOGICAL PROBLEMS:
1. Assisting in
a. Placement of trans oesophageal devices.
NG tubes, enteral feeding tubes, Sengstaken-Blackemore tube
b. Maintenance of urinary catheters
c. Placement of hemodialysis catheters
d. Management peritoneal dialysis
e. Management CVVHD

NERVOUS SYSTEM:
Assisting in:
Lumbar puncture
Application of intracranial pressure monitoring device
Application of on-line immobilisation (C spine protection)
Cervical neck collar.
TOXICOLOGY:
Gastric lavage
ANALGESIA and SEDATION
Care of Epidural
Patient Controlled Analgesia
HAEMATOLOGICAL DISORDERS:
Assisting in:
    Exchange Transfusion
Plasmapharesis

16. TRAUMA, BURNS, ENVIRONMENTAL INJURIES, PERIOPERATIVE CARE:
FOURTH YEAR

Internship

Description:

One-year compulsory internship in various clinical areas in Amrita Institute of Medical Sciences during which the students get to hone their skills and knowledge acquired in the three years of rigorous study. During this period their work is very similar to what is expected from them after the completion of their training. The training ensures their readiness to approach a patient in any setting.

Eligibility:

Student who has successfully completed his/her theory and practical in the first three years of the programme.

Duration:

One year (compulsory Internship) at Amrita Institute of Medical Sciences.
# SCHEME OF EXAMINATION

**B.Sc Operation Theatre Technology Degree Examination**

## Distribution of Marks for each subject

<table>
<thead>
<tr>
<th>Paper Code</th>
<th>Subject Name</th>
<th>Theory</th>
<th>Paper Total</th>
<th>Aggregate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>University</td>
<td>Internal</td>
<td>Oral</td>
</tr>
<tr>
<td>FIRST YEAR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Anatomy</td>
<td>70</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>II</td>
<td>Physiology</td>
<td>70</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>III</td>
<td>Biochemistry</td>
<td>70</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>IV</td>
<td>Microbiology</td>
<td>70</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>V</td>
<td>Section A – Introduction to Computer Application</td>
<td>50</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Section B - Quality Assurance and Accreditation</td>
<td>50</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>VI</td>
<td>English &amp; Soft Skills</td>
<td>100</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>SECOND YEAR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VII</td>
<td>Pharmacology</td>
<td>70</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>VIII</td>
<td>Pathology</td>
<td>70</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>IX</td>
<td>Applied Basic Sciences</td>
<td>100</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>X</td>
<td>Basics of Intensive Care Technology</td>
<td>100</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>THIRD YEAR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>XI</td>
<td>Intensive Care Technology-Clinical</td>
<td>100</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>XII</td>
<td>Intensive Care Technology-Applied</td>
<td>100</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>XIII</td>
<td>Intensive Care Technology-Advanced</td>
<td>100</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>XIV</td>
<td>Practical +Viva (100) Project (50)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
PATTERN OF QUESTION PAPERS

**Paper I to Paper IV and VII & VIII**
The duration of each theory paper will be three hours; the paper will have only one section for a total of 70 marks.

**Pattern of Question Paper**
- Structured Essay (2 out of 3) - 30 marks (2 x 15 marks)
- Short Notes (5 out of 6) - 25 marks (5 x 5 marks)
- Short answer question (5 out of 7) - 15 marks (5 x 3 marks)

Total Marks - 70 marks

**Paper V (English)**
The duration of the paper will be three hours; the paper will have two sections (Section A & Section B) each carrying 50 marks and a total of 100 marks.

**Pattern of Question Paper**
- Structured Essay (2 out of 2) - 20 marks (2 x 10 marks)
- Short Notes (3 out of 4) - 15 marks (3 x 5 marks)
- Short answer question (5 out of 7) - 15 marks (5 x 3 marks)

Total Marks - 50 marks

**Paper VI**
The duration of Paper V will be two hours; the paper will have only one section for a total of 50 marks.

**Pattern of Question Paper**
- English Grammar - 20 marks
- English Writing - 30 marks

Total Marks - 50 marks

**Paper IX to Paper XIII**
The duration of each theory paper will be three hours; the paper will have only one section of 100 marks.

**Pattern of Question Paper**
- Structured Essay (2 out of 2) - 30 marks (2 x 15 marks)
- Short Answer Question (10 out of 12) - 70 marks (10 x 7 marks)

Total Marks - 100 marks

**IMPORTANT TELEPHONE NUMBERS**
Amrita Institute of Medical Sciences : 0484-2801234/2851234
Principal’s Office : 0484-2858131/2858131
Chief Programme Administrator : +91 7994999019, Oncall: 1919
Programme Co-ordinator : +91 7994999118, Oncall: 6976