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Bhaikaka University

Instilling Purpose in Healthcare

Charutar Arogya Mandal, Karamsad

# A Curriculum

# For

# B.Sc. (Honours) in Medical Technology

# (Respiratory Care Technology)

## CAM Institute of Allied Health Sciences & Technology

## (A constituent Institute of Bhaikaka University)

## (Academic Year 2024-25)

## Vision

Our institute will be the most preferred destination for the aspirants who want to achieve the highest standard of excellence in the field of allied health sciences.

## Mission

- To promote a collaborative working environment for the academicians and the students.
- To offer a curriculum emphasizing practical knowledge and clinical experience as to be implemented in authentic settings.
- To collaborate with clinicians and experts from basic biomedical sciences for education and research.

# CURRICULUM

| | |
|---|---|
| **Discipline** | Medical Technology |
| **Program** | B.Sc. (Honours) Medical Technology |
| **Specialization** | Respiratory Care Technology |
| **Subject Code** | --- |
| **Tenure** | 4 years (Including 1 year of Internship) |
| **Last Revised** | July 2024 |

# NOTIFICATION

**Subject: Regulations and Curriculum pertaining to B.Sc. (Honours) Medical Technology (Respiratory Care Technology) Program**

In exercise of the power conferred under section 22(3) of the Gujarat State Private Universities Act 2009, the Academic Council in its 9th meeting held on 22nd August 2024 Under the agenda item no. 24.02.10 is pleased to approve the curriculum of B.Sc. (Honours) Medical Technology (Respiratory Care Technology) at Bhaikaka University.

The curriculum shall come into force from the Academic Year 2024-2025.

**By Order,**
**REGISTRAR**

# ACADEMIC REGULATIONS

## 1. TITLE OF THE PROGRAM:

This program shall be called as per the name given below under the Faculty of Medicine and discipline of Respiratory Care Technology at Bhaikaka University, Karamsad. It comes into effect from the Academic Year 2024-25. The relevant regulatory bodies reserve the right to make changes to the regulations at any period of time.

Name of the program shall be;

1) B. Sc. (Honours) Medical Technology (Medical Laboratory Technology)
2) B. Sc. (Honours) Medical Technology (Radiography & Medical Imaging Technology)
3) B. Sc. (Honours) Medical Technology (Radiotherapy Technology)
4) B. Sc. (Honours) Medical Technology (Operation Theatre & Anaesthesia Technology) 5) B. Sc. (Honours) Medical Technology (Respiratory Care Technology)

## 2. ELIGIBILITY FOR THE ADMISSION:

The candidate who has passed 10+2 (Science) examination conducted by any recognized School Certification Board or Equivalent Examination; with principal subjects like Physics, Chemistry, Biology and/or Maths and English. The student should complete minimum of 17 years at the time of securing admission.

### 2.1 DURATION OF THE PROGRAM:

The program of B.Sc. (Honours) in Medical Technology (Respiratory Care Technology) comprises of 4 (four) academic years including 1 (one) year of internship at the respective area of Shree Krishna Hospital affiliated with Bhaikaka University.

### 2.2 MEDIUM OF INSTRUCTION:

English will be the medium of instruction for all the subjects and also for the examination of the program.

## 3. METHOD [S] OF INSTRUCTIONS:

- This program shall include teaching through lectures, practical, demonstration, group discussion, individual learning, kinaesthetic or participative learning through traditional methods or by using ICT tools.
- Structured problem-based exercises shall be provided to simulate specific case examples
- Audio visual material and/or printed handouts shall be provided to supplement reading and classroom instruction.

## 4. CREDIT SYSTEM:

This program will have a curriculum in which every course will be assign certain credits reflecting its weight and contact periods per week as given below:

1 lecture (L)/week ( 15 Hours)* = 1 credit

1 Tutorial (T)/week (15 Hours)* = 1 credit

1 Practical (P)/week (30 Hours)* = 1 credit

* 1 credit of class room theory, tutorial and demonstration is equal to 15 hours of engagement in a year and 1 credit of practical class is equal to 30 hours of engagement in a year.

In addition to theory and laboratory practicals there may be other courses such as seminal. Clinical training/Hospital posting, projects etc., which will be assigned credits as per their contribution in the program without regards to contact periods.

## 5. ELIGIBILITY TO APPEAR IN ANNUAL EXAMINATION:

- The student must have attended at least 75% of the total classes conducted in each course of the year separately in theory, practical and clinical postings.
- The students must have secured 35% of the total marks in each course of the academic year separately in theory and practical.

## 6. ASSESSMENT:

 Assessments should be completed by the academic staff, based on the compilation of the student ‘s theoretical & clinical performance throughout the education programme. To achieve this, all assessment forms and feedback should be included and evaluated.

### 5.1 INTERNAL ASSESSMENT

 Internal assessment shall be done based on continuous evaluation of the student. It includes mainly two internal examinations (one terminal examination & one preliminary examination). It may also include several unit tests and assignments submitted by the students throughout the year in each subject of the program. In order to award the internal marks in theory and practical, the average of the two internal examinations as well as unit tests, assignments, attendance and participation in curricular/extra-curricular activities shall be considered.

### 5.2 EXTERNAL ASSESSMENT

- External assessment shall include theory and practical examinations conducted as a part of the annual examinations of each subject (course) as per the schedule decided by the college and university.
- The scheme of question paper for theory and practical examinations will be as prescribed by the regulatory body.

## 7. ACADEMIC PROGRESSION:

- The student will not be allowed to appear for the annual examination of the third year if he/she has not cleared all the courses of the first and second year of the program.
- The student will not be allowed to enter in the internship (fourth year) of the program, if he/she has not cleared all the courses of final year of the program.
- These rules will be strictly applicable and no complaint/request will be entertained from the students who may be detained under these rules.

## 8. INTERNSHIP:

- There shall be one year of internship after the successful completion of third year of the program. Internship should be done at the hospital recognized by Bhaikaka University only.
- The student shall be awarded the degree only after successful completion of the internship.

## 9. AWARD OF GRADES:

- The student must secure minimum 35 % of marks in theory and practical examination separately to pass in the final University Examination.
- In case a student fails to secure minimum 35% marks in any theory or practical course, he/she shall reappear for the supplementary examinations or the annual examination of that course. However, his/her marks of the internal assessment shall be carried over and he/she shall be entitled for the grade obtained on passing.

### 9.1 ALLOCATION OF GRADE POINTS:

The student shall be awarded a final letter grade at the end of the academic year for each course as per the table shown below;

**Table 1: Letter grades and Grade Points**

| Letter Grade | Grade Points | Marks |
|---|---|---|
| **O** (Outstanding) | 10 | ≥90 |
| **A+** (Excellent) | 9 | 80-89 |
| **A** (Very Good) | 8 | 70-79 |
| **B+** (Good) | 7 | 60-69 |
| **B** (Above Average) | 6 | 50-59 |
| **C+** (Average) | 5 | 40-49 |

| | | |
|---|---|---|
| **P** (Pass) | 4 | 35-39 |
| **F** (Fail) | 3 | <35 |
| **Ab** (Absent) | 0 | -- |

### 9.2 DECLARATION OF CLASS:

The class shall be awarded on the basis of CGPA as follows;

| Class | CGPA |
|---|---|
| **First Class with Distinction** | **≥ 7.50** |
| **First Class** | **6.00 to 7.49** |
| **Second Class** | **4.8 to 5.59** |
| **Pass Class** | **<4.8** |

**The class shall be awarded on the basis of following;**

| Class | Details |
|---|---|
| First Class with Distinction | A successful candidate obtaining 75% and more marks of the grand total aggregate in the first attempt shall be declared to have passed these subjects with Distinction |
| First Class | A successful candidate obtaining 60% and more and less than 75% of the marks of the grand total aggregate in the first attempt shall be declared to have passed these subjects with first class |
| Second Class | A successful candidate obtaining 50% and more and less than 60% of the marks of the grand total aggregate in the first attempt shall be declared to have passed these subjects with Second class |
| Pass Class | Those candidates who do not fall in any above criteria's, but fulfil the requirement of passing of the whole course, will be shown as "PASS" in the grade card/mark sheet |

## 10. PROGRAM OBJECTIVES:

Program objectives aim at making the students being able to:

- Perform objective self-assessments of their knowledge and skills; learn and refine existing skills; and acquire new skills
- Apply newly gained knowledge or skills to patient care
- Enhance their personal and professional growth and learning by constant introspection and utilizing experiences

- Search (including through electronic means), and critically evaluate medical literature to enable its application to patient care
- Develop a research question and be familiar with basic, clinical and translational research in its application to patient care

## 11. PROGRAM OUTCOMES:

**PO1**: **Improvement and understanding of paramedical science:**
Students will make use of their subject-matter expertise to effectively render healthcare services.

**PO2: Patient treatment methods and clinical services:**
Students will use fundamental scientific concepts to choose pertinent investigations while offering patient care in an effective and economical manner. They ought to establish plans for sickness avoidance alongside healthcare improvement**.**

**PO3: Intellectual proficiency:**
The student will be competent to supervise diagnostics and clinical administration procedures and troubleshoot concerns.

**PO4: Aptitudes for interaction:**
In order to give stakeholders and the healthcare team pertinent information, students will be able to express themselves concisely and adaptably. They will be provided with purposeful counselling approaches to promoting lifestyle changes that will optimize health.

**PO5: Research/ Exploration:**
The ability for students to think critically on their own will be significant, as will be their ability to communicate verbally as well as in writing.

**PO6: Ethics and accountability:**
Students will comprehend the fundamental principles of clinical ethics and legislation so they may use them in their practice as healthcare practitioners.
Students should be able to:

- Describe and apply the fundamental ideas of clinical ethics to real-world scenarios and circumstances
- To provide patients with access to healthcare resources fairly, equally, and without bias, discrimination, or undue influence.
- Establish an understanding and effectively apply fundamental legal principles to their practice.
- Embrace professional responsibility for the beginning, maintaining, and closure of patient provider conversations.

**PO7: Leadership, mentor-ship and teamwork:**
Where necessary, the student must assume a leadership position to assure optimal clinical outcomes and patient satisfaction. They must be able to effectively manage both

themselves and other people, as well as respond to planned and unknown circumstances on their own and with confidence.

**PO8: Responsibility and public accountability**
The students will be exposed to community service that is guided by study and the practice of medicine. They will encourage creative solutions to effectively address community requirements. They will do their duties with a focus towards an emerging and enduring healthcare system.

**PO9: Sustainability and the surroundings**
Students will apply effective biological waste management and disposal strategies in order to preserve the environment, community wellness, and safety.

**PO10: Continuous learning**
The student should be committed to continuous improvement in skills and knowledge while harnessing modern tools and technology.

Name of the Institute: CAM Institute of Allied Health Sciences & Technology
Name of the Program: B. Sc. (Hons) in Medical Technology
Year of the Program: First year

| | Regular Subjects | Elective Subjects | Total |
|---|---|---|---|
| Subjects | 07 | 01 | **08** |
| Credit | 40 | 02 | **42** |

## CURRICULUM & CREDIT FRAME WORK

### Regular Subjects

| Course Code | Course Title | Hours/week | | | Marks | | Total Marks | Credit |
|---|---|---|---|---|---|---|---|---|
| | | L | T/D | P | Internal | External | | |
| **Core/Major Courses** | | | | | | | | |
| 24BMT0101 | Human Anatomy | 3 | 1 | - | 30 | 70 | **100** | **4** |
| 24BMT0102 | Human Physiology | 3 | 1 | -- | 30 | 70 | **100** | **4** |
| 24BMT0103 | General Pathology | 3 | 1 | - | 30 | 70 | **100** | **4** |
| 24BMT0104 | General Microbiology | 3 | 1 | - | 30 | 70 | **100** | **4** |
| 24BMT0105 | General Biochemistry | 3 | 1 | - | 30 | 70 | **100** | **4** |
| 24BMT0106 | English | 3 | 1 | - | 30 | 70* | **100** | **4** |
| 24BMT0107 | Health Care | 2 | **--** | **-** | 20 | 40* | **60** | **2** |
| 24BMT0108 | Introduction to Medical Technology | 1 | **-** | **-** | 60 | -- | **60** | **1** |
| 24CES0101 | Clinical Education (studentship) | **--** | **13** | **-** | **100** | **--** | **100** | **13** |
| | **Total** | **21** | **19** | **-** | **360** | **460** | **820** | **40** |
| | **Total hours** | **1280** | | | **-** **-** **-** | **---** | **---** | |

### Elective Subjects

| Course Code | Course Title | Hours/week | | Marks | | Total Marks | Credit |
|---|---|---|---|---|---|---|---|
| | | L | T/D | Internal | External | | |
| 24ELC0101 | Yoga and Health | -- | 2 | 20 | 40* | **60** | **2** |
| 24ELC0102 | Basic emergency care and life support | -- | 2 | 20 | 40* | **60** | **2** |

Name of the Institute: CAM Institute of Allied Health Sciences & Technology
Name of the Program: B. Sc. (Hons) in Medical Technology (Respiratory Care Technology)
Year of the Program: Second year

| | Regular Subjects | Elective Subjects | Total |
|---|---|---|---|
| Subjects | 05 | 01 | **06** |
| Credit | 40 | 02 | **42** |

## CURRICULUM & CREDIT FRAME WORK

### (Regular Subjects)

| Course Code | Course Title | Hours per week | | | Marks | | Total Marks | Credit |
|---|---|---|---|---|---|---|---|---|
| | | L | T/D | P | Internal | External | | |
| **Core/Major Courses** | | | | | | | | |
| 24BRC0201 | Applied Pathology & Microbiology | 4 | -- | -- | 30 | 70 | **100** | **4** |
| 24BRC0202 | Practical- Pathology & Microbiology | -- | 1 | 2 | 20 | 40 | **60** | **2** |
| 24BRC0203 | Applied Pharmacology & Medicine | 4 | -- | -- | 30 | 70 | **100** | **4** |
| 24BRC0204 | Introduction to Respiratory Care Technology | 4 | -- | -- | 30 | 70 | **100** | **4** |
| 24BRC0205 | Practical- Respiratory Care Technology | -- | 4 | 4 | 20 | 40 | **60** | **4** |
| 24BSC0201 | Basics of Research Methodology | 2 | 1 | -- | 20 | 40 | **60** | **3** |
| 24CES0201 | Clinical Education (Studentship) | -- | 19 | -- | -- | -- | **100** | **19** |
| | **Total** | **14** | **25** | **6** | **150** | **330** | **580** | **40** |
| | **Total hours** | **1280** | | | **--** | **--** | **--** | **40** |

## Elective Subjects

| Course Code | Course Title | Hours / week | | Marks | | Total Marks | Credit |
|---|---|---|---|---|---|---|---|
| | | L | T/D | Internal | External | | |
| 24ELC0201 | Phlebotomy | | 2 | 20 | 40* | **60** | **2** |
| 24ELC0202 | Computer | | 2 | 20 | 40* | **60** | **2** |

Name of the Institute: CAM Institute of Allied Health Sciences & Technology
Name of the Program: B. Sc. (Hons) in Medical Technology (Respiratory Care Technology)
Year of the Program: Third year

| | Regular Subjects | Elective Subjects | Total |
|---|---|---|---|
| Subjects | 05 | 01 | **06** |
| Credit | 40 | 02 | **42** |

## CURRICULUM & CREDIT FRAME WORK

### (Regular Subjects)

| Course Code | Course Title | Hours | | | Marks | | Total Marks | Credit |
|---|---|---|---|---|---|---|---|---|
| | | L | T/D | P | Internal | External | | |
| **Core/Major Courses** | | | | | | | | |
| 24BRC0301 | Respiratory Care Technology- Clinical | 4 | - | - | 30 | 70 | **100** | **4** |
| 24BRC0302 | Respiratory Care Technology- Applied | 4 | - | - | 30 | 70 | **100** | **4** |
| 24BRC0303 | Respiratory Care Technology- Advanced | 4 | - | - | 30 | 70 | **100** | **4** |
| 24BRC0304 | Practical Respiratory Care Technology | -- | 6 | 4 | 40 | 160 | **200** | **8** |
| 24CES0301 | Clinical Education (Studentship) | -- | 20 | -- | -- | -- | **100** | **20** |
| | **Total** | **12** | **26** | **4** | **130** | **370** | **600** | **20** |
| | **Total hours** | **1280** | | | | | | **40** |

## Elective Subjects

| Course Code | Course Title | Hours/week | | Marks | | Total Marks | Credit |
|---|---|---|---|---|---|---|---|
| | | L | T/D | Internal | External | | |
| 24ELC0301 | Leadership and Management Skills | | 2 | 20 | 40* | **60** | **2** |
| 24ELC0302 | AI in Health care | | 2 | 20 | 40* | **60** | **2** |

**Note:**

1) **Abbreviations: L-Lecture, T-Tutorial, D-Demonstration and P-Practical**
2) **Considering eight months per academic year as working months, total contact hours per year shall be 1280 (One thousand two hundred and eighty)**

Name of the Institute: CAM Institute of Allied Health Science & Technology
Name of the Program: B. Sc. (Hons) in Medical Technology (Respiratory Care Technology)
Year of the Program: Fourth Year

## CURRICULUM & CREDIT FRAME WORK

| Course Code | Course Title | Hours | | | Marks | | Total Marks | Credit |
|---|---|---|---|---|---|---|---|---|
| | | L | T/D | P | Internal | External | | |
| **Core/Major Courses** | | | | | | | | |
| 24BRC0401 | Clinical Internship | -- | -- | 840 | 50 | 150 | **200** | **28** |
| 24BRC0402 | Research Project | -- | -- | 360 | 30 | 70 | **100** | **12** |
| | Total | | | 1200 | -- | -- | **300** | **40** |

## ROTATION DURING INTERNSHIP

**(1 credit = 30 hours of clinical postings) (Reference)**

| Clinical area at hospital | Hours | Credit |
|---|---|---|
| SICU | 180 hours | 6 credits |
| NICU | 180 hours | 6 credits |
| CARDIAC ICU | 150 hours | 5 credits |
| PFT | 60 hours | 2 credits |
| PHYSIOTHERAPY | 150 hours | 5 credits |
| PICU | 60 hours | 2 credits |
| NICU | 60 hours | 2 credits |
| **Total** | **840 hours** | **28 credits** |
| Research Project | 360 hours | 12 credits |
| **TOTAL** | **1200 hours** | **40 credits** |

**Note:**

1) **Abbreviations: L-Lecture, T-Tutorial and P-Practical**
2) **Considering eight months per academic year as working months, total contact hours per year shall be 1280 (One thousand two hundred and eighty)**
3) **There shall be no annual Practical Examination in the first year of the program.**

*The external examination will be taken at the institute level.

**The credit of the course "Introduction to Medical Technology" shall not be reflected in the annual marksheet. However, it will be reflected in the transcript.

# Detailed Curriculum
# of
# B.Sc.(Honours) Medical Technology
# (Respiratory Care Technology)

## First Year

# 24BMT0108 (Introduction to Medical Technology)

**Name of the Institute:** CAM Institute of Allied Health Sciences & Technology
**Name of the Program:** B. Sc. (Hons) in Medical Technology
**Year of the Program:** First year

| Course Code | 24BMT0108 | Total Credit | 1 |
|---|---|---|---|
| Title of Subject | Introduction to Medical Technology | Total Hours | 15 |

## Examination Scheme

| Continuous Assessment (30 marks) | | | External | TOTAL |
|---|---|---|---|---|
| Internal examinations | Projects / Assignments | Attendance | Annual examination | |
| 10 | 05 | 05 | 40 | 60 |

| | |
|---|---|
| Course Objectives | 1) To introduce the medical technology field and its applications.<br>2) To enhance understanding of basic medical concepts, techniques, and equipment. 3) To develop critical thinking and problem-solving skills related to medical technology.<br>4) To prepare students for advanced studies and practical applications in the respective field. |

## Course Content

| Sessions | Description | Weightage |
|---|---|---|
| 1 | **Introduction to Medical Technology**<br>History and Evolution of Medical Technology<br>Overview of Medical Technology Applications<br>Role of Medical Technologists in Healthcare | 1 Hour<br>10% |
| 2 | **Medical Terminology**<br>Common Medical Terms and Abbreviations<br>Understanding routine laboratory procedures<br>Communication in Medical Settings | 2 hours<br>20% |
| 3 | **Basic Human Anatomy and Physiology**<br>Introduction to Human Body Systems<br>Major Organs and Their Functions<br>Basic Physiological Processes | 3 Hours<br>20% |
| 4 | **Biochemistry**<br>Introduction<br>Key Areas<br>Importance<br>Terms and Abbreviations | 2 hour<br>10% |
| 5 | **Clinical Microbiology and Immunology**<br>Introduction<br>Key Areas<br>Importance<br>Terms and Abbreviations | 2 hour<br>10 % |

| | | |
|---|---|---|
| 6 | **Pathology**<br>Introduction<br>Key Areas<br>Importance<br>Terms and Abbreviations | 2 hour<br>10% |
| 7 | **Communication Skills**<br>Etiquettes in Communication<br>Oral Communication<br>Written Communication | 1 hour<br>10% |
| 8 | **Professionalism and Values**<br>Institutional/ organizational values<br>Institutional Rules & Regulations<br>Maintaining Discipline: During College Hours(Theory & Laboratory Postings )<br>Behaviour Etiquettes: During College Hours(Theory & Laboratory Postings ) | 2 hour<br>10% |

**Learning Activities:**

- **Lecture and Presentation  Group Discussion**
- **Class Participation**:
  - Engage in discussions and role-playing exercises, demonstrating an understanding of the material

**Assessment:**

- **Quiz**:
- Multiple-choice and short-answer questions

# 24BMT0101 (Human Anatomy)

| Course Code | 24BMT0101 | Total Credit | 4 |
|---|---|---|---|
| Title of Subject | Human Anatomy | Total Hours/week | 4 |

## Examination Scheme

| Continuous Assessment (30 marks) | | | External | TOTAL |
|---|---|---|---|---|
| Internal examinations | Projects / Assignments | Attendance | Annual examination | |
| 20 | 05 | 05 | 70 | 100 |

| Course Objectives | To provide students with basic knowledge of anatomical terminology, basic histology, and understanding of the structural and functional organization of the normal human body. |
|---|---|

## Course Content

| Unit | Description | Weightage |
|---|---|---|
| 1 | **Introduction-Human body as a whole**<br>**1.1** Definition of anatomy and its divisions<br>1.2 Terms of location, positions and planes<br>1.3 Cell and its organelles<br>1.4 Epithelium-definition, classification, function, describe with examples<br>1.5 Glands- classification, describe serous & mucous glands with examples<br>1.6 Basic tissues – classification with examples<br><br>**Demonstration &Tutorials:**<br>**1.7** Histology & types of epitheliums<br>1.8 Histology of serous, mucous & mixed salivary gland | 10% |
| 2 | **Locomotion and support**<br>2.1 Cartilage- Types with example<br>2.2 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<br>2.3 Joints- Classification of joints with examples, synovial joint<br>2.4 Muscular system: Classification of muscular tissue<br>2.5 Names of muscles of the body<br><br>**Demonstration &Tutorials:**<br>2.6 Demonstration of all bones showing parts, radiographs of normal bones & joints<br>2.7 Demonstration of muscles of the body (as functional groups) | 10% |

| | | |
|---|---|---|
| 3 | **Cardiovascular system**<br>3.1 Heart-size, location, chambers, exterior & interior<br>3.2 Blood supply of heart<br>3.3 Systemic & pulmonary circulation | 10% |

| | | |
|---|---|---|
| | 3.4 Branches of aorta, common carotid artery, subclavian artery, axillary artery, brachial artery, superficial palmar arch, femoral artery, internal iliac artery<br>3.5 Inferior venacava, portal vein, portosystemic anastomosis<br>3.6 Great saphenous vein<br>3.7 Lymphatic system- cisterna chyli & thoracic duct<br>3.8 Names and brief of regional lymphatics, axillary and inguinal lymph nodes<br><br>**Demonstration &Tutorials:**<br>**3.9** Demonstration of heart and vessels in the body<br>3.10 Normal chest radiograph showing heart shadows | |
| 4 | **Gastro-intestinal system**<br>4.1 Parts of GIT, Oral cavity [lip, tongue (with histology)], tonsil, dentition, pharynx, salivary glands, Waldeyer's ring<br>4.2 Esophagus, stomach, small and large intestine, liver, gall bladder, pancreas<br>4.3 Radiographs of abdomen | 10% |
| **5** | **Respiratory system**<br>5.1 Parts of upper and lower Respiratory System: nose, nasal cavity, larynx, trachea, lungs<br>5.2 Names of paranasal air sinuses<br><br>**Demonstration &Tutorials:**<br>**5.3** Demonstration of parts of respiratory system<br>5.4 Normal radiographs of chest | 10% |
| **6** | **Urinary system**<br>6.1 Kidney, ureter, urinary bladder, male and female urethra<br><br>**Demonstration &Tutorials:**<br>6.2 Demonstration of parts of urinary system<br>6.3 Radiographs of abdomen-IVP, retrograde cystogram | 10% |
| **7** | **Reproductive system**<br>7.1 Parts of male reproductive system, testis, vas deferens, epididymis, prostate (gross & histology)<br>7.2 Parts of female reproductive system, uterus, fallopian tubes, ovary (gross & histology)<br>7.3 Mammary gland – gross<br><br>**Demonstration &Tutorials:**<br>**7.4** Demonstration of section of male and female pelvis with organs *in situ*<br>7.5 Radiographs of pelvis – hysterosalpingogram | 10% |

| | | |
|---|---|---|
| **8** | **Endocrine glands**<br>8.1 Pituitary gland<br>8.2 Thyroid gland, parathyroid gland,<br>8.3 Suprarenal gland- (gross)<br><br>**Demonstration &Tutorials:**<br>8.4 Demonstration of the endocrine glands | 10% |
| **9** | **Nervous system**<br>9.1 Neuron | 10% |
| | 9.2 Classification of Nervous System<br>9.3 Cerebrum, cerebellum, midbrain, pons, medulla oblongata, spinal cord with spinal nerve (Gross Anatomy)<br>9.4 Meninges, Ventricles & cerebrospinal fluid<br>**9.5** Blood supply of brain (in brief)<br>9.6 Cranial nerves (only names)<br><br>**Demonstration &Tutorials:**<br>9.7 Demonstration of all parts of brain | |
| **10** | **Sensory organs**<br>10.1 Skin: histology and appendages of skin<br>10.2 Eye: Parts of eye & lacrimal apparatus<br>10.3 Extra-ocular muscles & nerve supply<br>10.4 Ear: parts of ear- external, middle & inner ear and contents<br><br>**Demonstration &Tutorials:**<br>10.5 Demonstration and histology of eyeball | 10% |

**REFERENCE BOOKS**


1. William Davis (P) understanding Human Anatomy and Physiology MC Graw Hill
2. Human Anatomy for Nursing & Allied Sciences - 1st edition, Dr. M.K.Anand, Dr. Meena Verma, The Arora Medical Publishers Pvt. Ltd.
3. Fattana, Human anatomy,(Description and applied), Saunder's & C P Prism Publishers, Bangalore – 1991
4. ESTER, M. Grishcimer, Physiology & Anatomy with Practical, Considerations, J.P. Lippin Cott. Philadelphia


**Course Outcome:** At the end of the course, Students will be able to:

| | |
|---|---|
| **CO1** | Define and use basic anatomical terminology of location, positions and planes of human body |
| **CO2** | Identify and describe locations, relations, and functions of major organ system of human body |
| **CO3** | Correlate structural and functional organization of cells and basic tissue of human body |
| **CO4** | Execute this knowledge during their health care practice |

# 24BMT0102 (Human Physiology)

| Course Code | 24BMT0102 | Total Credit | 4 |
|---|---|---|---|
| Title of Subject | Human Physiology | Total Hours /week | 4 |

## Examination Scheme

| Continuous Assessment (30 marks) | | | External | TOTAL |
|---|---|---|---|---|
| Internal examinations | Projects / Assignments | Attendance | Annual examination | |
| 20 | 05 | 05 | 70 | 100 |

| Course Objective | To provide a comprehensive understanding about functioning of the human body at the cellular, tissue, organ and system levels including mechanism of homeostasis, integration of various physiological processes with applications. |
|---|---|

## Course Content

| | | |
|---|---|---|
| 1 | **Blood and Muscle Physiology**<br>1.1 Blood<br>**1.1.1** Composition & Function of Blood<br>**1.1.2** Erythropoiesis<br>1.1.3 Blood group<br>1.1.4 Hemostasis<br><br>1**.2 Muscle**<br>**1.2.1 Structure & classification**<br>**1.2.2** Neuromuscular junction<br>1.2.3 Muscle contraction: Mechanism & action<br><br>**Demonstration &Tutorials:**<br>**1.3** Hb Estimation<br>1.4 RBC & WBC Count<br>1.5 Blood Group<br>**1.6** Bleeding Time & Clotting Time | 15% |
| 2 | **Digestive System and Excretory System**<br>2.1 Movement and Alimentary tract<br>2.2 Deglutition and Mechanism of Vomiting, Diarrhea<br>2.3 Digestive juices<br>2.4 Micturition<br>2.5 Function of Kidney<br>2.6 Regulation of acid-base balance | 15% |

| | | |
|---|---|---|
| 3 | **Cardiovascular and Respiratory System**<br>3.1 Heart rate and sound<br>3.2 Blood pressure<br>3.3 Mechanism of breathing<br>3.4 Transportation of Oxygen and Carbon dioxide<br>3.5 Pulmonary volume and capacity<br><br>**Demonstration &Tutorials:**<br>**3.6** Arterial Blood Pressure<br>3.7 Pulse, Heart rate, Breathing rate | 20% |
| | 3.8 Thermometry | |
| 4 | **Endocrinology and Reproductive System**<br>4.1 Contraceptives Measures and Menstrual cycle<br>4.2 Puberty<br>4.3 Pregnancy and Lactation<br>4.4 Hormones of Pituitary gland,<br>**4.5** Hormones of Thyroid & Parathyroid Glands<br>4.6 Hormones of Adrenal Gland and Pancreas<br><br>**Demonstration &Tutorials:**<br>4.7 Pregnancy Test | 20% |
| **5** | **Embryology**<br>5.1 Spermatogenesis & oogenesis<br>5.2 Ovulation, fertilization<br>5.3 Placenta | 15% |
| **6** | **Nervous System and Special Senses**<br>6.1 Neuron and Neuroglia<br>6.2 Properties of nerve fiber<br>6.3 Reflex mechanism and Receptors<br>6.4 Mechanism of vision and hearing<br>6.5 Taste and smell<br><br>**Demonstration &Tutorials:**<br>6.6 1st, 2nd & 8th Cranial nerve<br>**6.7** Examination of sensory system, motor system & reflex | 15% |

**REFERENCE BOOKS**

1. Guyton (Arthur) Text Book of Physiology. Latest Ed. Prism publishers
2. Ganong (William F) Review of Medical Physiology. Latest Ed. Appleton
3. Jain AK, Concise Physiology, Latest Ed.

**Course Outcome:** At the end of the course, Students will be able to:

| | |
|---|---|
| **CO1** | State the basic terminology & functions of each organ system of the human body |
| **CO2** | Define, explain, and correlate basic physiological processes of each organ system of human body |
| **CO3** | Correlate and explain the integrated responses of the organ systems of the body to physiological and pathological stresses |
| **CO4** | Execute this knowledge during their health care practice |

# 24BMT0103 (General Pathology)

| Course Code | 24BMT0103 | Total Credit | 4 |
|---|---|---|---|
| Title of Subject | General Pathology | Total Hours/Week | 4 |

## Examination Scheme

| Continuous Assessment (30 marks) | | | External | TOTAL |
|---|---|---|---|---|
| Internal examinations | Projects / Assignments | Attendance | Annual examination | |
| 20 | 05 | 05 | 70 | 100 |

| | |
|---|---|
| **Course Objectives** | • To equip the students with the knowledge of basic steps of histopathology including sample receiving, fixation, tissue processing, section cutting, staining and bio-medical waste management<br>• To understand basic concepts of haematology, clinical pathology, and blood banking including routine laboratory investigations like collection, transport and processing of various samples or specimen including blood and urine, blood grouping and Rh typing. |

## Course Content

| Unit | Description | Weightage |
|---|---|---|
| 1 | **Histopathology**<br>**1.1** Introduction to Histopathology<br>1.2 Receiving of specimen in the laboratory<br>1.3 Use & care of Microscope<br>1.4 Various Fixatives: Mode of action, Preparation and Indication<br>1.5 Tissue processing for routine paraffin sections<br>1.6 Section Cutting<br>1.7 Staining of tissues- H & E Staining<br>1.8 Bio-Medical waste management | 25% |
| 2 | **Clinical Pathology**<br>2.1 Introduction to Clinical Pathology<br>2.2 Collection, Transport, Preservation, and Processing of various clinical specimens<br>2.3 Urine Examination-<br>2.3.1 Collection and Preservation of Urine<br>2.3.2 Physical, Chemical, Microscopic Examination | 30% |
| 3 | **Hematology**<br>3.1 Introduction to Haematology<br>3.2 Normal constituents of Blood, their structure and function<br>3.3 Collection of Blood samples<br>3.4 Various Anticoagulants used in Haematology<br>3.5 Laboratory safety guidelines<br>3.6 SI units and conventional units in Clinical Pathology Laboratory<br>3.7 Hb Estimation , PCV, ESR | 25% |
| 4 | **Blood Bank**<br>4.1 Introduction of blood banking<br>4.2 Blood grouping and Rh Types | 20% |

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|---|---|---|
| | **Tutorial/ Demonstration**<br>1) Blood Grouping Rh typing | |

| | | |
|---|---|---|
| | 2) Hb Estimation<br>3) Packed Cell Volume [PCV],<br>4) Erythrocyte Sedimentation rate [ESR]<br>5) Bleeding Time, Clotting Time<br>6) Histopathology- Section cutting and H & E Staining [For B.Sc. MLT only] | |

**REFERENCE BOOKS**

- Bancroft : Theory and Practical of Histology techniques
- Textbook of Clinical Blood Banking Science by Zmijewski
- Manual for Clinical Pathology by Sabitry Sanyal
- Practical Pathology by Dr.P.Chakraborty & Gargi Chakraborty
- Haematology for students and practitioners by Ramnik Sood
- Histological techniques by K.Laxminarayan
- Practical Pathology by Dr. K.Uma Chaturvedi & Tejiindersingh

**Course Outcome:** At the end of the course, Students will be able to:

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|---|---|
| **CO1** | Demonstrate basic steps of histopathology including sample receiving, fixation, tissue processing, section cutting, staining and bio-medical waste management |
| **CO2** | Explain basic concepts of haematology & routine clinical investigations of Haematology laboratory |
| **CO3** | Describe composition of blood and methods of estimating different components of blood |
| **CO4** | Perform samples collection, processing, transportation and urine examination |
| **CO5** | Explain blood banking and perform blood grouping and Rh typing |

# 24BMT0104 (General Microbiology)

| Course Code | 24BMT0104 | Total Credit | 4 |
|---|---|---|---|
| Title of Subject | General Microbiology | Total Hours/Week | 4 |

## Examination Scheme

| Continuous Assessment (30 marks) | | | External | TOTAL |
|---|---|---|---|---|
| Internal examinations | Projects / Assignments | Attendance | Annual examination | |
| 20 | 05 | 05 | 70 | 100 |

| | |
|---|---|
| **Course Objectives** | • To provide basic knowledge of history & development of microbiology, application of various microscopes, morphology & physiology of bacteria.<br>• To explain relationships between the microorganisms, infection and immunity<br>• To introduce various methods as well as instruments for sterilization and disinfection<br>• To incorporate the concept of different culture media, methods and biochemical tests<br>• To provide knowledge about hospital acquired infection and biomedical waste management |

## Course Content

| Unit | Description | Weightage |
|---|---|---|
| 1 | **Historical development & microbiology**<br>1.1 History and Pioneers in Microbiology: Contributions of Antony Van Leeuwenhoek, Louis Pasteur, Joseph Lister, Robert Koch (Koch's Postulates).Nobel prize awarded for research in Microbiology<br>1.2 Development in medical microbiology & immunology | 10% |
| 2 | **Microscopy**<br>2.1 Microscopy: instruments ,Types of microscopic techniques<br>2.2 Details of Light Microscope (Principles, Techniques & Applications)<br>2.3 Principle & Application of following microscope: Dark Field Microscopy, Phase contrast Microscopy, Fluorescent Microscopy, Confocal Microscopy & Electron Microscopy | 15% |
| 3 | **Morphology & Classification**<br>3.1 Nomenclature and classification of microbes (in brief)<br>3.2 Size & Shape<br>3.3 Morphology of bacteria: Structures of a bacterial cell and their functions<br>3.4 Physiology of Bacteria: Nutrition, Gaseous requirement, temperature requirement and other growth requirements | 15% |

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| 4 | **Immunology**<br>4.1 Immunity (in brief)<br>4.2 Infection: Sources of infection, Modes of transmission, Factors predisposing to microbial pathogenicity, Types of infectious diseases<br>4.3 Types of Vaccine & Immunization schedule | 15% |

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| **5** | **Sterilization and Disinfection**<br>5.1 Sterilization and Disinfection (in detail)<br>5.2 Principles and use of equipments of sterilization (Namely Hot Air Oven, Autoclave, Incinerator & Pasteurization)<br>5.3 Anti septic and disinfectants | 15% |
| **6** | **General Microbiology**<br>6.1 Culture media in diagnostic bacteriology<br>6.2 Culture methods<br>**6.3** Identification of bacteria-biochemical tests<br>6.4 Antimicrobial sensitivity test | 15% |
| **7** | **Hospital infection**<br>7.1 Causative agents, transmission methods<br>7.2 Prevention and Control Hospital Infection<br>7.3 Blood Borne Infections<br>7.4 Principles and practice Biomedical Waste Management | 15% |
| | **Tutorial/ Demonstration**<br>1) Compound Microscope<br>2) Grams stain<br>3) Acid Fast staining<br>4) Demonstration and sterilization of equipments- Hot Air oven, Autoclave, Bacterial filters<br>5) Demonstration of commonly used culture media, culture methods: Nutrient broth, Nutrient agar, Blood agar, Chocolate agar, MacConkey medium, LJ media, Robertson Cooked meat media<br>6) Visit to hospital for demonstration of Biomedical waste management | |

**REFERENCE BOOKS**


- Ananthanarayana & Panikar's Textbook of Microbiology
- Roberty Cruckshank – Medical Microbiology – The Practice of Medical Microbiology
- Essentials of Medical Microbiology by Apurba S. Sastry & Sandhya Bhat
- Silverton: Introduction to Medical Laboratory Technology

**Course Outcome:** At the end of the course, Students will be able to:

| | |
|---|---|
| **CO1** | Explain history and development of microbiology |
| **CO2** | Use and handle various types of microscopes with proper technique and care |
| **CO3** | Identify and differentiate various types of bacteria |
| **CO4** | Describe the role of immunity against pathogens, types of infection and importance of Immunization |
| **CO5** | Select and operate various sterilization and disinfection techniques/instruments used in clinical laboratory |
| **CO6** | Select specific culture media, perform different culture methods and biochemical test for isolation and identification of specific microorganisms |
| **CO7** | Prevent and control hospital infections and manage biomedical wastes in health care settings |
| **CO8** | Perform Antibiotic Sensitivity Test and interpret the results |

# 24BMT0105 (General Biochemistry)

| Course Code | 24BMT0105 | Total Credit | 4 |
|---|---|---|---|
| Title of Subject | General Biochemistry | Total Hours/Week | 4 |

## Examination Scheme

| Continuous Assessment (30 marks) | | | External | TOTAL |
|---|---|---|---|---|
| Internal examinations | Projects / Assignments | Attendance | Annual examination | |
| 20 | 05 | 05 | 70 | 100 |

| Course Objectives | |
|---|---|
| | • To provide basic concepts of routine laboratory investigations and volumetric analysis required of clinical biochemistry laboratory<br>• To sensitize about code of ethics for Medical Laboratory Technician at Health care organizations<br>• To provide fundamental knowledge of different bio-molecules like carbohydrate, protein, lipid, enzymes, vitamins and nucleic acids |

## Course Content

| Unit | Description | Weightage |
|---|---|---|
| 1 | **Introduction, Specimen collection and Handling**<br>1.1 Introduction to Bio-chemistry including code of ethics for Medical Lab technicians and Medical Lab Organization<br>a) Duties to Patient<br>b) Duties to colleagues and other professionals<br>c) Duties to yourself<br>d) Duties to society<br>**e)** Duties to your profession<br>1.2 Reception, Registration and Bio-chemical parameters investigated<br>1.3 Sample Collection and Handling<br>1.3.1 Types of vials used in blood /specimen collection<br>1.3.2 Anticoagulants<br>1.3.3 Preservatives<br>1.3.4 Blood collection<br>1.3.5 Processing of samples<br>1.3.6 Preservation & Disposal of samples<br>1.4 Biological and chemical hazards: Safety and first aid<br>1.5 Introduction to laboratory apparatus:<br>1.5.1 Pipettes - different types (Graduated, volumetric, Pasteur, Automatic etc.), Calibration of glass pipettes<br>1.5.2 Burettes, Beakers, Flasks, Funnels, Cuvettes | 15% |
| 2 | **Units of measurements and Preparation of solutions**<br>2.1 Conventional and SI units<br>2.2 Preparation of solutions<br>2.2.1 Molecular weight, equivalent weight of elements and compounds, Normality, Molarity<br>2.2.2 Molar solutions, Normal solutions, Percent solutions | 10% |

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| 3 | **Carbohydrates**<br>3.1 Definition, biological importance, classification,<br>3.2 Qualitative tests of carbohydrates<br>3.3 Digestion & Absorption of carbohydrates | 15% |

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|---|---|---|
| 4 | **Lipids**<br>4.1 Definition, biological importance, classification,<br>4.2Acid value, Iodine value, saponification value<br>4.3 Digestion & Absorption of lipids | 15% |
| **5** | **Amino acids and Proteins**<br>5.1 Definition, biological importance, classification<br>5.2 Qualitative tests of proteins<br>5.3 Digestion & Absorption of proteins | 15% |
| **6** | **Vitamins**<br>Classification of Vitamins, Sources, Daily requirements, Deficiency diseases (In Brief) | 10% |
| **7** | **Enzymes**<br>**7.1** Nature, Classification of Enzymes<br>7.2 Factors affecting enzyme activity<br>7.3 Enzyme Inhibition | 10% |
| **8** | **Nucleic acids- Structure and functional aspects**<br>**8.1** Purine bases, Pyrimidine bases, Nucleosides, Nucleotides<br>8.2 DNA: Types, Structure & functions<br>8.3 RNA: Types, Structure & functions | 10% |
| | **Tutorial/ Demonstration**<br>1) Reception and registration<br>2) Collection of Capillary blood & Venous blood<br>3) Separation of Serum and plasma from blood<br>4) Laboratory glass ware: Identification, Handling, Care and Maintenance, Uses<br>5) Lab instruments: Centrifuges, Balances, Photo Electric colorimeter, Spectrophotometer<br>6) Preparation of Solutions: Percentage solutions, Normal solutions, Molar solutions<br>7) Qualitative identification tests of sugars<br>8) Qualitative identification tests of proteins and amino acids | |

**REFERENCE BOOKS**


- Text book of Biochemistry by Satyanarayana
- TEITZ – Clinical chemistry
- Vasudevan (DM) Sreekumari (S) Text book of Biochemistry for Medical students
- Varley – Clinical chemistry
- Kaplan – Clinical chemistry

**Course Outcome:** At the end of the course, Students will be able to:

| | |
|---|---|
| **CO1** | Execute codes of ethics for Medical Laboratory Technologists at respective health care settings |
| **CO2** | Collect, process, preserve and dispose various samples used in clinical biochemistry laboratory |
| **CO3** | State all the biochemical parameters with its clinical conditions and interpret the diagnostic tests. |
| **CO4** | Manage and handle safety, first aid and hazards of the clinical biochemistry laboratory. |
| **CO5** | Prepare and handle each reagent and samples used in clinical biochemistry laboratory. |
| **CO6** | Describe fundamental concepts of all the bio-molecules like carbohydrates, proteins, lipids, enzyme, vitamins and nucleic acids |
| **CO7** | Analyze and interpret qualitative tests of bio-molecules independently. |

# 24BMT0106 (English)

| Course Code | 23BMT0106 | Total Credit | 4 |
|---|---|---|---|
| Title of Subject | English | Total Hours/Week | 4 |

## Examination Scheme

| Continuous Assessment (30 marks) | | | External * | TOTAL |
|---|---|---|---|---|
| Internal examinations | Projects / Assignments | Attendance | Annual examination | |
| 20 | 05 | 05 | 70 | 100 |

| Course Objectives | • Develop communication skills in English by training them in handling all the four language skills effectively. The learners will be able to listen, speak, read and write in English adequately so that they could participate in various activities and perform satisfactorily. |
|---|---|

## Course Content

| Unit | Description | Weightage |
|---|---|---|
| 1 | **Reading**<br>Short stories from the text:<br><br>1.1 The happy Prince<br>1.2 A Horseman in the sky<br>1.3 The Wolves of Cernogratz<br>1.4 The Mark of Vishnu<br>1.5 The Trust Property | 25% |
| 2 | Grammar Part:<br>2.1 Prefixes / Suffixes<br>2.2 Phrasal Verbs<br>2.3 Registers<br>2.4 Writing paragraphs, developing points / ideas<br>2.5 Writing resume, Job applications, Leave Application.<br>2.6 Letters of invitations (inviting / accepting/ declining),<br>2.7 Letters of complaint to civil authorities<br>2.8 Connectives<br>2.9 Concords- Subject-Verb Agreement.<br>2.10 Homophones and Homonyms<br>2.11 Reading Comprehension | 50% |

| | | |
|---|---|---|
| 3 | **Ability Enhancement**<br>3.1 Use various notions and function of everyday usage:<br>3.1.1 Dialogue Writing<br>3.1.2 Notions and Function of Language<br>3.2 Give short formal and informal talks, speeches<br>3.2.1 Self-Introduction.<br>3.2.2 Welcome speech.<br>3.2.3 Vote of thanks.<br>3.2.4 Describing People / Object / Scene.<br>3.2.5 Asking questions (Wh'/Interrogative/Choice (Disjunctive)/ Question tags (tail question))<br>3.2.6 Expansion of idea. | 25% |

| | | |
|---|---|---|
| | 3.2.7 Discuss topic in Group Discussion. | |
| | **There shall be no University Practical Examination.**<br>***External exam will be taken at institute level** | |

**REFERENCE BOOKS**


- Grant Taylor. English Conversation Practice. New Delhi: Tata McGraw Hill
- R.P.Bhatnagar and R.T.Bell (1999) **Communication in English**, Hyderabad: Orient Longma


**Course Outcome:** At the end of the course, Students will be able to:

| | |
|---|---|
| **CO1** | Listen, speak, read, and write in English effectively, enabling to participate in various academic and professional activities proficiently. |
| **CO2** | Understand and apply key grammatical concepts enhancing vocabulary and language precision. |
| **CO3** | Be proficient in composing structured paragraphs, developing points/ideas, and crafting various types of formal and informal letters |
| **CO4** | Enhance their reading comprehension skills, enabling them to understand and interpret a variety of texts accurately and efficiently. |
| **CO5** | Practice and perform various everyday communication functions and participate in group discussion |

# 24BMT0107 (Health Care)

| Course Code | 24BMT0107 | Total Credit | 2 |
|---|---|---|---|
| Title of Subject | Health Care | Total Hours/Week | 2 |

## Examination Scheme

| Continuous Assessment (20 marks) | | | External | TOTAL |
|---|---|---|---|---|
| Internal examinations | Projects / Assignments | Attendance | Annual examination | |
| 10 | 05 | 05 | 40 | 60 |

| | |
|---|---|
| **Course Objectives** | • To provide a foundational understanding of health and nursing, covering health definitions, determinants, national policies, and key health programs in India.<br>• To emphasize nursing principles, patient care techniques, bedside management, and first aid skills, equipping students with essential knowledge and practical abilities for effective healthcare delivery. |

## Course Content

| Unit | Description | Weightage |
|---|---|---|
| 1 | **Introduction to Health**<br>1.1 Definition of Health<br>1.2 Determinants of Health<br>1.3 Health Indicators of India<br>1.4 Health Team | 10% |
| 2 | **Health Policy and Programmes**<br>2.1 Concept<br>2.2 National Health Policy<br>2.3 National Health Programmes ( Briefly Objectives and scope)<br>2.4 Population of India and Family welfare Programme in India | 10% |
| 3 | **Introduction to law and ethics in health care**<br>**1.1** Medical ethics - Definition - Goal - Scope<br>**1.2** Introduction to Code of conduct<br>**1.3** Basic principles of medical ethics – Confidentiality<br>**1.4** Malpractice and negligence - Rational and irrational drug therapy<br>**1.5** Autonomy and informed consent - Right of patients<br>**1.6** Care of the terminally ill- Euthanasia<br>**1.7** Medico legal aspects of medical records – Medico legal case and type-Records and document related to MLC - ownership of medical records - Confidentiality Privilege communication - Release of medical information-Unauthorized disclosure - retention of medical records - other various aspects. | 20% |

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|---|---|---|
| 4 | **Introduction to Nursing**<br>4.1 What is Nursing? Nursing principles<br>4.2 Inter-Personnel relationships<br>4.3 Bandaging: Basic turns; Bandaging extremities; Triangular Bandages and their application<br>4.4 Nursing Position, Bed making, prone, lateral, dorsal, dorsal recumbent, Fowler's positions, comfort measures, Aids and rest and sleep<br>4.5 Lifting and Transporting Patients: Lifting patients up in the bed. | 20% |
| | Transferring from bed to wheel chair. Transferring from bed to stretcher | |
| 5 | **Bed Side Management**<br>5.1 Giving and taking Bed pan, Urinal<br>5.2 Observation of stools, urine and sputum<br>5.3 Understand use and care of catheters, enema giving<br>5.4 Methods of Giving Nourishment: Feeding, Tube feeding, drips, transfusion<br>5.5 Recording of body temperature, respiration and pulse<br>**5.6** Simple aseptic technique: Sterilization and disinfection<br>5.7 Surgical Dressing: Observation of dressing procedures | 20% |
| **6** | **First Aid**<br>6.1 Introduction to first aid: Definition and importance, Legal and Ethical consideration<br>6.2 Initial assessment and response<br>6.3 Common first aid procedures: Cardiopulmonary Resuscitation (CPR) Techniques for adults, children, and infants, Choking (Recognition and response), Bleeding and Wound care<br>6.3 Handling specific emergencies: Burns, Fractures & sprains, poisoning<br>6.4 Shock management: Recognizing shock and initial treatment | 20% |

**REFERENCE BOOKS**


1. Medical Ethics, by C.M. Francis, Jaypee Brothers
2. Current Problems in Medical Ethics, by George V. Lobo, St. Paul's Society, Allahabad.
3. Ethics for doctors, nurses & patients by H.P. Dunn, St. Pauls Bandar, Mumbai


**Course Outcome:** At the end of the course, Students will be able to:

| | |
|---|---|
| **CO1** | Define health, identify its determinants, and assess health indicators specific to India, understanding the roles and functions within a healthcare team. |
| **CO2** | Analyze the national health policy and major health programs in India, including family welfare initiatives, and evaluate their objectives and scope. |
| **CO3** | Acquire and demonstrate fundamental nursing principles, including patient positioning, bandaging, and safe lifting and transporting techniques, ensuring effective and compassionate care. |
| **CO4** | To perform bed side management and aseptic techniques |
| **CO5** | To provide basic first aid techniques and respond to emergency situations with essential life-saving skills |

# Detailed Curriculum Of
# B.Sc.(Hons) Medical Technology
# (Respiratory Care Technology)

## Second Year

# 24BRC0201 (Applied Pathology & Applied Microbiology)

**Name of the Institute:** CAM Institute of Allied Health Science & Technology
**Name of the Program:** B. Sc. (Hons) in Medical Technology (Respiratory Care Technology)
**Year of the Program:** Second year

| Course Code | 24BRC0201 | Total Credit | 4 |
|---|---|---|---|
| Title of Subject | Applied Pathology & Applied Microbiology | Total Hours/Week | 4 |

**Examination Scheme**

| Continuous Assessment (30 marks) | | | External | TOTAL |
|---|---|---|---|---|
| Internal examinations | Projects / Assignments | Attendance | Annual Examination | |
| 20 | 05 | 05 | 70 | 100 |

**Course Objectives**

- **Applied Pathology:**
- To understand atherosclerosis and hypertension.
- To explore diagnostic approaches for cardiovascular diseases.
- To examine anemia types and hematological disorders.
- To emphasize diagnostic methods for hematological conditions.
- To investigate obstructive airway diseases (COPD, asthma).
- To analyze diagnostic tools for respiratory conditions.
- To examine chronic kidney disease and glomerulonephritis.
- To explore factors contributing to renal disorders.
- To understand types and consequences of head injuries.
- To analyze diagnostic methods for assessing head injuries.
- To Define key terms for each system.
- To explore causes and risk factors.
- To emphasize accurate diagnosis and common diagnostic tools.
- To analyze the significance of early detection.

- **Applied Microbiology:**
- To understand the principles and practices of infection control in healthcare settings.  To identify common healthcare-associated infections and strategies for prevention.
- To Explore the concept of antimicrobial resistance and its implications in healthcare
- To recognize diseases communicable to healthcare workers and implement preventive measures.
- To learn the essentials of microbiological surveillance for early detection and management of infections.
- To understand various sterilization techniques applicable in healthcare settings
- To Explore protocols and best practices for the safe management of biomedical waste.

| | |
|---|---|
| | • To Implement preventive measures to control the spread of infections in healthcare environments.<br>• To acquire skills in effective sampling techniques for microbiological analysis.<br>• To develop proficiency in the application of protocols for disinfection and sterilization. |

**Course Content**

| Unit | Description | Weightage |
|---|---|---|
| | **Section-A** | |
| 1 | **Cardiovascular System**<br>**1.1** Atherosclerosis- Definition, Risk Factors, Briefly Pathogenesis & Morphology, Clinical Significance and Prevention.<br>**1.2** Hypertension- Definition, Types and Briefly Pathogenesis And Effects Of Hypertension.<br>**1.3** Ischaemic heart diseases- Definition, Types. Briefly Pathophysiology, Pathology & Complications of various types of IHD.<br>**1.4** Valvular Heart diseases- causes, Pathology & complication. Complications of artificial valves.<br>**1.5** Congenital heart diseases – Basic defect and effects of important types of congenital heart diseases. | |
| 2 | **Haematology**<br>**2.1** Anaemia – Definition, morphological types and diagnosis of anaemia. Brief concept about Haemolytic anaemia and polycythaemia.<br>**2.2** Bleeding disorders- Definition, classification, causes & effects of important types of bleeding disorders. Briefly various laboratory tests used to diagnose bleeding disorders. | |
| 3 | **Respiratory System**<br>**3.1** Chronic obstructive airway diseases – Definition and types. Briefly causes, Pathology and complications of each type of COPD.<br>**3.2** Briefly concept about obstructive versus restrictive pulmonary disease. | |
| 4 | **Renal System**<br>**4.1** Clinical manifestations of renal diseases. Briefly causes, mechanism, effects and laboratory diagnosis of ARF & CRS. Briefly Glomerulonephritis and Pyelonephritis.<br>**4.2** End stage renal disease – Definition, causes, effects and role of dialysis and renal transplantation in its management.<br>**4.3** Brief concept about obstructive neuropathy. | |
| **5** | **Central Nervous System**<br>**5.1** Head Injury | |

| Unit | Description | Weightage |
|---|---|---|
| | **Section B** | |
| **6** | **Health care associated infections and antimicrobial resistance:**<br>**6.1** 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 Clostriduium difficle, Vancomycin resistant enterococci etc.<br>**6.2** 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. | |
| **7** | **Disease communicable to healthcare workers in hospital set up and its preventive measure:**<br>**7.1** Occupationally acquired infections in healthcare professionals by respiratory route (tuberculosis, varicella-zoster, respiratory synctial virus etc), blood borne transmission ( HIV, Hepatitis B, Hepatitis C, Cytomegalovirus, Ebola virus etc), orofaecal route ( Salmonella, Hepatitis A etc), direct contact ( Herpes Simplex Virus etc). Preventive measures to combat the spread of these infections by monitoring and control. | |
| **8** | **Microbiological surveillance and sampling:**<br>**8.1** 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 | |
| **9** | **Importance of sterilization:**<br>**9.1** Disinfection of instruments used in patient care: Classification, different methods, advantages and disadvantages of the various methods.<br>**9.2** Disinfection of the patient care unit<br>**9.3** Infection control measures for ICU's | |
| **10** | **Sterilization:**<br>**10.1** Rooms: Gaseous sterilization<br>**10.2** Equipments: classification of the instruments and appropriate methods of sterilization.<br>**10.3** Central supply department: the four areas and the floor plan for instrument cleaning, high-level disinfecting and sterilizing areas. | |
| **11** | **Preparation of materials for autoclaving:**<br>**11.1** Packing of different types of materials, loading, holding time and unloading. | |

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|---|---|---|
| 12 | **Biomedical waste Management:**<br>**12.1** Biomedical waste handling and disposal | |

**Course Outcome:** At the end of the course, Students will be able to:

| | |
|---|---|
| **C01** | Cardiovascular: Understand atherosclerosis, hypertension, and prevention. Explore diagnostics.<br>Hematological: Know anemia types, disorders, and advanced diagnostics. |
| **C02** | Respiratory: Analyze obstructive airway diseases, explore diagnostics, and emerging technologies.<br>Renal: Explore chronic kidney disease, glomerulonephritis, prevention, and early detection. |
| **C03** | Neurological: Recognize head injury consequences, explore diagnostics, neuroimaging, and interventions.<br>Comprehensive: Define medical terms, explore causes, risk factors, assessments, and common diagnostics. |
| **C04** | Diagnostic Precision: Emphasize accurate diagnosis, collaboration, and common tools. Early Detection Impact: Understand its significance, prevention strategies, and societal benefits. |
| **C05** | Understand principles and practices.<br>Identify common healthcare-associated infections and prevention strategies. |
| **C06** | Explore antimicrobial resistance and its healthcare implications. |
| **C07** | Recognize communicable diseases to healthcare workers.<br>Implement preventive measures. |
| **C08** | Learn essentials for early infection detection.<br>Acquire skills in effective microbiological sampling. |
| **C09** | Understand various sterilization techniques. |
| **C010** | Explore protocols and best practices for safe waste management.<br>Implement preventive measures for infection control. |
| **C011** | Develop skills in applying protocols for disinfection and sterilization. |

# 24BRC0202 (Practical- Pathology and Microbiology)

| Course Code | 24BRC0201 | | Total Credit | 2 |
|---|---|---|---|---|
| Title of Subject | Applied Pathology & Applied Microbiology-Practical | | Total Hours/Week | |
| **Examination Scheme** | | | | |
| **Continuous Assessment (40 marks)** | | | **External** | **Total** |
| Internal Examination | Projects/Assignments | Attendance | | |
| 30 | 05 | 05 | 60 | 100 |
| **Course Objectives** | ➢ This course provides an in-depth understanding of cardiovascular, respiratory, renal, and hematologic disorders, focusing on the pathophysiology, risk factors, and clinical manifestations associated with conditions like atherosclerosis, myocardial infarction, emphysema, and glomerulonephritis. Students will explore diagnostic criteria, treatment options, and preventive strategies, with an emphasis on effective management of kidney infections, hematologic conditions, and urine disorders. The goal is to equip students with comprehensive knowledge of disease mechanisms and the skills necessary for accurate diagnosis and treatment. | | | |
| **Course Content** | | | | |
| **Unit** | **Description** | | | **Weightage** |
| 1 | **Applies Pathology**<br>**Description & diagnosis of the following gross specimens.**<br>1.1 Atherosclerosis.<br>1.2 Aortic aneurysm.<br>1.3 Myocardial infraction.<br>1.4 Emphysema<br>1.5 Chronic glomerulonephritis.<br>1.6 Chronic pyelonephritis.<br><br>**Interpretation & diagnosis of the following charts**. 1.7 Hematology Chart - AML, CML, Hemophilia, neutrophilia,eosinophilia.<br><br>1.8 Urine Chart - ARF, CRF, Acute glomerulonephritis | | | |

| | | |
|---|---|---|
| 2 | **Applied Microbiology**<br>2.1 Principles of autoclaving & quality control of Sterilization.<br>2.2 Collection of specimen from outpatient units, inpatient units, minor operation theater and major operation theater for sterility testing.<br>2.3 The various methods employed for sterility testing.<br>2.4 Interpretation of results of sterility testing.<br>2.5 Disinfection of wards, OT and Laboratory. | |

Outcome of Course

| | |
|---|---|
| CO1 | Atherosclerosis: Buildup of plaque in arteries, narrowing them. |
| CO2 | Aortic Aneurysm: Abnormal bulging of the aortic wall. |
| CO3 | Myocardial Infarction: Necrosis of myocardial tissue due to blocked coronary arteries. |
| CO4 | Emphysema: Destruction of alveolar walls, leading to reduced gas exchange. |
| CO5 | Chronic Pyelonephritis: Persistent bacterial infection leading to kidney inflammation and scarring. |
| C06 | Chronic Glomerulonephritis: Progressive inflammation of kidney glomeruli. |
| C07 | Hematology disorders: Require appropriate treatment such as chemotherapy for leukemia, clotting factor replacement for hemophilia, and management of underlying causes for neutrophilia and eosinophilia. |
| C08 | Urine disorders: Management involves addressing underlying causes and may include fluid/electrolyte management, medication adjustments, and potentially renal replacement therapy in severe cases. |

**Reference Books: .**

1. Ramadas Nayak, Textbook of Pathology for Allied Health Sciences.
2. Essential of Hospital Infection Control,Aprba S Satry and Deepashree R.

# 24BRC0203 (Applied Pharmacology and Medicine)

**Name of the Institute:** CAM Institute of Allied Health Science & Technology
**Name of the Program:** B. Sc. (Hons) in Medical Technology (Radiotherapy Technology) **Year of the Program:** Second year

| Course Code | 24BRC0203 | Total Credit | 4 |
|---|---|---|---|
| Title of Subject | Applied Pharmacology & Medicine | Total Hours/Week | 4 |

| **Examination Scheme** | | | | |
|---|---|---|---|---|
| **Continuous Assessment (30 marks)** | | | **External** | **TOTAL** |
| Internal examinations | Projects / Assignments | Attendance | Annual examination | |
| 20 | 05 | 05 | 70 | 100 |

| Course Objectives | • To Gain comprehensive knowledge of pharmacology, cardiovascular pharmacotherapy, and respiratory care medicine effectively.<br>• To assess, manage, and treat various medical conditions in diverse patient populations. | |
|---|---|---|

## Course Content

### SECTION A (APPLIED PHARMACOLOGY)

| Unit | Description | Weightage |
|---|---|---|
| 1 | **Introduction to Pharmacology & Routes of administration of drugs**<br>• Phamacokinetics<br>• Pharmacodynamics<br>• Adverse drug reactions<br>• Introduction to Autonomic nervous system<br>• Drugs acting on cholinergic system<br>• Drugs acting on sympathetic system<br>• Skeletal muscle relaxants<br>• Introduction to Cardiovascular system<br>• Drugs used in hypertension<br>• Drugs used in angina pectoris<br>• Drugs used in congestive cardiac failure<br>• Drug therapy for cough including antihistaminics<br>• Antiemetic drugs<br>• Drug used in Bronchial asthma<br>• Drugs for respiratory tract infection including tuberculosis<br>• Chemoprophylaxis / Surgical antibiotic prophylaxis<br>• Nonsteroidal antiinflammatory drugs and opioid analgesics | |

| | | |
|---|---|---|
| | • Sedative hypnotic drugs<br>Corticosteroids and other emergency drugs topics in pharmcology for allied health students. | |
| | **SECTION B (APPLIED MEDICINE)** | |
| **2** | **MEDICINE RELEVANT TO RESPIRATORY CARE TECHNOLOGY**<br>• Diabetes Mellitus<br>• Hypertension<br>• Ischaemic heart disease<br>• Obesity<br>• Elderly Patient<br>• Pregnancy<br>• Shock<br>• COPD<br>• Chronic renal failure<br>• Chronic liver disease/failure<br>• Anaemia<br>• Pediatric patient Infant/Neonate<br>• Epilepsy<br>CVA | |

**Course outcomes:**

| | |
|---|---|
| **CO1** | Understand pharmacokinetics, including drug absorption, distribution, metabolism, and excretion. |
| **CO2** | Explain pharmacodynamics, covering drug-receptor interactions and dose-response relationships. |
| **CO3** | Identify and manage common adverse drug reactions. |
| **CO4** | Describe the autonomic nervous system and its modulation by cholinergic and sympathetic drugs. |
| **CO5** | Evaluate drug therapy for cardiovascular conditions, respiratory diseases, pain management, and emergency situations. |
| **CO6** | Understand diabetes mellitus, hypertension, and ischaemic heart disease pathophysiology and management. |
| **CO7** | Recognize respiratory implications of obesity, elderly age, pregnancy, and shock, implementing appropriate interventions. |
| **CO8** | Evaluate COPD, chronic renal failure, chronic liver disease/failure, and anaemia in respiratory care. |
| **CO9** | Provide specialized care for pediatric patients, including infants and neonates, addressing their unique respiratory needs. |
| **CO10** | Manage respiratory complications of epilepsy and cerebrovascular accidents (CVA), ensuring appropriate support and intervention. |

# 24BRC0204 (Introduction to Respiratory Care Technology)

**Name of the Institute:** CAM Institute of Allied Health Science & Technology
**Name of the Program:** B. Sc. (Hons) in Medical Technology (Radiotherapy Technology) **Year of the Program:** Second year

| Course Code | 24BRC0204 | Total Credit | 4 |
|---|---|---|---|
| Title of Subject | Introduction to Respiratory Care Technology | Total Hours/Week | 4 |

## Examination Scheme

| Continuous Assessment (30 marks) | | | External | TOTAL |
|---|---|---|---|---|
| Internal examinations | Projects / Assignments | Attendance | Annual examination | |
| 20 | 05 | 05 | 70 | 100 |

| | |
|---|---|
| **Course Objectives** | • To enhance communication abilities by learning various aspects of nonverbal communication.<br>• To apply universal safety measures, including proper handwashing and isolation protocols.<br>• To conduct thorough assessments of vital signs, covering overall appearance, mental status, pulse, blood pressure, and breathing.<br>• To recognize anatomical landmarks and lines on the chest, evaluate the respiratory and cardiovascular systems, perform chest therapy, understand gas properties, manage medical gas distribution, utilize gas delivery equipment, administer oxygen therapy, interpret electrocardiograms and chest X-rays, and conduct pulmonary function tests. |

## Course Content

| Unit | Description | Weightage |
|---|---|---|
| | **Section A** | |
| 1 | **Nonverbal Communication**<br>**1.1** Aspects of nonverbal communication<br>**1.2** Definitions<br>**1.3** Characteristic | |
| 2 | **Universal Precautions**<br>**2.1** Handwashing/ Hand hygiene<br>**2.2** Insolation procedures | |

| | | |
|---|---|---|
| 3 | **Assessment of vital signs**<br>**3.1** General appearance<br>**3.2** Sensorium<br>**3.3** Pulsation<br>**3.4** Blood pressure<br>**3.5** Respiration | |
| 4 | **Chest topography**<br>**4.1** Identification of imaginary lines<br>**4.2** Topographical landmarks of thorax ,Lungs & Pleura | |

| | | |
|---|---|---|
| | | |
| **5** | **Assessment of respiratory system**<br>**5.1** Inspection Palpation, percussion and auscultation of respiratory system<br>**5.2** Definition and significance of the presence alteraed resonadge abnormal death sounds and advections sound | |
| **6** | **Assessment of cardiovascular system**<br>**6.1** Topography of the heart<br>**6.2** Examination of the procardium<br>**6.3** Overall cardiovascular functions<br>**6.4** Symptoms of cardiovascular disease<br>**6.5** Radiovascular paid | |
| **7** | **Segment of other body System**<br>**7.1** Skin and extermination<br>**7.2** Neurological system<br>**7.3** Abdomen | |
| **SECTION B** | | |
| **8** | **Chest physical therapy**<br>**8.1** Definition, indication / Contraindicationtechniques of chest physical therapy | |
| **9** | **Gas Physics**<br>**9.1** State of matter Temperature conversion<br>**9.2** Humidity<br>**9.3** pressure measurement<br>**9.4** Gas flows and diffusion<br>**9.5** Gas laws<br>**9.6** Discellaneous concepts such as density and specific gravity | |

| | | |
|---|---|---|
| **10** | **Medical Gas supply**<br>**10.1** Compressed gas cylinders<br>**10.2** Colour coding<br>**10.3** Cylinders and Cylinders valves<br>**10.4** Cylinder storage<br>**10.5** Diameter index safety system<br>**10.6** Medical gas pipeline system and station outlets<br>**10.7** Air components<br>**10.8** Oxygen concentrators<br>**10.9** Alarms and safety revises | |
| **11** | **Gas Administration devices (Reducing valves, flow meters and regulators).**<br>**11.1** Simple oxygen administration devices<br>**11.2** Methods of controlling gas flow<br>**11.3** Reducing valve<br>**11.4** Flow meters<br>**11.5** Regulators<br>**11.6** Flow restrictors | |
| **12** | Oxygen therapy (rationale for oxygen therapy, precautions assessment of need and adequacy and therapy and the relevant devices)<br>**12.1** Definition<br>**12.2** Humidity therapy Definition<br>**12.3** Aerosol therapy definition | |
| | **12.4** Small volume nebuliser therapy – definition, physiological rationale | |
| **13** | **ECG – basic principles, normal ECG, interpretation in disease**<br>**13.1**Introduction, value and limitation of chest X-ray, conventional and special radiological views | |
| **14** | **Pulmonary function testing-Definition**<br>**14.1** PFT - in disease and their significance<br>**14.2** Provocative tests and postbronchodilator tests of lung function | |
| **Reference Books:**<br>• Clinical application of mechanical ventilation (4th edition) by David W. Chang<br>• Handbook of Respiratory care (3rd edition) by Robert L. Chatburn<br>• Egan's fundamentals of Respiratory care (11th edition) by Robert M. Kacmarek | | |

## Course Outcomes:

| | |
|---|---|
| **CO1** | Students will demonstrate a comprehensive understanding of nonverbal communication, encompassing its various aspects, definitions, and characteristics. |
| **CO2** | Students will exhibit proficiency in universal precautions, including proper handwashing and isolation procedures, ensuring effective infection control practices. |
| **CO3** | Students will demonstrate competence in assessing vital signs, encompassing general appearance, sensorium, pulsation, blood pressure, and respiration, to evaluate overall health status effectively. |

| | |
|---|---|
| **CO4** | Students will acquire proficiency in chest topography, including identifying imaginary lines and recognizing topographical landmarks of the thorax, lungs, and pleura. |
| **CO5** | Students will demonstrate competency in assessing the respiratory system through techniques such as inspection, palpation, percussion, and auscultation, and interpret the significance of altered resonance, abnormal breath sounds, and adventitious sounds. |
| **CO6** | Students will proficiently assess the cardiovascular system, including understanding the topography of the heart, examining the precordium, evaluating overall cardiovascular functions, recognizing symptoms of cardiovascular disease, and identifying cardiovascular-related pain. |
| **CO7** | Students will analyze segments of various body systems, including skin and extermination, the neurological system, and the abdomen, to assess and understand their respective functions and health indicators. |
| **CO8** | Students will comprehend chest physical therapy, including its definition, indications, contraindications, and techniques, to effectively administer appropriate interventions for respiratory conditions. |
| **CO9** | Students will demonstrate understanding of gas physics principles, including the state of matter, temperature conversion, humidity, pressure measurement, gas flows and diffusion, gas laws, and miscellaneous concepts like density and specific gravity. |
| **CO10** | Students will master medical gas supply, covering compressed gas cylinder handling, color coding, cylinder management, storage, diameter index safety system, medical gas pipeline systems, air components, oxygen concentrators, and safety protocols. |
| **CO11** | Students will become proficient in gas administration devices, including reducing valves, flow meters, regulators, and flow restrictors, and understand the use of simple oxygen administration devices and methods for controlling gas flow. |
| **CO12** | Students will understand ECG principles, interpret normal ECG and its role in disease diagnosis, alongside grasping the introduction, value, and limitations of chest X-ray, including conventional and special radiological views. |
| **CO13** | Students will grasp ECG fundamentals, interpret normal ECGs in disease diagnosis, and comprehend the introduction, value, and limitations of chest X-ray, including conventional and specialized views. |
| **CO14** | Students will define pulmonary function testing (PFT), understand its significance in disease diagnosis, including provocative tests and postbronchodilator tests of lung function. |

# 24BRC0205 (Practical- Respiratory Care Technology)

**Name of the Institute:** CAM Institute of Allied Health Sciences & Technology
**Name of the Program:** B. Sc. (Hons) in Medical Technology (Practical-Respiratory Care Technology) **Year of the Program:** Second year

| Course Code | 24BRC0205 | Total Credit | 2 |
|---|---|---|---|
| Title of Subject | Practical- Respiratory Care Technology | Total Hours/Week | 2 |

## Examination Scheme

| Continuous Assessment (30 marks) | | External | TOTAL |
|---|---|---|---|
| Internal examinations | Attendance | Annual examination | |
| 10 | 10 | 40 | 60 |

| | |
|---|---|
| **Course Objectives** | • Perform comprehensive assessments and formulate care plans.<br>• Identify, use, and evaluate oxygen delivery devices.<br>• Interpret ECGs and diagnose common cardiac issues.<br>• Initiate ventilation and interpret pulmonary function tests. |

## Course Content

| Unit | Description | Weightage |
|---|---|---|
| 1 | **Patient Assessment**<br>**1.1** Histroy<br>**1.2** Physical Examination<br>**1.3** Lab investigation evaluation<br>**1.4** Radiological investigation evaluation'<br>**1.5** Microbiological investigation evaluation<br>**1.6** Pharmaco therapy evaluation<br>**1.7** Patient summary<br>**1.8** Formulation of plan of care | |
| 2 | **Oxygen therapy**<br>**2.1** Identification of different oxygen delivery devices<br>**2.2** Uses of oxygen delivery devices<br>**2.3** Their specific advantages and disadvantages | |
| 3 | **ECG**<br>**3.1** Normal ECG and basic nomenclature<br>**3.2** Diagnosis of abnormal rhythms<br>**3.3** Myocardial Infarction and other common pathology | |

| | | |
|---|---|---|
| 4 | **Mechanical Ventilator**<br><br>**4.1** Medical gas supply<br>**4.2** Gas administration devices<br>**4.3** Initiation of mechanical ventilator support | |
| 5 | **Pulmonary Function Test:**<br><br>**5.1** Normal PFT<br>**5.2** PFT – in disease and their significance | |

**Course Outcome:** At the end of the course, Students will be able to:

| | |
|---|---|
| **CO1** | Students will be able to accurately assess and plan patient care. |
| **CO2** | Students will be able to effectively use oxygen delivery devices. |
| **CO3** | Students will be able to correctly interpret ECGs and diagnose issues. |
| **CO4** | Students will be able to skillfully manage ventilators and analyze PFTs. |

# 24BSC0201 (Basics of Research Methodology)

| Course Code | 24BSC0201 | Total Credit | 2 |
|---|---|---|---|
| Title of Subject | Basics of Research Methodology | Total Hours/Week | 2 |

## Examination Scheme

| Continuous Assessment (30 marks) | | | External | TOTAL |
|---|---|---|---|---|
| Internal examinations | Projects / Assignments | Attendance | Annual examination | |
| 10 | 05 | 05 | 40 | 60 |

| | |
|---|---|
| **Course Objectives** | • Understand the fundamental concepts and significance of research in Medical Technology.<br>• Learn about different types of research designs and methodologies.<br>• Gain knowledge on various data collection techniques and tools.<br>• Understand basic statistical concepts and data analysis techniques.<br>• Learn about ethical issues and guidelines in research.<br>• Develop skills in writing research proposals, reports, and scientific papers.<br>• Apply research methodology concepts in designing and conducting a small-scale research project. |

## Course Content

| Unit | Description | Weightage |
|---|---|---|
| 1 | **Introduction to Research:**<br>1.1 Definition and purpose of research<br>1.2 Types of research: Basic, Applied, Clinical, and Translational<br>1.3 Importance of research in medical technology<br>1.4 The research process: Steps from idea to publication | 15% |
| 2 | **Research Design**:<br>2.1 Types of research designs: Descriptive, Analytical, Experimental, Quasi-experimental<br>2.2 Qualitative vs Quantitative research<br>2.3 Cross-sectional and Longitudinal studies | 20% |
| 3 | **Data Collection (in brief)**<br>3.1 Primary vs Secondary data<br>3.2 Data collection methods: Surveys, Interviews, Observations, Questionnaires<br>3.3 Tools for data collection: Designing surveys and questionnaires | 15% |
| 4 | **Data Analysis (in brief)**<br>4.1 Introduction to statistical concepts: Mean, Median, Mode, Standard Deviation<br>4.2 Data analysis techniques: Descriptive and Inferential statistics<br>4.3 Interpreting and presenting data: Tables, Graphs, Charts | 20% |

| | | |
|---|---|---|
| 5 | **Ethical Considerations in Research**<br><br>5.1 Importance of ethics in research<br>5.2 Informed consent and confidentiality<br>5.3 Plagiarism and Research misconduct | 15% |
| 6 | **Research Writing** | 15% |
| | 6.1 Structure of a research proposal: Title, Abstract, Introduction, Methodology, Results, Discussion, Conclusion, References<br>6.2 Referencing styles: APA, MLA, Chicago, Vancouver<br>6.3 Presenting research findings: Oral and Poster presentations<br>6.4 Writing research reports and scientific papers | |

**REFERENCE BOOKS**

- "Research Methodology: A Step-by-Step Guide for Beginners" by Ranjit Kumar
- "The Practice of Research in Health Care" by Hugh McLaughlin
- "Biostatistics: A Foundation for Analysis in the Health Sciences" by Wayne W. Daniel
- Articles from relevant medical and scientific journals

**Course Outcome:** At the end of the course, Students will be able to:

| | |
|---|---|
| **CO1** | Apply the basic principles of research methodology in the field of Medical Technology |
| **CO2** | Design a small research project in the respective field |
| **CO3** | Effectively communicate the research findings |

# Detailed Curriculum
# Of
# B.Sc.(Honours) Medical Technology
# (Respiratory Care Technology)

## Third Year

# 24BRC0301 Respiratory Care Technology- Clinical

**Name of the Institute:** CAM Institute of Allied Health Science & Technology
**Name of the Program:** B. Sc. (Hons) in Medical Technology (Respiratory Care Technology)
**Year of the Program:** Third year

| Course Code | 24BRC0301 | Total Credit | 4 |
|---|---|---|---|
| Title of Subject | Respiratory Care Technology- Clinical | Total Hours/Week | 4 |

**Examination Scheme**

| Continuous Assessment (30 marks) | | | External | TOTAL |
|---|---|---|---|---|
| Internal examinations | Projects / Assignments | Attendance | Annual examination | |
| 20 | 05 | 05 | 70 | 100 |

| | |
|---|---|
| **Course Objectives** | • To grasp the symptoms, disease principles, and clinical approaches for both upper and lower respiratory infections, encompassing pneumonia, tuberculosis, and acute respiratory failure.<br>• To apply oxygen therapy principles, including hypoxemia assessment, device selection, and hazard management, ensuring patient well-being.<br>• To execute aerosol therapy effectively, considering therapy objectives, risks, and factors influencing aerosol distribution within the lungs, utilizing devices like nebulizers, metered dose inhalers, and gas analyzers.<br>• To exhibit proficiency in operating respiratory care equipment such as pulse oximeters, capnography devices, manual resuscitators, and artificial airways, while understanding their indications, risks, and proper utilization. |

**Course Content**

| Unit | Description | Weightage |
|---|---|---|
| | **SECTION A** | |

| | | |
|---|---|---|
| 1 | **Symptoms of respiratory diseases**<br>**1.1** Cough, Haemoptysis, dyspnoea, cyanosis Concept of disease, clinical Evaluation and management of the following Respiratory Diseases<br>**1.2** Acute Rhimitis<br>**1.3** Acute sinusits<br>**1.4** Acute pharynagitis<br>**1.5** Larynogo tracheitis<br>**1.6** Epiglotitis | |
| 2 | **Lower respiratory tract infection**<br>**2.1** Bronchietis<br>**2.2** Pneumonia – community acquired, hospital acquired<br>**2.3** Innunocomprmised host<br>**2.4** Lung abscess | |

| | | |
|---|---|---|
| | **2.5** Atypical pnecemia<br>**2.6** Common viral and fungal lower respiratory<br>**2.7** Pulmonary tuborcuiosis<br>**2.8** Tropical consinophelia<br>**2.9** Acute obstructive pulmonary diseases and acute respiratory failure<br>**2.10** Pulmonary oedema<br>**2.11** Acute lung injury<br>**2.12** Toxic inhalation<br>**2.13** Bronchial asthma and other types of chronic obstructive pulmonary disease Oxygen therapy (rationale for oxygen therapy, precautions assessment of need and adequacy and therapy and the relevant devices)<br>**2.14** Causes and responses to hypoxemia<br>**2.15** Clinical signs of hypoxemia<br>**2.16** Goals of oxygen therapy<br>**2.17** Oxygen therapy devices<br>**2.18** Hazards of oxygen therapy<br>**2.19** Uses of humidification<br>**2.20** Types of humidifies (including active and passive methods of humidification )<br>**2.21** Goals of aerosol therapy<br>**2.22** Hazards of aerosol therapy<br>**2.23** Assessment of aerosol therapy<br>**2.24** Factors influencing aerosol deposition in the lungs<br>**2.25** Particle deposition<br>**2.26** Aerosol generators | |
| **SECTION B** | | |

| | | |
|---|---|---|
| 3 | **Nebulisers and metered dose inhaler**<br>**3.1** Types of nebulisers<br>**3.2** Aerosol output<br>**3.3** Small volume nebuliser therapy-definition, physiological rationale<br>**3.4** Gas Analysers (Oxygen ,Carbon - Dioxide)<br>**3.5** Gas analysis<br>**3.6** Transcutaneos oxygen monitors<br>**3.7** pulse oximeters<br>**3.8** Capnography | |
| 4 | **Manual Resuscitators**<br>**4.1** Types of resuscitator bags, bruits airway<br>**4.2** Indications<br>**4.3** Hazards | |
| **5** | **Artificial air way (oral and Nasal Endotracheal tubes tracheostomy tubes)**<br>**5.1** Parts of airway and features<br>**5.2** Types sizes and method of insertion<br>**5.3** Face mask – types sizes and its usage | |
| **Reference Books:**<br>• Clinical application of mechanical ventilation (4th edition) by David W. Chang<br>• Handbook of Respiratory care (3rd edition) by Robert L. Chatburn<br>• Egan's fundamentals of Respiratory care (11th edition) by Robert M. Kacmarek | | |

**Course Outcome:**

| | |
|---|---|
| **C01** | Students will recognize and manage symptoms of respiratory diseases, including cough, hemoptysis, dyspnea, and cyanosis, and understand the clinical evaluation and management of conditions such as acute rhinitis, acute sinusitis, acute pharyngitis, laryngotracheitis, and epiglottitis. |
| **C02** | Students will master the spectrum of lower respiratory tract infections, oxygen therapy, humidification, aerosol therapy, and associated hazards and assessments, encompassing causes, clinical signs, goals, and factors influencing aerosol deposition. |
| **C03** | Students will understand nebulizers, metered dose inhalers, gas analyzers, transcutaneous oxygen monitors, pulse oximeters, and capnography for respiratory assessment and therapy. |
| **C04** | Students will learn about manual resuscitators, including types of resuscitator bags, proper airway management, indications for use, and potential hazards associated with their use. |
| **C05** | Students will study artificial airways, including oral and nasal endotracheal tubes, tracheostomy tubes, understanding parts, features, types, sizes, methods of insertion, and usage of face masks. |

# 24BRC0302 Respiratory Care Technology- Applied

**Name of the Institute:** CAM Institute of Allied Health Science & Technology
**Name of the Program:** B. Sc. (Hons) in Medical Technology (Respiratory Care Technology)
**Year of the Program:** Third year

| Course Code | 24BRC0302 | Total Credit | 4 |
|---|---|---|---|
| Title of Subject | Respiratory Care Technology – Applied | Total Hours/Week | 4 |

## Examination Scheme

| Continuous Assessment (30 marks) | | | External | TOTAL |
|---|---|---|---|---|
| Internal examinations | Projects / Assignments | Attendance | Annual examination | |
| 20 | 05 | 05 | 70 | 100 |

| | |
|---|---|
| **Course Objectives** | • Grasp core concepts like airway resistance, lung compliance, and conditions leading to ventilation failure.<br>• Assess the effects of positive pressure ventilation on pulmonary, cardiovascular, and other systems.<br>• Differentiate between types of ventilators and effectively operate them in various clinical settings.<br>• Demonstrate proficiency in intubation, extubation, and managing artificial airways in mechanical ventilation.<br>• Understand and apply pharmacological agents used in mechanical ventilation, including their indications and effects. |

## Course Content

| Unit | Description | Weightage |
|---|---|---|
| 1 | **Principles of Mechanical Ventilation – 1.1**<br>Airway resistance<br>**1.2** lung compliance<br>**1.3** dead space Ventilation<br>**1.4** Ventilatory Failure<br>**1.5** Oxygenation Failure<br>**1.6** Clinical conditions leading to mechanical ventilation. | |
| 2 | **Effect of Positive Pressure Ventilation**<br>**2.1** Introduction<br>**2.2** Pulmonary Consideration<br>**2.3** Cardiovascular Consideration<br>**2.4** Hemodynamic Consideration<br>**2.5** Other System Consideration<br>**2.6** Summary | |

| | | |
|---|---|---|
| 3 | **Classification of Mechanical Ventilator**<br>**3.1** Introduction<br>**3.2** Various Mechanics related to mechanical ventilator (Piston Driv / Bellow Drive / Micro processor Controlled )<br>**3.3** Control variable (Pressure Vs Volume Control, Flow Vs Time | |

| | | |
|---|---|---|
| | control)<br>**3.4** Phase Variable (Trigger Variable Vs Limit Variable Vs Cycle Variable)<br>**3.5** Alarm Systems<br>**3.6** Terminology of ventilator modes (volume control ventilation/ pressure control ventilation/ Intermittent mandatory ventilation/ Pressure support/ Pressure limited time cycled breath /Pressure limited Flow cycled Breath/ Proportional Assist Ventilation/ Automatic Tube Compensation/ Airway Pressure Release Ventilation)<br>**3.7** Summary | |
| 4 | **Ventilator waveform**<br>**4.1** Pressure waveform<br>**4.2** Volume waveform<br>**4.3** Flow waveform | |
| | **SECTION B** | |

| | | |
|---|---|---|
| 5 | **Operating Mode of Mechanical Ventilation**<br>**5.1** Introduction<br>**5.2** Negative and positive pressure ventilation<br>**5.3** Operating modes of mechanical ventilator<br>**5.4** Closed Loop System<br>**5.5** Spontaneous Ventilation<br>**5.6** Positive end expiratory pressure (PEEP)<br>**5.7** Continuous Positive Airway Pressure (CPAP)<br>**5.8** Bilevel Positive Airway Pressure (Bi PAP)<br>**5.9** Controlled Mandatory Ventilation (CMV)<br>**5.10** Assist / Control (AC)<br>**5.11** Synchronized Intermittent Mandatory Ventilation (SIMV)<br>**5.12** Pressure Support Ventilation<br>**5.13** Adaptive Support Ventilation<br>**5.14** Proportional Assist Ventilation<br>**5.15** Volume Assured Pressure Support (VAPS)<br>**5.16** Pressure Regulated Volume Control (PRVC)<br>**5.17** Adaptive Pressure Control (APC)<br>**5.18** Pressure Controlled Ventilation (PCV)<br>**5.19** Airway Pressure Release Ventilation (APRV)<br>**5.20** Biphasic Positive Airway Pressure (BiPAP)<br>**5.21** Inverse Ratio Ventilation<br>**5.22** Automatic Tube Compensation (ATC)<br>**5.23** Neurally Adjusted Ventilatory Assist (NAVA)<br>**5.24** High Frequency Oscillatory Ventilation (HFOV) **5.25** Summary | |
| 6 | **Airway management in mechanical ventilation**<br>**6.1** Intubation<br>**6.2** Common artificial airways<br>**6.3** Intubation procedure<br>**6.4** Rapid Sequence Intubation<br>**6.5** Management of endotracheal and tracheostomy tubes<br>**6.6** Extubation<br>**6.7** Complications of the Endotracheal Airway. | |
| 7 | **Pharmacotheraphy for mechanical ventilation**<br>**7.1** Drugs for improving ventilation<br>**7.2** Steroids<br>**7.3** MDI medications<br>**7.4** Neuromuscular blocking agents<br>**7.5** Central Nervous System Agents<br>**7.6** Other agents used in mechanical ventilation (propofol / haloperidol / dexmedetomidine / nitric oxide) **7.7** Summary | |

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| 8 | **Noninvasive Positive Pressure Ventilation (NPPV)**<br>**8.1** Physiological effects of NPPV<br>**8.2** Use of continuous positive airway pressure (CPAP)<br>**8.3** Use of Bilevel Positive Airway Pressure<br>**8.4** Comman interfaces for CPAP and Bilevel PAP<br>**8.5** Potential problems with interfaces<br>**8.6** Titration of continuous positive airway pressure<br>**8.7** Titration of Bilevel positive airway pressure<br>**8.8** Home Bipap<br>**8.9** Summary | |
| 9 | **Critical care issues in mechanical ventilation**<br>**9.1** Acute Lung Injury and acute respiratory distress syndrome<br>**9.2** Ventilator Associated Pneumonia<br>**9.3** Hypoxic Ischemic Encephalopathy<br>**9.4** Traumatic Brain Injury<br>**9.5** Summary | |

**Reference Books:**

- Clinical application of mechanical ventilation (4th edition) by David W. Chang
- Handbook of Respiratory care (3rd edition) by Robert L. Chatburn
- Egan's fundamentals of Respiratory care (11th edition) by Robert M. Kacmarek

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|---|---|
| **CO1** | Students will grasp the principles of mechanical ventilation, including understanding airway resistance, lung compliance, dead space, and recognizing clinical conditions necessitating mechanical ventilation. |
| **CO2** | Learners will demonstrate proficiency in monitoring mechanical ventilation, encompassing vital signs, chest inspection, auscultation, fluid-electrolyte balance, and arterial blood gases analysis. |
| **CO3** | Participants will develop skills in managing mechanical ventilation, implementing strategies to optimize ventilation, oxygenation, acid-base balance, and fluid-electrolyte and nutrition management, while troubleshooting ventilator alarms and events and maintaining ventilation circuit and artificial airway care. |
| **CO4** | Students will understand pharmacotherapy for mechanical ventilation, including the administration of drugs to improve ventilation, manage steroids, utilize MDI medications, neuromuscular blocking agents, and anesthetic gases. |
| **CO5** | Participants will analyze the effects of positive end-expiratory pressure (PEEP) on pulmonary and cardiovascular systems, interpret basic ventilator waveform analysis, and comprehend the classification of mechanical ventilators and their components. |

# 24BRC0303 (Respiratory Care Technology- Advanced)

**Name of the Institute:** CAM Institute of Allied Health Science & Technology
**Name of the Program:** B. Sc. (Hons) in Medical Technology (Respiratory Care Technology)
**Year of the Program:** Third year

| Course Code | 24BRC0303 | Total Credit | 4 |
|---|---|---|---|
| Title of Subject | Respiratory Care Technology- Advanced | Total Hours/Week | 4 |

## Examination Scheme

| Continuous Assessment (30 marks) | | | External | TOTAL |
|---|---|---|---|---|
| Internal examinations | Projects / Assignments | Attendance | Annual examination | |
| 20 | 05 | 05 | 70 | 100 |

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| **Course Objectives** | • Understand the goals, indications, contraindications, and initial settings for initiating mechanical ventilation.<br>• Monitor vital signs, chest inspection, ABGs, and hemodynamic parameters in mechanically ventilated patients.<br>• Analyze ventilator waveforms and use them for patient-ventilator system assessment and troubleshooting.<br>• Manage mechanical ventilation, including strategies to improve ventilation and oxygenation, and handle alarms and artificial airways.<br>• Execute procedures like chest tube management, assist in bronchoscopy, and manage weaning from mechanical ventilation. |

## Course Content

| Unit | Description | Weightage |
|---|---|---|
| 1 | **Initiation of mechanical ventilation-**<br>**1.1** Goals of mechanical ventilation<br>**1.2** Indications<br>**1.3** contraindication<br>**1.4** Initial Ventilator settings<br>**1.5** Ventilator alarm settings<br>**1.6** Hazards and complications<br>**1.7** Summary | |

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| 2 | **Monitoring in mechanical ventilation-**<br>**2.1** Concepts of monitoring<br>**2.2** Vital signs,<br>**2.3** Chest inspection and auscultation,<br>**2.4** Fluid electrolyte balance<br>**2.5** Arterial blood gases<br>**2.6** Oxygen saturation monitoring<br>**2.7** End tidal carbon dioxide monitoring<br>**2.8** Summary | |
| 3 | **Haemodynamics monitoring**<br>**3.1** ECG<br>**3.2** arterial catheter | |

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|---|---|---|
| | **3.3** CVP<br>**3.4** pulmonary artery catheter<br>**3.5** Cardiac output and vascular resistance calculation<br>**3.6** Preload after load contractility assessment<br>**3.7** calculation of haemodynamic values<br>**3.8** monitoring of mixed venous saturation | |
| 4 | **Ventilator Waveform Analysis**<br>**4.1** Flow – time waveform<br>**4.2** Pressure – time waveform<br>**4.3** Volume – time waveform<br>**4.4** Spontaneous ventilation during mechanical ventilation<br>**4.5** Flow and Trans airway Pressure<br>**4.6** Compliance and alveolar Pressure<br>**4.7** Effect of descending Ramp flow waveform during volume controlled ventilation<br>**4.8** waveform developed during pressure controlled ventilation<br>**4.9** Pressure support and spontaneous ventilation<br>**4.10** Using waveform for patient ventilator system assessment<br>**4.11** Pressure Volume Loop and Flow volume loop **4.12** Summary | |
| | **SECTION B** | |

| | | |
|---|---|---|
| 5 | **Management of mechanical ventilation**<br>**5.1** Basis Management Strategies<br>**5.2** strategies to improve ventilation<br>**5.3** Strategies to improve oxygenation<br>**5.4** Arterial Blood Gas Analysis<br>**5.5** acid base electrolyte balance and their correction<br>**5.6** Fluid electrolyte nutrition balance and management<br>**5.7** Troubleshooting of ventilator alarms and events<br>**5.8** care of the ventilation circuit<br>**5.9** care of the artificial airway. | |
| 6 | **Procedures related to mechanical ventilation**<br>**6.1** Chest tube and drainage system<br>**6.2** Assisting in fibro optic bronchoscopy<br>**6.3** Transport of mechanically ventilated patients | |
| 7 | **Weaning from mechanical ventilation**<br>**7.1** Definition: Weaning success and failure<br>**7.2** weaning criteria<br>**7.3** weaning indices<br>**7.4** weaning procedure<br>**7.5** signs of weaning failure<br>**7.6** causes of weaning failure. | |
| 8 | **Neonatal mechanical ventilation**<br>**8.1** intubation and problems inherent to the neonate<br>**8.2** surfactant replacement therapy<br>**8.3** Nasal CPAP | |
| | **8.4** basic principles of neonatal ventilation<br>**8.5** modes, initiation and maintenance of neonatal ventilator support<br>**8.6** high frequency ventilation<br>**8.7** liquid ventilation | |
| 9 | **Miscellaneous Topics– 9.1**<br>Barotraumas<br>**9.2** Intra and inter hospital transport during ventilation<br>**9.3** hyperbaric therapy<br>**9.4** caissons disease and high altitude sickness<br>**9.5** sleep apnea and related disorders<br>**9.6** drug overdosing and poisoning requiring ventilation and their therapy<br>**9.7** Extracorporeal membrane oxygenation (ECMO)<br>**9.8** Mechanical ventilation in mass casualty incidents Summary | |

**Reference Books:**

- Clinical application of mechanical ventilation (4th edition) by David W. Chang
- Handbook of Respiratory care (3rd edition) by Robert L. Chatburn
- Egan's fundamentals of Respiratory care (11th edition) by Robert M. Kacmarek

## Course Outcomes:

| | |
|---|---|
| **CO1** | Students will grasp the initiation of mechanical ventilation, including indications, contraindications, initial settings, and potential complications. |
| **CO2** | Learners will demonstrate proficiency in weaning from mechanical ventilation, understanding criteria, procedures, and causes of failure. |
| **CO3** | Participants will develop skills in neonatal mechanical ventilation, covering intubation, surfactant therapy, modes, and neonatal-specific issues. |
| **CO4** | Students will analyze clinical scenarios in mechanical ventilation through case studies, applying principles and management strategies. |

# 24BRC0304 (Respiratory Care Technology- Practical)

**Name of the Institute:** CAM Institute of Allied Health Science & Technology
**Name of the Program:** B. Sc. (Hons) in Medical Technology (Respiratory Care Technology)
**Year of the Program:** Third year

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|---|---|---|---|
| **Course Code** | 24BRC0304 | **Total Credit** | **4** |
| **Title of Subject** | Respiratory Care Technology-Practical | **Total Hours/Week** | 4 |
| **Course Objectives** | • To develop skills in interpreting and correcting arterial blood gas and electrolyte abnormalities, as well as calculating body surface area, nutritional needs, and fluid electrolyte requirements.<br>• To acquire proficiency in setting ventilators and managing ventilatory accidents, including circuit disconnections and tube kinks.<br>• To recognize respiratory circuit components, understand their functions, sterilization procedures, and identify associated complications.<br>• To enhance understanding of pharmacology, including drug identification, mechanisms of action, and clinical applications, and acquire proficiency in calculating lung compliance, interpreting pulmonary function tests, and implementing suitable management approaches. | | |

## Course Content

| Unit | Description | Weightage |
|---|---|---|
| 1 | • Interpretation and correction of a given arterial blood gas<br>• Interpretation and correction of a given electrolyte abnormality<br>• Calculation of body surface area, nutritional requirement and fluid electrolyte requirement<br>• Setting of ventilators for a given case<br>• Managing a simulated ventilatory accident circuit including disconnection, kinking of tubes recognition of various alarms etc.<br>• Identification of various respiratory circuit components and their used, method of sterilization and complications related them.<br>• identification of drugs and their pharmacology<br>• Calculating lung compliance, interpretation of a PFT and management.<br>• CASE STUDIES (COPD/Status epilepticus/post abdominal surgery/head injury/smoke inhalation/drug overdose/tension hemo pneumothorax/chest trauma/acute respiratory distress syndrome/myasthenia gravis/guillain barre syndrome/meconium aspiration/home care/end of life sedation) | |

**Course Outcomes:**

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|---|---|
| **CO1** | Students will interpret and correct arterial blood gas and electrolyte abnormalities. |
| **CO2** | Participants will calculate body surface area, nutritional requirements, and fluid-electrolyte needs. |
| **CO3** | Learners will set ventilator parameters and manage simulated ventilatory accidents. |

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| **CO4** | Students will identify respiratory circuit components, their uses, sterilization methods, and related complications. |
| **CO5** | Participants will recognize drugs, understand pharmacology, and apply clinical implications, while calculating lung compliance and interpreting pulmonary function test results. |