PRESIDENCY UNIVERSITY

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REACH GREATER HEIGHTS

PROGRAMME REGULATIONS & CURRICULUM

2025-29

PRESIDENCY SCHOOL OF ALLIED HEALTH SCIENCES

B.SC. IN RESPIRATORY CARE TECHNOLOGY (RCT)

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PRESIDENCY UNIVERSITY
Presidency University Act, 2013 of the Karnataka Act No. 41 of 2013 | Established under Section 2(f) of UGC Act, 1956
Approved by AICTE, New Delhi | Approved By BCI
Bengaluru

Presidency School of Allied Health Sciences

B.Sc. in Respiratory Care Technology

Program Regulations and Curriculum

Based on Choice Based Credit System (CBCS) and Outcome Based Education (OBE)

Program: B.Sc. in Respiratory Care Technology

B.Sc. RCT

2025 – 2029

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PART A – PROGRAM REGULATIONS

1. Vision & Mission of the University and the School / Department

1.1 Vision of the University

To be a Value-driven Global University, excelling beyond peers and creating professionals of integrity and character, having concern and care for society.

1.2 Mission of the University

- Commit to be an innovative and inclusive institution by seeking excellence in teaching, research and knowledge-transfer.
- Pursue Research and Development and its dissemination to the community, at large.
- Create, sustain and apply learning in an interdisciplinary environment with consideration for ethical, ecological and economic aspects of nation building.
- Provide knowledge-based technological support and services to the industry in its growth and development.
- To impart globally-applicable skill-sets to students through flexible course offerings and support industry's requirement and inculcate a spirit of new-venture creation.

1.3 Vision of Presidency School of Allied Health Sciences

To be a value-based, practice-oriented school committed to producing globally competent Allied Health Professionals who contribute to excellence in patient care, education, and community well-being.

1.4 Mission of Presidency School of Allied Health Sciences

- Foster a dynamic learning environment that integrates theoretical knowledge with hands-on clinical practice.
- Attract and develop highly qualified faculty committed to excellence in teaching, research, and healthcare innovation.
- Establish state-of-the-art laboratories and clinical training facilities to enhance practical learning experiences.
- Encourage interdisciplinary collaboration to promote holistic patient care and inter-professional education.
- Instill leadership, ethical values, and a spirit of community service among students to meet global healthcare challenges.

1.5 Vision of Program B.Sc. Respiratory Care Technology (RCT)

To be a center of academic excellence in respiratory care education, fostering innovation, clinical competence, and ethical leadership to serve the evolving needs of the healthcare sector and contribute meaningfully to national and global health outcomes.

1.6 Mission of Program B.Sc. Respiratory Care Technology (RCT)

- To provide holistic and interdisciplinary education in respiratory care by integrating theoretical knowledge with hands-on clinical training.
- To develop competent, compassionate, and ethically responsible respiratory care professionals capable of addressing complex healthcare challenges.
- To foster a culture of research, critical thinking, and lifelong learning for continuous professional and academic growth.
- To strengthen industry and healthcare partnerships that enhance employability, clinical exposure, innovation, and community health outreach.

2. Preamble to the Program Regulations and Curriculum

This is the subset of Academic Regulations, and it is to be followed as a requirement for the award of Bachelor of Science in Respiratory Care Technology (RCT).

The curriculum for the Bachelor of Science in Respiratory Care Technology (RCT) program is designed in alignment with the Choice Based Credit System (CBCS), emphasizing practical and career-oriented learning. It incorporates Social Project-Based Learning, Industrial Training, and Clinical Internships to ensure that students gain real-world experience in critical care. This practice-driven approach equips graduates with the necessary skills and competencies to pursue successful careers in hospitals, surgical centers, and healthcare industries, as well as opportunities for higher studies or entrepreneurship in the healthcare sector.

In exercise of the powers conferred by and in discharge of duties assigned under the relevant provision(s) of the Act, Statutes and Academic Regulations, of the University, the Academic Council hereby makes the following Regulations.

3. Short Title and Applicability

a. These Regulations shall be called the Bachelor of Science in Respiratory Care Technology (RCT) Degree Program Regulations and Curriculum 2025-2029.
b. These Regulations are subject to, and pursuant to the Academic Regulations.
c. These Regulations shall be applicable to the ongoing Bachelor of Science in Respiratory Care Technology (RCT). Degree Programs of the 2025-2029 batch, and to all Bachelor

of Science in Respiratory Care Technology (RCT). Degree Programs which may be introduced in future.

d. These Regulations shall supersede all the earlier Bachelor of Science in Respiratory Care Technology (RCT). Degree Program Regulations and Curriculum, along with all the amendments thereto.

e. These Regulations shall come into force from the Academic Year 2025-2026.

4. Definitions

In these Regulations, unless the context otherwise requires:

a. *"Academic Calendar" means the schedule of academic and miscellaneous events as approved by the Vice Chancellor;*

b. *"Academic Council" means the Academic Council of the University;*

c. *"Academic Regulations" means the Academic Regulations, of the University;*

d. *"Academic Term" means a Semester or Summer Term;*

e. *"Act" means the Presidency University Act, 2013;*

f. *"Basket" means a group of courses bundled together based on the nature/type of the course;*

g. *"BOE" means the Board of Examinations of the University;*

h. *"BOG" means the Board of Governors of the University;*

i. *"BOM" means the Board of Management of the University;*

j. *"BOS" means the Board of Studies of a particular Department/Program of Study of the University;*

k. *"CGPA" means Cumulative Grade Point Average as defined in the Academic Regulations;*

l. *"Clause" means the duly numbered Clause, with Sub-Clauses included, if any, of these Regulations;*

m. *"COE" means the Controller of Examinations of the University;*

n. *"Course In Charge" means the teacher/faculty member responsible for developing and organizing the delivery of the Course;*

o. *"Course Instructor" means the teacher/faculty member responsible for teaching and evaluation of a Course;*

p. *"Course" means a specific subject usually identified by its Course-code and Course-title, with specified credits and syllabus/course-description, a set of references,*

taught by some teacher(s)/course-instructor(s) to a specific class (group of students) during a specific Academic Term;

q. *"Curriculum Structure" means the Curriculum governing a specific Degree Program offered by the University, and, includes the set of Baskets of Courses along with minimum credit requirements to be earned under each basket for a degree/degree with specialization/minor/honours in addition to the relevant details of the Courses and Course catalogues (which describes the Course content and other important information about the Course). Any specific requirements for a particular program may be brought into the Curriculum structure of the specific program and relevant approvals should be taken from the BOS and Academic Council at that time.*

r. *"DAC" means the Departmental Academic Committee of a concerned Department/Program of Study of the University;*

s. *"Dean" means the Dean / Director of the concerned School;*

t. *"Degree Program" includes all Degree Programs;*

u. *"Department" means the Department offering the degree Program(s) / Course(s) / School offering the concerned Degree Programs / other Administrative Offices;*

v. *"Discipline" means specialization or branch of B.Sc. Degree Program;*

w. *"HOD" means the Head of the concerned Department;*

x. *"L-T-P-C" means Lecture-Tutorial-Practical-Credit – refers to the teaching – learning periods and the credit associated;*

y. *"MOOC" means Massive Open Online Courses;*

z. *"MOU" means the Memorandum of Understanding;*

aa. *NCAHP: National Commission for Allied Health Professionals*

bb. *"NPTEL" means National Program on Technology Enhanced Learning;*

cc. *"Parent Department" means the department that offers the Degree Program that a student undergoes;*

dd. *"Program Head" means the administrative head of a particular Degree Program/s;*

ee. *"Program Regulations" means the Bachelor of Science Degree Program Regulations and Curriculum, 2025-2029;*

ff. *"Program" means the Bachelor of Science (B.Sc.) Degree Program;*

gg. *"PSoAHS" means the Presidency School of Allied Health Science;*

hh. *"Registrar" means the Registrar of the University;*

ii. *"School" means a constituent institution of the University established for monitoring, supervising and guiding, teaching, training and research activities in broadly related fields of studies;*

jj. *"Section" means the duly numbered Section, with Clauses included in that Section, of these Regulations;*

kk. *"SGPA" means the Semester Grade Point Average as defined in the Academic Regulations;*

ll. *"Statutes" means the Statutes of Presidency University;*

mm. *"Sub-Clause" means the duly numbered Sub-Clause of these Program Regulations;*

nn. *"Summer Term" means an additional Academic Term conducted during the summer break (typically in June-July) for a duration of about eight (08) calendar weeks, with a minimum of thirty (30) University teaching days;*

oo. *"SWAYAM" means Study Webs of Active Learning for Young Aspiring Minds.*

pp. *"UGC" means University Grant Commission;*

qq. *"University" means Presidency University, Bengaluru; and*

rr. *"Vice Chancellor" means the Vice Chancellor of the University.*

5. Program Description

The Bachelor of Science in Respiratory Care Technology (RCT) Degree Program Regulations and Curriculum 2025-2029 are subject to, and, pursuant to the Academic Regulations. These Program Regulations shall be applicable to the following ongoing Bachelor of Science (B.Sc.) Degree Programs of 2025-2029 offered by the Presidency School of Allied Health Sciences (PSoAHS):

1. Bachelors of Science in Anaesthesia & Operation Theater Technology (AOTT)
2. Bachelors of Science in Medical Laboratory Technology (MLT)
3. Bachelor of Science in Cardiac Care Technology (CCT)
4. Bachelor of Science in Respiratory Care Technology (RCT)
5. Bachelor of Science in Medical Radiology and Imaging Technology (MRIT)

5.1 These Program Regulations shall be applicable to other similar programs, which may be introduced in future.

5.2 These Regulations may evolve and get amended or modified or changed through appropriate approvals from the Academic Council, from time to time, and shall be binding on all concerned.

5.3 The effect of periodic amendments or changes in the Program Regulations, on the students admitted in earlier years, shall be dealt with appropriately and carefully, so as to ensure that those students are not subjected to any unfair situation whatsoever, although they are required to conform to these revised Program Regulations, without any undue favor or considerations.

6. Minimum and Maximum Duration

6.1 Bachelor of Science in Respiratory Care Technology (RCT)

The Bachelor of Science in Respiratory Care Technology (RCT)) Degree Program is a **Four-Year, Full-Time, Semester-Based Program**. The minimum duration of the program is **four (04) years**, comprising **eight (08) semesters**—each academic year consisting of **two semesters** (Odd and Even).

The academic structure includes:

- Theory Classes: 1590 Hours
- Practical Classes: 750 Hours
- Clinical Internship: 1200 Hours Minimum
- Summer Internship: - 120 hours
- Total Hours: 3660 Hours

6.2. A student who, for any reason, is unable to complete the program within the prescribed minimum duration may be granted an additional two (02) years beyond the normal period to fulfill the mandatory minimum credit requirements.

In general, the **maximum allowable duration** for completion of the program is defined as **'N + 2' years**, where **'N'** denotes the **normal duration (i.e., 4 years)**. Therefore, the **maximum duration to complete the B.Sc. RCT program is 6 years**.

6.3. The time taken by the student to improve Grades/CGPA, and in case of temporary withdrawal/re-joining (Refer to Clause 16.1 of Academic Regulations), shall be counted in the permissible maximum duration for completion of a Program.

6.4. In exceptional circumstances, such as temporary withdrawal for medical exigencies where there is a prolonged hospitalization and/or treatment, as certified through hospital/medical records, women students requiring extended maternity break (certified by registered medical practitioner), and, outstanding sportspersons representing the University/State/India requiring extended time to participate in National/International sports events, a further extension of one (01) year may be granted on the approval of the Academic Council.

6.5 The enrolment of the student who fails to complete the mandatory requirements for the award of the concerned Degree (refer Section 19.0 of Academic Regulations) in the prescribed maximum duration (Clauses 18.1 and 18.2 of Academic Regulations), shall stand terminated and no Degree shall be awarded.

7. Program Educational Objectives (PEO)

After four years of successful completion of the program, the graduates shall be:

PEO No.	Program Educational Objectives (PEO)
PEO1	**Professional Competence:** Graduates will demonstrate comprehensive knowledge and practical skills relevant to allied health care professions, enabling them to function effectively in diverse clinical settings.
PEO2	**Ethical and Responsible Practice:** Graduates will uphold professional ethics, patient confidentiality, and safety standards while delivering perioperative care.
PEO3	**Teamwork and Leadership:** Graduates will work effectively in multidisciplinary healthcare teams and demonstrate leadership qualities when required.
PEO4	**Lifelong Learning and Career Advancement:** Graduates will engage in continuous learning and professional development to adapt to evolving medical technologies and practices.
PEO5	**Research and Innovation:** Graduates will participate in clinical research and contribute to the advancement of allied health care practices through innovation and evidence-based approaches.

8. Program Outcomes (PO) and Program Specific Outcomes (PSO)

8.1 Program Outcomes (PO)

On successful completion of the Program, the students shall be able to:

PO No.	Program Outcome
PO1	**Disciplinary Knowledge:** Apply core knowledge of respiratory care, pulmonary diagnostics, and mechanical ventilation protocols in both acute and chronic respiratory conditions.
PO2	**Critical Thinking:** Analyze respiratory function and clinical data to make timely, evidence-based decisions during critical care and emergency scenarios.

PO3	**Effective Communication:** Communicate clearly and effectively with patients, families, and healthcare teams to ensure safe and coordinated respiratory care delivery.
PO4	**Social Interaction:** Collaborate efficiently within multidisciplinary teams while showing empathy and professionalism in diverse clinical settings.
PO5	**Effective Citizenship**: Promote respiratory health and contribute to public health initiatives by recognizing the role of respiratory technologists in society.
PO6	**Ethics:** Uphold ethical standards by maintaining patient confidentiality, obtaining informed consent, and delivering care with integrity.
PO7	**Environmental and Sustainability: Apply** sustainable practices in respiratory care services, such as efficient oxygen usage and biomedical waste disposal.
PO8	**Self-Directed and Lifelong Learning:** Commit to lifelong learning by staying updated with advancements in respiratory therapies, ventilatory technologies, and evidence-based care.
PO9	**Research-Related Skills:** Engage in or support clinical research to improve respiratory care outcomes and contribute to innovation in pulmonary medicine.
PO10	**Scientific Interpretation:** Interpret respiratory diagnostic reports like ABG, PFT, and radiological data to guide patient management effectively.
PO11	**Information and Digital Literacy:** Use respiratory care software, digital records, and monitoring systems to manage patient data and optimize respiratory therapy practices.

8.2 Program Specific Outcomes (PSOs):

On successful completion of the Program, the students shall be able to:

PSO No.	Program Specific Outcome
PSO1	**Respiratory Diagnostic and Therapeutic Skills:** Apply theoretical knowledge and technical proficiency to perform diagnostic tests such as pulmonary function tests (PFTs), arterial blood gas (ABG) analysis, and administer therapeutic interventions including oxygen therapy, aerosol therapy, and chest physiotherapy.
PSO2	**Ventilator and Equipment Management:** Operate, maintain, and troubleshoot respiratory care equipment such as mechanical ventilators, CPAP/BiPAP machines, and oxygen delivery systems, while ensuring adherence to safety and quality control standards.

PSO3	**Critical and Emergency Respiratory Care:** Assist in managing acute respiratory emergencies, provide ventilator support in ICUs, and respond effectively during cardiopulmonary resuscitation (CPR) and code blue situations.
PSO4	**Documentation and Infection Control:** Maintain accurate clinical records, respiratory therapy logs, and strictly follow protocols related to infection control, biomedical waste management, and patient safety within respiratory care settings.

9. Admission Criteria (as per the concerned Statutory Body)

The University admissions shall be open to all persons irrespective of caste, class, creed, gender, or nationality. All admissions shall be made on the basis of merit in the qualifying examinations and an entrance examination conducted by the University. The admission criteria for the B.Sc. in Respiratory Care Technology program are listed in the following sub-clauses:

9.1 An applicant who has passed the Higher Secondary (10+2) or equivalent examination recognized by any Indian University or a duly constituted Board with Physics, Chemistry, and Biology (mandatory), and Mathematics (optional), securing a minimum of 50% marks in aggregate, shall be eligible for admission to the Program. ST/SC 45% marks in aggregate, shall be eligible for admission to the Program.

9.2 Candidates who have studied abroad and have passed the equivalent qualification, as determined by the Association of Indian Universities, must have passed Physics, Chemistry, and Biology (mandatory) and Mathematics (optional) up to the 12th standard level.

9.3 Foreign Nationals (FN), Persons of Indian Origin (PIO), and Children of Indian Workers in Gulf Countries (CIWGC) must have completed qualifying examinations considered equivalent by the Association of Indian Universities/Academic Council to be eligible for admission.

9.4 Reservation for the SC / ST and other backward classes shall be made in accordance with the directives issued by the Government of Karnataka from time to time.

9.5 Admissions are offered to Foreign Nationals and Indians living abroad in accordance with the rules applicable for such admission, issued from time to time, by the Government of India.

9.6 Candidates must fulfil the medical standards required for admission as prescribed by the University.

9.7 If, at any time after admission, it is found that a candidate had not in fact fulfilled all the requirements stipulated in the offer of admission, in any form whatsoever, including possible misinformation and any other falsification, the Registrar shall report the matter to the Board of Management (BOM), recommending revoking the admission of the candidate.

9.8 The decision of the BOM regarding the admissions is final and binding.

10. Lateral Entry / Transfer Students requirements

10.1 Lateral Entry

The University admits students directly to the second year (3rd Semester) of the Bachelor of Science in Respiratory Care Technology (RCT) degree program as per the provisions and/or regulations of the Government and the Ministry of Family Health and Welfare (MoFHW) pertaining to the "Lateral Entry" scheme. The general conditions and rules governing the provision of Lateral Entry to the B.Sc. Program of the University are listed in the following Sub-Clauses:

10.1.1 Admission to the 2nd year (3rd Semester) of the B.Sc. Degree program shall be open to candidates who have completed a minimum of two (02) years full-time Diploma in Respiratory Care Technology from a Government-recognized body and who have secured a pass in the qualifying diploma examination

10.1.2 Provided that, such candidates must also have completed the Higher Secondary (10+2) or equivalent examination with Physics, Chemistry, and Biology as subjects.

10.1.3 Lateral Entry shall be permissible only if the subject studied at the Diploma level is the same as the one in which the admission is sought.

10.1.4 The number of students to be admitted under the Lateral Entry scheme shall not exceed twenty percent (20%) of the total annual intake for the B.Sc. Program.

10.1.5 Eligibility of candidates for Lateral Entry shall be based on performance in the qualifying diploma examination and the entrance examination conducted or approved by the NCAHP, as applicable.

10.1.6 Candidates admitted under the Lateral Entry scheme must adhere to all program-specific rules and regulations applicable from the 3rd semester onwards, including curriculum structure and credit requirements.

10.1.7 Foreign Nationals and candidates qualified from foreign Universities/Boards must obtain equivalence certification from the NCAHP Commission prior to admission, confirming their qualification is equivalent to the Indian diploma standards.

10.1.8 All existing University regulations, including any bridge courses prescribed by the University for Knowledge Alignment, shall be binding on students admitted through the Lateral Entry scheme. Such bridge courses, if prescribed, will not be included in CGPA calculations.

10.1.9 All the Courses (and the corresponding number of Credits) prescribed for the 1st Year of the concerned Program shall be waived for the student(s) admitted to the concerned Program through Lateral Entry. Further, the *Minimum Credit Requirements* for the award of the B.Sc. Degree in the concerned Program shall be prescribed / calculated as follows:

The ***Minimum Credit Requirements*** for the award of the Bachelor of Science Degree prescribed by the concerned Bachelor of Science Degree Program Regulations and Curriculum, 2025-2029, minus the number of Credits prescribed / accepted by the Equivalence Committee for the 1st Year (1st and 2nd Semesters) of the B.Sc. Program. For instance, if the *Minimum Credit Requirements* for the award of the Bachelor of Science (B.Sc.) Degree as prescribed by the Regulations for B.Sc. (Respiratory Care Technology) is "N" Credits, and, if the total credits prescribed in the 1st Year (total credits of the 1st and 2nd Semesters) of the Program concerned is "M" Credits, then the *Minimum Credit Requirements* for the award of the Bachelor of Science in Respiratory Care Technology for a student who joins the Program through the provision of the Lateral Entry, shall be "N – M" Credits.

10.1.10 Further, no other waiver except the Courses prescribed for the 1st year of the B.Sc. Program of the University shall be permissible for students joining the B.Sc. Program through the provision of Lateral Entry.

10.2 Transfer of student(s) from another recognized University to the 2nd year (3rd Semester) of the B. Sc. Program of the University

A student who has completed the 1st Year (i.e., passed in all the Courses / Subjects prescribed for the 1st Year) of the B.Sc., Three /Four-Year Degree Program from another recognized University, may be permitted to transfer to the 2nd Year (3rd Semester) of the B.Sc. Program of the University as per the rules and guidelines prescribed in the following Sub-Clauses:

10.2.1 The concerned student fulfils the criteria specified in Sub-Clauses 10.1.1, 10.1.2 and 10.1.3.

10.2.2 The student shall submit the Application for Transfer along with a non-refundable Application Fee (as prescribed by the University from time to

time) to the University no later than July 10 of the concerned year for admission to the 2nd Year (3rd Semester) B.Sc. Program commencing on August 1 on the year concerned.

10.2.3 The student shall submit copies of the respective Marks Cards / Grade Sheets / Certificates along with the Application for Transfer.

10.2.4 The transfer may be provided on the condition that the Courses and Credits completed by the concerned student in the 1st Year of the B.Sc. Three/Four-year Degree Program from the concerned University, are declared equivalent and acceptable by the Equivalence Committee constituted by the Vice Chancellor for this purpose. Further, the Equivalence Committee may also prescribe the Courses and Credits the concerned students shall have to mandatorily complete, if admitted to the 2nd Year of the B.Sc. Program of the University.

10.2.5 The Branch / Discipline allotted to the student concerned shall be the decision of the University and binding on the student.

11. Specific Regulations regarding Assessment and Evaluation (including the Assessment Details of NTCC Courses, Weightages of Continuous Assessment and End Term Examination for various Course Categories)

11.1 The academic performance evaluation of a student in a Course shall be according to the University Letter Grading System based on the class performance distribution in the Course.

11.2 Academic performance evaluation of every registered student in every Course registered by the student is carried out through various components of Assessments spread across the Semester. The nature of components of Continuous Assessments and the weightage given to each component of Continuous Assessments (refer Clause 8.8 of Academic regulations) shall be clearly defined in the Course Plan for every Course, and approved by the DAC.

11.3 Format of the End-Term examination shall be specified in the Course Plan.

11.4 Grading is the process of rewarding the students for their overall performance in each Course. The University follows the system of Relative Grading with statistical approach to classify the students based on the relative performance of the students registered in the concerned Course except in the following cases:

- Non-Teaching Credit Courses (NTCC)
- Courses with a class strength less than 30

Absolute grading method may be adopted, where necessary with prior approval of concerned DAC.

Grading shall be done at the end of the Academic Term by considering the aggregate performance of the student in all components of Assessments prescribed for the Course. Letter Grades (Clause 8.10 of Academic regulations) shall be awarded to a student based on her/his overall performance relative to the class performance distribution in the concerned Course. These Letter Grades not only indicate a qualitative assessment of the student's performance but also carry a quantitative (numeric) equivalent called the Grade Point.

11.5 Assessment Components and Weightage

Table 1: Assessment Components and Weightage for different category of Courses

Nature of Course and Structure	**Evaluation Component**	**Weightage**	**Minimum Performance Criteria**
Lecture-based Course *L component in the L-T-P Structure is predominant (more than 1) (Examples: 3-0-0; 3-0-2; 2-1-0; 2-0-2, 2-0-4 etc.)*	**Continuous Internal Evaluation (CIE)** (a) 50% of CIE from two notified formative written tests (b) 50% of CIE from internal assessments such as seminars, journal club presentations, case presentations, assignments, etc.	30% (CIE Total)	40% (in CIE to be eligible for ESE)
	End Semester Examination (ESE) University-conducted Theory exam with specified pattern, type, and weightage as per curriculum	70%	30% (in ESE)
Lab/Practice-based Course *P component in the L-T-P Structure is predominant (Examples:*	**Continuous Internal Evaluation (CIE)** Laboratory work including records, performance, attendance, project reports, etc. along	30% (CIE Total)	40% (in CIE to be eligible for ESE)

0-0-4; 1-0-4; 1-0-2; etc.)	with two formative tests and internal assessments (seminars, case-based assessments)		
	End Semester Examination (ESE) Practical exam: Spotters, equipment demonstration, case-based discussion, etc.	70%	30% (in ESE)
Skill-based Courses *Industry Internship, Capstone Project, Dissertation, Summer/Short Internship, Field Projects, Portfolio, etc., with non-L-T-P pedagogy*	**Guidelines for the assessment components and recommended weightages** will be specified in the concerned Program Regulations and Course Plans	As specified (typically 40%)	As per Program Regulations

The exact weightages of Evaluation Components shall be clearly specified in the respective Course Plan.

Normally, for Practice/Skill based Courses, without a defined credit structure (L–T–P) [NTCC], but with assigned Credits (as defined in Clause 5.2 of the Academic Regulations), the method of evaluation shall be based only on Continuous Assessments. The various components of Continuous Assessments, the distribution of weightage among such components, and the method of evaluation/assessment, shall be as decided and indicated in the Course Plan/PRC. The same shall be approved by the respective DAC.

11.6 Minimum Performance Criteria:

11.6.1 Theory only Course and Lab/Practice Embedded Theory Course

A student shall satisfy the following minimum performance criteria to be eligible to earn the credits towards the concerned Course:

a. A student must obtain a minimum of 30% of the total marks/weightage assigned to the End Term Examinations in the concerned Course.

b. The student must obtain a minimum of 40% of the AGGREGATE of the marks/weightage of the components of Continuous Assessments, Mid Term Examinations and End Term Examinations in the concerned Course.

11.6.2 Lab/Practice only Course and Project Based Courses

The student must obtain a minimum of 40% of the AGGREGATE of the marks/weightage of all assessment components in the concerned Course.

11.6.3 11.6.3 A student who fails to meet the minimum performance criteria listed above in a Course shall be declared as "Fail" and given "F" Grade in the concerned Course. For theory Courses, the student shall have to re-appear in the "Make-Up Examinations" as scheduled by the University in any subsequent semester, or, re-appear in the End Term Examinations of the same Course when it is scheduled at the end of the following Semester or Summer Term, if offered. The marks obtained in the Continuous Assessments (other than the End Term Examination) shall be carried forward and be included in computing the final grade, if the student secures the minimum requirements (as per Sub-Clause 8.9.1 and 8.9.2 of Academic regulations) in the "Make-Up Examinations" of the concerned Course. Further, the student has an option to re-register for the Course and clear the same in the summer term/ subsequent semester if he/she wishes to do so, provided the Course is offered.

12. Additional clarifications - Rules and Guidelines for Transfer of Credits from MOOC, etc. – Note: These are covered in Academic Regulations

The University allows students to acquire credits from other Indian or foreign institutions and/or Massive Open Online Course (MOOC) platforms, subject to prior approval. These credits may be transferred and counted toward fulfilling the minimum credit requirements for the award of a degree. The process of transfer of credits is governed by the following rules and guidelines:

12.1 The transfer of credits shall be examined and recommended by the Equivalence Committee (Refer ANNEXURE B of Academic regulations) and approved by the Dean - Academics.

12.2 Students may earn credits from other Indian or foreign Universities/Institutions with which the University has an MOU, and that MOU shall have specific provisions,

rules and guidelines for transfer of credits. These transferred credits shall be counted towards the minimum credit requirements for the award of the degree.

12.3 Students may earn credits by registering for Online Courses offered by *Study Web of Active Learning by Young and Aspiring Minds* (SWAYAM) and *National Program on Technology Enhanced Learning* (NPTEL), or other such recognized Bodies/ Universities/Institutions as approved by the concerned BOS and Academic Council from time to time. The concerned School/Parent Department shall publish/include the approved list of Courses and the rules and guidelines governing such transfer of credits of the concerned Program from time to time. The Rules and Guidelines for the transfer of credits specifically from the Online Courses conducted by SWAYAM/ NPTEL/ other approved MOOCs are as stated in the following Sub-Clauses:

12.3.1 A student may complete SWAYAM/NPTEL/other approved MOOCs as mentioned in Clause17.3(as per Academic regulations) and transfer equivalent credits to partially or fully complete the mandatory credit requirements of Discipline Elective Courses and/or the mandatory credit requirements of Open Elective Courses as prescribed in the concerned Curriculum Structure. However, it is the sole responsibility of the student to complete the mandatory credit requirements of the Discipline Elective Courses and the Open Elective Courses as prescribed by the Curriculum Structure of the concerned Program.

12.3.2 SWAYAM/NPTEL/ other approved MOOCs as mentioned in Clause 17.3 (as per Academic regulations) shall be approved by the concerned Board of Studies and placed (as Annexures) in the concerned PRC.

12.3.3 Parent Departments may release a list of SWAYAM/NPTEL/other approved MOOCs for Pre-Registration as per schedule in the Academic Calendar or through University Notification to this effect.

12.3.4 Students may Pre-Register for the SWAYAM/NPTEL/other approved MOOCs in the respective Departments and register for the same Courses as per the schedule announced by respective Online Course Offering body/institute/ university.

12.3.5 A student shall request for transfer of credits only from such approved Courses as mentioned in Sub-Clause 13.3.2 above.

12.3.6 SWAYAM/NPTEL/other approved MOOCs Courses are considered for transfer of credits only if the concerned student has successfully

completed the SWAYAM/NPTEL/other approved MOOCs and obtained a certificate of successful/satisfactory completion.

12.3.7 A student who has successfully completed the approved SWAYAM/NPTEL/ other approved MOOCs and wants to avail the provision of transfer of equivalent credits, must submit the original Certificate of Completion, or such similar authorized documents to the HOD concerned, with a written request for the transfer of the equivalent credits. On verification of the Certificates/Documents and approval by the HOD concerned, the Course(s) and equivalent Credits shall forwarded to the COE for processing of results of the concerned Academic Term.

12.3.8 The credit equivalence of the SWAYAM/NPTEL/other approved MOOCs are based on Course durations and/or as recommended by the Course offering body/institute/university. The Credit Equivalence mapped to SWAYAM/ NPTEL approved Courses based on Course durations for transfer of credits is summarized in Table shown below. The Grade will be calculated from the marks received by the Absolute Grading Table 8.11. in the Academic regulations.

Table 2: Durations and Credit Equivalence for Transfer of Credits from SWAYAM-NPTEL/ other approved MOOC Courses

Sl. No.	Course Duration	Credit Equivalence
1	4 Weeks	1 Credit
2	8 Weeks	2 Credits
3	12 Weeks	3 Credits

12.3.9 The maximum permissible number of credits that a student may request for credit transfer from MOOCs shall not exceed 20% of the mandatory minimum credit requirements specified by the concerned Program Regulations and Curriculum for the award of the concerned Degree.

12.3.10 The University shall not reimburse any fees/expense; a student may incur for the SWAYAM/NPTEL/other approved MOOCs.

12.3.11 The maximum number of credits that can be transferred by a student shall be limited to forty percent (40%) of the mandatory minimum credit requirements specified by the concerned Program Regulations and Curriculum for the award of the concerned Degree. However, the grades obtained in the Courses transferred from other Institutions/MOOCs, as

mentioned in this Section (13.0), shall not be included in the calculation of the CGP.

13. Structure / Component with Credit Requirements Course Baskets & Minimum Basket wise Credit Requirements

The B. Sc. in Respiratory Care Technology (RCT) Program Structure (2025-2029) totaling 171 credits. Table 3 summarizes the type of baskets, number of courses under each basket and the associated credits that are mandatorily required for the completion of the Degree.

Table 3: B. Sc. in Respiratory Care Technology (RCT): Summary of Minimum Credit Contribution from various Baskets

Sl. No.	Baskets/Category	Credit Contribution
1	**Core Courses (CC)**	68
2	**Ability Enhancement Compulsory Course (AECC)**	8
3	**Multi-Disciplinary**	9
4	**Minor**	21
5	**Skill Enhancement (SEC)**	9
6	**Clinical Internship (INT)**	40
7	**Value Added Course (VAC)**	8
8	**Research Project**	4
9	**Summer Internship**	4
	Total Credits	**171**

14. Minimum Total Credit Requirements of Award of Degree

The minimum total credit requirements for the Award of Degree shall be as per NCAHP/ MoFHW.

15. Other Specific Requirements for Award of Degree, if any, as prescribed by the Statutory Bodies.

15.1 The award of the Degree shall be recommended by the Board of Examinations and approved by the Academic Council and Board of Management of the University**.**

15.2 A student shall be declared to be eligible for the award of the concerned Degree if she/he:

a. Fulfilled the Minimum Credit Requirements and the Minimum Credits requirements under various baskets;

b. Secure a minimum CGPA of 4.50 in the concerned Program at the end of the Semester/Academic Term in which she/he completes all the requirements for the award of the Degree as specified in Sub-Clause 19.2.1 of Academic Regulations**;**

c. No dues to the University, Departments, Hostels, Library, and any other such Centres/ Departments of the University; and

d. No disciplinary action is pending against her/him.

16. Curriculum Structure – Basket Wise Course List:

List here all the courses Basket/Category wise as per the Credit Distribution shown in the Table 3.

Table 3.1 Core Course (CC)

S.No	Course code	Course Name	L	T	P	C
1	BPAHAP101	Anatomy	3	1	2	5
2	BPAHAP102	Physiology	3	1	2	5
3	BPAHAP201	Respiratory Care Technology - Basic	2	1	2	4
4	BPAHAP204	Introduction to Respiratory Care Technology	2	1	0	3
5	BPAHAP301	Basics of Medical Disorders	2	1	2	4
6	BPAHAP302	Applied Pharmacology & Medicine	2	1	2	4
7	BPAHAP304	Basic Respiratory Therapeutics & Monitoring	3	1	0	4
8	BPAHAP401	Respiratory Care Technology - Clinical I	2	1	2	4
9	BPAHAP402	Respiratory Care Technology - Applied I	2	1	2	4

10	BPAHAP403	Basic Intensive Care	2	1	2	4
11	BPAHAP404	Chest Physical Therapy and Pulmonary Rehabilitation	2	1	0	3
12	BPAHAP502	Respiratory Care Technology - Clinical II	2	1	2	4
13	BPAHAP503	Respiratory Care Technology - Applied II	2	1	2	4
14	BPAHAP504	Respiratory Care Technology – Advanced	2	1	2	4
15	BPAHAP601	Pulmonary Function Testing	2	1	2	4
16	BPAHAP602	Ventilator Management	2	1	2	4
17	BPAHAP603	Life Support System	2	1	2	4
		Total No. of Credits				**68**

Table 3.2 Ability Enhancement Compulsory Course (AECC)

S. No	Course code	Course Name	L	T	P	C
1	BPAHIC105	Introduction to Computing	2	0	2	3
2	BPAHMD306	Medical Documentation and Record Keeping	2	1	0	3
3	BPAHCC407	Campus to Corporate	2	0	0	2
		Total No. of Credits				**8**

Table 3.3 MINOR (M)

S. No	Course code	Course Name	L	T	P	C
3	BPAHBC103	Biochemistry	3	1	2	5
1	BPAHGM202	General Microbiology	2	1	2	4
3	BPAHPS303	Preventive and Social Medicine	2	0	0	2
4	BPAHDM405	Disaster Management	2	1	0	3
5	BPAHME406	Medical Ethics & Legal Aspects	2	1	0	3
6	BPAHHA654	Hospital Administration	2	1	2	4
		Total No. of Credits				**21**

Table 3.4 Multi-Disciplinary (MID)						
S. No	**Course code**	**Course Name**	**L**	**T**	**P**	**C**
1	BPAHQP104	Introduction to Quality and patient safety	2	0	2	3
2	BPAHES207	Environmental Sciences	2	1	0	3
3	BPAHCD305	Cultural Diversity in the Indian Society	2	1	0	3
		Total No. of Credits				**9**

Table 3.5 Clinical Internship (INT)						
S. No	**Course code**	**Course Name**	**L**	**T**	**P**	**C**
1	BPAHIP752	Clinical Internship-I	0	0	40	20
2	BPAHIP851	Clinical Internship-II	0	0	40	20
		Total No. of Credits				**40**

Table 3.6 Skill Enhancement (SEC)						
S. No	**Course code**	**Course Name**	**L**	**T**	**P**	**C**
1	BPAHAF106	Accounting and Finance	2	1	0	3
2	BPRTPC203	Patient care and basic nursing	1	0	2	2
3	BPAHAI501	Advanced Intensive Care (ACLS, PALS & NALS)	2	1	2	4
4	BPAHRM605	Research Methodology & Biostatistics	3	1	0	4
		Total No. of Credits				**13**

Table 3.7 Value Added Courses (VAC)						
S. No	**Course code**	**Course Name**	**L**	**T**	**P**	**C**
1	BPAHCS107	Communication Skills for Healthcare Professionals	2	1	0	3
2	BPAHHI205	Healthcare Informatics and Data Analytics	2	1	0	3
3	BPAHMH307	Mental Health & Emotional Intelligence	2	0	0	2
		Total No. of Credits				**8**

Table 3.9 Summer Internship					
Course code	**Course Name**	**L**	**T**	**P**	**C**
BPAHIP555	Summer Internship	0	0	8	4
Total No. of Credits			**4**		

17. Practical / Skill based Courses – Internships / Thesis / Dissertation / Capstone Project Work / Portfolio / Mini project

Practical / Skill based Courses like internship, project work, capstone project, research project / dissertation, and such similar courses, where the pedagogy does not lend itself to a typical L-T-P-C Structure as defined in Clause 5.1 of the Academic Regulations, are simply assigned the number of Credits based on the quantum of work / effort required to full fill the learning objectives and outcomes prescribed for the concerned Courses. Such courses are referred to as Non-Teaching Credit Courses (NTCC). These Courses are designed to provide students with hands-on experience and skills essential for their professional development. These courses aim to equip students with abilities in problem identification, root cause analysis, problem-solving, innovation, and design thinking through industry exposure and project-based learning. The expected outcomes are first level proficiency in problem solving and design thinking skills to better equip RCT graduates for their professional careers. The method of evaluation and grading for the Practical / Skill based Courses shall be prescribed and approved by the concerned Departmental Academic Committee (refer Annexure A of the Academic Regulations). The same shall be prescribed in the Course Handout.

17.1 Internship

A student may undergo an internship for a period of 4-6 weeks in an industry / company or academic / research institution during the Semester Break between 4th and 5th Semesters or 6th and 7th Semesters, subject to the following conditions:

17.1.1 The Internship shall be in conducted in accordance with the Internship Policy prescribed by the University from time to time.

17.1.2 The selection criteria (minimum CGPA, pass in all Courses as on date, and any other qualifying criteria) as applicable / stipulated by the concerned Industry / Company or academic / research institution for award of the Internship to a student;

17.1.3 The number of Internships available for the concerned Academic Term. Further, the available number of internships shall be awarded to the students by the University on the basis of merit using the CGPA secured by the student. Provided further, the student fulfils the criteria, as applicable, specified by the Industry / Company or academic / research institution providing the Internship, as stated in Sub-Clause 18.1.2 above.

17.1.4 A student may opt for Internship in an Industry / Company or academic / research institution of her / his choice, subject to the condition that the concerned student takes the responsibility to arrange the Internship on her / his own. Provided further, that the Industry / Company or academic / research institution offering such Internship confirms to the University that the Internship shall be conducted in accordance with the Program Regulations and Internship Policy of the University.

17.1.5 A student selected for an Internship in an industry / company or academic / research institution shall adhere to all the rules and guidelines prescribed in the Internship Policy of the University.

17.2 Minor Project Work

A student may opt to do a Minor Project Work for a period of 4-6 weeks in an Industry / Company or academic / research institution or the University Department(s) during the 3rd / 5th / 6th / 7th Semester as applicable, subject to the following conditions:

17.2.1 The Minor Project Work shall be approved by the concerned HOD and be carried out under the guidance of a faculty member.

17.2.2 The student may do the Minor project work in an Industry / Company or academic / research institution of her / his choice subject to the above-mentioned condition (Sub-Clause 18.2.1). Provided further, that the Industry / Company or academic / research institution offering such project work confirms to the University that the project work will be conducted in accordance with the Program Regulations and requirements of the University.

17.3 Research Project / Dissertation

A student may opt to do a Research Project / Dissertation for a period of 12-14 weeks in an Industry / Company or academic / research institution or the

University Department(s) as an equivalence of Capstone Project, subject to the following conditions:

17.3.1 The Research Project / Dissertation shall be approved by the concerned HOD and be carried out under the guidance of a faculty member.

17.3.2 The student may do the Research Project / Dissertation in an Industry / Company or academic / research institution of her / his choice subject to the above-mentioned condition (Sub-Clause 18.4.1). Provided further, that the Industry / Company or academic / research institution offering such Research Project / Dissertation confirms to the University that the Research Project / Dissertation work will be conducted in accordance with the Program Regulations and requirements of the University.

18. List of MOOC (NPTEL) Courses

NPTEL - Discipline Elective Courses for B.Sc. (Respiratory Care Technology)

Sl. No.	Course ID	Course Name	Duration
1	noc25-hs77	English Studies, Cultural Studies	12 Weeks
2	noc25-ge02	Basic Certificate in Palliative Care - 2	12 Weeks
3	noc25-ge38	Pulmonary Function tests - Interpretation and application in clinical practice	4 Weeks
4	noc25-ge12	Foundation Certificate In Palliative Care - 1	12 Weeks
5	noc25-ge36	Medical Law	12 Weeks
6	noc25-ge27	Qualitative Research Methods and Research Writing	12 Weeks

19. Recommended Semester Wise Course Structure / Flow including the Program / Discipline Elective Paths / Options

Semester I								
Sl. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**	**Contact Hours**	**Basket**
1	BPAHAP101	Anatomy	3	1	2	5	6	CC
2	BPAHAP102	Physiology	3	1	2	5	6	CC
3	BPAHBC103	Biochemistry	3	1	2	5	6	MI
4	BPAHQP14	Introduction to Quality and patient safety	2	0	2	3	4	MD
5	BPAHIC105	Introduction to Computing	2	0	2	3	4	AEC
6	BPAHAF106	Accounting and Finance	2	1	0	3	3	SEC
7	BPAHCS107	Communication Skills for Healthcare Professionals	2	1	0	3	3	VAC
		TOTAL CREDIT	**17**	**5**	**10**	**27**	**30**	
CC= Core Course, AECC= Ability Enhancement Compulsory Course, SEC= Skill Enhancement Course, MI – MINOR, MD- Multidisciplinary, VAC= Value Added Course. INT – Internship								

Semester II								
Sl. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**	**Contact Hours**	**Basket**
1	BPRTRC201	Respiratory Care Technology - Basic	2	1	2	4	5	CC
2	BPAHGM202	General Microbiology	2	1	2	4	5	MI
3	BPRTPC203	Patient care and basic nursing	1	0	2	2	3	SEC

4	BPRTIR204	Introduction to Respiratory Care Technology	2	1	0	3	3	CC
5	BPAHHI205	Healthcare Informatics and Data Analytics	2	1	0	3	3	VAC
6	BPAHES206	Environmental Sciences	2	1	0	3	3	MD
		TOTAL CREDIT	**11**	**5**	**6**	**19**	**22**	
CC= Core Course, AECC= Ability Enhancement Compulsory Course, SEC= Skill Enhancement Course, MI – MINOR, MD- Multidisciplinary INT – Internship								

Semester III

Sl. No.	Course Code	Course Name	L	T	P	Credits	Contact Hours	Basket
1	BPRTMD301	Basics of Medical Disorders	2	1	2	4	5	CC
2	BPRTAP302	Applied Pharmacology & Medicine	2	1	2	4	5	CC
3	BPAHPS303	Preventive and Social Medicine	2	0	0	2	2	MI
4	BPRTRT304	Basic Respiratory Therapeutics & Monitoring	3	1	0	4	4	CC
5	BPAHCD305	Cultural Diversity in the Indian Society	2	1	0	3	3	MD
6	BPAHMD306	Medical Documentation and Record Keeping	2	1	0	3	3	AEC
7	BPAHMH307	Mental Health & Emotional Intelligence	2	0	0	2	2	VAC
		TOTAL CREDIT	**15**	**5**	**4**	**22**	**24**	
CC= Core Course, AECC= Ability Enhancement Compulsory Course, SEC= Skill Enhancement Course, MI – MINOR, MD- Multidisciplinary INT – Internship								

Semester IV								
Sl. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**	**Contact Hours**	**Basket**
1	BPRTRC401	Respiratory Care Technology - Clinical I	2	1	2	4	4	CC
2	BPRTRA402	Respiratory Care Technology - Applied I	2	1	2	4	4	CC
3	BPRTBI403	Basic Intensive Care	2	1	2	4	4	CC
4	BPRTCP404	Chest Physical Therapy and Pulmonary Rehabilitation	2	1	0	3	3	CC
5	BPAHDM405	Disaster Management	2	1	0	3	3	MI
6	BPAHME406	Medical Ethics & Legal Aspects	2	1	0	3	3	MI
7	BPAHCC407	Campus to Corporate	2	0	0	2	2	AEC
		Total Credit	**14**	**6**	**6**	**23**	**23**	
CC= Core Course, AECC= Ability Enhancement Compulsory Course, SEC= Skill Enhancement Course, MI – MINOR, MD- Multidisciplinary INT – Internship								

Semester V								
Sl. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**	**Contact Hours**	**Basket**
1	BPAHAI501	Advanced Intensive Care (ACLS, PALS & NALS)	2	1	2	4	5	SEC
2	BPRTRC502	Respiratory Care Technology - Clinical II	2	1	2	4	5	CC
3	BPRTRA503	Respiratory Care Technology - Applied II	2	1	2	4	5	CC
4	BPRTAR504	Respiratory Care Technology - Advanced	2	1	2	4	5	CC
5	BPAHIP555	Summer Internship	0	0	8	4	8	SI
		Total Credit	**8**	**4**	**16**	**20**	**28**	
CC= Core Course, AECC= Ability Enhancement Compulsory Course, SEC= Skill Enhancement Course, MI – MINOR, MD- Multidisciplinary SI – Summer Internship INT – Internship								

Semester VI								
Sl. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**	**Contact Hours**	**Basket**
1	BPRTPF601	Pulmonary Function Testing	2	1	2	4	5	CC
2	BPRTVM602	Ventilator Management	2	1	2	4	5	CC
3	BPRTLS603	Life Support System	2	1	2	4	5	CC
4	BPAHHA604	Hospital Administration	2	1	2	4	5	Minor
5	BPAHRM605	Research Methodology & Biostatistics	3	1	0	4	4	SEC
		Total Credit	**11**	**5**	**8**	**20**	**24**	
CC= Core Course, AECC= Ability Enhancement Compulsory Course, SEC= Skill Enhancement Course, MI – MINOR, MD- Multidisciplinary SI – Summer Internship INT – Internship RWI : Research								

Semester VII								
Sl. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**	**Contact Hours**	**Basket**
1	BPAHIP751	Internship-I	-	-	40	20	40	INT
					Total Credit	**20**		
CC= Core Course, AECC= Ability Enhancement Compulsory Course, SEC= Skill Enhancement Course, MI – MINOR, MD- Multidisciplinary SI – Summer Internship INT – Internship								

Semester VIII								
Sl. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**	**Contact Hours**	**Basket**
1	BPAHIP752	Internship-II	0	0	40	20	40	INT
Total Credit						**20**		
CC= Core Course, AECC= Ability Enhancement Compulsory Course, SEC= Skill Enhancement Course, MI – MINOR, MD- Multidisciplinary SI – Summer Internship INT – Internship								

20. Course Catalogue

Course Code: BPAHAP101	**Course Title: Human Anatomy** **Type of Course: Core Course**	**L-T- P- C**	3	1	2	5
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course introduces students to the fundamentals of human anatomy essential for allied health professionals. It covers basic anatomical terminology, detailed study of bones (osteology), muscular, thoracic, excretory, digestive, and nervous systems. The structure and function of the gastrointestinal tract and the central nervous system are also explained. Through practical training using mannequins and radiological tools, students gain critical skills in bone identification, surface anatomy, organ localization, and interpretation of X-rays. The course aims to develop a foundational understanding of human anatomy with practical application for operation theatre and anesthesia technology students.					
Course Objective	• To familiarize students with anatomical structures and terminology. • To enable identification and description of bones, muscles, and internal organs. • To understand the anatomical basis of physiological functions. • To apply anatomical knowledge in clinical and diagnostic settings. • To interpret surface and radiological anatomy for practical use in operation theatres.					
Basic skill sets required for the laboratory:	The students shall be able to develop: 1. An attitude of enquiry 2. Confidence and ability to tackle new problems 3. Ability to interpret events and results 4. Ability to work as a leader and as a member of a team 5. Assess errors and eliminate them 6. Observe and measure anatomical phenomena 7. Write structured reports 8. Select suitable models, mannequins, and anatomical tools 9. Locate anatomical faults or abnormalities in systems 10. Manipulative skills for handling anatomical models and tools 11. Ability to follow dissection/simulation procedures 12. Awareness of safety precautions in labs 13. Judgment of anatomical proportions and orientation without measurement					
Course Outcomes	**On successful completion of the course the students shall be able to:** Describe the basic anatomical terminology and identify major bones of the upper and lower limbs, including the vertebral column.					

	CO. 1. Explain the anatomical structure of the thorax including intercostal sace, pleura, thoracic cage, and major thoracic bones. CO. 2. Describe the anatomical components of the respiratory system with emphasis on the lungs, trachea, and bronchial tree. CO. 3. Illustrate the surface anatomy, chambers, valves, and blood vessels of the heart along with the pericardium and coronary arteries. CO. 4. Identify and describe the major skeletal muscles of the thorax and upper limb, focusing on the origin, insertion, and action of flexor and extensor groups. CO. 5. Explain the structure and function of the excretory system including kidneys, ureters, and urinary bladder. CO. 6. Discuss the anatomy and physiology of the digestive system, including oral cavity, gastrointestinal tract, digestion, absorption, and common disorders. CO. 7. Describe the structure and function of neurons and outline the organization of the central and peripheral nervous systems, including cranial and spinal nerves
Course Content:	

Module 1	**Introduction to Anatomy**	Assignment		**12 Sessions**

1. **Topics:** Introduction to Anatomy: Basic Anatomical terminology
    a. Osteology-
        i. Upper limb – clavicle, scapula, humerus, radius, ulna,
        ii. Lower limb - femur, hipbone, sacrum, tibia, fibula &Vertebral column
    b. Thorax – Intercostal space, pleura, bony thoracic cage, ribs sternum &thoracic vertebrae

Lungs – Trachea, bronchial tree.

Module 2	**Heart**	Assignment		**8 Sessions**

Topics: Heart – Surface anatomy of heart, chambers of the heart, valves of the heart, and major blood vessels of heart, pericardium, and coronary arteries

Module 3	**Skeleton-muscular system**	Assignment		**10 Sessions**

Topics: Skeleton-muscular system – Muscles of thorax, muscles of upper limb(arm & fore arm) Flexor and extensor group of muscles (origin, insertion, action)

Module 4	**Excretory system**	Assignment		**6 Sessions**

Topics: Excretory system – Kidneys, ureters, bladder.

Module 5	**Digestive System**	Assignment		**10 Sessions**

Topics:

Digestive System:

i. Structure and function of the digestive system Oral cavity and digestive enzymes

ii. Anatomy and function of the gastrointestinal tract Absorption and digestion of nutrients

iii. Common digestive disorders

Module 6	**Nervous System**	Assignment		**`14 Sessions**

Topics: Nervous System:

- Structure and function of neurons
- Organization of the central nervous system (brain and spinal cord) Peripheral nervous system and its divisions
- Cranial nerves and spinal nerves Basic principles of neurophysiology

List of Laboratory Tasks:

Experiment No. 1: Gross Anatomy (Using Models and Charts)
Experiment No. 2: Identification of bones – upper limb: clavicle, scapula, humerus, radius, ulna
Experiment No. 3: Identification of bones – lower limb: femur, hip bone, sacrum, tibia, fibula
Experiment No. 4: Vertebral column – structure and types
Experiment No. 5: Surface anatomy – anatomical landmarks and orientations
Experiment No. 6: Heart, lungs, kidneys – external morphology and internal structures
Experiment No. 7: Digestive tract and accessory organs – liver, stomach, intestines
Experiment No. 8: Nervous system – brain, spinal cord, cranial nerves (models/charts)
Experiment No. 9: Radiological anatomy – interpretation of X-ray (Chest PA view)
Experiment No. 10: Identification of reproductive organs – male and female (models)

Targeted Application & Tools that can be used:

- Anatomical mannequins and charts
- Plastic and 3D printed bone and organ models
- Dissection videos and simulation software
- Radiological films and digital X-ray interpretation tools
- Surface anatomy tracing and virtual 3D anatomy apps (e.g., Visible Body, Kenhub)

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:

- **Create a labeled 3D model or diagram of the human heart, demonstrating its surface anatomy, chambers, valves, and major blood vessels.**
  (Type: Individual / Group Model-based Assignment)

- **Develop a detailed anatomical chart or digital presentation illustrating the bones of the upper and lower limbs with correct anatomical terminology and orientation.** *(Type: Individual Visual Assignment)*
- **Prepare a comparative chart on the structure and function of the central vs. peripheral nervous system, including cranial and spinal nerves.** *(Type: Research-based Assignment / Poster Presentation)*
- **Design a digestive system flowchart that maps the process of digestion and absorption along with the associated organs and enzymes.** *(Type: Diagrammatic / Concept Mapping Assignment)*

Text Book

1. *Anatomy and Physiology for Allied Health* by Kevin T. Patton
2. *Human Anatomy* by Marieb, Wilhelm & Mallatt

References

1. *Gray's Anatomy for Students* by Richard Drake
2. *Clinically Oriented Anatomy* by Keith L. Moore
3. *Atlas of Human Anatomy* by Frank H. Netter

Online learning resources:

1. EBook: https://presiuniv.knimbus.com/user#/home
2. https://puniversity.informaticsglobal.com/
3. https://www.visiblebody.com
4. https://www.kenhub.com
5. https://www.aheducation.co.in
6. https://www.anatomyzone.com

Topics relevant to "SKILL DEVELOPMENT":

1. Skill development through experiential learning via anatomical model handling and surface tracing
2. Identification and differentiation of human bones and organs
3. Radiological anatomy interpretation
4. Application of anatomical knowledge in real-life clinical environments such as operating theatres and diagnostic labs.

Course Code: BPAHAP102	**Course Title:** Physiology **Type of Course: Core Course**	**L-T- P- C**	3	1	2	5
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course provides comprehensive knowledge of the normal functions of the human body, focusing on the physiological mechanisms at cellular, tissue, organ, and system levels. Emphasis is placed on homeostasis, organ interrelationships, and the physiological basis of health and disease.					

Course Objective	1. Understand the functions of cells, tissues, organs, and systems of the human body. 2. Analyse physiological processes essential for homeostasis. 3. Apply physiological principles in understanding health and disease. 4. Support clinical decision-making through knowledge of normal functions. 5. Develop the foundation for advanced studies and research in healthcare sciences
Basic skill sets required for the laboratory:	1. Observation skills to detect normal physiological responses in the human body 2. Ability to perform basic physiological tests (e.g., BP, pulse, respiratory rate) 3. Competence in recording and interpreting vital signs and their variations 4. Skills in using physiological instruments such as sphygmomanometer, spirometer, ECG machine 5. Ability to assess sensory and motor responses through simple experiments 6. Confidence in evaluating muscle tone, reflexes, and neural responses 7. Accuracy in maintaining lab records and interpreting experimental data 8. Critical thinking to correlate lab findings with physiological principles 9. Team collaboration for conducting group-based physiological experiments 10. Precision in measuring and timing physiological parameters 11. Ability to identify deviations from normal and hypothesise possible causes 12. Safe handling and calibration of lab equipment 13. Understanding the ethical aspects of human experimentation in physiology labs 14. Application of physiological knowledge to clinical and diagnostic contexts
Course Outcomes	**On successful completion of the course the students shall be able to:** 1. Explain the normal functioning of organs and systems. 2. Understand interrelationships and interactions among various organs and systems for maintaining homeostasis.

	3. Assess contribution of organ systems to internal environment. 4. Differentiate between normal and abnormal organ function. 5. Understand pathophysiology of diseases. 6. Apply physiological principles in allied health care.			
Course Content:				
Module 1	**Cellular Physiology & Blood**	Assignment		**14 Sessions**

Topics:
General physiology

Introduction to Physiology, Concept of Homeostasis, cell – Morphology – Functions of organelles and Cell membrane, Transport mechanisms, Body fluid compartments.

Blood

Composition, properties, functions. Plasma proteins: Concentrations and functions, RBC: Morphology, functions, count, physiological variations and life span Erythropoiesis – stages, essential factors, regulation of Erythropoiesis, Hemoglobin: Functions, concentration, physiological variations. Fate of Hemoglobin – Jaundice, types, Color index, MCH, MCV, MCHC, PCV – normal values, WBC: Morphology, functions of all types including T & B lymphocytes, total and differential counts, physiological variations, Platelets: Morphology, count, functions, thrombocytopenia & bleeding time, Blood groups: Basis of blood 10 15 grouping. Landsteiner's laws, ABO system, determination of blood groups, blood transfusion, complications of incompatible blood transfusion, Rh group, erythroblastosis foetalis, prevention and treatment, Blood bank.

Haemostasis: Mechanisms. Clotting mechanism: factors, intrinsic and extrinsic pathways.

Disorders of clotting – hemophilia, vitamin K deficiency. Anticoagulants – mechanism of action and their uses, Anemia: Classification – Morphological and Etiological, Blood volume: normal values.

Module 2	**Cardiovascular Physiology**	Assignment		**10 Sessions**

Topics: Organization of cardiovascular system, greater and lesser circulation, Physiological anatomy of the heart, nerve supply, Junctional tissues of heart (pacemaker), Cardiac cycle: Mechanical events, Heart sounds, causes, characteristics and significance, Normal ECG, clinical significance of ECG, Heart rate – Physiological variations, Cardiac output: Definitions, normal values, physiological variations, Arterial blood pressure: Definitions, normal values, physiological variations, factors maintaining blood pressure. Role of baroreceptors in regulation of blood pressure.

Module 3	**Respiratory Physiology**	Assignment		**10 Sessions**

Topics: Respiratory and Non-respiratory function of respiratory system. Physiological anatomy of respiratory system Functions of respiratory tract. Respiratory membrane. Respiratory muscles. Surfactant: functions, respiratory distress syndrome.

Definitions of terms used in respiratory physiology: Eupnea, Hyperpnoea, Tachypnea, Apnea, Dyspnea.

Mechanics of breathing – intrapulmonary and Intrapleural pressure changes during a respiratory cycle.

Spirometry – Lung volumes and capacities. Vital capacity.

Oxygen transport: Role of hemoglobin, factors affecting, oxygen carrying capacity. Carbon dioxide transport: forms, chloride shift (Hamburgers phenomenon).

Respiratory centers. Role of chemo receptors in regulation of respiration. Pulmonary ventilation and alveolar ventilation.

Partial pressure of gases, Calculation of partial pressure of gasses in mixture. Arterial and venous blood gas concentrations and contents. Hypoxia: Types and effects Cyanosis, Asphyxia, Periodic Breathing, Acclimatization. Hyperbaric O2 therapy, Artificial respiration and Ventilators.

Module 4	**Excretory system**	Assignment		**8 Sessions**

Topics: Functions of kidneys. Nephrons – Juxta glomerular apparatus – functions, Steps in Urine formation – Ultrafiltration, Tubular Reabsorption, Tubular Secretion, GFR.

Definition, normal values, factors affecting GFR, measurement of GFR, Renal threshold for glucose, tubular load for glucose, Role of aldosterone and ADH in urine formation, Micturition, Innervation of bladder. Diuresis, Renal functions tests – Based on analysis of urine and analysis of blood, Skin: Functions of skin. Sweat glands.

Module 5	**Digestive System**	Assignment		**6 Sessions**

Introduction, structure of alimentary canal, Saliva: Composition, functions, Stomach: Functions. Gastric Juice: composition, functions, Pancreatic Juice: Composition and functions, Liver: Functions, Bile: composition, functions, Gall bladder: functions, Succusentericus: Composition, functions. Functions of large intestine, Movements of small intestines, Deglutition.

Module 6	**Neurophysiology, Special Senses & Reproduction**	Assignment		**10 Sessions**

Special senses- Vision: Physiological anatomy of eye ball, rods & cones, Refractive errors: Myopia, hypermetropia, presbyopia & astigmatism, Audition: Functions of outer, middle

& VII inner ear, cochlea, Deafness – types, Taste: Taste buds, primary taste sensation, Smell: Receptors, modalities of smell

Reproductive system - Male reproductive system: functions of testes, puberty, spermatogenesis functions of testosterone, semen, Female reproductive system: Ovarian hormones functions – Menstrual cycle, Hormonal basis of changes in menstrual cycle, Family Planning.

List of Laboratory Tasks:

Experiment No. 1: Study of microscope and its uses.
Experiment No. 2: Collection of blood, hemocytometer, hemoglobinometry.
Experiment No. 3: Determination of RBC and WBC count.
Experiment No. 4: Determination of blood groups and bleeding time.

Targeted Application & Tools that can be used:

1. **Cellular & blood studies:** *Microscope, stained slides, hemocytometer, hemoglobinometer, blood collection kits, centrifuge*
2. **Blood analysis & typing:** *Blood grouping kits, RBC/WBC slides, bleeding time apparatus*
3. **Neurophysiology & muscle:** *Nerve stimulators, muscle models, microscope*
4. **Cardiovascular:** *ECG, sphygmomanometer, stethoscope, pulse oximeter*
5. **Respiratory:** *Spirometer, gas analysers, lung models*
6. **Renal:** *Urine collection kits, GFR test kits*
7. **Digestive:** *GI tract models, pH meters, enzyme kits*
8. **Endocrine:** *Hormone assay kits, gland models*
9. **Special senses & reproduction:** *Eye/ear models, histology slides, microscope*
10. **Lab skills:** *Microscope use, blood sample handling, counts, bleeding time tests*

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:

1. **Create an illustrated 3D chart or working model of blood physiology**, showing major components (RBCs, WBCs, platelets, plasma), their functions, haemostasis mechanisms, and clotting pathways.
   (Type: Group Model-based Assignment)
2. **Develop a multi-panel infographic or animation explaining the cardiac cycle, ECG interpretation, and regulation of blood pressure.**
   (Type: Individual Visual Assignment)
3. **Design a comparative analysis chart that outlines respiratory, renal, and endocrine mechanisms for maintaining homeostasis.**
   (Type: Research-based Assignment / Poster Presentation)

Text Book

1. *Foundation of Anatomy and Physiology* – Ross & Wilson, Churchill Livingstone.
2. *Physiology & Anatomy with Practical Considerations* – Ester M. Grishcimer, J.P. Lippincott.

References

1. Text Book of Physiology – A.P. Krishna, Suman Publication. 4. *Text Book of Physiology* – 2. 2. A.K. Jain, Avichal Publishing Company.

Online learning resources:

1. https://www.practicalclinicalskills.com/?utm_source=chatgpt.com
2. https://www.coursera.org/learn/vital-signs?utm_source=chatgpt.com
3. https://www.trainhealthcare.com/courses/introduction-to-clinical-observation-online-training/?utm_source=chatgpt.com

Topics relevant to "SKILL DEVELOPMENT":

- **Vital Signs Assessment** – Learn to measure and interpret pulse, BP, respiratory rate, and temperature.
- **Use of Clinical Instruments** – Gain hands-on skills with tools like sphygmomanometer, ECG, and spirometer.
- **Neurological Examination** – Perform reflex testing and assess muscle tone and sensory responses.
- **Sensory Physiology Tests** – Conduct basic tests for vision, hearing, smell, and taste.
- **ECG Recording & Interpretation** – Record and interpret ECG signals using proper lead placement.
- **Lung Function Testing** – Use spirometry to evaluate pulmonary function and identify abnormalities.

Course Code: BPAHBC103	**Course Title:** Biochemistry **Type of Course: Minor**	**L-T- P- C**	3	1	2	5
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course introduces the fundamental concepts of biochemistry with a focus on the molecular basis of life. It covers the structure and function of biomolecules, enzymatic activity, metabolism, and biochemical pathways essential for cellular processes. The course also highlights the clinical relevance of biochemical principles, helping students understand how molecular mechanisms relate to health and disease. Designed for students in health and life sciences, it lays the groundwork for advanced studies in physiology, pathology, and medical sciences.					
Course Objective	The Biochemistry course is designed to provide students with a comprehensive understanding of the chemical principles underlying biological systems and processes. This course aims to explore the structure and function of biomolecules such as carbohydrates, lipids, proteins, nucleic acids, and enzymes, and how they contribute to cellular function and metabolism. Emphasis is placed on metabolic pathways, bioenergetics, and the biochemical basis of disease, with a focus on clinical relevance to human health. Students will develop foundational knowledge essential for understanding advanced topics in physiology, pathology, and pharmacology, and will gain skills in interpreting biochemical data, understanding molecular interactions, and linking biochemical mechanisms to organ system functions and clinical conditions.					

<table>
<tr><td>Basic skill sets required for the laboratory:</td><td colspan="4">The students shall be able to develop:

1. Accurately measure liquids and solids using lab equipment.
2. Prepare solutions and buffers with correct concentrations.
3. Follow safety rules and handle chemicals properly.
4. Operate instruments like spectrophotometers and pH meters.
5. Observe experiments carefully and record data precisely.
6. Perform basic biochemical tests and enzyme assays.
7. Analyze experimental data to draw conclusions.
8. Write clear and concise lab reports.</td></tr>
<tr><td>Course Outcomes</td><td colspan="4">On successful completion of the course the students shall be able to:
CO1: Accurately measure liquids and solids using standard laboratory equipment.
CO2: Prepare solutions and buffers at specified concentrations following proper protocols.
CO3: Demonstrate adherence to laboratory safety rules and proper chemical handling techniques.
CO4: Operate common laboratory instruments such as spectrophotometers and pH meters efficiently.
CO5: Observe experimental procedures meticulously and record data with precision.
CO6: Perform basic biochemical tests and enzyme assays competently.
CO7: Analyze experimental data critically to draw valid scientific conclusions.</td></tr>
<tr><td>Course Content:</td><td colspan="4"></td></tr>
<tr><td>Module 1</td><td>Introduction to Biochemistry and Carbohydrates</td><td>Assignment</td><td></td><td>11 Sessions</td></tr>
<tr><td colspan="5">Topics: Introduction to Biochemistry:

Definition and Scope: Career opportunities, Branches of Biochemistry.

Importance of Biochemistry: Bioelements and Biomolecules.

Carbohydrates: Classification, Properties and Functions; Derivatives of monosaccharides- Sugar, Amino sugars, and Acids; Chemical Structures- Amylose, Amlopectin, Glycogen, Inulin, Dextrin, Cellulose, Chitin, Hyaluronic acid; and Importance of Carbohydrates.</td></tr>
</table>

Module 2	**Lipids, Proteins, and Nucleic Acids**	Assignment		**13 Sessions**
Topics: Lipids: Introduction, Classification and functions of lipids Classification and functions of fatty acids and Clinical aspects of lipids. **Protein:** Introduction, classification, and structures. **Nucleic Acids:** Introduction, structures and Clinical aspects				
Module 3	**Enzymes and Hormones**	Assignment		**13 Sessions**
• **Topics: Enzymes:** Chemical nature, Classification and Properties, Factors affecting enzyme action and Enzyme inhibition. • **Hormones:** Classification, chemical nature and Properties of enzymes, factors affecting enzyme action enzyme inhibition, Diagnostic enzymes, General functions and classification of hormones, Mechanism of action of various, Hormones, clinical importance of hormones				
Module 4	**Vitamins & Minerals**	Assignment		**9 Sessions**
• **Topics: Vitamins**: Characteristics, Classification, and functions , Dietary sources , and Clinical aspects • **Minerals:** Key minerals and their importance				
Module 5	**Metabolic Profile**	Assignment		**14 Sessions**
Carbohydrate metabolism(glycolysis),Krebs cycle, Glycogenesis, lipid metabolism, amino acid metabolism, urea cycle				
Topics:				
List of Laboratory Tasks: • **Experiment 1.Laboratory essential practices** • Essentials of Laboratory Operations: Introduction to biochemistry laboratory, Common glassware, equipment, chemicals and reagents. • **Experiment 2. Laboratory safety:** Introduction to safety guidelines and laboratory discipline, Bioethical considerations in the laboratory, Laboratory waste management • **Experiment 3. SOPs of Laboratory instruments:** Adherence to safety protocols, handling of hazardous chemicals and equipment, emergency procedures and knowledge of safety equipment and techniques. • **Experiment 4. Sterilization techniques:** Adherence to safety protocols while using various sterilization techniques in biochemistry, Heat, chemical and pressure-based sterilization techniques. • **Experiment 5 Preparing Reagents and Chemicals:** Dilution and mixing techniques, error minimizing, and measurement of chemicals.				

- **Experiment 6 Test for macronutrients**
- Test for Carbohydrates: Identification of known and unknown carbohydrates using various reagents and identification methods. Investigative analysis of unknown carbohydrates.
- **Experiment 7 Test for Proteins:** Identification of known and unknown proteins using various reagents and identification methods. Investigative analysis of unknown proteins.
- **Experiment 8 Investigative Analysis of Unknown nutrients**
- Unknown Sample Investigation: Comprehensive practical investigation to determine the nature of unknown sample

Targeted Application & Tools that can be used:

1. **Clinical Diagnostics** – Use of biochemical kits and spectrophotometers to analyze blood and urine markers.
2. **Metabolic and Nutritional Analysis** – Application of metabolic pathway knowledge with tools like pH meters and buffer systems.
3. **Disease Mechanism Study** – Understanding molecular basis of diseases using virtual labs and case-based tools.
4. **Pharmacological Applications** – Exploration of drug interactions with enzymes and receptors through molecular modeling software.
5. **Genetic and Molecular Biology Integration** – Visualization of DNA/RNA structures and protein synthesis using tools like PyMOL and simulations.

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:

1. **Article review:** Recent Advances in Enzyme Therapy or Metabolic Disorders
2. **Presentation:** Make a simple PowerPoint or chart about any one biomolecule (like protein, fat, or carbohydrate).
3. **3. Case Study**: Biochemical Changes in a Common Metabolic Disorder (e.g., Diabetes Mellitus)

Text Book

Textbook of Medical Biochemistry – MN Chatterjea & Rana Shinde

References

Biochemistry –by U Sathyanarayana & U Chakrapani
2. Textbook of Medical Biochemistry by D.M Vasudeva & Shrrekumari.
3. Textbook of Medical Biochemistry- by MN Chatterjea & Rana Shinde
4.Textbook of Medical Laboratory technology by Godkar and Godkar.
5. Biochemistry- by Pankaja Naik

Online learning resources:

- *Harper's Illustrated Biochemistry* – Some editions available on Google Books
- *Biochemistry* by U. Satyanarayana – Often found on institutional e-libraries or PDF sites

Notes and PPTs:

- **NPTEL Biochemistry Notes and Slides** – https://nptel.ac.in
- **SlideShare** – Search for "Biochemistry PPT" on www.slideshare.net for user-shared presentations

- **LibreTexts Biochemistry** – https://bio.libretexts.org – Free, textbook-style learning

ideo Lectures:

- **Khan Academy Biochemistry** – Free, easy-to-follow videos: https://www.khanacademy.org

NPTEL Video Lectures – Comprehensive lectures by Indian professors: https://nptel.ac.in/courses/102/103/102103044/

Topics relevant to "SKILL DEVELOPMENT":

- **Basic Biochemical Laboratory Techniques -** Hands-on skills like pipetting, buffer preparation, and solution making.
- **Qualitative and Quantitative Biochemical Tests -** Performing and interpreting tests for carbohydrates, proteins, lipids, and enzymes.
- **Interpretation of Clinical Biochemistry Reports -** Understanding lab results such as blood glucose, liver function, and lipid profiles.
- **Enzyme Kinetics and Activity Analysis -** Studying how factors affect enzyme function using spectrophotometry.
- **Data Recording and Lab Report Writing -** Developing clear and accurate documentation of experimental work.

Course Code: BPAHQP104	**Course Title: Introduction to Quality and patient safety** **Type of Course:** Multi-Disciplinary	**L-T- P- C**	2	0	2	3
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course provides comprehensive knowledge and practical skills essential for quality healthcare delivery, emergency care, infection control, biomedical waste management, antibiotic resistance, and disaster management. It equips students with an understanding of quality assurance standards, life-saving techniques, safe handling of biomedical waste, infection prevention protocols, and strategies to combat antibiotic resistance, alongside preparedness for disaster situations. Emphasis is placed on applying current guidelines such as NABH and JCI to ensure patient safety and healthcare excellence.					
Course Objective	To develop students' understanding of quality management in healthcare settings, equip them with practical emergency and life support skills, promote safe biomedical waste and infection control practices, enhance awareness of antibiotic resistance challenges, and prepare them for effective disaster response and management					

<table>
<tr><td>Basic skill sets required for the laboratory:</td><td colspan="4">1. Ability to perform CPR and basic emergency procedures.
2. Proper use of PPE and hygiene protocols.
3. Segregation and disposal of biomedical waste.
4. Safe handling of disinfectants and waste treatment tools.
5. Interpretation of infection control checklists and antibiotic charts.
6. Team coordination during emergency and disaster drills.</td></tr>
<tr><td>Course Outcomes</td><td colspan="4">On successful completion of the course the students shall be able to:
CO1. Explain the principles of healthcare quality assurance and apply quality improvement tools.
CO2. Demonstrate basic emergency care skills including CPR, rescue breathing, and AED usage.
CO3. Segregate and manage biomedical waste safely according to current standards.
CO4. Apply infection prevention techniques and use PPE appropriately.
CO5. Describe antibiotic resistance mechanisms and promote antimicrobial stewardship.
CO6. Participate effectively in disaster preparedness and response activities in healthcare settings.</td></tr>
<tr><td>Course Content:</td><td colspan="4"></td></tr>
<tr><td>Module 1</td><td>Quality assurance and Management</td><td>Assignment</td><td></td><td>6 Sessions</td></tr>
<tr><td colspan="5">Topics: Concepts of Quality of Care, Quality Improvement Approaches, Standards and Norms, Quality Improvement Tools & Introduction to current NABH guidelines</td></tr>
<tr><td>Module 2</td><td>Basics of emergency care and Life support</td><td>Assignment</td><td></td><td>8 Sessions</td></tr>
<tr><td colspan="5">Topics: Vital signs and primary assessment, Basic emergency care – first aid and triage, Ventilations including use of bag-valve masks (BVMs), Choking, rescue breathing methods, One- and Two-rescuer CPR, Using an AED (Automated external defibrillator) & Managing an emergency including moving a patient.</td></tr>
</table>

Module 3	**Bio medical waste management and environment safety**	Assignment		**6 Sessions**
Topics: Definition of Biomedical Waste, Waste minimization, BMW – Segregation, collection, transportation, treatment and disposal (including color coding), Liquid BMW, Radioactive waste, Metals/ Chemicals / Drug waste, BMW Management & methods of disinfection, Modern technology for handling BMW, Use of Personal protective equipment (PPE), Monitoring & controlling of cross infection (Protective devices)				
Module 4	**Infection prevention**	Assignment		**5 Sessions**
Topics: Use of Personal protective equipment (PPE) & Monitoring & controlling of cross infection (Protective devices) Prevention & control of common healthcare associated infections, Components of an effective infection control program, and Latest Guidelines (NABH and JCI) for Hospital Infection Control.				
Module 5	**Disaster Management**	Assignment		**5 Sessions**
Topics: Fundamentals of emergency management, Psychological impact management, Resource management, Preparedness and risk reduction & Key response functions (including public health, logistics and governance, recovery.				

List of Laboratory Tasks:

1. Demonstration of Basic Life Support (BLS) & CPR using mannequins
2. Use of AED simulator and rescue breathing practice
3. Hands-on PPE donning and doffing procedure
4. Segregation and disposal of biomedical waste using color-coded bins
5. Disinfection methods: chemical and physical methods demonstration
6. Infection control audit and surface swab testing (simulated)
7. Demonstration of hand hygiene using fluorescent gel or Glo Germ kits
8. Mock triage and emergency patient shifting scenarios
9. Identification of antibiotic resistance using antibiograms (demo/simulation)
10. Disaster drill and resource planning simulation

Targeted Application & Tools that can be used:

1. **CPR mannequins & AED simulators –** For BLS training
2. **Color-coded bins, PPE kits, and disinfectants –** For waste management and infection control
3. **Glo Germ or hand hygiene kits –** For demonstrating proper handwashing techniques
4. **Antibiotic resistance charts/sensitivity discs –** For interpreting resistance trends
5. **Disaster drill kits & triage tags –** For simulation exercises

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:

1. Article review: Select and review a recent article on quality improvement in healthcare or antibiotic resistance, summarizing key points and implications for practice.

2. Presentation: Prepare a presentation on one of the following topics: Emergency Life Support techniques, Biomedical Waste Management protocols, or Infection Control measures based on latest NABH guidelines.

3. Case Study: Analyze a real or hypothetical case involving hospital infection outbreak, biomedical waste mishandling, or a disaster scenario, describing the management steps and lessons learned.

Text Book

Introduction to Healthcare Quality Management" by Patrice L. Spath.

References

1.Fundamentals of Patient Safety in Medicine and Surgery" by Venkat Manickam
2. "Patient Safety: Achieving a New Standard for Care" by Philip Aspden, Julie A. Wolcott, Lyle Bootman, and Linda R. Cronenwett

Online learning resources:

1. https://epgp.inflibnet.ac.in/
2. https://nptel.ac.in/

Topics relevant to "SKILL DEVELOPMENT":

- Perform CPR, first aid, and emergency response techniques.
- Use personal protective equipment (PPE) correctly.
- Segregate and dispose of biomedical waste as per protocols.
- Apply quality improvement tools and interpret NABH guidelines.
- Respond effectively to disaster scenarios with clear communication.

Course Code: BPAHIC105	**Course Title:** Introduction to Computing **Type of Course: Ability Enhancement**	**L-T- P- C**	2	0	2	3
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course introduces learners to the fundamentals of computer systems and their applications in everyday life. It covers the history, types, and core components of computers, providing a foundational understanding of how modern computing devices operate. Learners will gain hands-on experience with operating systems, file management, and essential productivity tools such as Microsoft Word and Excel.					
Course Objective	By the end of this course, learners will be able to: • Understand the basic concepts, history, and types of computers. • Identify and describe the major components and functions of a computer system. • Operate common computer operating systems with basic file and application management. • Use essential computer applications like Microsoft Word and Excel for document creation, data entry, and analysis. • Develop practical computing skills for personal, academic, and professional use.					
Basic skill sets required for the laboratory:	1. Fundamental computer literacy (booting, navigation, file handling) 2. Familiarity with keyboard and mouse usage 3. Basic understanding of MS Office interface 4. Internet browsing and search engine use					
Course Outcomes	**On successful completion of the course the students shall be able to:** **CO1.** Execute basic and external DOS commands for file and directory management. **CO2.** Create and manage an email account and use web browsers for information retrieval. **CO3.** Develop, format, and enhance documents using MS Word's advanced tools					

	CO4. Perform data entry, analysis, and visualization using MS Excel formulas and charts **CO5**. Design visually effective presentations using multimedia and animations in MS PowerPoint. **CO6.** Construct and manage simple databases and tables using MS Access.			
Course Content:				
Module 1	**Overview of Computers**	Assignment		**4 Sessions**
Topics: Definition and history of computers • Types of computers (desktop, laptop, tablet, smartphone) • Basic computer hardware components (CPU, RAM, storage, input/output devices) • Computer software (system software, application software)				
Module 2	**Components of a Computer**	Assignment		**6 Sessions**
Topics: Central Processing Unit (CPU) o Types of CPUs (Intel, AMD) o CPU clock speed and performance • **Input Devices:** o Keyboard, mouse, scanner, webcam, microphone • **Output Devices:** o Monitor, printer, speakers, projector • **Storage Devices:** o Hard disk drive (HDD), solid-state drive (SSD), optical drives, USB drives • Motherboard and its components				
Module 3	**Computer Operating Systems**	Assignment		**5 Sessions**
Topics: Definition and functions of operating systems • Types of operating systems (Windows, macOS, Linux) • Basic operations and features of common operating systems • File management and organization				
Module 4	**Computer Programs and Applications**	Assignment		**5 Sessions**
Topics: Definition and types of computer programs • Common software applications (word processing, spreadsheets, presentation software, web browsers) • Installing and uninstalling software				

- Software licensing and copyright

Module 5	**Microsoft Word**	Assignment		**10 Sessions**

Topics: Creating and editing documents

- Formatting text, paragraphs, and styles
- Inserting images, tables, and charts
- Using templates and styles
- Collaborating on documents

Microsoft Excel

- Creating and editing spreadsheets
- Working with cells, rows, and columns
- Entering data and formulas
- Using functions and formulas
- Creating charts and graphs

List of Laboratory Tasks:

1. Identification of Computer Components
2. Basic Operating System Operations
3. Using Microsoft Word
4. Using Microsoft Excel
5. Introduction to Internet and Web Browsing
6. Introduction to Email
7. Creating and Managing Presentations (Optional)

Targeted Application & Tools that can be used:

- **Operating Systems**: Windows 10/11, Ubuntu (optional)
- **Word Processing**: Microsoft Word
- **Spreadsheet Software**: Microsoft Excel
- **Browsers**: Google Chrome / Mozilla Firefox
- **Other Tools**: Snipping Tool, Paint, Notepad, Calculator

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:

1. Article review: Digital Transformation in Indian Healthcare: Opportunities and Challenges
2. Presentation: Prepare a PowerPoint presentation on "Types of Operating Systems" or "Evolution of Computers."
3. Case Study: *IT System Failure in Hospital Due to Poor OS Maintenance*

Text Book

. "Computer Science: An Overview" by J. Glenn Brookshear and Dennis Brylow

References

1. "Introduction to Computing Systems: From Bits and Gates to C and Beyond" by Yale N. Patt and Sanjay J. Patel

2. "Computer Networking: A Top-Down Approach" by James Kurose and Keith Ross
3. Starting Out with C++: From Control Structures through Objects" by Tony Gaddis

Online learning resources:

1. Microsoft Learn – Word, Excel, PPT - https://learn.microsoft.com/en-us/training/office/
2. GCFLearnFree.org (Office Tutorials) - https://edu.gcfglobal.org/en/
3. W3Schools MS Access Guide - https://www.w3schools.com/access/

Topics relevant to "SKILL DEVELOPMENT":

1. **Digital Literacy** – Understanding computer basics, hardware, software, and file management.
2. **Text Processing** – Using Microsoft Word for typing, formatting, editing, and templates.
3. **Data Management** – Applying Excel for data entry, formulas, functions, and charts.
4. **Problem Solving** – Using software tools to complete tasks like calculations and formatting.
5. **Ethical & Collaborative Use** – Practicing responsible software use and working with others through digital tools.

Course Code: BPAHAF106	**Course Title:** Accounting and Finance **Type of Course: Core Course**	**L-T- P- C**	2	1	0	3
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course provides an in-depth understanding of financial accounting principles, systems, and reporting standards. It explores concepts from basic accounting to the analysis of financial statements and valuation of financial assets, aiming to prepare students to effectively interpret, analyze, and apply financial information in business and healthcare environments.					
Course Objective	1. To introduce the fundamental principles and procedures of financial accounting. 2. To develop proficiency in preparing and analyzing financial statements. 3. To understand the adjustments, income measurement, and cash flow analysis. 4. To apply valuation techniques for financial assets like stocks and bonds.					

	5. To analyze financial reports for decision-making and strategic planning.			
Course Outcomes	**On successful completion of the course the students shall be able to:** **CO1:** Understand and apply basic financial accounting principles and systems. **CO2:** Understand and apply basic financial accounting principles and systems**.** **CO3:** Prepare and interpret key financial statements including income statements, balance sheets, and cash flow statements. **CO4:** Analyze financial statements using financial ratios and evaluate organizational performance. **CO5:** Understand inventory, depreciation, liabilities, and equity in the context of financial reporting. **CO6:** Apply asset valuation methods and assess the performance of financial assets such as stocks and bonds.			
Course Content:				
Module 1	**Basics of financial Accounting**	Assignment		**8 Sessions**
Topics: Introduction, significance of financial accounting, scope and prospects, evaluation scheme of the course, understanding business, Why we invest, financial statement users, analyzing financial statements, double-entry accounting system, debits and credits, Accounting rules and procedures, Assumptions in financial reporting, GAAP, Indian accounting system, IFRS, In AS, and Indian GAAP, Accounting methods, types of accounts, analyzing transactions, accounting process				
Module 2	**Accounting: The Language of Business and recording transactions**	Assignment		**9 Sessions**
Topics: Accounting system: traditional versus modern, Analyzing and journalizing transactions, posting transactions to ledger, accounting rules, Preparing the trail balance, effects of errors; accounting system, some basic accounting concepts, Revenue and expense transactions, depreciation, and prepaid transactions, accumulated depreciation, adjusted vs unadjusted trail balance, financial statements from trial balance, Closing the accounts, capital vs revenue, types of errors, ethics				

Module 3	**Measuring Income to Assess Performance**	Assignment		**6 Sessions**
Topics: Basics of income measurement, operating cycle, concepts related to income, recognition of revenue, the income statement, understanding income statement, cash dividends and retained earnings, Four popular financial ratios with real-world cases. critical thinking problems and real-world cases Class notes,				
Module 4	**Adjustments to the accounts and Financial Statements**	Assignment		**6 Sessions**
Topics: Adjustments to the accounts. four types of four types of adjustments (cont), classified balance sheet , Income statement and profitability evaluation ratios Critical thinking problems using financial statements				
Module 5	**Statement of cash flows**	Assignment		**6 Sessions**
Overview the cash flow statement, preparing the clash flow statement, types of cash flow activities, inflows and outflows of cash flows Preparation of cash flow statements using direct and indirect methods and its 4importance Cash flow statement and balance sheet, examples of cash flow s4tatements Methods of preparing cash flow statements, accounting rules, th4e importance of cash flow statements				
Module 6	**Accounting for Sales**	Assignment		**10 Sessions**
Topics: recognition of sales revenue, measuring sales revenue, cash sales and account receivables Recording the sales using contra account and internal controls Measuring of uncollectible accounts Assessing the level of account receivable, Internal control				

Targeted Application & Tools that can be used:

1. Tally / QuickBooks (Intro level for demo)
2. MS Excel (for financial statement modeling, ratio analysis)
3. MS Word / PowerPoint (report and presentation tasks)
4. Simple accounting software or templates
5. NSE Paathshala / Investopedia Simulations (for valuation modules)

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:
1. Article review Adoption of IFRS in Indian Healthcare Institutions: Challenges & Benefits

2. Presentation: *Cash Flow vs. Profit: Why Healthcare Organizations Must Track Both* **3. Case Study**: *Inventory Mismanagement in a Hospital Pharmacy: Financial Impacts*
Text Book 1. "Principles of Accounting" by Jerry J. Weygandt, Paul D. Kimmel, and Donald E. Kieso
References • Financial Accounting" by Robert Libby, Patricia A. Libby, and Frank Hodge • "Principles of Corporate Finance" by Richard A. Brealey, Stewart C. Myers, and Franklin Allen • Fundamentals of Financial Management" by James C. Van Horne and John M. Wachowicz Jr.
Topics relevant to "SKILL DEVELOPMENT": 1. **Financial Literacy** – Basics of accounting, understanding statements, income, and expenses. 2. **Analytical Thinking** – Ratio analysis, trend interpretation, identifying errors in trial balance. 3. **Tech-Enabled Decision Making** – Using Excel for financial analysis and valuation modeling. 4. **Business Communication** – Preparing formal reports and financial presentations. **5. Ethical Reasoning** – Understanding financial ethics, internal control, and transparency.

Course Code: BPAHCS 107	**Course Title: Communication Skills for Healthcare Professionals** **Type of Course: Value Added Course**	**L-T- P- C**	2	1	0	3
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course is designed to equip participants with essential professional and interpersonal skills needed in healthcare and related fields. Emphasis is placed on the impact of first impressions, body language, and effective communication—including verbal, nonverbal, written, and active listening skills. Learners will explore strategies for handling difficult conversations and delivering bad news with empathy and professionalism. The course also highlights the importance of etiquette, manners, and self-management in clinical and professional environments, fostering critical thinking and personal growth for long-term success.					
Course Objective	1. To enhance participants' understanding of the importance of first impressions and body language. 2. To develop effective communication skills, including verbal, nonverbal, written, and active listening. 3. To learn how to deliver bad news and handle difficult conversations professionally.					

	4. To understand the significance of etiquette and manners in healthcare settings. 5. To develop critical thinking and self-management skills for professional success.			
Course Outcomes	**On successful completion of the course the students shall be able to:** • **CO1**: Demonstrate effective verbal, nonverbal, and written communication in professional and healthcare settings. • **CO2**: Apply principles of phonetics and pronunciation to improve articulation and clarity. • **CO3**: Develop active listening and questioning skills to foster better interpersonal and patient interactions. • **CO4**: Exhibit professional etiquette, cultural sensitivity, and empathetic behavior in clinical environments. • **CO5**: Apply critical thinking and self-management techniques in handling teamwork, conflict, and stress effectively. • **CO6**: Communicate confidently in delivering complex or difficult messages within healthcare teams and to patients.			
Course Content:				
Module 1	**First Impressions and Body Language** **The Importance of Communication**	Assignment		**8 Sessions**
Topics: First Impressions and Body Language • The power of first impressions • Nonverbal communication cues (body language, facial expressions, gestures) • The impact of body language on perceived credibility and professionalism **The Importance of Communication** • Effective communication as a key to success • Types of communication (verbal, nonverbal, written) 2. Barriers to effective communication and how to overcome them				
Module 2	**Phonetics and Pronunciation**	Assignment		**10 Sessions**

Topics: Phonetics and Pronunciation

- Consonant sounds and pronunciation
- Vowel sounds and pronunciation
- Syllables and syllable stress
- Improving pronunciation and articulation

Active Listening

- The importance of active listening
- Techniques for effective listening
- Providing feedback and clarifying understanding

Communication Skills: Reading

- Effective reading techniques
- Comprehension strategies
- Critical reading and analysis

Module 3	**Questioning Skills** **Written Communication** **Delivering Bad News or Handling Difficult Conversations**	Assignment		**9 Sessions**

Topics: Questioning Skills

- Types of questions (open-ended, closed-ended, probing)
- Effective questioning techniques
- Active listening and questioning

Written Communication

- Effective writing styles and formats
- Business writing principles
- Email etiquette and professionalism

Delivering Bad News or Handling Difficult Conversations

- Strategies for delivering difficult news
- Handling objections and resistance
- Resolving conflicts and finding common ground

Module 4	**Healthcare Success: Mastering Etiquette and Manners** **Bedside Manners**	Assignment		**8 Sessions**

Topics: Healthcare Success: Mastering Etiquette and Manners

- Importance of etiquette and manners in healthcare settings
- Professional demeanour and behaviour
- Cultural sensitivity and awareness

Bedside Manners

- Communicating effectively with patients and their families
- Empathetic listening and understanding
- Building rapport and trust

Module 5	**Understanding Team Dynamics and Developing Critical Thinking**	Assignment		**10 Sessions**

Topics:

Understanding Team Dynamics and Developing Critical Thinking

- Team roles and dynamics
- Effective teamwork and collaboration
- Critical thinking skills for problem-solving and decision-making

Self-Management: Building Inner Strength

- Time management and prioritization
- Stress management techniques
- Building resilience and emotional intelligence

Targeted Application & Tools that can be used:

- Audio/video recording tools (e.g., mobile phone camera, Audacity) for evaluating speaking skills
- MS Word or Google Docs for business writing and email exercises
- MS PowerPoint or Canva for creating visual presentations
- Role-play and simulation platforms for doctor–patient interaction
- Online phonetic trainers (e.g., Sounds of English)
- Mind-mapping apps (like MindMeister) for critical thinking development

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:

1. Article review: The Role of Nonverbal Communication in Patient Care
2. Presentation: Effective Communication Strategies in Multicultural Healthcare Environments
3. Case Study: Handling a Difficult Patient Conversation

Text Book

Communicating in Groups: Applications and Skills - Katherine Adams, Gloria Galanes

References

1. **The Art of Communication: A Book of Skills** by Stephen Covey
2. **Crucial Conversations: Tools for Talking When Stakes Are High** by Kerry Patterson, Joseph Grenny, Ron McMillan, and Al Switzler

3. **How to Win Friends and Influence People** by Dale Carnegie
4. **"Communicating in Groups: Applications and Skills"** by Katherine Adams, Gloria Galanes
5. **"Technical Communication"** by Mike Markel
6. **"Interpersonal Communication: Everyday Encounters"** by Julia T. Wood

Online learning resources:

Topics relevant to "SKILL DEVELOPMENT":

1. **Verbal and Nonverbal Communication** – Building confidence, clarity, and appropriate professional expression.
2. **Listening & Comprehension** – Enhancing active listening for better teamwork and patient care.
3. **Writing & Documentation** – Formal email writing, reporting, and written communication skills.
4. **Interpersonal and Social Etiquette** – Polished behavior, empathy, and rapport-building in healthcare settings.
5. **Critical Thinking and Emotional Intelligence** – Decision-making under pressure, resilience, and team problem-solving.

SEMESTER II

Course Code: BPRTRC201	**Course Title:** Respiratory Care Technology – Basic **Type of Course: Core Course**	**L-T- P- C**	2	1	2	4
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course provides a comprehensive overview of oxygen, aerosol, and humidity therapy, focusing on their physiological foundations and clinical applications. Students will learn to identify appropriate indications and contraindications for oxygen therapy, understand various oxygen delivery systems, and accurately calculate flow rates and oxygen concentrations					
Course Objective	1. Understand the physiological basis for oxygen therapy. 2. Identify indications and contraindications for oxygen therapy. 3. Describe different oxygen delivery systems and their appropriate use. 4. Calculate oxygen flow rates and concentrations. 5. Explain the principles of aerosol and humidity therapy.					

	6. Identify indications for aerosol and humidity therapy. 7. Describe different types of aerosol and humidity delivery devices.			
Basic skill sets required for the laboratory:	• **Clinical Assessment Skills** • Accurate history taking and physical examination • Recognition of signs and symptoms of respiratory distress • **Respiratory Therapy Competencies** • Assessment of indications for oxygen, aerosol, and humidity therapy • Selection and application of appropriate delivery devices • **Instrument Handling and Operation** • Identification and functioning of nebulizers, humidifiers, oxygen delivery systems, PFT and ABG equipment • **Procedure Preparation and Assistance** • Preparing patients for procedures like thoracocentesis and intercostal drain (ICD) insertion • Aseptic techniques and safety protocols • **Diagnostic Interpretation** • Basic interpretation of pulmonary function tests (PFTs), arterial blood gas (ABG) values, ECG, and chest X-rays			
Course Outcomes	**On successful completion of the course the students shall be able to:** • **CO1:** Describe the principles, indications, contraindications, and safety considerations of oxygen, humidity, and aerosol therapies. • **CO2:** Select and apply appropriate respiratory therapy devices based on patient needs and therapy goals. • **CO3:** Interpret chest X-rays, pulmonary function tests, and arterial blood gas results in the context of clinical scenarios. • **CO4:** Identify types and mechanisms of respiratory failure and describe the steps in its management. • **CO5:** Understand and explain the pathophysiology, clinical features, and management approaches for major respiratory disorders including COPD, pneumonia, TB, and pleural diseases. • **CO6:** Demonstrate appropriate patient monitoring and response evaluation during respiratory interventions.			
Course Content:				
Module 1	**1. Oxygen therapy** **2. Humidity and Aerosol therapy**	Assignment		**12 Sessions**

	3.Chest Physical Therapy:			

Topics: Oxygen therapy:

Rationale for oxygen therapy, precautions, assessment of need and adequacy of therapy and the relevant devices, Definition, types, devices, goals, Indications and contraindications, Hazards and complications, Use and principles of oxygen delivery devices, Selection of device, precautions and monitoring of patient

2. Humidity and Aerosol therapy

Definition, types, devices, goals, indications, contraindications, hazards, complications, use, principles of humidifiers, aerosol therapy devices, small volume nebulization therapy with physiological rationale, selection of device, precautions, and monitoring of patients

3. Chest Physical Therapy: Introduction and Types of chest physical therapy.

Module 2	**Chest X ray and pulmonary function testing**	Assignment		**9 Sessions**

Topics:
Chest X ray and pulmonary function testing

1. **Chest X-rays:** Introduction, value, limitations, radiological views.
2. **Pulmonary Function Testing:** Types, principles, indications, contraindications, procedure, complications Spirometry: Patterns, significance, bronchodilator response , Broncho-provocative Tests. DLCO. Lung Volume Estimation: Body plethysmography.
3. **ECG:** Basic principles, normal ECG, interpretation in disease.

Module 3	**Respiratory Failure and Blood Gas Analysis**	Assignment		**8 Sessions**

Topics:

1. Respiratory Failure: Definition, types/classification, mechanism, causes, clinical features, complications, effects of hypoxia and hypercapnia on other systems, assessment, and management.

2. Arterial Blood Gas Analysis: Indications, contraindications, sampling of arterial blood, complications, transport, and interpretation.

Module 4	**Basics of**	Assignment		**8 Sessions**

	Respiratory Disorders - Part 1			

Topics: 1. **Respiratory Diseases:** Classification/types, airway diseases, parenchymal/interstitial diseases, respiratory infections, and a brief mention of common respiratory diseases.

2. **Airway Diseases:** Asthma, chronic obstructive pulmonary diseases (COPD), chronic bronchitis, emphysema.

3. **Respiratory Infections:** Upper respiratory infections, pneumonia (community-acquired, hospital-acquired, ventilator-associated, healthcare-associated), atypical pneumonia, viral pneumonia, fungal pneumonia, and pulmonary tuberculosis.

Module 5	**Basics of Respiratory Disorders - Part 2**	Assignment		**8 Sessions**

Topics:

1. **Suppurative Lung Diseases:** Lung abscess, bronchiectasis, empyema thoracis.

2. **Pleural Diseases:** Pleural effusion, pneumothorax, haemothorax.

3. Diseases of the Mediastinum and Chest Wall, Lung Cancer, Sleep-Related Breathing Disorders

List of Laboratory Tasks:

1. History taking and Clinical examination
2. Assessing the need for oxygen therapy, aerosol therapy and humidity therapy.
3. Uses, principles, advantages and disadvantages of instruments and Devices in Basic Respiratory care
4. Procedure demonstration, principles, indications, contraindications and preparation of patient for basic Respiratory Care procedures.
5. Preparing patient for procedures and assisting in procedures like thoracocentesis and ICD insertion
6. Basic Interpretation of Pulmonary Function Tests, Arterial Blood Gases, ECG and Chest X-rays.

Targeted Application & Tools that can be used:

- Oxygen therapy devices (Nasal cannula, simple mask, NRBM, venturi mask)
- Humidifiers, nebulizers, small volume nebulizers
- Spirometer, peak flow meters
- Chest X-ray view box or digital systems

- ABG analyzers and simulation software
- Body plethysmograph (demonstration only)

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:
1. Article review: "Effectiveness of High-Flow Nasal Cannula (HFNC) Oxygen Therapy in Acute Hypoxemic Respiratory Failure: A Review"
2. Presentation: "Pulmonary Function Testing – Interpretation and Clinical Application"
3. Case Study: "Management of a COPD Exacerbation with Acute Respiratory Failure"

Text Book

1. Egan's Fundamentals of Respiratory Care – Robert L. Wilkins et al.
2. Clinical Manifestations and Assessment of Respiratory Disease – Terry Des Jardins

References

1. Essentials of Cardiopulmonary Physical Therapy – Ellen Hillegass
2. Respiratory Physiology – John B. West
3. Interpretation of Pulmonary Function Tests – Robert Hyatt
4. Manual of Pulmonary Function Testing – Gregg Ruppel

Online learning resources:

1. American Association for Respiratory Care (AARC) **– www.aarc.org**
2. Radiopaedia (Chest X-ray & CT interpretation) **– www.radiopaedia.org**
3. The Thoracic Society (ATS/ERS guidelines) **– www.thoracic.org**
4. OpenAnesthesia ABG and PFT Calculators **– www.openanesthesia.org**
5. Geeky Medics (ECG & Clinical Exam Tutorials) **– www.geekymedics.com**

Topics relevant to "SKILL DEVELOPMENT":

- Clinical reasoning in selecting respiratory therapy modalities
- Interpretation of diagnostic tests (PFT, ABG, ECG, X-ray)
- Safe handling and troubleshooting of oxygen delivery systems
- Patient monitoring and emergency response readiness
- Communication and documentation of respiratory care procedures

Course Code: BPAHGM202	**Course Title: General Microbiology** **Type of Course: Minor**	**L-T- P- C**	2	1	2	4
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					

Course Description	This course provides a foundational understanding of microbiology and immunology relevant to healthcare. It introduces students to microbial classification, laboratory techniques, sterilization protocols, infection control measures, biomedical waste management, and essential virology. Special focus is given to hospital-acquired infections and the body's immune response mechanisms			
Course Objective	1. This course covers microbiology fundamentals, microscopy techniques, and sterilization methods, emphasizing essential skills for healthcare settings. 2. Additionally, it provides knowledge in immunology, infection control, and biomedical waste management, ensuring comprehensive understanding and practical application.			
Basic skill sets required for the laboratory:	1. Identify and demonstrate the correct use of basic microbiology laboratory equipment and glassware. 2. Perform standard sterilization techniques using autoclaves and hot air ovens. 3. Conduct differential staining methods including Gram, acid-fast, and Indian ink staining. 4. Demonstrate bacterial motility using the hanging drop method. Apply laboratory safety protocols while handling microbial specimens. 5. Interpret staining results for preliminary identification of microorganisms.**.**			
Course Outcomes	**On successful completion of the course the students shall be able to:** **CO1.** Describe the historical evolution, classification, and taxonomy of microorganisms. **CO2.** Operate and interpret results using various types of microscopes and culture techniques. **CO3.** Apply knowledge of sterilization, disinfection, and biomedical waste management in clinical and laboratory settings. **CO4.** Understand the principles of innate and adaptive immunity and explain antigen-antibody interactions. **CO5.** Explain common healthcare-associated infections and strategies for infection prevention and control. **CO6.** Describe the general properties, disease profiles, and preventive strategies for important human viruses (e.g., HIV, hepatitis, rabies).			
Course Content:				
Module 1	**General Microbiology**	Assignment		**14 Sessions**
Topics: **Introduction and History of Microbiology** – History, Classification, Nomenclature and Taxonomy				

Microscopy – Different types of Microscopes used in the Laboratory.
Sterilization and Disinfection – Sterilizing Agents (Physical and Chemical agents), Testing of Disinfectants, Sterilization and Disinfection in a Healthcare Setting

- **Culture Media** – Types of Media and Special Media employed in the laboratory
- **Culture Methods** – Aerobic and anaerobic culture methods, Methods of Isolating pure cultures of bacteria.

Module 2	**Immunology**	Assignment		**10 Sessions**

Topics:
Immunity – Innate or native immunity, Acquired or adaptive immunity, types, Measurement of immunity
Antigen and antibody – Definitions, types, biological classes of antigens and antibodies.
Hypersensitivity – Classification and types
Auto immunity – Definition and Mechanisms, Classification of autoimmune diseases

Module 3	**Infection Control**	Assignment		**8 Sessions**

Topics:
Healthcare associated infections – Types, sources, modes of transmission, methods to control infection
Infection – Classification, Sources, Methods of transmission, predisposing factors, types of infectious diseases

Module 4	**BMW**	Assignment		**5 Sessions**

Topics: Biomedical waste management – Types and General principles, use of equipment's for sterilization, chemicals used in disinfection

Module 5	**Virology**	Assignment		**8 Sessions**

General properties of viruses, diseases caused and prevention of following viruses, Hepatitis, HIV, Rabies and Poliomyelitis.

List of Laboratory Tasks:

1. Demonstration of Microscope and its parts
2. Demonstration of glassware used in microbiology.
3. Demonstration of autoclave and sterilization of glass wares.
4. Demonstration of Hot air oven and sterilization of glass wares.
5. To perform Gram staining
6. To perform Acid fast staining (Zeihl Neelsen staining)
7. To perform Indian ink staining
8. To perform Hanging drop method
9. To demonstrate agglutination reaction.

10. To perform RA test 11. To perform WIDAL test
11. To perform RPR test.
12. To perform CRP test.

Targeted Application & Tools that can be used:

Tools: Microscope, autoclave, laminar flow cabinet, incubator, anaerobic jar

Applications:

- Microbiological diagnostics in clinical labs
- Infection control in hospitals
- Vaccine and immunity awareness programs
- Biomedical waste handling in healthcare settings

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:

1. Article review: Review of current practices and emerging trends in sterilization techniques in hospitals.

2. Presentation: Presentation on the immunopathology and control of hospital-acquired infections.

3. Case Study: Case analysis of a hospital outbreak caused by an antibiotic-resistant microorganism and steps taken to contain it.

Text Book

1. **Textbook of Microbiology and Immunology** by Parija S.C.

References

1. Microbiology and Immunology by Ananthanarayan R., Paniker C.K.J.
2. Prescott's Microbiology by Michael T. Madigan, John M. Martinko, Kelly S. Bender, Gareth M. Garrity, David H. Brock
3. Microbiology: An Introduction by Gerard J. Tortora, Berdell R. Funke, Christine L.

Online learning resources:

1. **CDC Laboratory Safety Guidelines:** https://www.cdc.gov/labsafety
2. **Microbiology Virtual Lab (Amrita V-Labs):** https://vlab.amrita.edu
3. **Microbiology Society Resources:** https://microbiologysociety.org
4. **YouTube channels:** Osmosis, Khan Academy, Microbiology with Sumi

Topics relevant to "SKILL DEVELOPMENT":

1. Aseptic techniques in healthcare
2. Operation of laboratory equipment (microscopes, sterilizers)
3. Infection control protocols and PPE usage
4. Biomedical waste segregation and disposal
5. Antigen-antibody reaction simulations
6. Identification of microorganisms through culture and staining

Course Code: BPRTPC203	**Course Title:** Patient care and basic nursing **Type of Course: Skill Enhancement**	**L-T- P- C**	1	0	2	2
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course provides foundational knowledge and hands-on skills essential for patient care, communication, infection control, medication administration, emergency procedures, and basic life support, with a special emphasis on respiratory therapy. Students will learn to perform routine and emergency clinical procedures safely and competently while ensuring patient dignity, safety, and comfort					
Course Objective	By the end of this course, students will be able to: 1. Demonstrate knowledge of patient care principles including hygiene, safety, and communication. 2. Apply universal precautions and infection control measures in clinical practice. 3. Perform medication administration and patient transport procedures safely. 4. Deliver bedside care, monitor patient parameters, and assist immobile patients. 5. Provide wound care, first aid, and emergency support including BLS. 6. Document and communicate effectively within healthcare teams and with patients.					
Basic skill sets required for the laboratory:	1. Understanding of human anatomy and basic physiology 2. Familiarity with infection control principles and hygiene 3. Basic communication and interpersonal skills 4. Safe handling of medical equipment (e.g., thermometers, BP apparatus, nebulizers) 5. Manual dexterity for administering injections and applying bandages 6. Knowledge of emergency protocols (e.g., CPR, oxygen therapy)					
Course Outcomes	**On successful completion of the course the students shall be able to:**					

	On successful completion of this course the students shall be able to: • **CO1:** Explain principles of holistic patient care, including emotional and physical support. • **CO2:** Demonstrate effective communication and documentation with healthcare teams and patients. • **CO3:** Apply infection control practices including hand hygiene, PPE use, sterilization, and biomedical waste management. • **CO4:** Administer medications via different routes and ensure safe patient transport and positioning. • **CO5:** Deliver appropriate bedside care, monitor vital and advanced clinical parameters, and assist with nutrition and hygiene. • **CO6:** Perform basic wound care, emergency first aid, and initiate Basic Life Support (BLS) protocols.
Course Content:	

Module 1	**Bedside care and monitoring**	Assignment		**3 Sessions**

Topics:

1. Bedside Care and Nourishment –

A. Methods of Providing Nourishment

- **Oral feeding**: Assisted feeding techniques, precautions for dysphagia
- **Tube feeding**: NG/OG tube insertion basics, feeding protocols
- **Parenteral nutrition**: IV drips and indications
- **Blood transfusion basics**: Indications and reactions

B. Bedside Hygiene and Elimination Use of bedpans and urinals**: Privacy, positioning, and hygiene**

- **Observation of outputs**: Urine, stools, sputum, drain fluids (color, amount, consistency)
- **Care of catheters and rubber goods**: Indwelling catheter maintenance, infection prevention

Module 2	**Universal Precautions and Infection Control**	Assignment		**3 Sessions**

Topics:

1. Hand Washing, Hygiene, Injuries, and Personal Protection (30 mins)

- **Hand Hygiene:** Importance in infection prevention; WHO 5 Moments; soap & water vs alcohol rubs.
- **Injuries & PPE:** Needle-stick injury reporting; use of gloves, masks, goggles, gowns; proper donning and doffing.

2. Aseptic Techniques, Disinfection, and Sterilization

- **Aseptic Techniques:** Clean vs sterile procedures; maintaining sterile field.
- **Disinfection & Sterilization:** Definitions; disinfection (alcohol, chlorine, phenolics); sterilization methods (autoclave, dry heat, ETO, plasma).

3. Device & Equipment Sterilization

- **Respiratory Devices:** Cleaning nebulizers, humidifiers, ventilator circuits; high-level disinfection vs sterilization.
- **CSSD Overview:** Workflow from receiving to dispatch; role in infection control.

4. Biomedical Waste Management

- **Classification:** Color-coded waste categories with examples.
- **Handling & Disposal:** Segregation, transport, treatment methods (incineration, autoclaving).
- **Legal Considerations:** Hospital policies, national guidelines (e.g., CPCB India); respiratory therapist's role in compliance.

Module 3	**Medication Administration and Transport of patient**	Assignment		**3 Sessions**

Topics:

1. Medication Administration

- **Oral & Parenteral Routes:** Techniques, precautions; IV, IM, SC, ID routes—site selection, angles, volume, aseptic technique, error prevention.
- **IV Infusion:** Indications, fluid types (NS, RL, dextrose), rate calculation, IV setup, monitor complications (infiltration, phlebitis).
- **Aerosol Medications:** Devices (nebulizers, MDIs, DPIs), techniques, spacer use, monitoring.
- **Special Therapies:** Oxygen devices and flow rates, IV fluid maintenance vs replacement, blood transfusion basics and reactions.

2. Patient Positioning and Comfort

- **Positions:** Supine, prone (e.g., ARDS), lateral, Fowler's, dorsal recumbent; prevent pressure sores.
- **Comfort & Bed Management:** Bed making, pillows, side rails, promoting rest and sleep.
- **Mobility Support:** Early mobilization importance, fall prevention.

3. Lifting and Transporting Patients

- **Transfers:** One- and two-person techniques, bed-to-wheelchair/stretcher, use of gait belts and slide sheets.
- **Transporting Ill Patients:** Equipment monitoring (ventilators, oxygen, pumps), pre-transport checklist, communication with team.

Module 4	**Bedside care and monitoring**	Assignment		**2 Sessions**

Topics:

1. Bedside Care and Nourishment

- **Nourishment:** Oral feeding techniques, precautions for dysphagia; NG/OG tube feeding basics and protocols; parenteral nutrition and indications; blood transfusion basics and reactions.
- **Hygiene & Elimination:** Use of bedpans/urinals with privacy; observe urine, stool, sputum, drain outputs; catheter care and infection prevention.

2. Care of Immobile / Bedridden Patients

- **Immobility Management:** Regular position changes, pressure relief, range of motion exercises, use of air mattresses and heel protectors.
- **Preventing Complications:** Pressure sore staging and repositioning; aspiration prevention by proper feeding and positioning; oral care and pulmonary hygiene.

3. Patient Monitoring

- **Vital Signs:** Pulse, BP, respiration, temperature, SpO_2; manual vs automated; trend recording and early warning signs.
- **Advanced Monitoring:** ECG lead placement and rhythm interpretation; SpO_2 factors; multiparameter monitors and alarms.
- **Capnography & $ETCO_2$:** Principles, waveform analysis for ventilated/non-ventilated patients.
- **Ventilator Parameters:** Respiratory rate, tidal volume, PIP, plateau pressure, compliance, resistance; clinical importance for ventilation adjustments.

Module 5	**Wound care and first aid**	Assignment		**2 Sessions**

1. Dressing and Bandaging

- **Bandaging Techniques:** Types (roller, crepe, elastic); turns (circular, spiral, figure-of-eight); bandaging arms, legs, fingers; use of triangular bandages (slings).
- **Surgical Dressing:** Sterile dressing principles; observation and documentation; signs of infection.

2. Suturing Techniques and Materials

- **Sutures:** Absorbable vs non-absorbable; techniques (interrupted, continuous, mattress); needle types and handling; wound care.

3. Splinting and Burns Care

- **Splinting:** Purpose in trauma; types (rigid, soft, traction); application and monitoring of splints.
- **Burn Care:** Burn classification (1st, 2nd, 3rd degree); initial first aid (cooling, cleaning, covering); infection prevention, pain management; referral criteria.

Module 6	**First Aid and Basic Life Support (BLS)**	Assignment		**2 Sessions**

Topics:

1. Patient Handling and Basic Care

- **Positioning & Transport:** Techniques (supine, prone, lateral, Fowler's); safe transfers; care for critically ill/intubated patients.
- **Dressing & Bandaging:** Basic bandaging turns; care of intercostal drain tubes.
- **Tube Care:** Nasogastric tube insertion/feeding; urinary catheter insertion and care.

2. Phlebotomy, Blood Sampling, and Injections

- **Phlebotomy:** Venous blood (vacutainer), arterial blood gas sampling (site, technique, complications).
- **Injections:** IM, IV, SC, ID sites, needle sizes, angles, aseptic technique; IV catheter insertion; blood transfusion monitoring.

3. Monitoring and Therapeutic Procedures

- **ECG & Monitoring:** Lead placement, troubleshooting; multiparameter monitors (ECG, SpO_2, BP).
- **Oxygen & Aerosol Therapy:** Delivery devices (nasal cannula, masks), nebulizers, inhalers, spacers.

- **Airway Management:** Suctioning artificial airways; tracheostomy care.

4. First Aid and Basic Life Support (BLS)

- Emergency response: ABC approach; chest compressions and rescue breaths (adult & child); AED use basics.

List of Laboratory Tasks:

1. Hand Hygiene and Personal Protective Equipment (PPE)
2. Patient Positioning and Bedside Comfort Care
3. Administration of Oral and Parenteral Medications
4. Vital Signs Monitoring and Use of Basic Monitors
5. Biomedical Waste Segregation and Disposal
6. Basic Life Support (BLS) and First Aid Techniques

Targeted Application & Tools that can be used:

- Electronic Medical Records (EMR)
- Vital sign monitoring equipment (SpO_2, BP, ECG monitors)
- Nebulizers, oxygen delivery systems, suction apparatus
- Sterilization equipment: autoclave, dry heat, ETO
- Personal Protective Equipment (PPE)
- Patient transfer tools: wheelchairs, stretchers, slide sheets

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:
1. Article review: Critical review of an article related to infection control or patient care.
2. Presentation: Topic-based group or individual presentation (e.g., "Role of Respiratory Therapists in Emergency Care").

3. Case Study: Analysis of a clinical case involving infection control, medication errors, or patient monitoring.

Text Book
Principles and practice of Nursing - Sr Nancy

References
- Introduction to Critical Care Nursing - Mary Lou Sole
- First Aid - Red Cross society guidelines
- Basic Life Support (BLS) - American Heart Association guidelines

Online learning resources:
https://cpr.heart.org/en/courses/basic-life-support-bls-training
https://cpr.heart.org/-/media/cpr-files/cpr-guidelines/cpr-guidelines-2020.pdf

Course Code: BPRTIR204	**Course Title:** Introduction to Respiratory Care Technology **Type of Course: Core Course**	**L-T- P- C**	2	1	0	3

Version No.	1.0			
Course Pre-requisites	None			
Anti-requisites	None			
Course Description	This foundational course offers an in-depth understanding of the applied anatomy and physiology of the respiratory and cardiovascular systems, clinical examination skills, principles of respiratory gas physics, and the practical application of medical gases and delivery devices. It bridges theoretical concepts with hands-on laboratory skills and prepares students for critical clinical situations encountered in respiratory therapy.			
Course Objective	1. Understand and describe the detailed structure and function of the respiratory and cardiovascular systems. 2. Interpret the mechanical and physiological principles underlying respiration and gas exchange. 3. Perform systematic physical examination relevant to respiratory and general clinical assessment. 4. Comprehend and apply gas laws in clinical respiratory care contexts. 5. Identify, select, and operate gas administration devices safely and effectively. 6. Recognize the importance of safety standards in handling medical gases and associated equipment.			
Course Outcomes	**On successful completion of the course the students shall be able to:** **List the course outcomes** **On successful completion of this course the students shall be able to:** **CO1:** Identify and explain anatomical structures of the respiratory and cardiovascular systems relevant to respiratory therapy. **CO2:** Describe physiological principles including ventilation, perfusion, gas exchange, and control of breathing. **CO3:** Perform comprehensive respiratory and systemic clinical assessments. **CO4:** Apply physical principles and gas laws in understanding respiratory therapy equipment and gas behavior. **CO5:** Operate and troubleshoot gas delivery systems used in respiratory care. **CO6:** Demonstrate safety practices related to the use and maintenance of medical gas supply systems.			
Course Content:				
Module 1	**Cell Applied Anatomy and Physiology**	Assignment		**12 Sessions**

3. **Topics:**

Applied Anatomy (Respiratory & Cardiovascular)

Covers the structure of the airways, lungs, pleura, respiratory muscles, heart chambers, valves, vessels, and thoracic cavity. Emphasizes anatomical relationships crucial for respiration, circulation, and clinical procedures like auscultation and intubation.

Applied Physiology (Respiratory & Cardiovascular)

Explores breathing mechanics, lung volumes, gas exchange, and control of respiration, along with cardiac output, blood pressure, and hemodynamics. Focuses on how oxygen is transported and utilized, and how the heart and lungs work together to maintain homeostasis.

Types of hypoxia

- Acute vs chronic hypercapnia
- Type I and II respiratory failure

Module 2	**History taking and general physical examination**	Assignment		**9 Sessions**

Topics: Introduction to Physical Examination:
Focuses on preparing the patient and environment, ensuring hand hygiene, consent, and correct positioning.

General Appearance and Sensorium:
Assesses consciousness (AVPU/GCS), nutritional status, posture, and signs like cyanosis, pallor, and jaundice.

Pulse Examination:
Includes rate, rhythm, volume, and character with assessment of peripheral pulses (radial, carotid, femoral, etc.).

Blood Pressure Assessment:
Covers accurate cuff placement, reading technique, and interpretation of pulse pressure and orthostatic changes.

Respiratory Rate and Pattern:
Observes rate and identifies abnormal patterns like Cheyne-Stokes, Kussmaul, and Biot's breathing.

Body Temperature Measurement:
Describes temperature sites (oral, axillary, rectal, tympanic) and the significance of various fever patterns.

Fluid Status and Hydration Assessment:
Evaluates hydration via skin turgor, mucous membranes, capillary refill, edema, and jugular venous pressure.

Identification of Abnormal Physical Signs:
Detects signs like clubbing, cyanosis, edema, lymphadenopathy, and correlates them with clinical conditions.

Module 3	**SYSTEM EXAMINATION**	Assignment		**7 Sessions**

Topics:
Clinical Examination - Basic Assessment of respiratory system-Inspection, palpation, percussion and auscultation of respiratory system. Definition and significance of the presence of altered resonance, abnormal breath sounds and adventitious sounds.

Basic Clinical Assessment of other organ systems- Cardiovascular system i.e Symptoms of cardiovascular disease

Module 4	**Gas Physics**	Assignment		**9 Sessions**

Topics:

Gas Physics- Covers basic gas properties like density and specific gravity, affecting flow and aerosol behavior in therapy. Emphasizes the role of humidity and BTPS conditions in airway care. Includes measurement units (STPD, BTPS), pressure-volume-flow relationships, and gas diffusion using Fick's Law. Key gas laws (Boyle's, Charles's, Dalton's, and Henry's) are linked to clinical uses like ventilator settings and oxygen delivery.

Medical Gas Supply - Explains compressed gas cylinders, color coding, and safety systems like PISS and DISS. Covers pressure regulators, flowmeters, and duration calculation. Describes central pipeline systems, outlets, and air compressors. Highlights oxygen concentrators using PSA technology and essential alarms and valves that ensure safe gas delivery.

Module 5	**Gas Administration Devices**	Assignment		**8 Sessions**

Basics of Gas Administration Devices - the purpose and safety of gas administration devices, focusing on reducing valves that lower pressure, flow meters like Thorpe tubes and Bourdon gauges for measuring gas flow, and combined regulators. Manual and automatic flow control methods, including flow restrictors, and emphasizes device setup, leak testing, and troubleshooting

Types, Selection, and Clinical Consideration - simple oxygen devices divided into low-flow (nasal cannula, simple mask) and high-flow types (Venturi mask, non-rebreather). Device selection depends on patient condition, clinical goals, and setting. It highlights device pros and cons such as flow accuracy and comfort, safety precautions like fire risk and humidification, and stresses monitoring. Hands-on practice and case scenarios enhance clinical decision-making.

Targeted Application & Tools that can be used:

1. **Oxygen therapy setups:** Nasal cannula, Venturi mask, non-rebreather, HFNC
2. **Gas supply systems:** Oxygen cylinders, regulators, flowmeters, concentrators
3. **Monitoring tools:** Pulse oximeter, ABG sampling (indirect), stethoscope
4. **Case-based learning platforms:** Simulators, mannequins for practice
5. **Assessment tools:** OSCE, spot tests, device assembly practice

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:
1. Article review: Recent advances in gas therapy or device technology
2. Presentation: Case presentation on a respiratory condition (e.g., COPD, ARDS) with applied therapy
3. Case Study: Simulated clinical scenario requiring device selection and justification

Text Book

1. "Egan's Fundamentals of Respiratory Care" by Robert M. Kacmarek, J. M. Stoller, and Al Heuer

References

1. "Introduction to Respiratory Care" by David C. Shelledy and Michael D. Johnson
2. "Fundamentals of Respiratory Care" by Dean Hess and J. M. Albin
3. "Respiratory Care: Principles and Practice" by Dean Hess and J. M. Albin

Online learning resources:

1. https://archive.org/details/respiratorycarep0002unse?utm_source=chatgpt.com
2. https://moys.gov.iq/upload/common/Essential_Respiratory_Medicine_2019.pdf
3. https://archive.org/details/respiratorycarem0000unse

Topics relevant to "SKILL DEVELOPMENT":

1. Clinical assessment techniques: Inspection, palpation, percussion, auscultation
2. Hands-on training with gas therapy devices and flow systems
3. Medical gas supply safety and device maintenance
4. Integration of anatomy and physiology with pathophysiological understanding
5. Application of respiratory gas laws in patient care
6. Structured case-based reasoning and diagnosis

Course Code: BPAHHI205	**Course Title:** Healthcare Informatics and Data Analytics **Type of Course: Value Added**	**L-T- P- C**	2	1	0	3
Version No.	1.0					
Course Pre-requisites	None					

Anti-requisites	None
Course Description	This course introduces fundamental concepts and methodologies of **biostatistics** essential for healthcare and clinical research. It covers descriptive and inferential statistical techniques, probability theory, comparative tests, and regression methods. Emphasis is placed on interpreting statistical outputs and applying these tools in real-world biomedical and epidemiological settings.
Course Objective	• Understand the role of informatics in healthcare delivery. • Gain proficiency in healthcare information systems and technologies. • Learn data collection, storage, and retrieval methods in healthcare settings. • Develop skills in data analysis and interpretation for improving healthcare outcomes. • Understand healthcare data standards and interoperability principles. • Explore the use of data analytics for clinical decision support and population health management. • Learn about healthcare data privacy, security, and regulatory compliance. • Develop competency in using healthcare analytics tools and software. • Apply data analytics techniques to identify trends, patterns, and insights in healthcare data. • Enhance communication and collaboration skills for interdisciplinary healthcare teams.
Course Outcomes	**On successful completion of the course the students shall be able to:** • **CO1**: Classify and organize data using appropriate types and scales of measurement. • **CO2**: Summarize and visualize data using measures of central tendency and dispersion. • **CO3**: Apply basic probability concepts and distributions in real-world health data. • **CO4**: Conduct hypothesis testing and interpret p-values and confidence intervals. • **CO5**: Perform comparative statistical tests (t-test, Mann Whitney U, Kruskal-Wallis).
Course Content:	

Module 1	**Introduction to Biostatistics**	Assignment		**8 Sessions**
Topics: Fundamentals of biostatistics, including basic concepts like variables, data types, and measurement scales, as well as learning about measures of central tendency, dispersion, and graphical representation of data.				
Module 2	**Probability and Probability Distributions**	Assignment		**9 Sessions**
Fundamentals of probability theory, exploring probability distributions (both discrete and continuous, such as binomial and normal distributions), and understanding their applications in healthcare research and epidemiology				
Module 3	**Statistical Inference**	Assignment		**8 Sessions**
Topics: Sampling distributions, hypothesis testing concepts (null and alternative hypotheses, significance level, and values), and recognizing the types of errors in statistical analysis.				
Module 4	**Comparative Analysisc**	Assignment		**8 Sessions**
Topics: Conducting ttests and nonparametric tests such as Mann Whitney U test and KruskalWallis test, and ability to interpret statistical results accurately for informed decisionmaking				
Module 5	**Regression Analysis and Multivariate Methods**	Assignment		**12 Sessions**
Topics: Simple linear regression and its coefficient interpretation, mastering multiple regression techniques, and understanding the applications of logistic regression and survival analysis in statistical modelling and data analysis.				
Targeted Application & Tools that can be used: **Software**: MS Excel, SPSS, R, GraphPad Prism, Python (for advanced learners) **Statistical calculators and online tools**: OpenEpi, MedCalc, VassarStats				
Project work/Assignment: Mention the Type of Project /Assignment proposed for this course: **1. Article review** Critical statistical analysis of a published medical research paper. **2. Presentation:** Explaining statistical significance in a real clinical study. **3. Case Study**: Using regression analysis on hospital data (e.g., predicting length of stay based on vitals				

Text Book

1. **Health Informatics: A Practical Approach** by Dr. Anupama Reddy

References

- **Medical Informatics: An Indian Perspective** by Dr. Rajesh Bhatia
- **Health Data Analytics and Informatics** by Mbuso Mabuza
- **Big Data Analytics and Machine Intelligence in Biomedical and Health Informatics by** Dr. Sunil Dhal, Dr. Subhendu Kumar Pani, Dr. Srinivas Prasad, Dr. Sudhir Kumar Mohapatra

Online learning resources:

1. https://www.futurelearn.com/courses/eit-health-data-analytics
2. https://medicine.nus.edu.sg/continuing-education/course-catalogue/health-informatics-and-data-visualisation/?utm_source=chatgpt.com
3. https://medicine.nus.edu.sg/continuing-education/course-catalogue/health-informatics-and-data-visualisation/?utm_source=chatgpt.com

Topics relevant to "SKILL DEVELOPMENT":

- Data collection and tabulation techniques
- Use of statistical software (Excel/SPSS/R)
- Interpretation and communication of statistical results
- Evidence-based reasoning for clinical decisions
- Real-world case handling using biostatistical analysis

Course Code: BPAHES206	**Course Title:** Environmental Sciences **Type of Course: Multi-Disciplinary**	**L-T- P- C**	2	1	0	3
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course provides an in-depth understanding of the environment and its components, ecosystems, and the impact of human activities on environmental health and sustainability. It also discusses pressing global environmental issues, pollution, environmental laws, waste management strategies, and ethical approaches to conservation.					
Course Objective	1. To understand and define terminology commonly used in environmental science 2. To teach students to list common and adverse human impacts on biotic communities, soil, water, and air Quality. 3. To understand the processes that govern the interactions of organisms with the biotic and abiotic. 4. Understand the relationship between people and the environment; Differentiate between key ecological terms and concepts					
Course Outcomes	**On successful completion of the course the students shall be able to:**					

	• **CO1**: Identify and describe components of the environment and explain human-environment interactions. • **CO2**: Understand ecological principles, including ecosystem structure, food chains, energy flow, and ecological balance. • **CO3**: Analyze global environmental problems and their implications for biodiversity, climate, and health. • **CO4**: Evaluate different types of pollution, their causes, effects, and control measures, including urban, industrial, and rural contexts. • **CO5**: Apply environmental management strategies to control environmental diseases and understand sanitation practices. • **CO6**: Discuss environmental laws, ethics, and international initiatives for environmental protection and sustainable development.			
Course Content:				
Module 1	**Component of Environment**	Assignment		**6 Sessions**
Topics: Hydrosphere, lithosphere, atmosphere and biosphere – definitions with examples; Interaction of man and environment				
Module 2	**Ecosystem**	Assignment		**8 Sessions**
Topics: Basic concepts, components of ecosystem, Tropic levels, food chains and food webs, Ecological pyramids, ecosystem functions, Energy flow in ecological systems, Characteristics of terrestrial fresh water and marine ecosystems				
Module 3	**Global Environmental Problems**	Assignment		**8 Sessions**
Topics: Green House Effect, Acid rain, El Nino, Ozone depletion, deforestation, desertification, salination, biodiversity loss; chemical and radiation hazards				
Module 4	**Environmental Pollution and Degradation**	Assignment		**8 Sessions**

Topics: Pollution of air, water and land with reference to their causes, nature of pollutions, impact and control strategies; perspectives of pollution in urban, industrial and rural areas. Habitat Pollution by Chlorinated Hydrocarbons (DDT, PCBs, Dioxin etc, Endocrine disrupting chemicals, Nutrient pollution				
Module 5	**Environmental Management**	Assignment		**7 Sessions**
Topics: Concept of health and sanitation, environmental diseases – infectious (water and air borne) and pollution related, spread and control of these diseases, health hazards due to pesticide and metal pollution, waste treatment, solid waste management, environmental standards and quality monitoring				
Module 6	**Environmental Protection Act**	Assignment		**8 Sessions**
Topics: Environmental Laws, national movements, environmental ethics – holistic approach of environmental protection and conservation, IUCN – role in environmental protection. Concept with reference to UN – declaration, aim and objectives of human right policies with reference to India, recent northsouth debate on the priorities of implementation, Environmental Protection Agency (EPA) Oil spills, Wastewater treatment, chemical degradation, heavy Metals.				

Targeted Application & Tools that can be used:

1. **Tools/Software**: Environmental impact analysis tools, GIS (Geographic Information Systems), air and water quality testing kits, waste auditing tools.
2. **Platforms**: CPCB (Central Pollution Control Board) portals, WHO environmental databases, UNEP and EPA resources.
3. **Multimedia Tools**: Documentaries (e.g., *Our Planet*, *Before the Flood*), online simulations of ecosystem dynamics.

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:

1. Article review: Analyze a published research article on pollution control or climate change mitigation.

2. Presentation: Prepare a PowerPoint presentation on a global environmental issue (e.g., oil spills, ozone depletion, plastic pollution).

3. Case Study: Develop a case study on waste management practices in a rural vs. urban setting in India.

Text Book

1. **Environmental Science: Earth as a Living Planet** by G. Tyler Miller and Scott **Spoolman**

References

1. Environmental Science: Earth as a Living Planet by G. Tyler Miller and Scott **Spoolman**

1. **Fundamentals of Environmental Science** by William P. Cunningham and Mary Ann Cunningham
2. **Environmental Science:** A Global Perspective by Richard T. Wright and David W. Lea:

Online learning resources:

1. **Amazon:** Environmental Science: Earth as a Living Planet
2. **Google Books Preview:** Environmental Science
3. **Perlego (Subscription Required):** Environmental Science PDF
4. **Internet Archive (Free Access):** Environmental Science by G. Tyler Millercengage.com+3amazon.com+3faculty.cengage.com+3books.google.comperlego.comarchive.org

Topics relevant to "SKILL DEVELOPMENT":

1. Environmental monitoring and data collection techniques
2. Conducting local environmental impact assessments
3. Report writing on pollution surveys
4. Designing eco-friendly solutions for waste and water management
5. Critical analysis of environmental laws and policies
6. Developing awareness campaigns on sanitation and sustainability

III Semester

Course Code: BPRTMD301	**Course Title: Basics of Medical Disorders** **Type of Course: Core Course**	**L-T- P- C**	2	1	2	4
Version No.	1.0					

Course Pre-requisites	None
Anti-requisites	None
Course Description	This course provides a comprehensive understanding of common cardiac, respiratory, neurological, renal, gastrointestinal, infectious, hematological, and toxicological conditions encountered in clinical practice. Emphasis is placed on pathophysiology, clinical features, diagnostic criteria, and initial management strategies. Special focus is given to conditions requiring respiratory support and intensive care, such as ARDS, sepsis, and poisoning.
Course Objective	1. To learn about basic concepts of common medical disorders and their therapeutic options. 2. Identify and manage hematological disorders, fluid and electrolyte imbalances, and acid-base abnormalities with appropriate corrective strategies. 3. Recognize and respond to critical conditions such as pulmonary edema, acute lung injury, ARDS, sepsis, and multi-organ dysfunction syndrome. 4. Address health issues in special populations, including pregnant women, children, elderly individuals, and patients with chronic illnesses like diabetes, obesity, HIV/AIDS, and endocrine disorders. 5. Classify and manage poisoning and overdose emergencies, and provide primary care in life-threatening situations like drowning and hanging.
Basic skill sets required for the laboratory:	1. Effective patient communication and history-taking. 2. Proficiency in physical and systemic examination techniques. 3. Accurate monitoring and interpretation of vital signs. 4. Safe handling of respiratory therapy equipment and instruments. 5. Basic interpretation of lab values and infection control practices.
Course Outcomes	**On successful completion of the course the students shall be able to:** • **CO1**: Explain the etiology, clinical manifestations, and emergency management of cardiovascular and respiratory diseases. • **CO2**: Describe the presentation and care of neurological, renal, gastrointestinal, and infectious diseases relevant to critical care. • **CO3**: Interpret abnormalities related to blood, fluid, electrolytes, and acid-base balance, and suggest corrective strategies. • **CO4**: Assess and manage acute critical illnesses such as pulmonary edema, ARDS, sepsis, and MODS.

	• **CO5**: Evaluate health concerns in special populations (pregnancy, neonates, elderly, HIV, diabetes, obesity) and respond to related emergencies. • **CO6**: Recognize and initiate appropriate primary care for poisoning, drug overdose, and miscellaneous emergencies like drowning and hanging.			
Course Content:				
Module 1	**Cardiac and Respiratory Diseases**	Assignment		**10 Sessions**
Topics: 1. Cardiovascular Diseases: Hypertension, ischemic heart diseases, myocardial infarction, arrhythmias, heart failure, shock (types, causes). **2. Respiratory Diseases:** Pneumonia, tuberculosis, chronic obstructive pulmonary disease, asthma, pleural effusion, pneumothorax, interstitial lung disease.				
Module 2	**Neurological, Renal, GI & Infectious DiseaseS**	Assignment		**10 Sessions**
Topics: **1. Neurological Diseases:** Poliomyelitis, Guillain-Barre syndrome, myasthenia gravis, epilepsy/seizure disorders, cerebrovascular accident/stroke. **2. Renal Diseases:** Acute kidney injury, chronic kidney disease. **3. Gastrointestinal and Liver Diseases:** Gastritis/acute peptic disease, peptic ulcer, acute gastroenteritis, hepatitis, hepatic failure, alcoholic liver disease. **4. Infectious Diseases:** Dengue, malaria, leptospirosis				
Module 3	**Blood, fluid, electrolyte and acid base abnormalities**	Assignment		**7 Sessions**
Topics: 1. **Blood Loss and Anemia:** Thrombocytopenia. 2. **Fluid and Electrolyte Imbalance:** Corrective methods. **Acid-Base Abnormalities:** Corrective methods				
Module 4	**Pulmonary Oedema, Sepsis and MODS**	Assignment		**8 Sessions**
1. **Topics:** Pulmonary Edema, Acute Lung Injury, and Acute Respiratory Distress Syndrome. Sepsis, Multi-Organ Failure, and Multi-Organ Dysfunction Syndrome				

Module 5	**Health problems in Specific conditions and Toxicology**	Assignment		**10 Sessions**

1. Health Problems in Specific Conditions: Pregnancy (antenatal care, disorders in pregnancy), children and new-borns, obesity, diabetes mellitus, HIV infections and AIDS, elderly subjects and disability, brief mention of endocrine disorders.
2. Poisoning and Drug Overdosing: Classification of poisons, principles of treatment of poisoning and primary care, poisons and drug overdosing requiring ventilation.
3. Miscellaneous: Drowning, hanging

List of Laboratory Tasks:

1. Patient history taking (cardiac, respiratory, GI, renal, neurological)
2. General physical examination (head-to-toe approach)
3. Systemic examination – respiratory, cardiovascular, CNS, abdomen
4. Monitoring of vital signs (manual and digital techniques)
5. Introduction to oxygen therapy and nebulizer setup
6. Hands-on training in using pulse oximeter, BP monitor, and ECG
7. Basic infection control practices in clinical settings
8. Observation of therapeutic interventions in selected patients
9. Basic interpretation of lab values (CBC, LFT, RFT, electrolytes, ABG)
10. Role-play and simulation on emergency scenarios (e.g., asthma attack, poisoning)

Targeted Application & Tools that can be used:

1. ICU Protocols & Ventilator Simulators
2. ABG Analyzers and Interpretation Software
3. Case simulation tools for emergency scenarios
4. Clinical decision support systems (CDSS)
5. WHO and CDC case management guidelines

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:
1. Article review: Review of recent research or case studies on ARDS management or sepsis guidelines.
2. Presentation: Group presentation on topics like "Emergency Management of Poisoning" or "Respiratory Management in COPD Exacerbation".
3. Case Study: Real or simulated case of a patient with multi-organ dysfunction requiring respiratory support. Discuss diagnosis, clinical reasoning, and outcome.

Text Book

1. "Harrison's Principles of Internal Medicine" edited by J. Larry Jameson, Anthony S. Fauci, and Dennis L. Kasper

References

1. "Current Medical Diagnosis and Treatment" by Maxine A. Papadakis, Stephen J. McPhee, and Michael W. Rabow
2. "Basic and Clinical Pharmacology" by Bertram G. Katzung, Anthony J. Trevor, and Marvin M. B. Schwartzbauer
3. "Medical Microbiology and Infection Control" by Richard L. Guerrant, David H. Walker, and Peter F. Weller

Online learning resources:

1. Medscape Clinical Procedures
2. Geeky Medics – Clinical Examination Videos
3. WHO Clinical Guidelines

Topics relevant to "SKILL DEVELOPMENT":

- Interpretation of ABG and electrolyte reports
- Rapid assessment and triage in medical emergencies
- Emergency drug dosage and protocol familiarity
- Clinical reasoning and prioritization in multi-system diseases
- Multidisciplinary communication skills in critical care settings
- Preparation for ventilator support in poisoning or ARDS cases

Course Code: BPRTAP302	**Course Title:** Applied Pharmacology & Medicine **Type of Course: Course Code**	**L-T- P- C**	2	1	2	4
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course offers an integrated overview of pharmacology and medical conditions critical to respiratory therapy. It covers drug classifications, mechanisms of action, clinical applications, and side effects, with a strong emphasis on respiratory-related pharmacotherapy. Additionally, the course includes an in-depth examination of systemic and infectious diseases relevant to respiratory care, focusing on clinical manifestations, diagnosis, and therapeutic strategies.					
Course Objective	1. To understand the pharmacodynamics and pharmacokinetics of drugs commonly used in respiratory care. 2. To identify and explain medications relevant to cardiopulmonary and neurological emergencies. 3. To recognize and manage clinical presentations of common and critical diseases encountered in respiratory practice. 4. To apply knowledge of drug actions and disease mechanisms to select appropriate therapeutic interventions.					

	5. To develop clinical decision-making skills based on current medical and pharmacological evidence			
Basic skill sets required for the laboratory:	1. Accurate drug dosage calculation 2. Sterile technique and preparation of solutions 3. Interpretation of drug effects from simulation/chart 4. Prescription writing format (generic names, dose, route, frequency) 5. Understanding of drug administration routes and pharmacokinetic principles 6. Familiarity with ethical considerations in experimental pharmacology			
Course Outcomes	**On successful completion of the course the students shall be able to:** **CO1:** Identify drug categories relevant to the autonomic, cardiovascular, and respiratory systems. **CO2:** Explain the pharmacological management of respiratory and critical care diseases. **CO3:** Analyze the clinical implications of systemic diseases like diabetes, HIV/AIDS, and renal/liver disorders in respiratory therapy. **CO4:** Interpret and apply knowledge of infectious and occupational lung diseases. **CO5:** Discuss the use of emergency drugs, anesthetics, and IV fluids in acute care. **CO6:** Demonstrate ability to correlate pharmacological interventions with medical case presentations in respiratory patients.			
Course Content:				
Module 1	**APPLIED PHARMACOLOGY-**	Assignment		**25 Sessions**
• **Topics: Autonomic Nervous System**: Anatomy, drugs affecting sympathetic/parasympathetic functions, dosage, and side effects. • **Cardiovascular Drugs**: Antihypertensives, antiarrhythmics, inotropes, vasodilators, lipid-lowering agents, and emergency cardiologic drugs. • **Anaesthetic Agents**: General and local anesthetics – types, pharmacokinetics, and routes of administration. • **Analgesics**: Classification of opioid and non-opioid drugs, uses, and adverse effects. • **Antihistamines and Antiemetics**: Mechanisms, classifications, and clinical applications. • **CNS Agents**: CNS depressants and stimulants, neuromuscular blockers, and muscle relaxants.				

- **CPB-related Pharmacology**: Drugs used for organ protection during cardiopulmonary bypass.
- **Inhalational Gases and Emergency Drugs**: Clinical applications in acute care.
- **Respiratory Pharmacotherapy**: Management of asthma, cough, and use of mucolytics, corticosteroids, and aerosols.
- **Diuretics**: Mechanism, sites of action, indications, and complications.
- **Chemotherapy of Infections**: Major antimicrobial classes, mechanisms, and resistance concerns.
- **Miscellaneous**: IV fluids, electrolytes, immunosuppressants, and new drugs in perfusion.

Module 2	**MEDICINE RELEVANT TO RESPIRATORY TECHNOLOGY**	Assignment		**20 Sessions**

Topics: **Common Diseases**: Management of diabetes, hypertension, and ischemic heart disease.

Special Populations: Considerations in obesity, elderly, and pregnant patients.

Core Respiratory Conditions: Respiratory failure (types, signs, and management) ,Asthma, COPD, ARDS

Neuromuscular and Infectious Conditions: AIDS, polio, Guillain-Barré, Myasthenia Gravis, status epilepticus

Pediatric Respiratory Disorders: Recognition and management of common pediatric respiratory conditions.

Critical Illnesses : Sepsis, septic shock, poisoning

Pneumonia and Related Disorders: Community- and hospital-acquired pneumonia, lung abscess, atypical infections

Pulmonary Infections: Viral/fungal infections, tuberculosis, tropical eosinophilia

Occupational and Structural Lung Disorders: Pulmonary edema, toxic inhalation, pleural and chest wall diseases

Embolic Conditions: Pulmonary thromboembolism, fat embolism

List of Laboratory Tasks:

1. Preparation of commonly used drug solutions (e.g., salbutamol, adrenaline, dopamine)
2. Writing mock prescriptions for real-life scenarios

3. Observation of experimental charts demonstrating:
4. Effects of drugs on heart rate or respiration
5. Dose-response relationship

Targeted Application & Tools that can be used:

1. Pharmacology simulation software
2. Respiratory drug delivery systems (MDI, DPI, nebulizers)
3. Clinical decision-making tools for critical care
4. Interactive e-learning platforms (e.g., CIMS India, Medscape)
5. Monitoring tools: ABG analyzers, pulse oximeters, ventilators

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:
1. Article review : Analyze a recent journal publication related to pharmacological or respiratory disease management.
2. Presentation: Deliver a seminar on pharmacotherapy in ARDS, COPD, or a chosen respiratory condition.
3. Case Study: Write and present a case-based discussion involving disease identification, drug prescription, and rationale for chosen therapy.

Text Book

1. "Basic and Clinical Pharmacology" by Bertram G. Katzung, Anthony J. Trevor, and Marvin M. B. Schwartzbauer

References

1. "Goodman & Gilman's: The Pharmacological Basis of Therapeutics" by Laurence L. Brunton, Randa Hilal-Dandan, and Bjorn C. Knollmann

2. "Clinical Pharmacology and Therapeutics" by John M. O. Davies and Michael P. H. Smith

Online learning resources:

1. **Virtual Labs** (vlab.co.in – Pharmacology module)
2. **MedlinePlus Drug Information**
3. **Khan Academy – Pharmacology modules**
4. **PubMed for case-based pharmacology**

Topics relevant to "SKILL DEVELOPMENT":

1. Clinical pharmacology interpretation
2. Drug dosage calculation and route selection
3. Critical evaluation of medical literature
4. Case-based therapeutic reasoning
5. Emergency drug administration protocols

6. Patient counseling on medication adherence

Course Code: BPAHPS303	**Course Title: Preventive and Social Medicine** **Type of Course: Minor**		**L-T- P- C**	2	0	0	2
Version No.	1.0						
Course Pre-requisites	None						
Anti-requisites	None						
Course Description	This course provides an in-depth understanding of the principles and applications of preventive medicine, public health, and social medicine. It emphasizes the importance of health promotion, disease prevention, and the impact of public health initiatives on population health						
Course Objective	1. The course aims to provide students with a comprehensive understanding of the principles and practices of preventive medicine, public health, and social medicine. 2. By the end of the course, students should be able to identify and assess health risks and determinants, plan and implement preventive interventions, and advocate for policies and programs that promote health and well-being at the individual, community, and population levels.						
Course Outcomes	**On successful completion of the course the students shall be able to:** **CO1:** Explain the principles of preventive medicine and differentiate between levels of prevention. **CO2:** Identify major public health issues and assess community needs and determinants of health. **CO3:** Design and evaluate public health programs using health indicators and evidence-based practices. **CO4:** Demonstrate ethical and professional behavior in dealing with individuals and communities. **CO5:** Apply critical thinking to develop innovative solutions to population health challenges. **CO6:** Advocate for preventive policies and programs that address health disparities and promote wellness.						
Course Content:							
Module 1	**Principles of Preventive medicine**	Assignment		**6 Sessions**			
Topics: Primary, secondary, and tertiary prevention, Importance of preventive measures in reducing the burden of disease and promoting overall health and well-being							

Module 2	**Public Health Issues**	Assignment		**6 Sessions**
Topics: What are Public Health Issues, Community needs assessments, Social, economic, environmental, and behavioral determinants, Population health outcomes				
Module 3	**Public Health Programs**	Assignment		**6 Sessions**
Topics: Public health interventions and programs, Monitoring and evaluation plans, Health indicators, Evidence-based decision-making in public health practice				
Module 4	**Ethical and Professional Conduct**	Assignment		**6 Sessions**
Topics: Ethical principles and professional standards, Professionalism, integrity, and cultural competence in interactions with individuals, communities, and diverse populations				
Module 5	**Critical Thinking and Problem-Solving Skills**	Assignment		**6 Sessions**
Topics: Challenges and opportunities for improving population health, Innovative solutions and strategies to improve public health problems.				
Targeted Application & Tools that can be used: 5. Public health data collection software (e.g., Epi Info, Google Forms) 6. Health surveillance systems 7. WHO and CDC datasets 8. GIS tools for mapping health indicators 9. SPSS/Excel for data analysis 10. Role-play and simulation for ethical scenario training				
Project work/Assignment: Mention the Type of Project /Assignment proposed for this course: **1. Article review** Critical review of a current preventive health intervention or global health report.				

2. Presentation: On a public health program (national or international), its impact, and evaluation metrics. **3. Case Study**: Analysis of a community health problem with preventive and policy solutions
Text Book 1. Park's Textbook of Preventive and Social Medicine
References 1. Maxcy-Rosenau-Last Public Health and Preventive Medicine 2. Textbook of Community Medicine: Preventive and Social Medicine by Sunder Lal **Online learning resources:** 1. https://www.ruralhealthinfo.org/toolkits/rural-toolkit/1/needs-assessment?utm_source=chatgpt.com 2. https://www.letstalkpublichealth.com/health-communication-toolbox.html?utm_source=chatgpt.com
Topics relevant to "SKILL DEVELOPMENT": 1. Community needs assessment 2. Program planning and evaluation 3. Health communication and education 4. Epidemiological analysis and interpretation 5. Ethical decision-making in public health 6. Data-driven policy advocacy 7. Leadership in public health promotion

Course Code: : BPRTRT304	**Course Title: Basic Respiratory Therapeutics & Monitoring** **Type of Course: Core Course**	**L-T- P- C**	3	1	0	4
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course provides an in-depth understanding of patient assessment, therapeutic modalities, drug administration, monitoring, and emergency airway management in respiratory care. Students will gain practical and theoretical knowledge essential for clinical decision-making and hands-on skills in respiratory therapy, including the use of devices, artificial airways, and ventilators.					
Course Objective	1. Develop a systematic approach to patient assessment for respiratory conditions. 2. Acquire proficiency in selecting and applying appropriate respiratory therapeutic modalities. 3. Master the skills necessary for effective respiratory monitoring and assessment. 4. Develop the ability to recognize and manage respiratory emergencies.					

	5. Understand the safe and effective use of respiratory medications and nutrition. 6. Acquire knowledge of artificial airway management and emergency airway techniques. 7. Develop expertise in the operation and maintenance of manual and mechanical ventilators			
Course Outcomes	**On successful completion of the course the students shall be able to:** **CO1:** Conduct comprehensive assessments for respiratory care requirements. **CO2:** Choose and manage appropriate respiratory devices and therapies. **CO3:** Demonstrate knowledge of respiratory pharmacology and nutritional considerations. **CO4:** Monitor patients using gas analysis, pulse oximetry, capnography, and other tools. **CO5:** Manage artificial airways and perform emergency airway interventions. **CO6:** Operate and maintain manual resuscitators and understand mechanical ventilation basics.			
Course Content:				
Module 1	**Patient Assessment and Device Selection**	Assignment		**12 Sessions**
Topics: Selection of Device, Precautions, and Monitoring of Patient During Respiratory Care: Including oxygen therapy, humidity therapy, aerosol therapy, and chest physical therapy.				
Module 2	**Drugs and Nutrition in Respiratory Care**	Assignment		**12 Sessions**
Topics: 1. Drugs Acting on the Respiratory System and Emergency Drugs: Drugs acting on the airway, antibiotics for lung infections and anti-TB drugs, emergency drugs. 2. Nutrition Assessment and Supplementation.				
Module 3	**Patient Monitoring in Respiratory Care**	Assignment		**12 Sessions**

Topics: Monitoring of a Patient with Respiratory Disease: Gas analysis and analyzers, transcutaneous oxygen monitors and pulse oximeters, capnography, monitoring response to therapy and progression of disease, multi-parameter monitoring.

Module 4	**Artificial Airway and Emergency airway management**	Assignment		**12 Sessions**

Topics: 1. Artificial Airways: Oral and nasal endotracheal tubes, tracheostomy tubes—types, parts, features, sizes, and selection of airway; indications and complications.

2. Airway Management: Procedures (intubation, extubation, and care of artificial airway), tracheostomy and de-cannulation, oxygen therapy, humidity therapy, aerosol therapy, and chest physical therapy in patients with artificial airway.

3. Emergency Airway Management and Basic Life Support (BLS).

Module 5	**Manual resuscitators and ventilation**	Assignment		**12 Sessions**

1. **Manual Resuscitators and Ventilators:** Face masks, AMBU, Bains; advantages and disadvantages of manual resuscitators; selection and use of manual resuscitators.

2. Basics of Mechanical Ventilation: Positive and negative pressure ventilation; types of ventilators.

Targeted Application & Tools that can be used:

1. ABG analyzers, pulse oximeters, capnography monitors
2. Oxygen delivery devices, nebulizers, humidifiers
3. Airway manikins, intubation kits, BLS training aids
4. Ventilator simulators (e.g., mechanical ventilators with test lungs)
5. Drug administration models and medication charts
6. Nutrition planning tools and assessment forms

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:
1. Article review Critical review of recent research on aerosol therapy or ventilator-associated pneumonia.
2. Presentation: Device selection and respiratory therapy planning in a clinical scenario.
3. Case Study: Evaluation and management of a patient requiring emergency airway intervention.

Text Book

1. Pulmonary and Critical Care Medicine by Tobin, Murray, and Knudson

References

1. Critical Care Medicine by Marino

2. Pulmonary Rehabilitation by Celli and MacIntyre:

Online learning resources:

1. https://en.seamaty.com/index.php?s=%2Fsys%2F664.html&utm_source=chatgpt.com
2. https://opencriticalcare.org/encyclopedia/overview-of-oxygen-delivery-devices/?utm_source=chatgpt.com

Topics relevant to "SKILL DEVELOPMENT":

1. Clinical decision-making in device selection
2. Emergency airway management (simulation-based)
3. Interpretation of ABG and monitoring data
4. Application of respiratory pharmacology
5. Manual resuscitation technique practice
6. Mechanical ventilator operation and troubleshooting

Course Code: BPAHCD305	**Course Title: Cultural Diversity in the Indian Society** **Type of Course:** Multi-Disciplinary	**L-T- P- C**	2	1	0	3
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course provides a comprehensive overview of the principles of preventive medicine and public health. It covers the spectrum of disease prevention (primary, secondary, and tertiary), explores contemporary public health issues, and examines public health programs and policies. It emphasizes ethical conduct, cultural competence, and critical thinking in addressing population health challenges.					
Course Objective	1. Appreciate the richness and complexity of Indian culture. 2. Analyze the historical and contemporary dimensions of cultural diversity. 3. Evaluate the impact of cultural diversity on social, political, and economic life. 4. Develop a critical understanding of the challenges and opportunities associated with cultural diversity. 5. Contribute to fostering a harmonious and inclusive Indian society.					

Course Outcomes	**On successful completion of the course the students shall be able to:** **CO1.** Describe the principles and levels of disease prevention. **CO2.** Identify determinants of health and conduct community needs assessments. **CO3.** Evaluate and design public health interventions and programs. **CO4.** Apply ethical and professional standards in public health practice. **CO5.** Analyze population-level health data for planning and decision-making. **CO6.** Demonstrate critical thinking in proposing solutions to public health challenges.			
Course Content:				
Module 1	**Foundations of Indian Diversity**	Assignment		**9 Sessions**
• **Topics:** Define culture and its components (language, religion, customs, traditions, art, etc.) • Explain the historical factors contributing to India's cultural diversity (geographic, linguistic, religious, and social). • Analyze the concept of unity in diversity and its relevance to Indian society.				
Module 2	**Religious Diversity**	Assignment		**9 Sessions**
• **Topics:** Describe the major religions of India (Hinduism, Islam, Christianity, Sikhism, Buddhism, Jainism) and their core beliefs. • Examine the historical coexistence and conflicts among different religious groups. • Analyze the role of religion in shaping Indian society and culture.				
Module 3	**Linguistic Diversity**	Assignment		**9 Sessions**
• **Topics:** Explain the linguistic landscape of India, including Indo-Aryan, Dravidian, and other language families. • Analyze the impact of language diversity on identity, communication, and social cohesion. • Discuss the role of language in nation-building and cultural integration.				
Module 4	**Ethnic and Tribal Diversity**	Assignment		**9 Sessions**
• **Topics:** Define ethnicity and tribe, and differentiate between them. • Explore the diversity of ethnic and tribal groups in India, their geographical distribution, and cultural practices. • Analyze the challenges faced by ethnic and tribal communities in contemporary India.				

Module 5	**Cultural Dynamics and Challenges**	Assignment		**9 Sessions**

- **Topics:** Examine the processes of acculturation, assimilation, and pluralism in Indian society.
- Analyze the impact of globalization and modernization on Indian culture.
- Discuss the challenges posed by cultural diversity, such as communalism, casteism, and regionalism.
- Explore strategies for promoting cultural harmony and national integration.

Targeted Application & Tools that can be used:

1. **Cultural Mapping Software** (e.g., ArcGIS, Tableau Public) for visualizing linguistic, tribal, or religious distribution.
2. **Government Databases**: Census of India, Ministry of Tribal Affairs, NCERT archives.
3. **Digital Archives and Repositories**: IGNCA, Sahapedia, National Digital Library of India (NDLI).
4. **Multimedia Tools**: Canva, PowerPoint, Google Slides for presentations; Kahoot or Quizizz for interactive learning.
5. **Survey Tools**: Google Forms or Microsoft Forms for conducting community or campus-based diversity assessments.
6. **LMS Platforms**: Use of Moodle or Google Classroom for structured content delivery and evaluation.

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:

1. Article review: "Challenges in Protecting Tribal Rights in India" – analyze and summarize key takeaways.

2. Presentation: "Unity in Diversity: Case Studies from Indian States" or "Language and Identity in Modern India."

3. Case Study: Select a specific culturally diverse region (e.g., North-East India, Jammu & Kashmir, or Kerala).Discuss how religious, ethnic, or linguistic diversity shapes public life and governance in the region.

Text Book

Indian Society: Structure, Change and Continuity by Andre Beteille

References

1. Culture, Diversity and Society by B.L. Maheshwari
2. Indian Social Structure by M.N. Srinivas
3. The Indian Mind by D.P. Chattopadhyaya
4. Religion and Society in India by M.N. Srinivas

Online learning resources:

1. https://www.npi.org/seminars/technology/arcgis-cultural-resources-introduction?utm_source=chatgpt.com
2. https://www.ncertbooks.guru/old-ncert-books/?utm_source=chatgpt.com

Topics relevant to "SKILL DEVELOPMENT":

1. **Intercultural Communication Skills** – essential for working in diverse teams and communities.
2. **Community profiling and Engagement** – useful for NGO, public health, and policy work.
3. **Critical Thinking & Comparative Analysis** – analyzing cultural similarities and differences.
4. **Conflict Resolution & Peacebuilding** – addressing communal or caste-based tensions.
5. **Ethnographic Research Methods** – observing and documenting cultural practices.
6. **Policy Literacy** – understanding the role of law and governance in cultural integration (e.g., minority rights, language policy, and tribal welfare programs).

Course Code: BPAHMD306	**Course Title: Medical Documentation and Record Keeping** **Type of Course: Ability Enhancement**	**L-T- P- C**	2	1	0	3
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course provides foundational knowledge in medical documentation and health records management, including formats, processes, roles, responsibilities, and compliance with healthcare information management standards.					
Course Objective	1. To familiarize students with the principles and practices of medical documentation and health record management. 2. To develop competency in handling, reviewing, preserving, and disposing of patient records. 3. To introduce basic concepts of medical coding, electronic health record (EHR) systems, and regulatory standards. 4. To equip students with the necessary skills for accurate documentation, data entry, confidentiality, and software usage.					
Course Outcomes	**On successful completion of the course the students shall be able to:** 1. **CO1:** Define medical documentation and explain the types and formats of medical records. 2. **CO2:** Demonstrate the role and responsibilities of a medical record assistant including confidentiality and data handling. 3. **CO3:** Outline the documentation process from patient admission to discharge. 4. **CO4:** Review and verify medical documents using standard checklists. 5. **CO5:** Use appropriate software tools for medical record management and demonstrate basic data entry.					

	6. **CO6:** Describe and apply basic concepts of medical coding (ICD, ICF), record retention, and destruction protocols			
Course Content:				
Module 1	**Introduction to Medical Documentation & Record**	Assignment		**9 Sessions**
Topics: **Definitions**: Medical documentation, health record, medical record, and medical chart. • **Types & Formats**: Paper and electronic records, HIMS documentation per organizational policy. 4. **Medical Record Assistant**: Roles, responsibilities, confidentiality, accuracy, record retrieval, and handling incomplete/conflicting data.				
Module 2	**Medical Record Receiving & Reviewing**	Assignment		**9 Sessions**
Topics: **Documentation Process**: Collecting and verifying discharge files and patient information. **Checklist & Review**: Sample checklist, reviewing admission sheets, progress notes, discharge summaries, and other documents.				
Module 3	**Software for Medical Records Management**	Assignment		**9 Sessions**
Topics: **Usage & Selection**: Overview of tools, selecting suitable software per organizational needs. **Tool Management**: License verification, data backup, and proper tool usage as per developer guidelines				
Module 4	**Retention, Preservation & Destruction of Records**	Assignment		**9 Sessions**
Topics: **Retention**: Storing records per protocol (normal, death, medico-legal, transplant).				

Preservation: Organizing and storing old records securely.
Destruction: Approved destruction process as per statutory guidelines, with proper documentation.

Module 5	**Medical Coding – ICD & ICF**	Assignment		**9 Sessions**

- **Basics**: Definition and importance of medical coding.
  ICD & ICF: Purpose, differences, and applications.
- **Terminology**: Common diseases, terms, and abbreviations.

Targeted Application & Tools that can be used:

1. **Electronic Health Record (EHR) Software** – e.g., Medixcel, Practo, OpenMRS
2. **Document Management Systems** – Zoho Docs, Google Drive
3. **ICD/ICF Browser Tools** – WHO online coding tools
4. **Medical Record Checklists** – Customized admission/discharge templates
5. **Data Backup Tools** – Cloud storage solutions or local hospital systems
6. **Audit Software** – For record auditing and retention verification

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:
1. Article review "The Role of Digital Records in Healthcare Efficiency."
2. Presentation: "ICD vs ICF – Applications in Real-World Healthcare Settings"

3. Case Study: Present recommendations for improving data safety and compliance.

Text Book
1. **Health Information Management Technology** by Richard W. Gartee

References
1. **Documentation for Medical Records** by Barbara Odom Wesley

Online learning resources:
1. https://aaagh.delhi.gov.in/aaagh/medical-record-depatment?utm_source=chatgpt.com
2. https://pbieducation.com/courses/mr-17/?utm_source=chatgpt.com
3. https://www.cpepdoc.org/cpep-courses/medical-records-keeping-seminar-2/?utm_source=chatgpt.com

Topics relevant to "SKILL DEVELOPMENT":

1. Record Review and Checklist Preparation
2. Basic ICD/ICF Coding Skills
3. Confidentiality and Data Protection Practices
4. EHR Software Handling
5. Retention & Legal Disposal Procedures
6. Communication Skills for Record Management Professionals

Course Code: BPAHMH307	**Course Title: Mental Health & Emotional Intelligence** **Type of Course: Value Added**	**L-T- P- C**	2	0	0	2
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course provides a foundational understanding of mental health and its essential components. It emphasizes the significance of emotional intelligence, stress management, and mental health promotion. Students will explore mental health challenges, treatment options, and the importance of building support systems.					
Course Objective	1. Understand the concept of mental health and its importance. 2. Develop emotional intelligence and apply it to personal and interpersonal relationships. 3. Identify and manage stress effectively. 4. Promote mental well-being in themselves and others. 5. Seek appropriate help for mental health challenges.					
Course Outcomes	**On successful completion of the course the students shall be able to:** • **CO1:** Define mental health and identify common mental health conditions. • **CO2:** Analyze the impact of stigma on mental health and develop strategies to reduce it. • **CO3:** Understand and apply emotional intelligence in personal and professional settings. • **CO4:** Identify stressors and develop effective coping strategies. • **CO5:** Promote mental health and well-being within their communities. • **CO6:** Recognize treatment modalities and support systems for mental health recovery.					
Course Content:						
Module 1	**Understanding Mental Health**	Assignment		**6 Sessions**		
• **Topics:** Define mental health and its components (emotional, psychological, and social well-being). • Identify common mental health challenges (anxiety, depression, bipolar disorder, schizophrenia, etc.). • Explain the impact of stigma and discrimination on mental health.						

Module 2	**Emotional Intelligence**	Assignment		**6 Sessions**
• **Topics:** Define emotional intelligence and its components (self-awareness, self-regulation, social awareness, relationship management). • Discuss the role of emotional intelligence in personal and professional success. Develop strategies for enhancing emotional intelligence				
Module 3	**Stress Management and Coping**	Assignment		**6 Sessions**
• **Topics:** Define stress and its types (acute, chronic). • Identify common stress management techniques (relaxation, meditation, time management). • Develop coping strategies for handling stress and adversity.				
Module 4	**Mental Health Promotion and Prevention**	Assignment		**6 Sessions**
• **Topics:** Discuss the importance of mental health promotion and prevention. • Identify risk and protective factors for mental health. • Develop strategies for promoting mental well-being in individuals and communities.				
Module 5	**Mental Health Treatment and Support**	Assignment		**6 Sessions**
• Explain different mental health treatment approaches (psychotherapy, medication, etc.). • Discuss the role of support systems in mental health recovery. • Identify resources for mental health support and crisis intervention				
Targeted Application & Tools that can be used: • **Self-assessment tools** – mental health checklists, emotional intelligence tests • **Stress management apps** – Headspace, Calm, Breathe2Relax • **E-counseling platforms** – iCall, Talkspace (demo or simulation) • **Collaborative tools** – Google Slides/Docs for presentations, Canva for infographics • **Online survey tools** – Google Forms or Microsoft Forms (for community assessments)				
Project work/Assignment: Mention the Type of Project /Assignment proposed for this course: **1. Article review:** Review a scientific or journalistic article on mental health stigma or recent advances in therapy.				

2. Presentation: "The Role of Emotional Intelligence in Workplace Mental Health" or "Youth Mental Health Trends in India" **3. Case Study**: Analyze a fictional or real-life case dealing with stress, emotional management, or a mental health recovery journey, and propose solutions or interventions.
Text Book 1. Psychology and Life by Richard J. Gerrig and Philip G. Zimbardo
References 1. Abnormal Psychology by Ronald J. Comer 2. Emotional Intelligence: Why It Can Matter More Than IQ by Daniel Goleman 3. Emotional Intelligence 2.0 by Travis Bradberry and Jean Greaves **Online learning resources:** https://www.cdc.gov/mental-health/about/index.html?utm_source=chatgpt.com https://www.verywellhealth.com/mental-illness-5113353?utm_source=chatgpt.com
Topics relevant to "SKILL DEVELOPMENT": • Emotional intelligence training • Stress management and mindfulness practices • Community mental health advocacy • Communication and empathy skills • Crisis response and help-seeking behavior

Semester IV

Course Code: BPRTRC401	**Course Title:** Respiratory Care Technology - Clinical I **Type of Course: Core Course**	**L-T- P- C**	2	1	2	4
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course provides an in-depth understanding of various respiratory disorders, focusing on upper respiratory tract diseases, pulmonary infections, airway and interstitial lung diseases, and pleural conditions.					
Course Objective	1. Acquire proficiency in assessing patients with respiratory symptoms, including history taking, physical examination, and diagnostic test interpretation. 2. Develop a systematic approach to diagnosing common respiratory diseases. 3. Understand the pathophysiology of common respiratory diseases and their impact on the patient. 4. Acquire knowledge of pharmacological and non-pharmacological management options for respiratory diseases.					

	5. Develop skills in selecting and implementing appropriate respiratory care interventions. 6. Master the principles of oxygen therapy, aerosol therapy, and airway clearance techniques. 7. Understand the role of pulmonary function tests in the assessment and management of respiratory diseases. 8. Develop the ability to recognize and manage respiratory emergencies. 9. Foster effective communication and collaboration with other healthcare providers.			
Basic skill sets required for the laboratory:	• Proficiency in clinical history taking and patient communication • Knowledge of basic respiratory anatomy and physiology • Competency in using respiratory care equipment (e.g., nebulizers, humidifiers, oxygen delivery devices) • Skill in interpreting patient signs and symptoms to select appropriate care • Ability to follow aseptic and safety protocols • Accurate documentation of patient findings and procedures			
Course Outcomes	**On successful completion of the course the students shall be able to:** • **CO1:** Explain the pathophysiology and clinical manifestations of upper respiratory disorders. • **CO2:** Describe the types, causes, and treatment of pulmonary infections including tuberculosis and pneumonia. • **CO3:** Differentiate between obstructive and restrictive airway diseases, including asthma, COPD, and bronchiectasis. • **CO4:** Discuss interstitial lung diseases and their clinical significance. • **CO5:** Analyze the diagnosis and management of pleural diseases such as effusion, pneumothorax, and empyema. • **CO6:** Apply clinical knowledge to identify and manage respiratory conditions through evidence-based approaches.			
Course Content:				
Module 1	**Upper Respiratory Disorders**	Assignment		**12 sessions**
Topics: 1. Upper Respiratory Tract - Acute rhinitis, sinusitis, pharyngitis, Larynogotrachiitis and Epiglotitis.				

2. Sleep Apnoea Syndrome

Module 2	**Pulmonary Infections**	Assignment		**15 sessions**

Topics: Pulmonary Infections

a) Common viral and fungal lower respiratory infections.
b) Pulmonary tuberculosis. Pneumonia: community acquired, hospital acquired, in immune compromised host. Atypical pneumonia.
c) Lung abscess.

Module 3	**Airway And Interstitial Lung Disease**	Assignment		**18 sesssion**

Topics: Diseases of the Airway

- a) Bronchitis, Asthma, Chronic Obstructive Pulmonary Disease (COPD).
- b) Bronchiectasis.

2**. Interstitial Lung Disease**

3. Pleural Diseases

- Pleural Effusion, Pneumothorax, Hemothorax, Empyema, Thoracis.

List of Laboratory Tasks:

1. Demonstration of history taking and clinical examination
2. Patient assessment and therapeutic decision-making
3. Oxygen therapy – nasal cannula, face mask, venturi mask
4. Nebulization technique – equipment setup and patient administration
5. Chest physiotherapy – postural drainage and percussion
6. Humidification techniques
7. Documentation of procedures and patient response

Targeted Application & Tools that can be used:

1. **Diagnostic interpretation tools** – chest X-ray, HRCT scan analysis
2. **Spirometry and PFT software**
3. **Clinical case simulation platforms**
4. **eLearning tools** – UpToDate, Radiopaedia, PubMed for current literature

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:

1. Article review : Review a journal article on the rising incidence of multi-drug resistant tuberculosis or updates in COPD management.

2. Presentation: "Management of Community-Acquired Pneumonia" or "Current Trends in Asthma Care"

3. Case Study: A patient presenting with pleural effusion—assessment, diagnosis, and management plan.

Text Book

Fundamentals of Respiratory Care" by Robert M. Kacmarek, J. M. Stoller, and Al Heuer

References

1. "Applied Respiratory Physiology" by Peter J. S. D. DePalo
2. "Respiratory Care: Principles and Practice" by Dean Hess and J. M. Albin
3. "Clinical Respiratory Medicine" by Steven E. Weinberger and J. W. K. Cloutier

Online learning resources:

1. American Association for Respiratory Care (AARC) – www.aarc.org
2. MedEdPortal
3. YouTube channels on RT procedure demos (e.g., RTClinic, Khan Academy Medicine)

Topics relevant to "SKILL DEVELOPMENT":

1. Clinical case interpretation
2. Spirometry and pulmonary function test skills
3. Diagnostic imaging (CXR and HRCT) reading
4. Patient counseling on asthma and COPD
5. Interpretation of arterial blood gases (ABGs)
6. Understanding infection control protocols for TB and pneumonia

Course Code: BPRTRA402	**Course Title Respiratory Care Technology - Applied I** **Type of Course: Core Course**	**L-T- P- C**	2	1	2	4
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					

Course Description	This laboratory course equips students with practical knowledge and hands-on skills in respiratory care documentation, basic and advanced principles of mechanical ventilation, and clinical monitoring. The course focuses on respiratory therapy interventions for systemic diseases with pulmonary manifestations, ventilator settings, waveform interpretation, and patient assessment techniques relevant to mechanical ventilation.			
Course Objective	1. To develop competency in documentation related to respiratory care. 2. To understand and demonstrate assessment techniques to evaluate the need for respiratory therapy. 3. To explain the fundamental concepts and operational principles of mechanical ventilators. 4. To recognize clinical situations that require mechanical ventilation and apply appropriate ventilator settings. 5. To perform comprehensive patient monitoring during mechanical ventilation. 6. To correlate pulmonary complications with systemic diseases and deliver appropriate respiratory care.			
Basic skill sets required for the laboratory:	1. Basic understanding of pulmonary physiology 2. Familiarity with respiratory care principles 3. Preliminary knowledge of ABG interpretation 4. Ability to perform basic patient assessments 5. Understanding of clinical terminology and patient care protocols			
Course Outcomes	**On successful completion of the course the students shall be able to:** **CO1:** Document respiratory care procedures accurately and systematically. **CO2:** Assess the need for respiratory therapy based on clinical findings. **CO3:** Describe basic principles of mechanical ventilation including compliance, resistance, and ventilation parameters. **CO4:** Demonstrate the ability to set up and operate different types of mechanical ventilators. **CO5:** Interpret ventilator waveforms and make necessary adjustments. **CO6:** Monitor patients effectively using clinical and instrumental methods during mechanical ventilation.			
Course Content:				
Module 1	**Documentation and Assessment for Respiratory care**	Assignment		**10 sessions**
Topics:				

1. Documentation in respiratory care

2. Assessment for need of respiratory care and therapy

3. Respiratory care for pulmonary manifestation/complications of diseases of other organ systems.

Module 2	**Mechanical ventilation – Basics**	Assignment		**20 Sessions**

Topics: 1. Principles of Mechanical Ventilation

Airway resistance, lung compliance, dead space ventilation, ventilatory failure, oxygenation failure, clinical conditions leading to mechanical ventilation, and operating modes of mechanical ventilation.

2. Mechanical Ventilators

Classification, working principles, drive mechanism, control circuits, control variables, phase variables, output, waveform, alarm system, and basic ventilator waveform analysis.

3. Initiation of Mechanical Ventilation

Indications, contraindications, initial ventilator settings, ventilator alarm settings, and hazards and complications.

Module 3	**Mechanical ventilation – Monitoring**	Assignment		**15 Sessions**

Topics: Monitoring in mechanical ventilation: concepts of monitoring, vital signs, chest inspection and auscultation, fluid electrolyte balance, arterial blood gases, oxygen and end tidal carbon dioxide monitoring.

List of Laboratory Tasks:

1. Clinical situations and its management

2. Recognition of signs suggestive of complications related to ventilation

3. Home care plan preparation

4. Demonstration of various monitoring procedures

5. Initial ventilator settings for different clinical conditions

6. Operating mechanical ventilators, NIV, monitors, infusion and syringe pumps

Targeted Application & Tools that can be used:

- Mechanical ventilators (simulated or real units)
- Pulse oximeter, capnography device, ABG analyzer
- Clinical mannequins for simulation
- Respiratory care documentation software or EHR templates
- Multimedia tools for waveform interpretation
- Ventilator simulator apps (e.g., IngMar Medical, VentSim)

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:
1. Article review : Review and critique of latest mechanical ventilation practices
2. Presentation: Case-based ventilator setup and management plan
3. Case Study: Documentation and monitoring analysis for a patient on ventilatory support

Text Book
Fundamentals of Respiratory Care" by Robert M. Kacmarek, J. M. Stoller, and Al Heuer

References

1. "Applied Respiratory Physiology" by Peter J. S. D. DePalo
2. "Respiratory Care: Principles and Practice" by Dean Hess and J. M. Albin
3. "Clinical Respiratory Medicine" by Steven E. Weinberger and J. W. K. Cloutier

Online learning resources:

1. www.aarc.org – American Association for Respiratory Care
2. www.rcjournal.com – Respiratory Care Journal
3. Elsevier ClinicalKey and Medscape articles
4. Ventilator simulators: IngMar Medical, VentSim
5. YouTube: Demonstrations from reputable clinical institutions

Topics relevant to "SKILL DEVELOPMENT":

1. Clinical documentation skills
2. Real-time patient assessment and monitoring
3. Ventilator setup and troubleshooting
4. ABG and waveform interpretation
5. Interdisciplinary clinical decision-making
6. Use of simulation tools for critical care training

Course Code: BPRTBI403	**Course Title: Basic Intensive Care** **Type of Course: Core Course**	**L-T- P- C**	2	1	2	4
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course provides a detailed understanding of multidisciplinary care provided in the Intensive Care Unit (ICU). It covers general ICU care, patient monitoring, infection control practices, nutrition management, and specialized care for systemic failures and trauma.					
Course Objective	1. To familiarize students with the principles and protocols of ICU care and patient monitoring. 2. To impart knowledge about infection control, nutrition, and fluid balance in critically ill patients. 3. To explain ICU management for systemic failures including cardiac, respiratory, renal, and hepatic dysfunctions. 4. To understand trauma management, transfusion practices, and neonatal ventilation in ICU. 5. To introduce interpretation of ICU diagnostics such as X-rays and ultrasounds. 6. To develop awareness of physiotherapy and rehabilitation in the ICU context.					
Basic skill sets required for the laboratory:	1. Understanding of vital signs and physiological parameters 2. Familiarity with ICU terminologies and drug names 3. Ability to operate and interpret basic biomedical devices 4. Competence in aseptic technique and safety practices 5. Communication and teamwork in simulated ICU environment					
Course Outcomes	**On successful completion of the course the students shall be able to:** **CO1.** Describe the essential components of general ICU care and patient transport protocols. **CO2.** Perform and interpret various ICU monitoring methods including invasive monitoring.					

	CO3. Implement effective infection control and nutritional strategies for ICU patients. **CO4.** Identify and manage ICU care for common systemic diseases and organ failure. **CO5.** Apply knowledge in head injury, trauma care, and transfusion practices in ICU. **CO6.** Interpret acid-base imbalances, manage neonatal ventilation, and utilize ICU imaging and physiotherapy techniques.			
Course Content:				
Module 1	**General ICU Care and Monitoring**	Assignment		**10 Sessions**

1. Topics: General Care and Transport of ICU Patients

- Eye, skin, bladder care, position, airways, drains, catheters.
- Transport of critically ill patients to and out of ICU, transport of patients with drains, airway, inotropes, mechanical ventilator.

2. Monitoring in Critical Care

- Vital signs, drains, ECG, fluid intake & output, invasive hemodynamic and central venous pressure monitoring.

Module 2	**Infection Control and Nutrition in ICU**	Assignment		**8 Sessions**

1. Topics: Infection Control in ICU

- Prevention of cross infection, personal protection, antibiotics, and policy.

2. Nutrition and Fluid Balance

- Total parenteral nutrition, nasogastric tube, gastric tube, jejunostomy tube care and feeding.

Module 3	**Systemic Diseases and Care in ICU**	Assignment		**12 Sessions**

Topics: 1. Cardiac Care in ICU

- Hypertension, hypotension, arrhythmias, cardiac arrest, ACLS.

2. Respiratory Care in ICU

- Airway care, tracheostomy care, endotracheal intubation, mechanical ventilation, care of ventilated patient, complications and weaning.

3. Renal Failure

- Types, etiology, complications, corrective measures.

4. Hepatic Failure

- Types, etiology, complications, corrective measures.

Module 4	**Head Injury and Trauma care in ICU**	Assignment		**7 Sessions**

Topics: .

1. Head Injury and Trauma Care

- Glasgow Coma Scale, care of head injury patient, polytrauma patient**.**

2. Blood and Blood Products Transfusion

- Transfusion reactions & complications, massive transfusion.

Module 5	**Acid base disorders, neonatal ventilation, imaging in ICU**	Assignment		**8 Sessions**

Topics: 1. Acid-Base & Electrolyte Balance

- Acid-base & electrolyte balance and their correction, fluid, electrolyte, nutrition balance and management.

2. Neonatal Mechanical Ventilation

- Intubation and problems inherent to the neonate, basic principles of neonatal ventilation, modes, initiation and maintenance.

3. Miscellaneous

- X-rays, ultrasound, chest and limb physical therapy in ICU.

List of Laboratory Tasks:

1. Monitoring of Patients

2. Operating devices, ventilator and monitor settings for different clinical conditions

3. Drugs used in Intensive Care

4. Trouble shooting and maintenance of monitors, equipment and ventilators

Targeted Application & Tools that can be used:

1. Multiparameter monitors
2. Mechanical/NIV ventilators
3. Central line manikins
4. ECG/ABG simulators
5. Ultrasound for ICU imaging
6. Chest physiotherapy tools

7. Transport stretchers with ventilator support

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:
1. Article review Latest ICU care guidelines (e.g., sepsis, ARDS, COVID protocols)
2. Presentation: Presentation on care protocols (e.g., tracheostomy care, fluid resuscitation)
3. Case Study: **Case Study** analysis involving multiple organ support in ICU

Text Book
"Basic Intensive Care Medicine" by Paul L. Marino

References

1. "Intensive Care Medicine: A Comprehensive Review" by Andrew Webb and Duncan Young
2. "Fundamentals of Critical Care Medicine" by Michael E. O'Connor and Joseph E. Parrillo
3. "Principles of Critical Care" by Frederick A. M. P. 8th Edition

Online learning resources:
1. https://www.utas.edu.au/study/short-courses/basic-assessment-and-support-in-intensive-care?utm_source=chatgpt.com
2. https://www.westernhealth.org.au/EducationandResearch/Education/Pages/CourseOutlines/BASIC-Course-%28Basic-Assessment-and-Support-in-Intensive-Care%29.aspx?utm_source=chatgpt.com
3. https://asterhealthacademy.com/courses/certificate-level-program-in-critical-care-medicine/?utm_source=chatgpt.com

Topics relevant to "SKILL DEVELOPMENT":

1. ICU device handling and monitoring
2. Patient transport and triage in critical settings
3. Decision-making under pressure
4. Antibiotic stewardship
5. Nutritional and electrolyte therapy
6. Trauma triage and protocol-based care
7. Interpretation of critical diagnostics
8. Respiratory and cardiac resuscitation skills

Course Code: BPRTCP04	**Course Title: Chest Physical Therapy and Pulmonary Rehabilitation Type of Course: Core Course**	**L-T- P- C**	2	1	0	3

Version No.	1.0			
Course Pre-requisites	None			
Anti-requisites	None			
Course Description	This course introduces the foundational concepts of physical therapy in relation to respiratory care, focusing on chest physiotherapy techniques, respiratory muscle strengthening, and pulmonary rehabilitation. It covers both hospital-based and home-care approaches, emphasizing patient assessment, therapy planning, safety considerations, and evidence-based therapeutic modalities.			
Course Objective	1. Develop a comprehensive understanding of various respiratory disorders and their impact on the patient. 2. Acquire proficiency in assessing respiratory function and identifying factors affecting it. 3. Master the techniques of chest physical therapy, including postural drainage, percussion, vibration, and autogenic drainage. 4. Develop the ability to design and implement individualized pulmonary rehabilitation programs. 5. Understand the principles of exercise physiology and its application to pulmonary rehabilitation. 6. Develop effective patient education and counselling skills for self-management. 7. Foster interdisciplinary collaboration for optimal patient care.			
Course Outcomes	**On successful completion of the course the students shall be able to:** **CO1.** Understand the physical principles applied in chest physical therapy. **CO2.** Assess the patient's condition and determine the need for airway clearance and lung expansion therapy. **CO3.** Apply appropriate airway clearance and lung expansion techniques with monitoring. **CO4.** Demonstrate competence in prescribing and supervising respiratory muscle training and breathing exercises. **CO5.** Plan and implement pulmonary rehabilitation programs, including cardiopulmonary exercise testing. **CO6.** Prepare and manage comprehensive home care plans for long-term pulmonary care.			
Course Content:				
Module 1	**Introduction**	Assignment		**6 Sessions**
Topics: 1. Introduction to Physical Therapy: Mention of physical quantities and basic principles used in physical therapy.				

2. Introduction to Chest Physical Therapy: Assessment of need for chest physical therapy, use and principles of chest physical therapy methods and devices, selection of method and device, precautions, monitoring of patient, and preparation of care plan.				
Module 2	**Airway Clearance Therapy**	Assignment		**10 Sessions**
Topics: Airway Clearance Therapy: Indications, contraindications, procedure, complications; selection of method and device, precautions, and monitoring of patient.				
Module 3	**Lung Expansion Therapy**	Assignment		**9 Sessions**
Topics: Lung Expansion Therapy: Indications, contraindications, procedure, complications; selection of method and device, precautions, and monitoring of patient.				
Module 4	**Respiratory Muscle Strengthening**	Assignment		**8 Sessions**
Topics: Respiratory Muscle Strengthening and Breathing Exercises: Indications, contraindications, procedure, complications; selection of method and device, precautions, and monitoring of patient.				
Module 5	**Pulmonary Rehabilitation and Home care Plan**	Assignment		**12 Sessions**
1. Pulmonary Rehabilitation: Goals, scientific basis and principles; components and methods; assessment of the patient and selection; cardiopulmonary exercise testing; planning the rehabilitation program; monitoring during rehabilitation and complications; cardiac rehabilitation. **2.** Home Care Plan for Pulmonary Rehabilitation.				
Targeted Application & Tools that can be used: 1. Incentive spirometer 2. IPPB device 3. Oscillatory PEP devices 4. Respiratory training devices (e.g., Threshold IMT) 5. Pulse oximeter 6. CPET equipment (if available) 7. Patient simulation software				

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:

1. Article review : Review of recent research on effectiveness of pulmonary rehab.

2. Presentation: Comparison of airway clearance devices with clinical application.

3. Case Study: Design a chest physiotherapy plan for a COPD or bronchiectasis patient.

Text Book

1. Physical Therapy for the Pulmonary Patient" by Deborah L. Haines and Michael L. S. Gossman

References

1. "Pulmonary Rehabilitation: Guidelines to Success" by John R. Bach and David P. Claman
2. "Pulmonary Rehabilitation: An Interdisciplinary Approach" by Scott T. K. Trujillo and Janet L. Weinberger
3. "Chest Physical Therapy: A Clinical Approach" by Robert L. Wilke and Barbara J. Koss

Online learning resources:

1. https://reliasacademy.com/rls/store/courses/skill-builder-performing-chest-pt/_/A-product-c1201504?utm_source=chatgpt.com
2. https://rotherhamrespiratory.com/lungs-courses/pulmonary-rehabilitation-course-online/?utm_source=chatgpt.com
3. https://respirehab.com/?utm_source=chatgpt.com

Topics relevant to "SKILL DEVELOPMENT":

1. Respiratory care device handling
2. Physiological monitoring during therapy
3. Clinical decision-making in patient care planning
4. Safe and effective implementation of therapy protocols
5. Patient education and motivation for home rehabilitation

Course Code: BPAHDM405	**Course Title: Disaster Management** **Type of Course: Minor**	**L-T- P- C**	2	1	0	3
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course provides a foundational understanding of disaster management with a focus on preparedness, mitigation, response, and recovery. Students will learn to distinguish between emergency and disaster scenarios, assess risks and vulnerabilities, understand disaster impact on development, and apply strategic frameworks for disaster preparedness and response.					
Course Objective	1. Understand types and phases of disasters. 2. Learn risk assessment and mitigation strategies. 3. Master emergency response protocols. 4. Develop coordination and leadership skills.					

	5. Enhance communication and teamwork abilities. 6. Implement disaster preparedness plans. 7. Evaluate and improve disaster response effectiveness. 8. Provide immediate medical and humanitarian aid.			
Course Outcomes	**On successful completion of the course the students shall be able to:** **CO1:** Explain the types, causes, and consequences of various disasters. **CO2:** Understand and apply the phases of the disaster management cycle. **CO3:** Analyze the interrelationship between disasters and development. **CO4:** Evaluate strategies for disaster mitigation and preparedness. **CO5:** Develop disaster response and recovery plans using modern methodologies. **CO6:** Integrate child protection and gender considerations in disaster **planning.**			
Course Content:				
Module 1	**Introduction to Disaster Management**	Assignment		**8 Sessions**
Topics: Introduction, Distinguishing between an emergency and a disaster situation, Types of natural and non-natural disasters, Implications of disasters on your region and environment.				
Module 2	**Disaster Management Cycle – Phase I: Mitigation**	Assignment		**10 Sessions**
Topics: Disaster Management Cycle. Disaster Mitigation, Mitigation strategies5 Hazard identification and vulnerability analysis, Mitigation strategies or measures Disaster Mitigation and Infrastructure Considerations, Disaster and Development The impact of disasters on development programs Vulnerabilities caused by development, Development programs can decrease vulnerability, Developing a draft country-level disaster and development policy.				
Module 3	**Disaster Management Cycle – Phase II:Preparedness**	Assignment		**15 Sessions**
Topics: Introduction Disaster Preparedness, Disaster Risk Reduction (DRR), The Emergency Operation Plan (EOP), Developing and Writing the EOP, Mainstreaming Child Protection and Gender in Emergency Planning				

Module 4	**Disaster Management Cycle – Phases III and IV: Response and Recovery**	Assignment		**12 Sessions**

Topics: Disaster Response, Aims of disaster response, Disaster Response Activities, Modern and traditional responses to disasters, Modern methods of disaster response, Disaster Recovery, The Recovery Plan, Disasters as opportunities for development initiatives

Targeted Application & Tools that can be used:

- GIS & remote sensing tools for hazard mapping
- Online disaster simulation platforms (e.g., UNDRR tools)
- E-learning modules from NDMA, UNISDR, Sphere Handbook
- Risk assessment templates and software
- Community engagement frameworks

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:
1. Article review : Review recent case studies on disaster response in India.
2. Presentation: Create a community-based disaster preparedness plan.
3. Case Study: Analyze a real disaster event (e.g., Kerala floods, 2004 Tsunami) covering all phases of the disaster cycle.

Text Book
Disaster Management by R.B. Singh

References

1. **Natural Hazards and Disaster Management: Vulnerability and Mitigation** by R.B. Singh
2. **Disaster Management: A Comprehensive Approach** by S. Lakshmi:

Online learning resources:

1. https://nidm.gov.in/online.asp
2. https://get.disasterready.org/disaster-management/
3. https://onlinecourses.swayam2.ac.in/ntr25_ed61/preview

Topics relevant to "SKILL DEVELOPMENT":

1. Disaster risk and vulnerability mapping
2. Community-based disaster management (CBDM)
3. Development of Emergency Operation Plans (EOP)
4. Rapid needs assessment and resource coordination
5. Inclusion of vulnerable groups in disaster strategies

Course Code: BPAHME406	**Course Title:** Medical Ethics & Legal Aspects **Type of Course: Minor**			**L-T- P- C**	2	1	0	3
Version No.	1.0							
Course Pre-requisites	None							
Anti-requisites	None							
Course Description	This course provides a comprehensive overview of the ethical and legal frameworks guiding healthcare professionals. It aims to instill a strong foundation in medical ethics, patient rights, legal obligations, and the principles that govern medical decision-making.							
Course Objective	1. Understand ethical principles guiding medical practice. 2. Comprehend legal frameworks governing healthcare. 3. Analyze ethical dilemmas in medical decision-making. 4. Navigate legal responsibilities in patient care. 5. Apply ethical reasoning in clinical and research contexts. 6. Interpret healthcare laws and regulations. 7. Foster ethical behaviour and professionalism in healthcare. 8. Address conflicts between medical ethics and legal requirements. 9. Advocate for patient rights and autonomy.							
Course Out Comes	**On successful completion of the course the students shall be able to:** **CO1.** Define medical ethics and describe its scope and goals in healthcare practice. **CO2.** Interpret the legal and ethical aspects of malpractice, negligence, and patient rights. **CO3.** Explain the medico-legal significance of documentation and patient confidentiality. **CO4.** Apply ethical principles to case-based situations in medical laboratory practice. **CO5.** Critically evaluate dilemmas involving end-of-life care, reproductive rights, and healthcare disparities. **CO6.** Demonstrate professional conduct in accordance with ethical and legal standards.							
Course Content:								
Module 1	**Introduction to Medical Ethics and**	Assignment		**10 Sessions**				

	Code of Conduct			
Topics: Medical ethics – Definition – Goal – Scope, Introduction to Code of conduct, Basic principles of medical ethics – Confidentiality				
Module 2	**Malpractice, Negligence, and Patient Rights**	Assignment		**12 Sessions**
Topics: Malpractice and negligence – Rational and irrational drug therapy, Autonomy and informed consent – Right of patients, Care of the terminally ill- Euthanasia. Development of standardized protocol to avoid near miss or sentinel events				
Module 3	**Medico-Legal Aspects and Ethics in Laboratory Practice**	Assignment		**13 Sessions**
Topics: Organ transplantation, 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. Ethics in the profession of Medical Laboratory Science.				
Module 4	**Ethical Principles and Contemporary Issues in Healthcare**	Assignment		**10 Sessions**
Topics: Autonomy, Beneficence, Non-malfeasance, Justice and confidentiality, Informed consent, medical privacy, end-of-life care, reproductive rights, and healthcare disparities				
Targeted Application & Tools that can be used: 1. Case law analysis tools 2. Ethical dilemma simulation activities 3. Clinical documentation audit frameworks 4. Policy guidelines from MCI, WHO, ICMR				

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course: **1. Article review :** Analyze a peer-reviewed article on informed consent or euthanasia. **2. Presentation:** Present a case on medical negligence or ethical decision-making in ICU. **3. Case Study**: Develop a report on an MLC (Medico-Legal Case) with recommendations for ethical improvement.
Text Book 1. Medical Law and Ethics by B. Sandeepa Bhat
References 1. Perverse Medical Negligence Judgments: The Bane of Modern Medicine by Dr. Shri Gopal Kabra **Online learning resources:** 1. ScienceDirect Topics: Medical Ethics 2. https://nextgenu.org/courses/medical-ethics-online/?utm_source=chatgpt.com 3. https://learningpath.org/articles/Free_Online_Medical_Ethics_and_Bioethics_Courses_from_Top_Universities.html?utm_source=chatgpt.com
Topics relevant to "SKILL DEVELOPMENT": 1. Ethical reasoning and decision-making 2. Handling patient data and documentation 3. Professional communication and conflict resolution 4. Medico-legal writing and case analysis

Course Code: BPAHCC407	**Course Title:** Campus to Corporate **Type of Course: Ability Enhancement**	**L-T- P- C**	2	0	0	2
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course is designed to develop essential soft skills for success in professional, academic, and clinical settings. It emphasizes professional etiquette, effective communication, teamwork, interpersonal relationships, time management, bedside manners, and legal awareness through the POSH Act.					
Course Objective	1. Develop professional etiquette and communication skills for corporate environments.					

<table>
<tr><td></td><td colspan="5">2. Cultivate empathy and effective bedside manners in patient interactions.
3. Understand and comply with Prevention of Sexual Harassment (PoSH) policies and procedures.
4. Practice respectful and inclusive behaviour in workplace interactions.
5. Enhance conflict resolution and problem-solving skills.
6. Learn to navigate workplace dynamics and organizational culture.
7. Develop self-awareness and emotional intelligence.
8. Foster teamwork and collaboration in professional settings.
9. Acquire strategies for managing workplace stress and maintaining well-being.
10. Apply ethical principles and values in corporate and healthcare contexts.</td></tr>
<tr><td>Course Outcomes</td><td colspan="5">On successful completion of the course the students shall be able to:

CO1: Demonstrate appropriate professional etiquette, attire, and workplace behavior.
CO2: Communicate effectively using verbal, non-verbal, listening, and written skills in diverse situations.
CO3: Exhibit teamwork, resolve conflicts constructively, and contribute to collaborative efforts.
CO4: Build strong interpersonal relationships through respect, empathy, and effective conversation.
CO5: Apply time management and emotional self-regulation techniques for personal and professional balance.
CO6: Understand and apply the POSH Act to foster a safe, inclusive work/study environment.</td></tr>
<tr><td>Course Content:</td><td colspan="5"></td></tr>
<tr><td>Module 1</td><td>Professional Etiquette</td><td>Assignment</td><td></td><td colspan="2">4 Sessions</td></tr>
<tr><td colspan="6">Topics: Making a strong first impression
• Dress code and professional attire
• Displaying courtesy and respect in the workplace
• Workplace etiquette and protocol</td></tr>
<tr><td>Module 2</td><td>Communication Skills</td><td>Assignment</td><td></td><td colspan="2">5 Sessions</td></tr>
<tr><td colspan="6">Topics: Effective verbal and non-verbal communication
• Active listening techniques
• Developing questioning skills
• Written communication and professional writing</td></tr>
<tr><td>Module 3</td><td>Teamwork and Collaboration</td><td>Assignment</td><td></td><td colspan="2">4 Sessions</td></tr>
<tr><td colspan="6">Topics: Understanding corporate values and culture</td></tr>
</table>

- Building trust and effective teams
- Conflict resolution and management
- Team synergy and collaboration

Module 4	**Interpersonal Skills**	Assignment		**3 Sessions**

Topics: Developing strong interpersonal relationships
- Acknowledging and respecting differences
- Conversation etiquette and building rapport
- Professional boundaries and social media etiquette

Module 5	**Time Management and Self-Management**	Assignment		**4 Sessions**

Topics: Prioritization and time management techniques
- Dealing with distractions and procrastination
- Work-life balance strategies
- Self-care practices and emotional intelligence

Module 6	**Bedside Manners**	Assignment		**4 Sessions**

Topics: The concept of bedside manners
- Developing empathy, compassion, and ownership
- Effective patient communication and interaction
- Building trust with patients and their families

Module 7	**POSH (Prevention of Sexual Harassment)**	Assignment	**6 Session**	**20 Sessio**

Topics:
- Understanding the changing work environment
- The POSH Act: key provisions and implications
- Prevention and reporting of sexual harassment
- Creating a safe and inclusive workplace

Targeted Application & Tools that can be used:

1. Case-based discussion platforms
2. Self-assessment and personality tools (MBTI, Johari Window)
3. Mock interviews, group activities, empathy exercises

4. POSH policy templates and real-life workplace simulations

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:

1. Article review: Explore a real-life case of professional misconduct or exemplary bedside manner.

2. Presentation: Create and deliver a role-play on conflict resolution or patient interaction.

3. Case Study: Analyze a scenario of workplace harassment under the POSH Act and suggest a redressal plan.

Text Book

1. The Power of Etiquette by Peggy Post

References

1. Crucial Conversations: Tools for Talking When Stakes Are High by Kerry Patterson, Joseph Grenny, Ron McMillan, and Al Switzler
2. The Five Dysfunctions of a Team by Patrick Lencioni
3. The Art of Empathy by Karla McLaren

Online learning resources:

1. https://10minuteschool.com/en/product/corporate-ettiquette/?utm_source=chatgpt.com
2. https://training.safetyculture.com/course-collection/empathy-training-courses/?utm_source=chatgpt.com
3. https://www.skillindiadigital.gov.in/courses/detail/35d1b0e0-7dfb-4d07-a3d8-d6632ece72c8?utm_source=chatgpt.com

Topics relevant to "SKILL DEVELOPMENT":

1. Workplace etiquette & grooming
2. Verbal & written communication
3. Team coordination and leadership
4. Empathy and patient communication
5. Time and stress management
6. Legal literacy through POSH

Semester - V

Course Code: BPAHAI501	**Course Title:** Advanced Intensive Care (ACLS, PALS & NALS) **Type of Course: Skill Enhancement**	**L-T- P- C**	2	1	2	4
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course equips students with in-depth knowledge and practical skills necessary to manage critical cardiovascular and respiratory emergencies across the lifespan—from adult advanced cardiac life support (ACLS) to pediatric (PALS) and neonatal resuscitation (NRP). Emphasis is placed on recognizing life-threatening arrhythmias, managing advanced airways, pharmacologic interventions, defibrillation, and performing high-quality CPR through scenario-based training.					
Course Objective	1. Advanced Cardiac Life Support: Students will acquire the skills and knowledge necessary to manage cardiac and respiratory emergencies in critical care settings. 2. Rhythm Recognition: Students will be able to accurately identify and interpret various cardiac rhythms. 3. Pediatric and Neonatal Emergencies: Students will be able to recognize and manage pediatric and neonatal emergencies effectively. 4. Basic Life Support (BLS): Students will master the skills and knowledge necessary to perform BLS for infants and children. 5. Pediatric Advanced Life Support (PALS): Students will apply advanced life support techniques to manage pediatric emergencies. 6. Neonatal Resuscitation: Students will learn the principles and techniques of neonatal resuscitation.					
Basic skill sets required for the laboratory:	1. Basic Life Support (BLS) proficiency 2. ECG rhythm interpretation 3. Airway handling (mask, oral, and intubation) 4. IV access and drug calculation 5. Teamwork and communication in emergencies					
Course Outcomes	**On successful completion of the course the students shall be able to:** **CO1:** Apply the ACLS, PALS, and NRP algorithms in simulated and clinical scenarios. **CO2:** Recognize cardiac rhythms and provide appropriate defibrillation and pacing interventions. **CO3:** Perform advanced airway management procedures including intubation and cricothyrotomy. **CO4:** Administer emergency medications with correct dosage, route, and timing in adults and children. **CO5:** Execute effective pediatric and neonatal resuscitation including					

	pharmacological and airway management. **CO6:** Demonstrate decision-making skills and teamwork in simulated emergency case scenarios.			
Course Content:				
Module 1	**Advanced Cardiac Life Support Algorithms**	Assignment		**6 Sessions**
Topics: ACLS algorithm o Cardiac rhythm recognition o Advanced airway management (intubation, cricothyrotomy) o ACLS medications (e.g., epinephrine, amiodarone, vasopressin) o Post-arrest care (temperature management, sedation) o Neurologic assessment				
Module 2	**Pharmacology in ACLS**	Assignment		**5 Sessions**
Topics: ACLS medications (e.g., epinephrine, amiodarone, vasopressin, atropine) o Indications, dosages, and administration routes o Mechanisms of action and side effects o Drug calculations o Adverse drug reaction management				
Module 3	**Advanced Airway Management**	Assignment		**6 Sessions**
Topics: Endotracheal intubation techniques o Difficult airway management o Cricothyrotomy o Airway complications (e.g., aspiration, tube dislodgement				
Module 4	**Defibrillation and Pacing**	Assignment		**5 Sessions**
Topics: Defibrillation principles (biphasic, monophasic) o Defibrillation technique o Pacemaker modes (e.g., fixed-rate, demand) o Pacing indications and complications				
Module 5	**Post-Arrest Care and Neurologic Assessment**	Assignment		**6 Sessions**
Topics: Post-arrest care (temperature management, sedation) o Neurologic assessment (GCS, pupil response)				

- Targeted temperature management

Module 6	**Pediatric Basic Life Support (PBLS)**	Assignment		**5 Sessions**

Topics: Pediatric BLS algorithm
- CPR for infants and children
- AED use in pediatrics
- Airway management in children

Module 7	**Pediatric Advanced Life Support(PALS**	Assignment		**8 Sessions**

Topics: PALS algorithm
- Pediatric cardiac arrest management
- PALS medications (e.g., epinephrine, amiodarone, vasopressin)
- Advanced airway management
- Pediatric cardiac monitoring and defibrillation

Module 8	**Neonatal Resuscitation**	Assignment		**Sessions**

Topics: NRP algorithm
- Newborn assessment (Apgar score, respiratory distress, bradycardia)
- Neonatal ventilation techniques
- Neonatal chest compressions
- Neonatal medications (e.g., epinephrine, volume expanders)

Module 9	**Pediatric Pharmacology**	Assignment		**4 Sessions**

Topics: Pediatric drug dosage calculations
- Pharmacokinetics in children
- Common pediatric medications (e.g., epinephrine, atropine, amiodarone)
- Medication administration routes and technique.

List of Laboratory Tasks:

1. Practice ACLS algorithm execution with simulated cardiac arrest scenarios.
2. Identify and interpret ECG rhythms (VF, VT, PEA, asystole, etc.).
3. Perform simulated code blue response on adult manikins.
4. Prepare and administer ACLS drugs like epinephrine, amiodarone, and vasopressin.

5. Demonstrate IV drug delivery and calculate emergency drug doses.
6. Manage adverse drug reactions in emergency settings.
7. Perform oral and nasal endotracheal intubation on airway models.
8. Demonstrate effective bag-valve-mask ventilation techniques.
9. Simulate emergency cricothyrotomy procedure.
10. Identify and troubleshoot airway complications (aspiration, tube dislodgement).

Targeted Application & Tools that can be used:

1. ECG rhythm simulators
2. Neonatal and pediatric manikins
3. Defibrillator and AED training units
4. Airway management kits and simulation videos
5. Emergency drug cards and calculators

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:
1. Article review: Scientific literature on survival outcomes post-ACLS/PALS
2. Presentation: PALS algorithm interpretation with simulated case
3. Case Study: Neonatal resuscitation management with complications

Text Book

- AHA ACLS , BLS Provider Manual

References

1. AHA Pediatric Advanced Life Support Provider Manual
2. AHA NALS Guidelines

Online learning resources:

1. www.heart.org – AHA Guidelines
2. www.nrpexam.org – Neonatal Resuscitation Program
3. www.openpediatrics.org – Pediatric emergency learning
4. YouTube channels: Laerdal Medical, AHA Training Videos

Topics relevant to "SKILL DEVELOPMENT":

1. Critical decision-making under stress
2. ECG interpretation and rhythm recognition
3. Emergency pharmacology and drug administration
4. Simulation-based clinical reasoning
5. Airway and resuscitation equipment handling
6. Pediatric and neonatal emergency care skills

Course Code: BPRTRC502	**Course Title: :** Respiratory Care Technology - Clinical II **Type of Course: Core Course**	**L-T- P- C**	2	1	2	4
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course provides in-depth knowledge of complex respiratory conditions including chest wall abnormalities, neuromuscular and pulmonary vascular diseases, acute lung injury, ARDS, lung cancer, and pediatric respiratory disorders. Emphasis is placed on understanding pathophysiology, clinical features, diagnostics, and management strategies for both adult and pediatric populations.					
Course Objective	1. Acquire proficiency in assessing patients with respiratory symptoms, including history taking, physical examination, and diagnostic test interpretation. 2. Develop a systematic approach to diagnosing common respiratory diseases. 3. Understand the pathophysiology of common respiratory diseases and their impact on the patient. 4. Acquire knowledge of pharmacological and non-pharmacological management options for respiratory diseases. 5. Develop skills in selecting and implementing appropriate respiratory care interventions. 6. Master the principles of oxygen therapy, aerosol therapy, and airway clearance techniques. 7. Understand the role of pulmonary function tests in the assessment and management of respiratory diseases. 8. Develop the ability to recognize and manage respiratory emergencies. 9. Foster effective communication and collaboration with other healthcare providers.					

<table>
<tr><td>Basic skill sets required for the laboratory:</td><td colspan="4">1. Proper handling and use of respiratory care equipment
2. Infection control and patient preparation techniques
3. Proficiency in interpreting PFT, ABG, ECG, and chest X-ray results
4. Communication and documentation skills in a clinical setting
5. Decision-making based on diagnostic reports</td></tr>
<tr><td>Course Outcomes</td><td colspan="4">On successful completion of the course the students shall be able to:

CO1: Describe the pathophysiology and clinical features of chest wall deformities and neuromuscular respiratory conditions.
CO2: Discuss the causes, manifestations, and treatment of major pulmonary vascular diseases including pulmonary hypertension and embolism.
CO3: Explain the mechanisms and clinical implications of pulmonary edema, acute lung injury, and ARDS.
CO4: Analyze the types, diagnostic approaches, and management plans for lung cancer.
CO5: Identify and manage common respiratory disorders in neonates and children.</td></tr>
<tr><td>Course Content:</td><td colspan="4"></td></tr>
<tr><td>Module 1</td><td>Chest wall and pulmonary vascular disease</td><td>Assignment</td><td></td><td>15 Sessions</td></tr>
<tr><td colspan="5">Topics: 1. Neuromuscular Diseases and Chest Wall Abnormalities - Kyphosis, scoliosis , Neuromuscular diseases affecting respiratory muscles

2. Pulmonary Vascular Disease , Pulmonary hypertension , Pulmonary thromboembolism , Pulmonary haemorrhage</td></tr>
<tr><td>Module 2</td><td>ARDS, lung cancer</td><td>Assignment</td><td></td><td>15 Sessions</td></tr>
<tr><td colspan="5">Topics: Pulmonary Oedema, Acute lung injury and ARDS , Lung Cancer</td></tr>
</table>

Module 3	**Respiratory disorders in children**	Assignment		**15 Sessions**

Topics: Respiratory diseases in children and newborn

List of Laboratory Tasks:

1. Procedure demonstration, principles, indications, contraindications and preparation

of patient for basic Respiratory Care procedures.

2. Interpretation of Pulmonary Function Tests, Arterial Blood Gases, ECG and Chest

X-rays

Targeted Application & Tools that can be used:

1. Chest X-rays and CT scans
2. ABG analysis
3. Pulmonary Function Tests (PFTs)
4. Echocardiography (for pulmonary hypertension)
5. Spirometry interpretation software
6. Pediatric manikins for simulated care

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:

1. Article review Latest research on ARDS management or pediatric asthma.
2. Presentation: Clinical case presentation on pulmonary embolism or lung cancer.
3. Case Study: Pediatric patient with congenital lung disorder or neonatal RDS.

Text Book

1. "Clinical Applications of Respiratory Care" by Dean Hess and J. M. Albin

References

1. Advanced Respiratory Care: Clinical Management and Practice" by Michael J. H. Bennett and Andrew M. D. Scott
2. "The Clinical Practice of Respiratory Care" by Robert M. Kacmarek and James W. Stoller
3. "Management of Respiratory Disorders: An Integrated Approach" by R. Philip Dellinger and Michael M. Jones

Online learning resources:

1. MedEdPortal
2. Radiopaedia.org
3. ACLS/PALS online simulations (AHA)

4. ABG and ECG interpretation simulators

Topics relevant to "SKILL DEVELOPMENT":

1. Clinical case analysis
2. Diagnostic reasoning using imaging and ABG
3. Respiratory assessment in pediatric vs adult patients
4. Interpretation of PFT and echocardiography
5. Multidisciplinary care approach in oncology and critical care settings

Course Code: BPRTRA503	**Course Title** Respiratory Care Technology - Applied II **Type of Course: Core Course**	**L-T- P- C**	2	1	2	4
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course provides an in-depth understanding of mechanical ventilation, including its monitoring, complications, and weaning strategies. It also emphasizes the importance of continuing respiratory care in community and home settings. The course integrates clinical case discussions to prepare students for real-life situations and fosters the ability to educate patients and families in long-term respiratory care strategies.					
Course Objective	1. To develop a comprehensive understanding of ventilator settings and their effects on patient physiology 2. To identify, prevent, and manage complications associated with mechanical ventilation 3. To build competency in ventilator weaning techniques and failure management 4. To apply knowledge in home-based respiratory care and community health education					

<table>
<tr><td>Basic skill sets required for the laboratory:</td><td colspan="4">1. Understanding of mechanical ventilation principles
2. Familiarity with critical care terminology and patient monitoring
3. Basic interpretation of ABG, ventilator waveforms, and vital signs
4. Effective communication for patient education and family instruction</td></tr>
<tr><td>Course Outcomes</td><td colspan="4">On successful completion of the course the students shall be able to:

CO1: Analyze the impact of different ventilator settings on ventilation and oxygenation.
CO2: Evaluate the physiological effects of PEEP on various organ systems.
CO3: Recognize and manage complications of mechanical ventilation.
CO4: Apply weaning criteria, indices, and procedures in clinical scenarios.
CO5: Interpret and manage mechanical ventilation through clinical case studies.
CO6: Design and implement home respiratory care plans and provide patient education.</td></tr>
<tr><td>Course Content:</td><td colspan="4"></td></tr>
<tr><td>Module 1</td><td>Mechanical ventilation - Monitoring</td><td>Assignment</td><td></td><td>15 Sessions</td></tr>
<tr><td colspan="5">Topics:
• Effects of various ventilator settings on ventilation and oxygenation.
• Effect of PEEP: pulmonary considerations, effects on the cardiovascular system, hemodynamic, renal & neurological considerations.</td></tr>
<tr><td>Module 2</td><td>Mechanical ventilation - Complications, weaning and Clinical situations</td><td>Assignment</td><td></td><td>15 Sessions</td></tr>
<tr><td colspan="5">Topics: 1. Prevention and Recognition of Complications of Ventilation

2. Weaning from Mechanical Ventilation

• Weaning and its failure, weaning criteria and indices, weaning procedure, signs, causes of weaning failure.</td></tr>
</table>

3. Clinical Situations with Case Studies of Mechanical Ventilation and Management

Module 3	**Respiratory care in community**	Assignment		**15 Sessions**

Topics: 1. Respiratory Care at Home

Home oxygen therapy, home non-invasive ventilation therapy, home aerosol therapy, home mechanical ventilation: goals, indications, patient selection, equipment selection, and home plan for chest physical therapy and pulmonary rehabilitation**.**

2. Health Education and Training

Patient and family education: disease prevention and health promotion.

List of Laboratory Tasks:

1. Clinical situations and its management
2. Recognition of signs suggestive of complications related to ventilation
3. Home care plan preparation
4. Demonstration of various monitoring procedures
5. Initial ventilator settings for different clinical conditions
6. Operating mechanical ventilators, NIV, monitors, infusion and syringe pumps

Targeted Application & Tools that can be used:

1. Mechanical ventilators (ICU-based & portable)
2. ABG analyzers
3. PEEP valves and manometers
4. Weaning assessment tools
5. Patient education leaflets, oxygen concentrators, CPAP/BiPAP devices
6. Multimedia teaching modules for patient education

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:

1. Article review: Current trends in ventilator weaning protocols
2. Presentation: Community-based respiratory care models in India
3. Case Study: Home care plan for a COPD patient on NIV

Text Book

1. "Applied Respiratory Physiology" by Peter J. S. D. DePalo

References

1. "Advanced Respiratory Care: Theory and Practice" by Martin G. MacIntyre and M. J. John
2. "Respiratory Care Anatomy and Physiology: Foundations for Clinical Practice" by William

V. G. Schuster and Philip M. K. Angeletti
3. "Mechanical Ventilation: Clinical Applications and Pathophysiology" by Robert L. Wilke and David H. Collins

Online learning resources:

1. American Association for Respiratory Care (AARC)
2. Open Respiratory Medicine Journal
3. MedEdPORTAL – Simulation Cases

Topics relevant to "SKILL DEVELOPMENT":

1. Mechanical ventilator troubleshooting
2. Interpreting ventilator waveforms
3. Developing patient-specific home care plans
4. Patient and caregiver education techniques
5. Case-based clinical decision-making

Course Code: BPRTAR504	**Course Title:** Respiratory Care Technology – Advanced **Type of Course: Core Course**	**L-T- P- C**	2	1	2	4
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course covers advanced respiratory care techniques including the use of newer oxygen therapy devices, hyperbaric oxygen therapy, invasive and non-invasive mechanical ventilation, management and troubleshooting of mechanical ventilators, neonatal ventilation, and invasive diagnostic procedures like bronchoscopy and medical thoracoscopy.					
Course Objective	1. To familiarize students with modern oxygen delivery systems and hyperbaric oxygen therapy. 2. To develop competency in the use and monitoring of non-invasive and invasive mechanical ventilation. 3. To understand the pharmacological management related to mechanical ventilation. 4. To learn advanced ventilation modes and neonatal ventilation techniques. 5. To gain practical knowledge of bronchoscopy and medical thoracoscopy procedures.					

Basic skill sets required for the laboratory:	1. Understanding of respiratory physiology and pathophysiology 2. Familiarity with mechanical ventilators and monitoring devices 3. Basic knowledge of ABG interpretation and pharmacology 4. Safety and hygiene protocols in clinical environments 5. Manual dexterity and patient communication skills			
Course Outcomes	**On successful completion of the course the students shall be able to:** CO1: Demonstrate the use of newer oxygen therapy devices including ambulatory and hyperbaric oxygen therapy. CO2: Explain the principles, indications, contraindications, and monitoring of non-invasive ventilation (NIV). CO3: Manage and troubleshoot invasive mechanical ventilation, including ventilator alarms, patient safety, and pharmacotherapy. CO4: Apply advanced ventilation modes and provide neonatal mechanical ventilation care effectively. CO5: Demonstrate knowledge of bronchoscopy and medical thoracoscopy, including patient preparation, monitoring, and post-procedure care. CO6: Integrate theoretical knowledge with practical skills to improve patient outcomes in respiratory care.			
Course Content:				
Module 1	**Newer Oxygen therapy devices and hyperbaric oxygen therapy**	Assignment		**7 Sessions**
Topics: . 1. Newer Oxygen therapy devices: Portable/Ambulatory oxygen therapy 2. Hyper baric Oxygen therapy: decompression sickness, caissons disease, high altitude pulmonary oedema.				
Module 2	**Invasive Mechanical**	Assignment		**8 Sessions**

	Ventilation			
Topics: 1. Noninvasive Positive Pressure Ventilation • Introduction, Terminology, Indications, CPAP, Bilevel PAP 2. Principles and Mechanism of Action of NIV in Various Clinical Settings 3. Contraindications and Monitoring During NIV 4. NIV Interface / Mask and Types				
Module 3	**Advanced Management of Mechanical Ventilation**	Assignment		**10 Sessions**
Topics: 1. Management & Troubleshooting of Mechanical Ventilation • Strategies to improve ventilation, improve oxygenation, acid-base & electrolyte balance and their correction, fluid, electrolyte, nutrition balance and management, ventilator alarms and events, care of the ventilation circuit, care of the artificial airway, safety mechanisms and alarms in ventilators. **2. Pharmacotherapy for Mechanical Ventilation** • Drugs for improving ventilation, steroids, MDI medications, neuromuscular blocking agents like nitric oxide, propofol, and anesthetic gases.				
Module 4	**Newer Modes and neonatal ventilation**	Assignment		**10 Sessions**
Topics: **1. Newer Modes of Ventilation** **2. Neonatal Mechanical Ventilation** 6. Intubation and problems inherent to the neonate, surfactant replacement therapy, basic principles of neonatal ventilation, modes, initiation and maintenance, high-frequency ventilation, liquid ventilation.				
Module 5	**Bronchoscopy and Medical Thoracoscopy**	Assignment		**10 Sessions**
Topics: **1. Bronchoscopy:** a) Instrument and components b) Indications and contraindications c) Pre Procedure evaluation d) Preparation of patient for procedure e) Monitoring during procedure f) Post procedure care **2. Medical Thoracoscopy:** a. Instrument and components b. Indications and contraindications c. Pre Procedure evaluation d. Preparation of patients for procedure e. Monitoring during procedure f. Post procedure care				

List of Laboratory Tasks:

1.Operating mechanical ventilators, NIV, monitors, infusion and syringe pumps
2. Recognize and interpretation of basic ventilator waveforms
3. Identify and correction of blood gas, acid base and electrolyte abnormalities.
4. Demonstration of effects of various ventilator settings with test lung
5. Drugs used in Respiratory Care
6. Trouble shooting and maintenance of ventilators
7. Practical aspects of basic respiratory critical care
8. Preparing the patient and assisting in bronchoscopy

Targeted Application & Tools that can be used:

7. Mechanical ventilators (invasive and non-invasive)
8. Hyperbaric oxygen chambers
9. Bronchoscopy and thoracoscopy instruments
10. Patient monitoring systems
11. Simulation software for ventilation scenarios

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:

1. Article review Article review on advances in oxygen therapy or mechanical ventilation
2. Presentation: Presentation on clinical case studies involving NIV or neonatal ventilation
3. Case Study: Case study analysis on management of complications in invasive ventilation

Text Book

1. Egan's Fundamentals of Respiratory Care" by Robert M. Kacmarek, J. M. Stoller, and Al Heuer

References

1."Respiratory Care: Principles and Practice" by Dean Hess and J. M. Albin
2."Clinical Respiratory Medicine" by Steven E. Weinberger, J. W. K. Cloutier, and W. F. H. Chapman
3. "Mechanical Ventilation: Clinical Applications and Pathophysiology" by Robert L. Wilke and David H. Collins

Online learning resources:

1. American Association for Respiratory Care (AARC)
2. Respiratory Therapy Review websites (e.g., RT Clinic, Learnpicu.com)
3. NEJM videos and Medscape procedural guides
4. Open respiratory simulation platforms

Topics relevant to "SKILL DEVELOPMENT":

1. Setup and operation of advanced oxygen therapy devices
2. Patient assessment and monitoring during ventilation
3. Managing ventilator alarms and troubleshooting
4. Performing bronchoscopy and medical thoracoscopy preparation and care
5. Neonatal ventilation techniques and surfactant therapy

Semester-VI

Course Code: BPRTPF601	**Course Title:** Pulmonary Function Testing **Type of Course: Core Course**	**L-T- P- C**	2	1	2	4
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course provides in-depth knowledge and practical exposure to pulmonary function testing (PFT), focusing on the physiological principles, equipment operation, test performance, and interpretation of results. The course includes training in spirometry, diffusion studies, plethysmography, and gas exchange mechanisms to enhance diagnostic skills relevant to respiratory care.					
Course Objective	To develop competency in performing, analyzing, and interpreting pulmonary function tests using standard protocols and modern equipment to aid in the diagnosis and monitoring of respiratory diseases.					
Basic skill sets required for the laboratory:	1. Basic knowledge of respiratory physiology 2. Familiarity with respiratory test equipment 3. Safe handling and calibration of instruments 4. Ability to communicate and coordinate with patients 5. Clinical hygiene and infection control practices					
Course Outcomes	**On successful completion of the course the students shall be able to:** **CO1:** Explain the types, classifications, and significance of various pulmonary function tests **CO2:** Describe the structure and function of the pulmonary interstitium and blood-gas barrier **CO3:** Perform and interpret spirometry, including peak expiratory flow rate **CO4:** Operate diffusion testing equipment and interpret DLCO values **CO5:** Demonstrate understanding and application of body plethysmography for lung volume assessment **CO6:** Correlate test results with ventilation-perfusion mismatch and clinical conditions					
Course Content:						

Module 1	**Introduction to Pulmonary Function Testing**	Assignment		**10 Sessions**
Topics: **1.Types and Classification** - Lung Volumes and Capacities **2.Pulmonary Interstitium, Blood Gas Barrier** - Exchange of Gases Across Alveolar-Capillary Membrane **3.Ventilation-Perfusion Mismatch**				
Module 2	**Spirometry**	Assignment		**12 Sessions**
Topics: Basics of spirometry, various tests and maneuvers in spirometry, spirometer equipment operation and maintenance, performing spirometry tests, basic interpretation, and peak expiratory flow rate.				
Module 3	**Diffusion Studies (DLCO)**	Assignment		**10 Sessions**
Topics: Basics of diffusion studies, Diffusing Capacity of Lungs for Carbon Monoxide (DLCO) including principle and procedure, DLCO equipment operation and maintenance, performing DLCO, and basic interpretation				
Module 4	**Body Plethysmography**	Assignment		**13 Sessions**
Topics: Basics of body plethysmography, lung volume testing, and body plethysmography equipment and basic operation				

List of Laboratory Tasks:

1. Demonstration of pulmonary function testing equipment and calibration
2. Performing and interpreting basic spirometry (FVC, FEV1, FEV1/FVC ratio)
3. Measuring and recording Peak Expiratory Flow Rate (PEFR)
4. Conducting and interpreting DLCO (Diffusing Capacity of Lung for Carbon Monoxide)
5. Operating body plethysmography for lung volume measurements
6. Identifying and managing common errors/artifacts in PFT
7. Maintenance and troubleshooting of PFT equipment
8. Report generation and clinical case interpretation

Targeted Application & Tools that can be used:

1. Spirometers (handheld and lab-based)
2. DLCO machines
3. Body plethysmograph (test chamber)
4. Peak flow meters
5. PFT interpretation software
6. Case-based simulations

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:

1. Article review : Review on latest advancements in PFT technologies

2. Presentation: Present a clinical case using spirometry, DLCO, and body box data

3. Case Study: PFT results of a COPD or interstitial lung disease patient

Text Book

1. "Pulmonary Function Testing: A Practical Approach" by Michael J. H. Bennett and Andrew M. D. Scott

References

1. "Clinical Pulmonary Medicine" by Richard J. Dutton and David A. Schwartz
2. "Interpretation of Pulmonary Function Tests: A Practical Guide" by Thomas J. P. B. L. MacIntyre
3. "Pulmonary Function Testing: A Case-Based Approach" by William W. Brundage and James H. Butler

Online learning resources:

1. American Thoracic Society (ATS) guidelines for spirometry and DLCO
2. ERS e-learning modules
3. Video tutorials (e.g., YouTube – RT Channel, MedCram)

Topics relevant to "SKILL DEVELOPMENT":

1. Spirometry test performance
2. Diffusion and plethysmography interpretation
3. Equipment troubleshooting and calibration
4. Clinical correlation of respiratory physiology
5. Report writing and communication of test results

Course Code: BPRTV602	**Course Title: Ventilator Management** **Type of Course: Core Course**	**L-T- P- C**	2	1	2	4
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course introduces the principles, monitoring, management, and complications associated with mechanical ventilation in clinical practice. Emphasis is placed on understanding ventilatory physiology, ventilator mechanics, waveform interpretation, patient monitoring, and evidence-based weaning protocols. It prepares students to critically assess ventilated patients and respond effectively to changes in clinical conditions.					

Course Objective	**1.** Understand the principles of mechanical ventilation and its indications. **2.** Develop a comprehensive understanding of ventilator modes and their applications. **3.** Master the skills necessary for ventilator setup, monitoring, and troubleshooting. **4.** Acquire knowledge of ventilator-associated complications and their prevention. **5.** Develop the ability to assess ventilator-dependent patients and optimize ventilator settings. **6.** Understand the process of weaning patients from mechanical ventilation. **7.** Master the management of ventilator alarms and emergencies. **8.** Develop effective communication and collaboration with the healthcare team.			
Basic skill sets required for the laboratory:	1. Knowledge of normal respiratory physiology and pathology 2. Familiarity with ventilator components and circuits 3. Ability to analyze ventilator waveforms 4. Competence in handling ABG and electrolyte data 5. Skill in adjusting ventilator settings and using NIV 6. Knowledge of aseptic precautions and infection control			
Course Outcomes	**On successful completion of the course the students shall be able to:** **CO1:** Explain the fundamental principles of mechanical ventilation and ventilator modes **CO2:** Operate and classify different types of mechanical ventilators and interpret ventilator waveforms **CO3:** Assess patient status and perform effective monitoring during mechanical ventilation **CO4:** Analyze the physiological effects of ventilator settings on major organ systems **CO5:** Identify, prevent, and manage complications associated with mechanical ventilation **CO6:** Apply weaning protocols and manage various clinical scenarios through case-based reasoning			
Course Content:				
Module 1	**Mechanical ventilation – Basics**	Assignment		**Sessions**

Topics: 1. Principles of mechanical ventilation: airway resistance, lung compliance, dead space ventilation, ventilatory failure, oxygenation failure, clinical conditions leading to mechanical ventilation, operating modes of mechanical ventilation.

2. Mechanical Ventilators: Classification, working principles, drive mechanism, control circuits, control variables, phase variables, output, waveform, alarm system, Basic ventilator waveform analysis

3. Initiation of mechanical ventilation: indications, contraindication, initial ventilator settings, ventilator alarm settings, hazards and complications.

Module 2	**Mechanical ventilation – Monitoring**	Assignment		**13 Sessions**

Topics: Monitoring in mechanical ventilation: concepts of monitoring, vital signs, chest inspection and auscultation, fluid electrolyte balance, arterial blood gases, oxygen and end tidal carbon dioxide monitoring.

Module 3	**Effects of Mechanical ventilation**	Assignment		**10 Sessions**

Topics: Effects of various ventilator settings on ventilation and oxygenation. Effect of PEEP: pulmonary considerations, effects on the cardiovascular system, hemodynamics, renal & neurological considerations.

Module 4	**Mechanical ventilation - Complications, weaning and Clinical situations**	Assignment		**8 Sessions**

Topics: Prevention and Recognition of complications of ventilation

Weaning from mechanical ventilation: weaning and its failure, weaning criteria and indices, weaning procedure, signs, causes of weaning failure.

Clinical situations with case studies of mechanical ventilation and management

List of Laboratory Tasks:

1. Operation and settings of mechanical ventilators and NIV
2. Ventilator waveform analysis (pressure, flow, volume)
3. Demonstration of ventilator settings on a test lung
4. Interpretation and correction of ABG, acid-base and electrolyte data
5. Simulated management of complications and alarms
6. Patient preparation and assistance during bronchoscopy
7. Setting and interpreting PEEP levels and compliance changes

8. Maintenance procedures for ventilators, pumps, and monitoring systems

Targeted Application & Tools that can be used:

1. Mechanical ventilators (pressure & volume-controlled)
2. Test lungs
3. Capnography, ABG analyzers
4. Respiratory monitors and simulators
5. Software for ventilator waveform simulation and case-based learning

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:
1. Article review : Ventilator-associated lung injury or PEEP optimization strategies
2. Presentation: Interpretation of ventilator graphics and clinical decision-making
3. Case Study: Management of ARDS patient on mechanical ventilation

Text Book
"Ventilator Management: A Clinical Guide" by William F. Hager and Steven R. Simpson

References

1. "Clinical Manual of Emergency Pediatrics" by Michael Cabana and Dennis W. D'Angelo
2. "Mechanical Ventilation: Physiological and Clinical Applications" by George N. K. D. D. L. R. B. Orton
3. "Principles and Practice of Mechanical Ventilation" by Martin J. Tobin

Online learning resources:

1. OpenPediatrics.org
2. [YouTube RT Simulations and Case Demos]
3. NBRC Clinical Simulation Labs (virtual)
4. ERS/ATS Ventilation Guidelines

Topics relevant to "SKILL DEVELOPMENT":

1. Real-time waveform analysis and troubleshooting
2. Evidence-based ventilator setting adjustments
3. Patient-ventilator synchrony improvement
4. Critical thinking in ventilator-related emergencies
5. Decision-making in weaning and extubation

Course Code: BPRTLS603	**Course Title: Life Support System** **Type of Course: Core Course**	**L-T- P- C**	2	1	2	4
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					

Course Description	This course introduces students to the fundamental principles, technologies, and practices involved in life support systems in critical care settings such as ICU, NICU, and emergency departments. Emphasis is placed on the role of respiratory therapists in operating and managing respiratory and cardiovascular life support equipment, patient monitoring systems, and ensuring safety and effectiveness of care.			
Course Objective	1. Understand the principles of life support systems used in critical care. 2. Operate respiratory life support equipment like ventilators and oxygen delivery systems. 3. Perform basic and advanced life-saving procedures in emergencies. 4. Monitor patient vitals and respond to alarms effectively. 5. Maintain, troubleshoot, and ensure safety in the use of life support systems.			
Basic skill sets required for the laboratory:	**1. Understanding and executing** Basic Life Support (BLS) **procedures.** **2. Competency in** operating and troubleshooting ventilators**.** **3. Proper handling of** oxygen therapy devices **including masks, nasal cannulas, cylinders, and concentrators.** **4. Practical use of** CPAP/BiPAP machines**.** **5. Performing** airway management simulations**, including basic intubation techniques.** **6. Using and interpreting** ECG and pulse oximetry**.** **7. Recognizing and responding to** equipment alarms**.** **8. Conducting** cleaning, disinfection, and maintenance **of respiratory equipment.**			
Course Outcomes	**On successful completion of the course the students shall be able to:** **CO1:** Describe the scope and importance of life support systems in critical care. **CO2:** Operate ventilators, CPAP/BiPAP systems, and oxygen delivery devices in clinical practice. **CO3:** Demonstrate airway management, tracheostomy care, and CPR techniques. **CO4:** Monitor patients using ECG, pulse oximeters, capnography, and interpret alarms. **CO5:** Apply principles of equipment cleaning, calibration, and patient safety. **CO6:** Evaluate recent innovations in life support systems including portable ventilators, Tele-ICU, and smart technologies.			
Course Content:				
Module 1	**Introduction to Life Support**	Assignment		**6 Sessions**

- **Topics:** What is life support?
- Role of respiratory therapists in ICU/ER
- BLS vs ALS
- Overview of critical care environments (ICU, NICU, Emergency)

Module 2	**Respiratory Life Support**	Assignment		**10 Sessions**

- **Topics:** Ventilators: types, modes, indications
- CPAP and BiPAP systems
- Oxygen therapy: masks, nasal cannulas, concentrators
- Airway management: intubation basics, tracheostomy care

Module 3	**Cardiovascular Support**	Assignment		**8 Sessions**

- **Topics:** CPR techniques and procedures
- Defibrillators: AEDs and manual defibrillation
- Basic function of pacemakers
- Monitoring heart rate and blood pressure

Module 4	**Patient Monitoring Systems**	Assignment		**7 Sessions**

- **Topics:** Pulse oximetry and oxygen saturation
- ECG monitoring basics
- Capnography (ETCO2)
- Alarms: types, responses, and safety

Module 5	**Equipment Maintenance and Safety**	Assignment		**7 Sessions**

- Cleaning and disinfection of respiratory equipment
- Routine checks and calibration
- Electrical and patient safety

Power backups and battery managemen**t**

Module 6	**Advances in Life Support**	Assignment		**7 Sessions**

- **Topics:** Portable and transport ventilators
- Tele-ICU and remote monitoring

- IoT in life support equipment
- Smart alarms and AI in critical care

List of Laboratory Tasks:

1. Basic Life Support (BLS) – Hands-on CPR
2. Operating a ventilator (set-up, mode change, alarms)
3. Demonstration of oxygen therapy devices (cylinder, concentrator, masks)
4. Use of CPAP/BiPAP machines
5. Simulation of airway intubation
6. ECG and pulse oximeter usage
7. Understanding alarm systems in ICU equipment
8. Cleaning and maintenance of respiratory devices

Targeted Application & Tools that can be used:

- Ventilators (transport and ICU)
- CPAP/BiPAP devices
- AEDs and defibrillators
- Multiparameter monitors
- Capnography and pulse oximeters
- Smart ICU systems (simulations)

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:
1. Article review Innovations in life support (e.g., AI in ICU)
2. Presentation: Case-based learning on ventilator management
3. Case Study: Management of a patient on life support in ICU

Text Book

1. **Shelledy, D. C., & Peters, J. I.** – *Respiratory Care: Principles and Practice*
2. **Egan's Fundamentals of Respiratory Care** – Kacmarek, Stoller, Heuer

References

1. **AARC Clinical Practice Guidelines** – American Association for Respiratory Care
2. **Basic Life Support Provider Manual** – American Heart Association (AHA)
3. **User Manuals** of ventilators and life support devices (e.g., Dräger, Philips, GE)

Online learning resources:

1. AARC (American Association for Respiratory Care)
2. ERS e-learning
3. OpenPediatrics.org

Topics relevant to "SKILL DEVELOPMENT":

1. Emergency and ICU equipment handling
2. Basic to advanced ventilator setting skills
3. Life-saving CPR and defibrillation techniques
4. Patient monitoring and interpretation
5. Clinical decision-making in life-threatening conditions

Course Code: BPAHHA604	**Course Title : Hospital Administration** **Type of Course: Minor**	**L-T- P- C**	2	1	2	4
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course introduces students to the foundational principles of hospital administration and healthcare management. It explores the structure, policies, and operational strategies that govern hospitals and healthcare institutions. Students will learn about various hospital departments, healthcare regulations, financial and human resource management, and the role of information technology in healthcare settings.					
Course Objective	1. Understand the structure, roles, and functions of hospital departments and administrators. 2. Interpret healthcare regulations, accreditation, and compliance standards. 3. Apply basic financial principles in hospital budgeting and cost control. 4. Analyze HR practices in recruitment, retention, and legal compliance. 5. Explore quality improvement models and patient safety initiatives. 6. Understand the application of information technology in healthcare management.					

<table>
<tr><td>Basic skill sets required for the laboratory:</td><td colspan="4">1. Registration & Admission: Data entry, communication, and form-filling accuracy.
2. Patient Records & Discharge: Documentation, computer use, and confidentiality.
3. Duty Roster Design: Scheduling, Excel skills, and shift coordination.
4. Hospital Budget Prep: Budgeting, resource planning, and spreadsheet use.
5. Patient Safety Audit: Observation, protocol knowledge, and reporting.
6. Quality Forms: QA/QI knowledge, analysis, and proper form handling.
7. Dummy HMS Use: Software navigation, data input, and module familiarity.</td></tr>
<tr><td>Course Outcomes</td><td colspan="4">On successful completion of the course the students shall be able to:

• CO1: Explain the structure and functions of various hospital departments and the role of hospital administrators.
• CO2: Demonstrate understanding of healthcare policies, ethical concerns, and accreditation requirements.
• CO3: Apply principles of financial management including budgeting and cost containment in healthcare.
• CO4: Analyze human resource strategies relevant to healthcare staffing, performance, and legal compliance.
• CO5: Implement patient safety measures and quality improvement strategies in hospital environments.
• CO6: Utilize healthcare IT systems like EHRs and understand data privacy and digital health records management.</td></tr>
<tr><td>Course Content:</td><td colspan="4"></td></tr>
<tr><td>Module 1</td><td>Introduction to Hospital Management</td><td>Assignment</td><td></td><td>6 Sessions</td></tr>
<tr><td colspan="5">Topics: Definition, departments, types of hospital, hierarchy, roles and responsibilities of hospital administrators.
Importance: hospital administration in healthcare delivery</td></tr>
<tr><td>Module 2</td><td>Healthcare Policies and Regulations</td><td>Assignment</td><td></td><td>7 Sessions</td></tr>
<tr><td colspan="5">Topics: Introduction, compliance requirements (e.g., accreditation, licensing). Ethical considerations in healthcare management.</td></tr>
</table>

Module 3	**Financial Management in Healthcare**	Assignment		**8 Sessions**
Topics: Principles: financial management in healthcare organizations, Budgeting, revenue cycle management, and financial reporting. Cost containment strategies in healthcare.				
Module 4	**Human Resource Management in Healthcare**	Assignment		**7 Sessions**
• **Topics: HR Policy:** Recruitment, training, and retention of healthcare personnel. • **Employee relations and performance management:** Legal and ethical issues in human resource management in healthcare.				
Module 5	**Quality Improvement and Patient Safety**	Assignment		**9 Sessions**
Concepts: methodologies of quality improvement in healthcare. **Patient safety:** Initiatives and adverse event reporting systems. Implementing quality improvement projects in hospitals. **NABH:** Introduction, definition, 5 Patient Topic, 5 hospital Staff Topics.				
Module 6		Assignment		**8 Sessions**
Topics: Introduction: Role of information technology in healthcare administration. **Electronic health records (EHRs):** implementation and interoperability, Data security and privacy in healthcare IT systems				

List of Laboratory Tasks:

1. Simulated registration and admission process
2. Maintenance of patient records and discharge summary
3. Designing a hospital duty roster
4. Preparing mock hospital budget and resource plan
5. Conducting a mock patient safety audit
6. Filling and interpreting quality improvement forms
7. Operating dummy hospital management software
8. Simulating a patient feedback and grievance redressal mechanism

Targeted Application & Tools that can be used:

- Hospital Management Software (e.g., MedSys, Insta HMS)
- EHR platforms (e.g., Practo, Medixcel EMR)
- Quality improvement toolkits (e.g., FMEA, RCA)

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:

1. Article review Emerging trends in healthcare administration

2. Presentation: Accreditation systems and their impact on hospitals

3. Case Study: Role of IT in transforming hospital operations

Text Book

Hospital Administration and Management" by D.C. Joshi and Mamta Joshi

References

1. Principles of Hospital Administration and Planning" by B.M. Sakharkar
2. Textbook of Hospital Administration" by C.M. Francis and Mario C. de Souza

Online learning resources:

1. www.nabh.co (NABH accreditation guidelines)
2. www.healthit.gov (Healthcare IT best practices)
3. www.who.int (Hospital management protocols by WHO

Topics relevant to "SKILL DEVELOPMENT":

1. Digital Health Record Management
2. Healthcare Budgeting and Financial Planning
3. Legal and Ethical Decision-Making in Healthcare
4. Use of QI Tools in Patient Safety

Course Code: BPAHRM605	**Course Title : Research Methodology & Biostatistics** **Type of Course: SEC**	**L-T- P- C**	3	1	0	4
Version No.	1.0					
Course Pre-requisites	None					
Anti-requisites	None					
Course Description	This course provides foundational knowledge in research methodology, ethical considerations, biostatistics, sampling techniques, and the use of digital tools for effective research in health sciences. It equips students with essential skills to develop research proposals, analyze data, and uphold academic integrity in scholarly writing.					
Course Objective	1. Understand and apply key research methodologies relevant to healthcare. 2. Identify ethical concerns and standards in clinical and academic research. 3. Analyze and interpret biostatistical data using appropriate tools. 4. Develop research proposals with structured sampling methods.					

	5. Utilize software tools for referencing, formatting, and plagiarism detection.			
Course Outcomes	**On successful completion of the course the students shall be able to:** **CO1:** Define research methods and differentiate between experimental and exploratory research. **CO2:** Identify and apply ethical principles and regulatory standards in research. **CO3:** Explain basic biostatistical concepts, data types, and variable relationships. **CO4:** Apply sampling methods and probability rules for data collection and summarization. **CO5:** Develop a research proposal incorporating clinical data and diagnostic models. **CO6:** Use digital tools for literature search, reference management, formatting, and plagiarism detection.			
Course Content:				
Module 1	**Basics of Research**	Assignment		**10 Sessions**
Topics: Introduction to research methods, identifying research problem, How this research differ from other experimental research, and exploratory research.				
Module 2	**Ethics**	Assignment		**8 Sessions**
Topics: Ethical issues in research, Research design, Ethics of clinical trials, permission of ethical committee, social ethics.				
Module 3	**Biostatics**	Assignment		**15 Sessions**
Topics: Basic Concepts of Biostatistics, Types of Data, Research tools and Data collection methods, Need of biostatistics, Understanding of data in biostatistics, How & where to get relevant data, Relation between data & variables, Type of variables: defining data set				
Module 4	**Sampling Methods**	Assignment		**12 Sessions**
Topics: Sampling methods, Probability rules & Probability distributions (Normal & Binomial) Collection of relevant data: sampling methods Construction of study: population, sample, normality and its beyond (not design of study, perhaps), Summarizing data on the pretext of underlined study, Understanding of statistical analysis (not methods)				
Module 5	**Counselling in Diverse Settings**	Assignment		**5 Sessions**
Developing a research proposal-Models by engaging patients' information and data-base of the diagnostic approaches				

Module 6	**Use of Advanced Search Tools**	Assignment		**10 Sessions**

Topics: Management Software like Zotero/Mendeley, Software for paper formatting like LaTeX/MS Office, Software for detection of Plagiarism

Targeted Application & Tools that can be used:

- Zotero, Mendeley (Reference Management)
- LaTeX, MS Word (Paper Formatting)
- Turnitin, Urkund (Plagiarism Check)
- SPSS or Excel (Data Analysis Basics)

Project work/Assignment: Mention the Type of Project /Assignment proposed for this course:

Text Book

1. Introduction to Biostatistics and Research Methods By Sundar Rao

References

1. Biostatistics & Research Methodology By Dr.Ashok A.Hajare
2. Biostatistics & Research Methodology By Dr.Chandrakant R.Kokare
3. Research Methodology – Methods | Techniques | Practices By Rabi Narayan Subudhi, Sumita Mishra, Malabika Sahoo

Online learning resources:

1. https://michener.ca/ce_course/research-methodology-biostatistics-online/?utm_source=chatgpt.com
2. https://catalyst.harvard.edu/courses/biostatscertificate/?utm_source=chatgpt.com
3. https://www.manipal.edu/psph/program-list/short-term4.html?utm_source=chatgpt.com

Topics relevant to "SKILL DEVELOPMENT":

1. Formulating research questions
2. Ethical proposal writing
3. Data summarization and variable classification
4. Research presentation skills
5. Proficiency in digital research tools