MALLA REDDY VISHWAVIDYAPEETH

SCHOOL OF ALLIED AND HEALTH SCIENCES AND TECHNOLOGY

SuraramXRoads,Jeedimetla, Hyderabad-500055
Web:https://mrvv.edu.in/

Bachelor of Science (B.Sc.)

Respiratory/Pulmonology Technology

2025

B.Sc., Respiratory/Pulmonary Technology

Vision

• To produce skilled and compassionate respiratory technologists for quality patient care and advanced respiratory services.

Mission

• To provide strong theoretical and clinical knowledge in respiratory care.
• To develop skills in respiratory diagnosis, therapy, and critical care.
• To promote ethical practice, teamwork, and professionalism.
• To encourage research and evidence-based respiratory care.
• To prepare students for lifelong learning and healthcare advancements.

Program Outcomes (POs)

• Apply respiratory science knowledge in patient care.
• Perform respiratory diagnostic and therapeutic procedures.
• Operate respiratory care equipment and ventilators effectively.
• Provide care in ICU, emergency, neonatal, and pulmonary settings.
• Follow ethical principles and professional standards.
• Work effectively with healthcare teams.
• Practice infection control and patient safety measures.
• Participate in research and evidence-based practice.
• Educate patients about respiratory health and home care.
• Continue professional growth and lifelong learning.

Course Outcomes (COs)

• Understand anatomy, physiology, pathology, and pharmacology related to respiratory care.
• Perform pulmonary function tests and ABG analysis.
• Administer oxygen therapy and aerosol therapy.
• Assist in airway management and mechanical ventilation.
• Provide respiratory care in critical care settings.
• Practice infection control and patient safety.
• Demonstrate communication and teamwork skills.
• Conduct basic research and project work.

Learning Outcomes (LOs)

• Identify respiratory structures and functions.
• Perform respiratory assessment procedures.
• Use respiratory equipment safely and effectively.
• Interpret ABG and pulmonary function reports.
• Apply mechanical ventilation principles.
• Deliver respiratory care to different patient groups.
• Maintain professionalism and ethics in practice.
• Communicate effectively with patients and healthcare teams.

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SCHOOLOFALLIEDANDPUBLICHEALTHSCIENCES AND TECHNOLOGY

Bachelor of Science Respiratory/Pulmonology Technology

COURSESTRUCTURE

I stYear Ist semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	Max. Marks		
							INT	EXT	TOTAL
1	BRP3510101	Human Anatomy-I	4	-	-	4	30	70	100
2	BRP3510102	Human Physiology-I	4	-	-	4	30	70	100
3	BRP3510103	Medical Bio-chemistry-I	4	-	-	4	30	70	100
4	BRP3510104	English and Communication Skills	2	-	-	2	30	70	100
5	BRP3510105	Basics of Computers	1	-	2	2	30	70	100
6	BRP3510101P	Human Anatomy-I Practical	-	-	4	2	30	70	100
7	BRP3510102P	Human Physiology-I Practical	-	-	4	2	30	70	100
8	BRP3510106VA	Environmental Awareness	2	-	-	2	100	-	100
9	BRP3510107	Sociology	2	-	-	2	30	70	100
TOTAL			**19**	**-**	**10**	**24**	**340**	**560**	**900**

Ist year IInd semester

S.NO	SUBJECTCODE	SUBJECT	L	T	P	C	Max. Marks		
							INT	EXT	TOTAL
1	BRP3510201	Human Anatomy–II	4	-	-	4	30	70	100
2	BRP3510202	Human Physiology-II	4	-	-	4	30	70	100
3	BRP3510203	Pathology	2	-	-	2	30	70	100
4	BRP3510204	Microbiology	3	-	-	3	30	70	100
5	BRP3510201P	Human Anatomy–II Practical	-	-	4	2	30	70	100
6	BRP3510202P	Human Physiology–II Practical	-	-	2	1	30	70	100
7	BRP3510205VA	Stress Management	1	-	-	1	100	-	100
8	BRP3510206	Medical Physics	2	-	-	2	30	70	100
9	BRP3510207	Introduction to Respiratory Technology	4	-	-	4	30	70	100
TOTAL			**20**		**6**	**23**	**340**	**560**	**900**

II Year III semester

S.NO	SUBJECTCODE	SUBJECT	L	T	P	C	TOTAL HOURS	Max. Marks		
								INT	EXT	TOTAL
1	BRP3510301	Pharmacology	3	-	-	3	3	30	70	100
2	BRP3510302	Medical law, Ethics &Medical Records	3	-	-	3	3	30	70	100
3	BRP3510303	HealthCare Administration	2	-	-	2	2	30	70	100
4	BRP3510304	Respiratory Diagnostics	3	-	-	3	3	30	70	100
5	BRP3510305	Procedure Related to Respiratory Technology	3	-	2	7	7	30	70	100
6	BRP3510306VA	Soft Skills Development	1	-	-	1	1	100	-	100
7	BRP3510307	Clinicalpostings-1	-	-	6	6	12	100	-	100
TOTAL			**15**	**-**	**11**	**26**	**31**	**350**	**350**	**700**

II Year IV semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	TOTAL HOURS	Max. Marks		
								INT	EXT	TOTAL
1	BRP3510401	Advanced Respiratory Diagnostics	3	-	-	3	3	30	70	100
2	BRP3510402	Pulmonary Function Test	3	-	-	3	3	30	70	100
3	BRP3510403	Respiratory Therapeutics	3	-	-	3	3	30	70	100
4	BRP3510404	Respiratory Diagnostics –I Practical	-	-	2	2	4	30	70	100
5	BRP3510405	Clinical postings-II	-	-	8	8	16	100	-	100
6	BRP3510406VA	Health & Well Being	1	-	-	1	1	100	-	100
TOTAL			**10**	**-**	**10**	**20**	**30**	**320**	**280**	**600**

III year–V semester

S.NO	SUBJECTCODE	SUBJECT	L	T	P	C	TOTAL HOURS	Max. Marks		
								INT	EXT	TOTAL
1	BRP3510501	Critical Care in Respiratory Technology	3	-	-	3	3	30	70	100
2	BRP3510502	Applied Respiratory Therapeutics	3	-	-	3	3	30	70	100
3	BRP3510503	Quality Assurance in Respiratory Care	3	-	-	3	3	30	70	100
4	BRP3510504	Respiratory Diagnostics–II Practical	-	-	2	2	4	30	70	100
5	BRP3510505	Clinical Postings-III	-	-	8	8	16	100	-	100
6	BRP3510506VA	Interpersonal Communication	1	-	-	1	1	100	-	100
TOTAL			10	-	10	20	30	320	280	600

III year–VI semester

S.NO	SUBJECTCODE	SUBJECT	L	T	P	C	TOTAL HOURS	Max. Marks		
								INT	EXT	TOTAL
1	BRP3510601	Advanced Respiratory Care	3	-	-	3	3	30	70	100
2	BRP3510602	Mechanical Ventilation Techniques	3	-	-	3	3	30	70	100
3	BRP3510603	Pulmonary Rehabilitation	3	-	-	3	3	30	70	100
4	BRP3510604	Advanced Respiratory Technology–Practical	-	-	2	2	4	30	70	100
5	BRP3510605	Clinical Postings-IV	-	-	6	6	12	100	-	100
6	BRP3510606	Research Methodology & Biostatistics	3	-	-	3	3	30	70	100
7	BRP3510607VA	Art of Being a Better Person	1	-	-	1	1	100	-	100
TOTAL			13	-	20	21	29	350	350	700

IV year –VII semester

Course code	Course title	Credits/week			Hours/semester			Assessment		Total
BRP3510701	Internship	L	P	C	L	T/P	Total	INT	EXT	
		2	2	22	30	900	930	-	100	100
	Project	-	06	06		270	270		100	100
Total		2	26	28	30	1170	1200	-	200	200

IV year–VIII semester

Course code	Course title	Credits/week			Hours/semester			Assessment		Total
BRP3510801	Internship	L	P	C	L	T/P	Total	INT	EXT	
		2	2	22	30	900	930	-	100	100
	Project	-	06	06		270	270		100	100
Total		2	26	28	30	1170	1200	-	200	200

1.1UnderGraduateProgrme

Sl. No.	Course	Duration	Eligibility for admission
1	BSC Respiratory/ Pulmonology technology	4Years	10+2 or equivalent

Medium of Instruction:

English shall be the medium of instruction for all subjects of study and for examinations.

Duration of the Course

Duration detail are mentioned underclauseno.1.1of this booklet.

Examination Regulations

Attendance:75%ofattendance (physical presence) is mandatory.

Medical leave or other types of sanctioned leaves will not be counted as physical presence. Attendance will be counted from the date of commencement of the session the last day of the closing of attendance before the final examination.

Internal Assessments:

a) Regular periodic assessment shall be conducted throughout the course. In each semester there will be **two one hour internal assessments (10 marks each)** and a continuous assessment (10 marks). Thus a total of 30 marks for the internal exam (i.e. Weight age forinternalassessmentshallbe30%of the total marks in each subject).

b) **Exam pattern for internal assessment** in each semester will be

(a) Shortquestions3nos.outofwhichthestudentshouldwritetwoquestionseachcarrying5marks (i.e. 2 x 510 marks). Two such internal examinations will be conducted.

(b) Continuous assessment of the student will be done. Students over all attendance, performance in class, behavior of the student, extra- curricular activities etc. will be assessed. Continuous assessment carries 10 marks.

(d) Thus a total of 30 marks for the internal examination. (10+10+10=30 marks). A candidate should secure a minimumof40% marks in the internal assessment in each subject to be eligible to appear for the University examination

(e) For value added courses, only internal examination will be conducted. The assessment comprised of five assignments/presentations/case presentations each carrying 10 (i.e. 5 x10=50 marks). Final examination will be for 50 marks with5 questions each carrying 10 marks (5x10=50marks). The minimum pass is 40% marks.

University Examinations (External):

a) University Examination shall be conducted at the end of every semester.

b) Acandidatewhosatisfiestherequirementofattendanceandinternalassessment marks, as stipulated by the University shall be eligible to appear for the University Examination.

c) Examination will be of 3 hours duration (for theory). The question pattern for those subjects withoutpracticalexamination(70marks)willbe(a)Threeessayquestionsoutofwhichthestudent should answer 2 questions each carrying 10 marks (i.e. 2 x 10 = 20 marks) (b) Eight short note questions out of which the student should attempt six questions, eachcarrying5 marks(6x5=30

marks).(c)Ten very short questions each carrying 2marks(i.e.10x2=20marks).Thusatotalof70 marks.

d) The question pattern for practical examination (a)Spotters/major practical/minor practical/Viva/practical record.

Theminimumpassforinternalassessmentis40%andfortheUniversityExaminationis50%.i.e. a student should score a total of 50% (adding the internal and external examination) to pass in each subject

I^st year I^st Semester

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							INT	EXT	TOTAL
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2	BRP3510102	Human Physiology-I	4	-	-	4	30	70	100
3	BRP3510103	Medical Bio-chemistry-I	4	-	-	4	30	70	100
4	BRP3510104	English and Communication Skills	2	-	-	2	30	70	100
5	BRP3510105	Basics of Computers	1	-	2	2	30	70	100
6	BRP3510101P	Human Anatomy-I Practical	-	-	4	2	30	70	100
7	BRP3510102P	Human Physiology-I Practical	-	-	4	2	30	70	100
8	BRP3510106VA	Environmental Awareness	2	-	-	2	100	-	100
9	BRP3510107	Sociology	2	-	-	2	30	70	100
TOTAL			**19**	**-**	**10**	**24**	**340**	**560**	**900**

SEMESTER-I

HUMANANATOMY–I **L/T/P/C**

UNIT-I **4/-/-/4**

GENERALANATOMYANDHISTOLOGY

General Anatomy:

1. Fascia
2. Muscles
3. Bones
4. Joints
5. Vessels
6. Nerve

General Histology:

1. Epithelial
2. Connective tissue
3. Muscle
4. Bone and cartilage
5. Nerve and vessels
6. Embryology

UNIT-II

UPPEREXTREMITY:

1. Osteology: Clavicle, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges.
2. Muscles: Origin, insertion, nerve supply and actions.

UNIT-III

UPPEREXTREMITY:

1. Joints: Shoulder girdle, shoulder joint, elbow joints, radio ulnar joint, wrist joint and joints of the hand.
2. Breast, pectoral region, axilla, cubital fossa, Arches of hand
3. Brachial plexus, nerves of upper extremity
4. Blood vessels and lymphatic drainage

UNIT-IV

CARDIOVASCULAR&RESPIRATORYANATOMY

1. Thoracic wall

2. Mediastinum

3. Heart:Anatomyofheart,bloodSupply,nervesupply,conductingSystemandmajorblood vessels

4. Lungs:Anatomyoflungs,bronchialtree,pleura,Bronchopulmonarysegments,blood Supply and nerve supply

5. Diaphragm: Origin, insertion, nerve supply and action, openings in the diaphragm.

6. Inter costal muscles and Accessory muscles of Respiration: Origin, insertion, nerve supply and action

7. Ribs and sternum

UNIT-V

SYSTEMICANATOMY

1. Digestive system:

List the parts of the digestive system

Anatomy of stomach, liver, gallbladder, spleen, pancreas, intestines.

2. Urinary system:

Anatomy of kidney, urinary bladder

3. Endocrine system:

Position and hormones secreted by each organ

4. Genital system:

Male organs and female organs

RECOMMEMDEDTEXTBOOKS

1. Human Anatomy-Snell

2. Anatomy- Chaurasia, Volume-I,II&III

3. Neuroanatomy-InderbirSingh

4. Human Anatomy-Kadasne,Volume-I,II&III

5. Neuro anatomy—VishrsamSingh

6. Human Anatomy-Data

HUMANPHYSIOLOGY–I

L/T/P/C

UNIT-I

4/-/-/4

GENERALPHYSIOLOGY

Cell:

- Structure of cell membrane
- a)Fluid mosaic model
- b)Lipid bi-layer
- c)Functions of cell membrane

2. Transport across cell membrane

- Basic mechanism of transport
  - Channel proteins
  - Carrier proteins
- Methods of transport
  - Passive transport
  - Active transport

3. Body fluids

- Intra cellular fluid
- Extra cellular fluid
- Body electrolytes
- Regulation of body fluid volume

4. Homeostasis

- Regulation of body function
- Homeostatic regulatory mechanism

BLOOD:

- Composition of blood & it's volume
- Plasma
- Hemopoiesis
  - Composition
  - Plasma protein
- Erythrocytes
  - Normal count
  - Structure of RBC (shape & size)
  - Functions of RBC
  - Hemoglobin (Normal Value, Fate, Function)
  - Anemia & policy themia
  - ESR&PCV
- Leukocytes
  - Classification

- Functions of leukocytes
- Platelets
  - Normal count
  - Functions of thrombocytes
  - Blood Coagulation
  - Bleeding time & clotting time
- Blood group
  - ABO system
  - Landsteiner'slaw
  - ABO incompatibility
  - Rh system
  - Rh in compatibility & erythroblastosis fetalis
- Blood transfusion
  - Collection & storage of blood
  - Precautions
  - Cross matching
  - Hazards of blood transfusion

NERVE:

- Structure of a neuron
- Classification of neurons
- Electrical activity of neuron
  - Resting membrane potential
  - Action potential
- Propagation of nerve impulse
- Properties of nerve fibers
- Neuroglia-Types &functions
- Nerve Injury
  - Types of nerve Injury
  - Effect of nerve Injury
  - Regeneration of damaged nerve fiber

UNIT-II

MUSCLEPHYSIOLOGY

- Classification
- Properties of skeletal muscle
- Structure of skeletal muscle
  - Sarcomere
  - Sarcotubular system
  - Neuro muscular junction & disease affecting it
- Excitation-Contraction coupling
- Mechanism of muscle contraction
- Functions of skeletal muscle
- Types of muscle contractions
- Red & white muscles
- Rigormortis,musculardystrophy,alteredmuscletone,musclecramp,atrophy,EMG

UNIT-III

CARDIOVASCULARSYSTEM

- Structure of heart & blood vessels
- Properties of cardiac muscle
- Origin & spread of cardiac pulse
- Cardiac cycle & heart sounds
- Cardiac output
    - Related terms
    - Regulation of cardiac output
    - Circulatory shock
- Pulse & Heart rate and it's regulation
- Blood pressure
    - Definitions
    - Factors controlling & Influencing BP
    - Regulation of BP
- Regional circulation
    - Coronary circulation
    - Cerebral circulation
- Normal ECG.

UNIT-IV

RESPIRATORY SYSTEM

- Introduction, structure & function of RS
    - Upper respiratory tract
    - Lower respiratory tract
    - Respiratory membrane
- Mechanism of breathing
    - Mechanics of breathing
    - Respiratory pressure change
    - Compliance
    - Surfactant
- Respiratory volumes & capacities
- Pulmonary ventilation & Dead space
- Transport of respiratory gases
- Nervous &chemical regulation of respiration
- 7.Pulmonaryfunctiontest-direct&indirectmethod
- 8.Physiologicalchangeswithaltitude&acclimatization

UNIT-V

EXERCISEPHYSIOLOGY

- Basal Metabolic Rate & Respiratory Quotient
- Energy metabolism
- Fatigue
- Oxygen debt

- Acute cardiovascular changes during exercise ; difference between mild, moderate &severe exercise
- Concept of endurance
- Acute respiratory changes during exercise
- Conceptoftraining/conditioning;effectsoflong-termexercise/trainingontheCVS&RS
- Body temperature regulation during exercise
- Hormonal & metabolic effects during exercise
- Exercise for muscle strength, power, endurance and their effects on it. Physical fitness& its components

RECOMMENDED TEXTBOOKS

1. Text book on Medical Physiology-Guyton

2. Text book of Physiology-AK Jain (for MBBS students)

3. Human Physiology-C.C. Chatterjee

4. Essentials of Medical Physiology-Sembulingam,K.

5. Comprehensive Textbook of Medical Physiology:Vol-1&2 -Pal, Gopal Krishna

6. Physiology: Prep Manual for Undergraduates-Joshi, Vijaya D.

7. Practical Physiology-Joshi, Vijaya D.

MEDICALBIOCHEMISTRY–I

L/T/P/C
4/-/-/4

UNIT-I

CARBOHYDRATE CHEMISTRY

- Definition, general classification with examples
- Composition and functions of Monosaccharide's, Disaccharides an Polysaccharides
- Anomers, Epimers, Enantiomers, Mutarotation
- Glycosaminoglycans(mucopolysaccharides)

LIPIDCHEMISTRY

- Definition, classification with examples.
- Classification and Functions of Fatty acids, Phospho lipids ,Lipoprotein
- Structure and functions of Cholesterol
- Sources and functions of Ketone bodies

UNIT-II

AMINOACID CHEMISTRY

- Definition, Classification of amino acids with examples.
- Definition, Classification of proteins with examples
- Structural organization of proteins
- Biologically important peptides
- NUCLEICACIDS AND NUCLEOTIDE CHEMISTRY
- Composition and Functions of Nitrogen bases, Nucleosides, Nucleotides
- Structure and Functions of DNA
- Structure, Types and Functions of RNA
- Differences between DNA and RNA

UNIT-III

ENZYMES

- Definition, Classification of enzymes with examples
- Active site, Enzyme specificity.
- Factors affecting enzyme activity
- Enzyme inhibition
- Iso enzymes and their clinical significance-LDH, creatine kinase, ALP

VITAMINS

- Definition, Classification
- Fat soluble Vitamins-Sources, RDA, Functions and Deficiency.
- Water soluble Vitamins-Sources, RDA, Functions and Deficiency

UNIT-IV

INTERMEDIARY METABOILISM

- Glycolysis
- TCA cycle
- B-oxidation of fatty acids (Palmiticacid)
- Ketone body formation and utilization Urea cycle

UNIT-V

MINERAL METABOLIS

- Definition,Classification.Sources,RDA,FunctionsandDeficiencyofCalcium, Phosphorous, Iron, Sodium, Potassium

CLINICAL BIOCHEMISTRY

- Normal and abnormal constituents of Urine and Blood and their clinical significance:
- Normal constituents:
- Organic: Urea, Uric acid, Creatinine
- Inorganic: Ca, phosphate, chloride, electrolytes
- Abnormal constituents:
- Glucose, Ketone bodies, Protein, Blood, Bile salts, Bile pigments

RECOMMENDED BOOKS

1. Essentials of Biochemistry by U. Satyanarayana.

2. Text book of Biochemistry for Medical students. DM Vasudevan

3. Integrated textbook of Biochemistry Volume-land II. Indumathi.

4. TextbookofBiochemistryforMedicalstudents.MNChatterjeeandRanaShinde.

5. Harper's Illustrated Biochemistry.

6. Essentials of Biochemistry. Pankaja Naik

ENGLISH AND COMMUNICATION SKILLS

L/T/P/C

2/-/-/2

Course Objectives

- To enhance the lexical and grammatical skills of the learners.
- To develop reading competencies for academic and professional requirements.
- To write effectively to meet professional needs.
- To honest peaking and listening kills.
- To enhance empathy and other vital interpersonal skills of the learners

UNIT1:Sympathy(Poem)by Charles Mackay

Reading - Reading and its importance, techniques of effective reading.

Writing-Paragraph Writing (To pic sentence, Supporting sentences, and Conclusion) Grammar - Parts of Speech (Parsing), Articles

ELCSLAB

CALLLAB : Phonetics- Vowel Sounds (Monophthongs and Diphthongs)

Listening-Introduction to listening, Purpose of Listening, and Barriers to effective listening

UNIT2:ABirthdayLetterbyJawaharlalNehru

Reading - Skimming and Scanning

Writing-Letter writing (Requests, Leave applications, Purchase letters, Letters in correspondence with medical insurance companies)

Grammar-Phrase, Clause and Sentence; Prepositions

ELCSLAB

CALLLAB: Phonetics- Consonant Sounds

Listening-

UNIT3:The secret of work by Swami Vivekananda

Reading-Making inferences and predictions
Writing-E-mail writing

Grammar-Tenses, Reported speech vocabulary–food and life style , instrument & equipment

ELCSLAB

CALLLAB :Intonation

Listening- Listening and identifying facts and opinions

ICSLAB: Speaking-Role Plays (OET) (Giving and taking instructions, Interacting with and explaining

UNIT4:All the world'sastage (Poem) by William Shakespeare

Reading-Reading for explicit and implicit meaning

Writing-Short essays: 2-ParagraphEssay,ThesisStatementGrammar-Subject-

ELCSLAB

CALLLAB: Consonant Clusters

Listening-Listen-Comprehend-Speak, HealthCare

UNIT5: Sister Nivedita: Calcutta'sAngel of Mercy Article/Essay)by Monidipa Dey

Reading- Intensive and Extensive Reading, Reading comprehension passages from OET and IELTS

Writing- Report writing (Analyzing tests and Reporting patient condition) Grammar– Voice, If conditionals

ELCSLAB

CALLLAB: Past Tense Markers and Plural Markers

Listening-Listening tasks

COURSE OUTCOMES:

- Construct grammatically correct sentences with appropriate vocabulary.
- Analyze, interpret and synthesize adverse range of profession-specific concepts through better comprehension of the text.
- Draft various types of written communication pieces useful to their professional lives.
- Understand and apply norms of scientific communication, soft skills and positive interpersonal communication.
- Listen effectively and speak fluently informal and informal situations, especially in their work place.

TEXT BOOK:

English for nurse's byVijayaLaxmiNaidu.NiraliPrakashan.2008.

RECOMMENDED BOOKS:

Practical English Usage by MichaelSwan.OUP.1995. On Writing Well by William Zinsser, Harper Resource Book.2001. Cambridge English for nursing by Virginia All umand Patricia McGarr.CUP.2010. English for nursing by Ross Wright and Bethany Cagnol.Pearson.2001.

English fornursing-2 by Maris Spada Symonds and RossWright.Pearson.2001. Everyday English for International nurses by Joy Parkins on and Chris Brooker. Elsevier. 2004. Oxford English for career Nurses by Tony Grice. Oxford University Press.2007.

BASICS OF COMPUTERS

L/T/P/C

1/-/2/2

COURSE OBJECTIVES:

- To understand all components of computer, different working environments and operations of computer.
- To learn creating different types of word documents, MS Excel manipulations, Power point documents.
- To understand basic requirements of computer network hard ware, software and its network architecture.

UNIT–I

Introduction to computers--Definition of Computer-Characteristics of computer-ComponentsofComputerHardware–Input&Outputdevices-Memories–RAMandROM–MB, GB their conversions – Software :Application Software and Systems software- Data and Information –Different computer languages- Number systems- Binary and decimal conversions.

UNIT–II

MS WORD: Typing text in MS Word–Manipulating text¬–formatting text–using different font sizes, bold, italic– bullets and numbering –Pictures, Aligning the text and justify–choosing paper size– adjusting margins– header and footer, inserting page no's in a doc–printingafilewithoptions–usingspellcheckandgrammar–findandreplace– mail merge– insert tables in a document.

UNIT–III

MS EXCEL: Creating MS Excel – Cell editing, using formulas and functions, manipulating data withexcel–usingsortfunctiontosortnumbersandalphabets–drawinggraphsandchartsusing data in excel.

MS POWER POINT: Slide transition and animation-slides with sounds–inserting clip arts–Pictures, tables and graphs.

UNIT–IV

Introduction to Computer Networks: Introduction, Computer Network Devices(Hubs, Switches, Routers, Gateway, Bridge, Modems, Wireless Access Points, Firewalls & NIC), TypesofcomputerNetworks(LAN,MAN&WAN),NetworkTopologies(Star,Ring,Mesh, Tree, Hybrid Topologies), Internet Based Applications, Advantages & Disadvantages of Computer Networks, E-Mail, Components of E-Mail, Attaching Files in E-mail, Different Search Engines.

UNIT–V

Introduction to Artificial Intelligence & ML: History of AI, Sub Areas of AI, Applications of AI in Healthcare, Benefits of AI in Health Care, Challenges of AI in Health care, Introduction to Machine Learning, Applications of Machine Learning, Machine Learning Algorithms, Real world Machine Learning Use Cases.

COURSE OUTCOMES:

- At the end of the course the student will be able
- To understand peripherals of the computer how it works and understand various languages of the computer.
- To create any kind of presentations for presenting their knowledge any where in the form of document or ppt.
- To create excel sheets to saved at a and process the data efficiently.
- To understand basic requirements of computer network hardware, software and its network architecture.

RECOMMENDEDB OOKS:

Computer Fundamentals by Goel, Anita Pearson

Computer Fundamentals: Concepts, Systems&Applications-8thEditionbyPritiSinha, Pradeep K., Sinha

MS-Office 2010 Training Guide by Prof. Satish Jain ,M. Geetha Computer Networks, Andrews ST an

enbaum, 5thEdition, Pearson Education

Artificial Intelligence: A modern Approach Stuart J.Russe ll and Peter Norvig, Third Edition, Pearson Education

Hands-on Machine Learning with Scikit-Learn, Keras, and Tens or Flow, Aurelien Geron-Oreilly, 2ndEdition.

HUMAN ANATOMY-I Practical

L/T/P/C

-/-/4/2

Human anatomy practicals for physiotherapy student are essential for understanding the structure of the human body, its systems, and their functional relationships. These practical's focus on giving students hands-on experience identifying anatomical structures, learning dissection techniques, and understanding the musculoskeletal, nervous, and cardiovascular systems, all of which are vital for effective physiotherapy practice.

GROSS SPECIMENS / SPOTTERS

Upper Extremity

Identify the spotter-(Cross section of shoulder Joint, Elbow Joint, Wrist complex, Hand)

Identify the bone-UPPEREXTREMITYBONES (Scapula, Clavicle, Humerus, Radius and Ulna, Carpals, Metacarpals and Phalanges) Including side determination

Surface Anatomy of the Upper Extremity–UPPER EXTREMITY BONES AND MUSCLES

Myology-(cadaveric spotter) Spotters of the upper extremity muscles including the origin, insertion, blood and nerve supply

Spotters of Blood vessels (Pro funda Brachii, Brachial, Radial, Ulnar) Spotter

of Nerves (Axillary, Musculocutaneous, Radial, Median, Ulnar)

StructureandPartsoftheBreast-SpotterCardio-vascularandRespiratoryAnatomy

Gross Specimen of Heart, Lung Spotters of Bronchial tree,

Bronchopulmonary segments

Myology-(Diaphragm, Inter coastal muscles and Accessory Muscles) Systemic

Anatomy

Gross Specimen/Spotter (Stomach, Liver, Gall Bladder, Spleen, Pancreas, Intestines, Kidney, Uterus)

Cross section of Kidney

Spotters of Glands-(Pituitary Gland, Thyroid gland, Adrenal gland, Parathyroid, Pineal Gland)

HUMAN PHYSIOLOGY–I Practical

L/T/P/C

-/-/4/2

These practicals typically align with the theoretical aspects of physiology and help students apply concept storeal-world clinical scenarios. Key Areas Covered in Human Physiology for this semester includes the following.

Determination of blood group

Estimation of hemoglobin

concentration Peripheral pulse

determination Auscultation of Heart

sounds Determination of blood

pressure Auscultation of breath sounds

Assessment of respiratory rate

Anthropometric assessment

(BMI&WHR)

ENVIRONMENTAL AWARNESS

L/T/P/C

2/-/-/2

Course Description:

This course introduces students to the fundamental concepts of environmental awareness, examining the relationship between humans and the environment. Emphasizes the impact of human activities on the planet and promotes sustain able practices. Students will explore key environmental issues, such as climate change, biodiversity, pollution, and resource conservation, and develop practical knowledge for contributing to environmental protection.

Course Objectives:

By the end of the course, students will be able to: Understand the basic concept s of environmental science and sustainability. Identify the major environmental challenges facing the world today.

Analyze the impact of human activities one co systems, biodiversity, and natural resources. Explore global environmental policies and local solutions to environmental problems. Implement sustainable practices in everyday life.

Unit1

Introduction to Environmental

Awareness What is environmental

awareness?

The importance of environmental education.

Key environmental concepts: eco systems, biodiversity, sustainability. Historical perspective on environmental awareness.

Unit2 Earth's Eco systems and

Biodiversity What are ecosystems?

Types of eco systems: forests, oceans, wetlands, etc. Importance of biodiversity. Threats to biodiversity: habitat loss, invasive species, climate change.

Unit3

Pollution and its impact

Types of pollution: air, water, soil, noise, and light pollution. Causes and effects of pollution on health and ecosystems. Case studies of major pollution events.

Unit4

Climate Change and Global Warming

The science of climate change.

Greenhouse effect and human contributions.

Impacts of climate change: rising temperatures, sea levels, extreme weather. Mitigation and adaptation strategies.

Unit5

Resource Conservation Renewable vs.

non-renewable resources.

The importance of conserving water, energy, and other resources. Techniques

for conservation: recycling, energy efficiency, and water-saving practices.

Unit6

Sustainable Agriculture and Food Systems Environmental impact of conventional farming

practices.

Sustainable agriculture: organic farming, permaculture, and agroecology. The role of diet in environmental sustainability.

Unit7

Waste Management

Types of waste: municipal, industrial, hazardous, electronic. The 3 Rs: Reduce, Reuse, Recycle. Landfills,

incineration, and composting. Zero waste lifestyle.

Unit8

Water Conservation and Management

The global water crisis: causes and consequences. Water management practices and policies. The

importance of clean water for all living organisms.

Unit9

Environmental Policy and Legislation

Global environmental treaties: Paris Agreement, Kyo to Protocol. National environmental policies and regulations.

Role of NGOs, governments, and individuals in policy development.

Unit10

Green Technologies and Innovations

Introduction to renewable energy sources (solar, wind, hydro, etc.). Electric vehicles and sustainable transportation.

Innovations in waste-to-energy and sustainable agriculture. The Role of Individuals in

Environmental Protection How individual actions impact the environment.

Eco-friendly lifestyles: reducing waste, sustainable consumption, green travel. Community action and grassroots movements.

Reference Textbook

Environmental Science: A Global Concern "by William P. Cunningham & Mary Ann Cunningham

SOCIOLOGY

L/T/P/C
2/-/-/2

SUBJECT DISCRIPTION

Sociology will introduce student to the basic sociology concepts,

principles and social process, social institutions in relation to the individual, family and community and the various social factors affecting the family in rural and urban communities in India will be studied.

UNIT 1

1. Introduction:

a. Meaning- Definition, Nature and Scope of Sociology

b. Methods of Sociological Investigations, Case Study, Social Survey, Questionnaire and Interview methods.

c. Importance of its study with special reference to Health Care Professionals.

2. Social Factors in health and disease situations:

a. Role of Social factors in health

b. Role of social factor in illness

c. Decision making in taking treatment.

UNIT-2

1. Socialization:

a. Definition and Meaning of Socialisation

b. Primary, Secondary and Anticipatory socialisation

c. Agencies of Socialisation

2. Social Groups:

UNIT-3

a. Definition and Features of Social Group

b. Primary Social Group

c. Secondary Social Group

d. The role of Primary and Secondary Groups in Hospitals.

1. Family:

a. The family, meaning and definition

b. Functions of family

c. Changing family patterns

d. Influence of Family on the individuals health, the effects of sickness in the family.

2. Community:

a. Rural community: meaning and features- Health problems of rural community.

b. Urban community: meaning and features - Health problems in urbanities.

UNIT-4

1. Culture and Health:

a. Concept of Health

b. Concept of Culture

c. Cultural factors affecting Health and diseases

2. Social Change:

a. Meaning of social change

b. Factors of social change

c. Human adaptation and social change

d. Social planning and Health

UNIT-5

1. Social Problems:

a. Population explosion

b. Juvenile delinquency

c. Alcoholism

d. Unemployment

e. Poverty

f. Problems of women

2. Social Security:

Social security and social legislation

Recommended Books:

1. Principles of sociology C.N. Shankar Rao

2. Sociology for physiotherapy students-K.P Neeraja

Ist IInd Semester

S.NO	SUBJECTCODE	SUBJECT	L	T	P	C	Max. Marks		
							INT	EXT	TOTAL
1	BRP3510201	Human Anatomy–II	4	-	-	4	30	70	100
2	BRP3510202	Human Physiology-II	4	-	-	4	30	70	100
3	BRP3510203	Pathology	2	-	-	2	30	70	100
4	BRP3510204	Microbiology	3	-	-	3	30	70	100
5	BRP3510201P	Human Anatomy–II Practical	-	-	4	2	30	70	100
6	BRP3510202P	Human Physiology–II Practical	-	-	2	1	30	70	100
7	BRP3510205VA	Stress Management	1	-	-	1	100	-	100
8	BRP3510206	Medical Physics	2	-	-	2	30	70	100
9	BRP3510207	Introduction to Respiratory Technology	4	-	-	4	30	70	100
TOTAL			**20**		**6**	**23**	**340**	**560**	**900**

SEMESTER-II

HUMANANATOMY–II

L/T/P/C

4/-/-/4

UNIT-I

LOWER EXTREMITY:

1. Osteology including features, side determination, muscular attachment, clinical and applied anatomy of the following lower extremity bones Innominate bone, femur, tibia, fibula, patella, tarsals, metatarsals and phalanges.

2. Myology: Origin, insertion, nerve supply, action, function, clinical and applied anatomy

• Anterior compartment of thigh, Medial compartment and Posterior compartment

• Gluteal Region

• Anterior aspect of leg, medial and lateral aspect, Posterior aspect of leg

• Dorsum of foot

UNIT-II

LOWER EXTREMITY:

1. Arthrology: Joint structure, articulating components, relations, joint actions, Clinical and Applied Anatomy including Radiography

2. Hip Joint, Knee joint, Ankle joint, joints of the foot.

3. Femoral triangle, femoral canal and inguinal canal, Adductor canal, popliteal fossa, arches of foot 4. Lumbar plexus, Sacral plexus, Nerves of the Lower Extremity including cutaneous Nerves

5.Bloodvesselsandlymphaticdrainage

UNIT-III

VERTEBRALCOLUMNANDPELVIC GIRDLE:

1. Atypical and typical vertebra

2. Structure and features of Cervical, thoracic, lumbar, sacral and coccygeal vertebrae

3. Origin, insertion, nerve supply and actions of preandpara vertebral muscles

4. Muscles of Trunk and Abdomen

5. Core muscle Anatomy

6. Joints of vertebral column, structure and composition of intervertebral disc including the Radiography Evaluation

7. Joint structure, articulating components, relations, joint actions, Clinical and Applied Anatomy including Radiography of Sacro-Iliac joint

8. Structure of Innominate bone Pelvicgirdleand muscles of the pelvic floor including Applied Anatomy

UNIT-IV

HEADANDNECK:

1. Bones of the skull and face

2. Muscles of the face and neck

3. Triangles of the neck

4. Gross anatomy of eye ball, nose, ears and tongue

UNIT-V

NEUROANATOMY:

1. General organization of Nervous System

2. Central Nervous System-Gross structure of Brain and Spinal Cord

3. Diencephalon- Gross structure of Thalamus, Hypothalamus and Basal Ganglia

4. Meninges and Coverings of spinal cord

5. Cerebro-Spinal Fluid and ventricles of brain

6. Spinal Cord- Segmental features, Laminae, Nuclei, Tracks of spinal cord

7. Spinal nerves, nerve root ganglia

8. Blood supply to brain and spinal cord with clinical and applied anatomy

9. Peripheral Nervous system

10. Cranial nerves-Course and applied Anatomy Neuromuscular junction

RECOMMEMDEDTEXTBOOKS

1. Human Anatomy– Snell
2. Anatomy-Chaurasia, Volume-I,II&III
3. Neuro anatomy–Inderbirsingh
4. Human Anatomy–Kadasne,Volume-I,II&III
5. Neuro anatomy—Vishram Singh
6. Human Anatomy– Datt

HUMANPHYSIOLOGY–II **L/T/P/C**

UNIT-I **4/-/-/4**

NERVOUSSYSTEM-I

1. Introduction to nervous system-CNS, PNS and ANS

2. Neurotransmitters-Definition, fate of neurotransmitter, types

3. Synapse-Definition, type, structure, transmission of impulse across a synapse, properties.

4. Receptors and Sensation-Types of sensations, Classification of receptors, properties

5. Sensory System-Organization of the sensory system, sensory Homunculus

6. AscendingTracts-Definitions,Neuronal composition of ascending tracts, dorsal column, anterolateral tract

7. Pathophysiology of pain-Definitions, hyperalgesia and allodynia, deep pain, referred pain and its theories, management of chronic pain, endogenous opioid analgesic system

8. Motor Cortex - Cerebrum, cortical areas of brain, motor homunculus, cerebral dominance, connections, mapping the functional areas of brain

9. Descending Tracts-Pyramidal system, extrapyramidal system

UNIT-II

NERVOUSSYSTEM-II

1. Spinal cord - Introduction, effects of complete transection of the spinal cord, effects of hemi section of the spinal cord(Brown-Sequard Syndrome)

2. Reflexes-Reflex action, reflexarc, classification, properties, types-conditioned reflex, stretch reflex, inverse stretch reflex, withdrawal reflex, crossed extensor reflex, superficial reflexes (Plantar & Abdominal)

3. Connections, Functions and applied aspect of thalamus, hypothalamus, cerebellum, basal ganglia

4. Regulation of tone, Posture and it's reflexes, Equilibrium and vestibule a apparatus

5. Limbic system, Reticular Activating System, Sleep and it's types, sleep disorders, Electroencephalogram (EEG)

6. Higher Functions-Learning, Memory, Speech

7. Autonomic Nervous System - Sympathetic division, Parasympathetic division, control of autonomic functions

8. Cerebro spinal fluid-Formation and circulation, composition and properties, functions, applied aspect - Hydrocephalus, lumbar puncture

UNIT-III

SPECIALSENSES:

1. Vision-Anatomy of eye, visual pathway, pupillary reflexes, dark adaptation, light adaptation, photosensitivity

2. Hearing-Anatomy of ear, auditory pathway, tests for hearing Watch test, Rinne's test, Weber's test, deafness, Audiometry

3. Taste and Smell: Taste sensations, taste pathway factory pathway

ENDOCRINOLOGY:

1. Hormones-Definition, types, hormonal chemistry regulation, hormone receptor, mechanism of action

2. Secretion, regulation, function and applied aspect of Hypothalamus, Pituitary Gland, Thyroid Gland, Parathyroid Gland, Pancreas, Adrenal Gland.

UNIT-IV

REPRODUCTIVESYSTEM:

1. Sex determination and differentiation & it's abnormalities puberty, importance of sex hormones

2. Female reproductive system – Internal & external genital organs, Oogenesis, Structure of egg, Follicle development, ovulation, menstrual cycle, menopause

3. Male reproductive system-Testes, accessory sex organs, Spermatogenesis, structure of sperm

4. Physiology of pregnancy - Fertilization, Implantation, Placenta (formation, function, hormones), maternal changes during pregnancy, pregnancy tests, infertility

5. Child birth Physiology-Parturition Lactation

UNIT-V

GASTROINTESTINAL SYSTEM:

1. Physiological stages of digestion
2. Liver function

EXCRETORY SYSTEM:

1. Kidneys- structure & function
2. Urine formation (to exclude concentration and dilution)
3. Juxtaglomerular apparatus
4. Fluid and electrolyte balance–Na, K, H2O
5. Neural control of Micturition and diuresis
6. Applied physiology: Types of bladders

RECOMMENDED TEXT BOOKS

1. Text book on Medical Physiology–Guyton
2. Text book of Physiology–AK Jain

PATHOLOGY

L/T/P/C

2/-/-/2

UNIT:1

Cellular adaptation, Cell injury & cell death.

- Introduction to pathology.
- Overview: Cellular response to stress and noxious stimuli. Cellular adaptations of growth and differentiation.
- Overview of cell injury and cell death.
- Causes of cell injury. Mechanisms of cell injury.
- Reversible and irreversible cell injury.
- Examples of cell injury and necrosis.

UNIT-II

Inflammation.

- General features of inflammation Historical highlights
- Acute inflammation
- Chemical mediators of inflammation Outcomes of acute inflammation Morphologic patterns of acute inflammation Summary of acute inflammation
- Chronic inflammation

UNIT-III

Immunity disorders.

- General features of the immune system Disorders of the immune system

UNIT-IV

Infectious diseases.

- General principles of microbial pathogenesis viral infections.
- Bacterialinfections-Rheumaticheartdisease.
- Fungal infections.
- Parasitic infections

UNIT-V

Neoplasia.

- Definitions Nomenclature.
- Biology of tumor growth benign and malignant neoplasms Epidemiology.
- Carcinogenic agents and their cellular interactions Clinical features of tumors.

UNIT-VI

Environmental and nutritional disorders.

- Environmental and disease.
- Common environmental and occupational exposures Nutrition and disease.
- Coronary artery disease.

RECOMMENDED BOOKS:

Pathology, Harsh Mohane. Basic Pathology by Robbins

MICROBIOLOGY

L/T/P/C
3/-/-/3

a) Morphology-

Classification of microorganisms, size, shape and structure of bacteria. Use of microscope in the study of bacteria.

b) Growth and nutrition.

Nutrition, growth and multiplications of bacteria, use of culture media in diagnostic bacteriology.

c) Culture media.

Use of culture media in diagnostic bacteriology, antimicrobial sensitivity test.

d) Sterilization and Disinfection.

Principles and use of equipment of sterilization namely hot air oven, autoclave, and serum inspissate, pasteurization, antiseptic and disinfectants.

e) Immunology. -

Immunity, vaccines, types of vaccine and immunization schedule, principles, and interpretation of common serological tests namely Widell VDRL, ASLO, CRP, RF & ELISA.

Rapid tests for HIV and HBs Ag (excluding technical details).

f) Systematic Bacteriology.

Morphology, cultivation, diseases caused, laboratory diagnosis including specimen collection of the following bacteria (excluding classification, antigenic structure, and pathogenicity),

Staphylococci, Streptococci, Pneumococci, Gonococci, Meningococci, C. diphtheriae, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella E. coli, Klebsiella, Proteus,

Vibriocholera Pseudomonas & Spirochetes.

g) Parasitology.

Morphology, lifecycle, laboratory diagnosis of following parasites E. histolytica Plasmodium, tapeworms, Intestinal nematodes

h) Mycology. -

Morphology, diseases caused and lab diagnosis of following fungi. Candida, Cryptococcus, Dermatophytes, opportunistic fungi

i) Virology -

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

Reference:

a. Microbiology, Anantha Narayan and Paniker's,

b. CP. Baveja. Text book of Microbiology for nurses.

c. A text book of Microbiology-Chakraborty.

HUMAN ANATOMY PRACTICAL–II

L/T/P/C

-/-/4/2

GROSS SPECIMENS/ SPOTTERS

SPINE, PELVIS AND LOWER EXTREMITY

Identify the spotter- Osteology- Identify the bone,

LOWER EXTREMITY BONES (Innominate bone, femur, tibia, fibula, patella, tarsals, metatarsals and phalanges.) Including side determination, Spinal Segments, Vertebrae (Cervical, Thoracic, Lumbar, Sacral and Coccyx), Pelvis and Innominate Bones

Surface Anatomy of the Spine and Lower Extremity–Atlas, Axis, C-7 vertebrae, Spinous and Transverse process of vertebra, Locate the Innominate bone, ASIS and PSIS, Coccyx, Sacrum, Greater Trochanter, Condyles of femur, Patella, Tibial Tubercles and condyles, Shin Bone, Tarsal bones, Malleoli

Myology- (cadavericspotter)Spottersofthelowerextremitymusclesincludingtheorigin, insertion, blood and nerve supply

Arthrology- (Cross section Hip Joint, Knee Joint, Ankle Joint, Joints of Foot, Pelvic Joints, Joints of Spine, Intervertebral Joints, Facet Joints, Sacro-Iliac Joints)

Abdominal muscles, Pre and paravertebral muscles, pelvic floor

muscles Popliteal Fossa, Inguinal Canal, Arches of foot Spotters

of Blood vessels

NEURO-ANATOMYIDENTIFYTHESPOTTER

Cross Section of the Skull, Sinuses of

skull, Muscles of the skull and face

Triangles of the neck SYSTEMIC

ANATOMY

Gross Specimen/Spotter (Brain and Spinal Cord) Cross section of

brain and spinal cord Identify the spinal nerves Cranial Nerves

HUMANPHYSIOLOGYPRACTICAL–II

L/T/P/C

-/-/2/1

Examination of superficial sensations

Examination of deep sensations

Examination of cortical sensations

Examination of reflexes Cranial nerve examination Examination of Balance and coordination

STRESS MANAGEMENT L/T/P/C

Course Objectives 1/-/-/1

- By the end of the course, students will:
- Understand what stress is and how it affects the body and mind.
- Learnhowtorecognizepersonalstressorsandindividualresponsestostress.
- Explore various coping strategies to manage stress effectively.
- Understand how lifestyle exchange can reduce overall stress.
- Learn how to manage stress in academic and professional settings.
- Equip students with tools to build long-term resilience against stress.

Unit1

- Introduction to Stress and Its Effects Definition of stress: Eustress vs. Distress Types of stress: Acute vs. Chronic
- The biology of stress (fight-or-flight response, hormones)
- Short-termandlong-term effects on physical and mental health The role of perception and coping mechanisms

Unit2

- Identifying Stressors and Personal Stress Responses
- Internal vs. external stressors (work, relationships, environment) Identifying stress patterns (thoughts, behavior, physical reactions) Emotional regulation and its role in stress management
- The Stress Process: How stress develop and escalate

Unit3

- Coping Strategies and Stress Re lief Techniques
- Problem-focused vs. emotion-focused coping
- Cognitive Behavioral Therapy (CBT)techniques for stress
- Relaxation techniques (deep breathing, progressive muscle relaxation) Time management and organization as stress-relief tools
- Developing a personal coping plan

Unit4

- Lifestyle Changes for Managing Stress The role of physical activity and exercise SleephygieneanditsconnectiontostressNutritionanditsimpactonmentalhealthSocial support and healthy relationships Mindfulness and meditation practices

Unit5

- Stress Management at Work and School
- Managing work and school stress: Time management, prioritization Dealing with high- pressure environments and deadlines
- Building resilience and avoiding burnout
- The importance of taking breaks and practicing self-care

Unit6

- Building Long-Term Stress Resilience
- Resilience theory and how to bounce back from adversity Developing a growth mindset to handle challenges Building emotional intelligence to cope with stress Integrating stress management into daily life

Assessment &Evaluation Participation:20 (Engagement Ing group

discussion and exercises) Assignments: 30

Final Exam (Internal):50marks

Reference Text book

Stress Management: From Basic Science to Best Practice "by C.L. Cooper and Philip L. Merritt

MEDICAL PHYSICS L/T/P/C

Unit I

Fundamentals of physics in medicine **2/-/-/2**

- Basic Units and Measurements–SI units, derived units, dimensions, conversions
- Mechanics and Motion–types of motion, Newton's laws, vectors, scalars, linear/angular momentum
- Fluid Mechanics–pressure, Pascal's law, Bernoulli's principle, applications in blood flow and respiratory systems
- Bio-Mechanics Basics–center of gravity, torque, levers (applications in human body)

Unit II

Heat, temperature, and thermodynamics

- Temperature Scales–Celsius, Kelvin, Fahrenheit
- Heat Transfer Mechanisms–conduction, convection, radiation
- Thermal Expansion and Clinical Devices
- First and Second Law of Thermodynamics–energy conservation and entropy in physiological systems
- Applications in Sterilization and Cryogenics

Unit III

Sound and ultrasonics in medicine

- Nature of Sound–frequency, wave length, velocity, amplitude
- A caustics of the Human Ear
- Medical Applications–stethoscope principles
- Ultra sound imaging–A-mode, B- mode, M-mode
- Doppler effect and fetal monitoring

Unit IV

Light, optics and lasers in medicine

- Nature of Light and Refraction
- Lenses and Optics in Vision–human eye structure, myopia, hyperopia, correction
- Medical Optical Instruments– microscope, endoscope, ophthalmoscope
- Laser in Medicine–laser types, properties, applications in dermatology, ophthalmology, surgery

Unit V

Electricity, magnetism and electromagnetic waves

- Basic Electrical Concepts–voltage, current, resistance, Ohm's law
- AC and DC Current–frequency, impedance, circuits
- Capacitors and Inductors–applications in defibrillators pacemakers
- Electromagnetic Radiation–spectrum, visible light, X-rays, UV, IR
- Magnetic Fields–MRI principle and application

Unit VI

Radiation physics and protection

- Radioactivity–alpha, beta, gamma radiation
- Nuclear Physics Basics–atomic structure, isotopes, half-life
- X-rays and Imaging–X-ray production, attenuation, interaction with tissues, CT scan principle
- RadiationDosimetry–units: Gray, Sievert, Becquerel
- Radiation Hazards & Protection–ALARA principle, shielding, time-distance-shielding concept, safety standards and regulatory bodies (ICRP, AERB)

Unit VII

Biomedical instrumentation basics

- Transducers and Sensors–temperature, pressure, ECG, EEG, EMG sensors
- Basic Monitoring Equipment–ECG, pulse oximeter, defibrillator, ventilators
- Electrical Safety in Hospitals–grounding, leakage currents, isolation techniques

Unit VIII

Working principles of imaging modalities

- Computed Tomography (CT)– principle, image formation, applications
- Magnetic Resonance Imaging (MRI)–principle, contrast mechanisms, applications
- Positron Emission Tomography (PET)–principle, radio isotopes used
- Digital Radiography– CR vs DR, image acquisition and processing

Recommended Textbooks & References

- "Medical Physics "by A. K. Bhattacharya
- "Basic Radiological Physics "by Dr. KT hayalan
- "Physics for Radiographers "by John L. Ball & Tony Price
- "Introduction to Biomedical Engineering "by John Ender le
- ICRP and AERBR adiation Safety Guide lines

INTRODUCTION TO RESPIRATORY TECHNOLOGY

L/T/P/C

4/-/-/4

Unit 1

Introduction to Respiratory Care **(6hours)**

- History and evolution of respiratory therapy
- Scope and importance in health care
- Roles and responsibilities of a respiratory therapist
- Interdisciplinary collaboration

Unit 2

Basic Anatomy & Physiology of the Respiratory System **(10hours)**

- Structure of the upper and lower respiratory tract
- Mechanics of breathing
- Gas exchange and transport
- Control of respiration

Unit 3

Introduction to Respiratory Diseases **(7hours)**

- Obstructive lung diseases: Asthma, COPD
- Restrictive lung diseases: Pulmonary fibrosis
- Infections: Pneumonia, Tuberculosis
- Acute respiratory failure and ARDS (introductory level)

Unit 4

Basic Respiratory Equipment and Procedures **(8hours)**

- Introduction to oxygen therapy devices
- Nebulizers, inhalers, and spacers
- Basics of spirometry and pulmonary function testing
- Airway clearance techniques

Unit 5

Infection Control and Patient Safety **(5hours)**

- Standard precautions and hand hygiene
- Use of PPE (Personal Protective Equipment)
- Disinfection and sterilization of respiratory equipment
- Patient handling and care ethics

II[nd] Year III[rd] Semester

S.NO	SUBJECTCODE	SUBJECT	L	T	P	C	TOTAL HOURS	Max. Marks		
								INT	EXT	TOTAL
1	BRP3510301	Pharmacology	3	-	-	3	3	30	70	100
2	BRP3510302	Medical law, Ethics &Medical Records	3	-	-	3	3	30	70	100
3	BRP3510303	HealthCare Administration	2	-	-	2	2	30	70	100
4	BRP3510304	Respiratory Diagnostics	3	-	-	3	3	30	70	100
5	BRP3510305	Procedure Related to Respiratory Technology	3	-	2	7	7	30	70	100
6	BRP3510306VA	Soft Skills Development	1	-	-	1	1	100	-	100
7	BRP3510307	Clinicalpostings-1	-	-	6	6	12	100	-	100
TOTAL			**15**	**-**	**11**	**26**	**31**	**350**	**350**	**700**

SEMESTER-III

PHARMACOLOGY **L/T/P/C**

3/-/-/3

UNIT-I

General Pharmacology

a) Absorption, distribution, metabolism and elimination of drugs,

b) Routes of drug administration.

c) Adverse reactions to drugs.

d) Factors modifying drug response

UNIT-II

Autonomic nervous system & Peripheral nervous system

a) Sympathetic nervous system-sympathomimetics, sympatholytic

b) Parasympathetic-Cholinergic Anticholinergics Drugs

c) Skeletal muscle relaxants

d) Local anesthetics

UNIT-III

Central nervous system

a) Drug therapy of various CNS disorders like epilepsy, depression.

b) Non-steroidal anti-inflammatory drugs

c) General

anesthetics

AUTOCOIDS

a) Histamine and antihistamine

UNIT-IV

Cardio vascular system

a) Drug therapy of hypertension, shock, angina, cardiac arrhythmias

b) Diuretics

c) Coagulants and anticoagulants, antiplatelet drugs

d) Hypo-lipidemic

Gastrointestinal and respiratorys ystem

a) Drug treatment of peptic ulcer

b) Drug therapy of bronchial asthma

UNIT-V

Hormones

a) Drug therapy of Diabetes

b) Corticosteroids

c) Chemotherapeutic agents - b-Lactam Antibiotics, fluoroquinolones, aminoglycoside, tetracyclines, chloramphenicol

RECOMMENDED BOOKS:

1. PadmajaUdaykumar-PharmacologyforDental&AlliedHealthSciences-4thedition, 2017.

2. Joginder Singh Pathania, Rupendra Kumar Bharti, Vikas Sood- Text book of Pharmacology for Paramedical Students 2019

3. KDTripathi-EssentialsofPharmacology-8thedition,2018.

4. HL Sharma & KK Sharma-Principles of Pharmacology - 3rdedition,2017.

HEALTH CARE ADMINISTRATION

L/T/P/C

2/-/-/2

Introduction to Health Care Systems

Overview of Health Care Organizations (Hospitals, Systems, Clinics); Governance and Leader ship in Health Care Organizations; Decision-Making and Communication Flows;

Health Care Policies and

Regulations Financial

Management and Budgeting

Health Insurance and

Reimbursement Health

Information Systems

Human Resources in Health Care: Health care workforce: Challenges and Trends; Workforce planning and job analysis; Recruitment and selection in health care; Employe retention and turn over; orientation, training, and professional development; Performance appraisal systems; Workplace safety, Wellness, and burnout prevention; HR analytics and Strategic planning

Quality Improvement and Patient Safety: Health care errors and adverse events; Root cause analysis (RCA) and Failure mode and effects analysis (FMEA); Quality measurement and performance indicators; Lean and six sig main health care; Accreditation and regulatory requirements; Reporting systems and learning from errors

Legal and Ethical Issues

Strategic Planning and

Marketing Emerging Trends

in Health Care

Recommended Text Books/ Reading

1. Hospital Administration and Human Resource Management by Sharma, D.C

2. Principles of Hospital Administration and Planning by B. M. Sakharam

3. Essentials of Hospital Management & Administration by S. L. Goel and R. K. Sharma

4. Health Care Management: Organization Design and Behavior by Shortell &Kaluzny

5. Organizational Behavior in Health Care by Nancy Borkowski

6. Introduction to Healthcare Quality Management by Patrice Spath

7. PatientSafetyandHealthcareImprovementataGlancebySukhmeetPanesaretal.

RESPIRATORY DIAGNOSTICS

L/T/P/C

3/-/-/3

Unit 1

Introduction to Respiratory Diagnostics

- Importance of respiratory diagnostics in patientcare
- Overview of respiratory diagnostic procedures
- Role of the respiratory technologist

Unit 2

Pulmonary Function Testing (PFT)

- Lung volumes and capacities
- Spirometry: indications, technique, interpretation
- Flow-volume loops and bronchodilator reversibility testing
- Lung diffusion studies (DLCO)
- Body plethysmography (basic introduction)

Unit 3

Arterial Blood Gas (ABG)Analysis

- Indications and contraindications
- Sampling techniques and pre- analytical precautions
- Interpretation of ABG: pH, $PaCO_2$ PaO_2, HCO_3^-,base excess
- Acid-base disorders: metabolic and respiratory

Unit 4

Oxygenation and Ventilation Assessment

- Pulse oximetry: principle, usage, limitations
- Capnography: wave form analysis and clinical application
- Alveolar-arterial (A–a) gradient, oxygen index, and shunt equations

Unit 5

Imaging and Advanced Respiratory Diagnostics

- Role of chest X-ray, CT, and HRCT in respiratory diagnostics
- Bronchoscopy: indications, procedure overview, technician's role
- Sleep studies (Polysomnography): basics and technician involvement
- Cardiopulmonary exercise testing (CPET)– basic introduction

PROCEDURE RELATED TO RESPIRATORY TECHNOLOGY

L/T/P/C

3/-/2/4

Unit-1

DIAGNOSTIC PROCEDURES

- Bronchoscopy
- Fluoroscopy
- Lung biopsy
- Thoracoscopy, mediastinoscopy
- Transtracheal aspiration
- Imaging sciences (assessment of portable chest x - ray, CT chest, bronchography, pulmonary angiography
- Nuclear (diffusion and perfusion scan)
- Ultra sound thorax
- Chest tube insertion and monitoring
- Saccharin test
- Sweat chloride test

Unit-2

INTERMITTENT POSITIVE PRESSURE BREATHING (IPPB)

- Physiology of ippb, the work of breathing
- Clinical goals of ippb therapy
- The criteria for ippb effectiveness

Unit-3

CHEST PHYSICAL THERAPY

- Goals of chest physical therapy
- Postural drainage
- Chest percussion
- Chest vibrations
- Cough instruction and stimulation

Unit-4

INCENTIVE SPIROMETRY

- Sustained maximal inspiration clinical goal sand administration
- Types of incentives spirometers

Unit-5

CARDIO PULMONARY RESUSCITATION (CPR)

- Elaborate CPR for adults, pediatric and neonate thermodilution cardiac output

Central venous pressure monitoring

PRACTICAL– OBSERVATIONAL

DIAGNOSTIC PROCEDURES

- Bronchoscopy
- Fluoroscopy
- Lung biopsy
- Thoracoscopy, mediastinoscopy
- Transtracheal aspiration
- Imaging sciences (assessment of portable chest x-ray, CT chest, bronchography, pulmonary angiography
- Nuclear MRI (diffusion and perfusion scan)
- Ultra sound thorax
- Chest tube insertion and monitoring
- Saccharin test
- Sweat chloride test

MEDICAL LAW/ ETHICS AND MEDICAL RECORDS — L/T/P/C

MEDICAL LAW — 3/-/-/3

UNIT-I

Medical ethics-Definition-Goal Scope

Introduction to Code of conduct

UNIT-II

BasicprinciplesofmedicalethicsConfidentialityMalpracticeandnegligence-Rationaland irrational drug therapy

UNIT-III

Autonomy and informed consent-Right of patients

Care of the terminally ill- Euthanasia

UNIT-IV

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 Releaseofmedicalinformation-Unauthorizeddisclosureretentionofmedicalrecords-other various aspects.

Professional Indemnity insurance policy

UNIT-V

Developmentofstandardizedprotocoltoavoidnearmissorsentineleventsobtainingan informed consent

RECOMMENDED BOOKS:

1. Law relating to medical negligence and compensation- Dr. K.P.D.A. Prabakar &Dr. Paulraj Joseph-2023

2. Atextbookofmedicaljurisprudenceandtoxicology-JusticeKKannan-25edition-1"edition-2016

3. Lawthedoctormustknow-HiteshJBhatt&GeetebdraSharma-2017

4. Law on medical negligence and legal remedies-Dr. Annu Bahl Mehra & Harshit Kiran- 2022

RECORD KEEPING

UNIT-I

Commonly Used Prefixes, Suffixes and root words in Medical Terminology, Common Latin Terms used in Prescription Writing, Study of Standard Abbreviations.

UNIT-II

Medical Records Management. Meaning, functions, principles of record keeping, Importance of medical records to patients, doctors, and hospitals, classification of records like coding system, indexing system, types of forms basic and special, legal aspects of medical records.

UNIT-III

International Classification of Diseases (ICD), Electronic Medical Record (EMR), Records Management: Registers, forms, retention and preservation of MR, Role of MRD personnel.

UNIT-IV

Medical Registers: Meaning, types, advantages of Medical Registers, registers used in various departments, Statutory registers and reports to be maintained-specimens

UNIT-V

Medical Audit: its process, role and importance in hospitals.

RECOMMENDED BOOKS:

Davies, Juanita. Essentials of Medical Terminology. 3rd edition. New York. Delmar. 2008

Mogli .J.D. Medical Records: Organization &Management 2nd edition New Delhi Jaypee Brothers.

The body by Bilbirson A greed for Occupance

ETHICS

UNIT-I

Introduction to Public Health Ethics.

Theories of Justice and Distribution of Public Health Resources.

Principle for Public Health Ethics.

UNIT-II

Priority-Setting and Resource Al location at the Macro Level.

Priority-Setting and Resource Al location at the Micro Level.

UNIT-III

Medical Ethics, Legal Aspects and Medical Terminology.

1) Role Definition and Interaction, Ethical, Moral, and Legal Responsibilities

2) Medical terminology

3) Medical waste Management

UNIT-IV

Contemporary Ethical and Legal Issues in Health Care: Legal regulation of a standalone diagnostic center, medico-legal cases and medical negligence, ethical aspects of health care.

Balancing Individual and Community

Interests. Ethics and Health Promotion.

UNIT-V

Role of Human Rights in Public Health

Ethics of Beath Promotion and Disease Prevention

RECOMMENDED BOOKS:

1. Ethics and Public Health Archana Rani Sahoo & PatitapahanDas-2017

2. Public Health, Ethics and Equity-Sudhir Anand, Fabienne Peter and AmartyaSen-2006

3. Nursingandhealthcareethics-Robinson&Doody-6edition-2022

4. Ethics-William K. Franken a 2 edition-2015

SOFT SKILLS DEVELOPMENT

L/T/P/C

1/-/-/1

Course Objectives:

By the end of the course, students will: Improve their communication and interpersonal skills. Develop motional intelligence (EQ)and conflicted solution strategies. Enhance their ability to work in teams and exhibit leadership qualities.

Gain confidence in public speaking and professional writing.

Master time management and personal organization strategies.

Week 1

Introduction to Soft Skills Definition of soft skills vs. hard skills The importance of soft skills in the workplace

Key soft skills: communication, teamwork, adaptability, problem-solving, leadership, etc. Activities: Ice breakers, group discussions on soft skills in the workplace

Assignment: Self- assessment on current soft skills

Week 2

Communication Skills

The communication process: sender, message, receiver, feedback Active listening techniques

Body language and non-verbal cues Effective speaking: tone, clarity, and pacing Email and phone communication etiquette

Activities: Role-playing scenarios (e.g., client interaction, conflict resolution)

Assignment: Practice active listening and sendanemailin corpora ting effective communication principles.

Week3

Emotional Intelligence (EQ) What is emotional intelligence? (Self-aware ness, self-regulation, motivation, empathy, and social skills) Recognizing and managing your emotions

Understanding others' emotions and building empathy Developing emotional resilience

Activities: Emotional intelligence quizzes, group discussion on handling emotion stressful situations

Assignment: Journaling emotional responses and reflection on Eq practices.

Week4

Team work and Collaboration Roles and dynamics with in teams Effective communication in teams Conflict resolution in teams

Building trust and fostering a collaborative environment Activities:

Team exercises, problem-solving tasks, and brain storming sessions

Assignment: Work on a team projector task, and present it in class.

Week5

Conflict Resolution Sources of conflict (miscommunication, differing

priorities, etc.)

Conflict resolution strategies (negotiation, mediation, compromise) The role of active listening in resolving conflicts

Managing personal emotions during conflict Activities: Case

studies, role- playing conflict resolution scenarios

Assignment: Reflect on a personal or professional conflict and propose are solution

strategy.

Week 6

Time Management and Personal Organization

The importance of time management in personal and professional success Prioritization techniques (e.g., Eisenhower Matrix, ABCDE method)

Tools for time management (digital calendars, to-do lists, Pomodoro technique) Setting SMART goals

Managing procrastination and avoiding distractions

Activities: Time-blocking exercises, goal-setting

workshop

Assignment: Create a personal time manage men plan and track daily productivity for a week.

Week 7

Leader ship and Influence

Types of leadership (e.g., transformational, transactional, servant leadership) Leading by example: qualities of effective leaders

Building and maintaining team morale The art of persuasion and influence Activities:

Leaderships reassessment, group discussions on leadership challenges Assignment: Write are

flection on a leader admire and why.

Week8

Public Speaking and Presentation Skills

Overcoming fear of public speaking

Structuring a presentation (opening, body, conclusion) Effective use of visual aids (PowerPoint, etc.)

Engaging the audience throughs tory telling, eye contact, and body language Activities:

Group presentations, peer feedback sessions, impromptu speaking exercises Assignment:

Prepare and deliver a short presentation(5-7minutes) on a topic of choice. Assessment and

Evaluation:

ClassParticipation:20

Assignments:30 Final:50

Reference Textbook

The 7 Habits of Highly Effective People "by Stephen R. Covey

CLINICAL POSTING-I

L/T/P/C

Primary Posting Areas (Departments): **-/-/14/7**

Students should rotate across key hospital areas where respiratory therapy is applied:

1. Pulmonary Function Testing (PFT)Lab
2. General Wards (Medical/Surgical)
3. Emergency Department (Casualty)
4. Outpatient Department (OPD)–Pulmonology
5. Non-Invasive Ventilation Unit(optional)
6. ICU Observation (limited, under supervision)

1. **Patient Assessment Skills**

- Basic clinical history taking (focus on respiratory symptoms)
- Respiratory rate, pulse oximetry, temperature, BP
- Use of stethoscope: Auscultation (normal vs abnormal sounds)
- Identifying signs of respiratory distress

2. **Pulmonary Function Testing (PFT)**

- Observe and assist in:
  - Spirometry (FVC, FEV1)
  - Peak Expiratory Flow Rate (PEFR)
  - Body plethysmography (if available)
  - Diffusing capacity test (DLCO–observe only)
- Patient preparation and instruction
- Calibration of PFT equipment
- Infection control practices

3. **Basic Respiratory Procedures**

- Oxygen therapy methods (nasal cannula, mask)
- Use of pulse oximeter
- Nebulization–equipment set up, medication administration
- Humidification and aerosol therapy
- Incentive spirometry and breathing exercises

4. **Equipment Handling**

- Assembly/disassembly and cleaning of:
  - Oxygen therapy devices
  - Nebulizers
  - Spirometers
  - Suction equipment
- Understanding basics of flow meters, humidifiers, oxygen concentrators

5. **Medical Documentation**

- Recording vital signs and PFT values
- Maintaining patient observation charts
- Learning the basics of SOAP notes (if introduced)

II[nd] Year IV[th] Semester

S.NO	SUBJECT CODE	SUBJECT	L	T	P	C	TOTAL HOURS	Max. Marks		
								INT	EXT	TOTAL
1	BRP3510401	Advanced Respiratory Diagnostics	3	-	-	3	3	30	70	100
2	BRP3510402	Pulmonary Function Test	3	-	-	3	3	30	70	100
3	BRP3510403	Respiratory Therapeutics	3	-	-	3	3	30	70	100
4	BRP3510404	Respiratory Diagnostics –I Practical	-	-	2	2	4	30	70	100
5	BRP3510405	Clinical postings-II	-	-	8	8	16	100	-	100
6	BRP3510406VA	Health & Well Being	1	-	-	1	1	100	-	100
TOTAL			**10**	**-**	**10**	**20**	**30**	**320**	**280**	**600**

SEMESTER-IV

ADVANCED RESPIRATORY DIAGNOSTICS

L/T/P/C

3/-/-/3

Unit I

Medical Gas Systems & Basic Respiratory Equipment

- Medical gas pipelines
- Types of cylinders (H-type and E-type)
- Cylinder storage capacity
- Universal colour coding in medical gases
- Oxygen and other medical gas cylinders
- Oxygen flow meters
- Humidifiers including heat and moisture exchanger and heated humidifiers
- Ambu bag
- Incentive spirometer

Unit II

Respiratory Monitoring & Airway Devices

- Pulse oximeter
- Capnography monitor
- Cuff pressure manometer
- Peak expiratory flow meter
- Spirometer
- Wright's spirometer
- Oxygen analyzer
- Artificial airways (basic and advanced)
- Laryngoscope
- Bain's breathing circuit

Unit III

Ventilators, Aerosol Therapy & Advanced Respiratory Devices

- Various types of invasive ventilators
- Non-invasive ventilators
- Various types of aerosol devices
- Ultrasonic jet nebulizer
- High flow nasal cannula
- Bronchoscope and its washing techniques
- Defibrillator

Unit IV

Intercostal Drainage & Troubleshooting in Respiratory Care

- Intercostal drainage placement and indications
- Troubleshooting of respiratory equipment
- Equipment maintenance and safety checks
- Sterilization and infection control practices
- Management of equipment alarms and failures

Unit V

Cardiovascular Diseases in Respiratory Care

- Myocardial ischemia and infarction
- Valvular heart disease (mitral stenosis and mitral regurgitation)
- Endocarditis
- Myocarditis and cardiomyopathy

- Pericardial diseases (pericarditis, pericardial effusion and tamponade)
- Congenital heart disease
- Cardiogenic shock
- Heart failure (systolic, diastolic and right ventricular failure)
- Pulmonary edema
- Pulmonary hypertension
- Pulmonary embolism
- Ischemic heart disease

PULMONARY FUNCTIONTEST

L/T/P/C

3/-/-/3

Unit 1

Introduction to Pulmonary Function Testing

- Importance and indications of PFTs
- Overview of lung volumes and capacities
- ATS/ERS guide lines for standardization
- Pre-test preparation and contraindications

Unit 2

Spirometry

- Principles of spirometry
- Forced Vital Capacity (FVC), Forced Expiratory Volume (FEV_1), FEV_1/FVC ratio
- Flow-volume loops and volume-time curves
- Reversibility (bronchodilator) testing
- Common errors and troubleshooting

Unit 3

Lung Volumes and Capacities

- Methods to measure lung volumes:
  - Helium dilution
  - Nitrogen washout
  - Body plethysmography
- Interpretation of restrictive, obstructive, and mixed patterns

Unit 4

Diffusing Capacity of the Lung (DLCO)

- Physiology of gas diffusion
- Single-breath method
- Factors affecting DLCO
- Clinical applications and interpretation

Unit 5

Peak Expiratory Flow Rate (PEFR) and Bedside Pulmonary Function Tests

- PEFR measurement techniques
- Use of hand held devices
- Six- minute walk test(6MWT) basics
- Breath-holding time, chest expansion

Unit 6

Quality Control and Safety in PFT Labs

- Calibration of equipment
- Infection control protocols
- Recording and reporting standards
- Ethical considerations and patient communication

RESPIRATORY TERAPEUTICS

L/T/P/C

3/-/-/3

Unit-1`

Fundamentals & Pharmacotherapy

- Review of respiratory physiology and pathophysiology
- Principles of aerosol therapy, oxygen therapy, and humidity therapy
- Bronchodilators, corticosteroids, mucolytics, MDI/ nebulizer use
- Neuromuscular blockers, inhaled anesthetics, nitric oxide modalitie

Unit-2

Mechanical Ventilation–Applied Management

- Indications and contraindications for ventilator support
- Initial set up of ventilator settings and alarm parameters
- Adjustments for improved oxygenation, ventilation, and acid-base balance
- Weaning strategies and criteria, handling weaning failure

Unit-3

Monitoring & Complications

- Bedside monitoring tools: SpO_2, $EtCO_2$,ABG, vital signs
- Interpretation of ventilator wave forms, troubleshooting common ventilator alarms and events
- Circuit maintenance, humidification management, airway management
- Complications: barotrauma, volutrauma, oxygen toxicity, pulmonary shunting

Special Care Settings

- Neonatal and pediatric ventilation: surfactant therapy, high-frequency and liquid ventilation
- Non-invasive ventilation modalities: CPAP, BiPAP, indications and patient selection
- Home ventilation care and transport ventilation basics
- Sleep-disordered breathing(sleepapnea), hyper baric therapy principles, high-altitude disorders

REFERENCE BOOK

- Egan’s Fundamentals of Respiratory Care–widely used in RT programs
- Respiratory therapy pharmacology texts &ABG interpretation guides

RESPIRATORY DIAGNOSTICS– I PRACTICAL

L/T/P/C

-/-/4/2

Unit-1

Pulmonary Function Testing (PFT)

- **Spirometry**: Techniques for measuring lung volumes (FEV_1,FVC), flowrates, VC, MVV
- **Bronchodilator response testing**: Pre-and post-bronchodilator interpretation
- **Diffusion capacity and lung volumes** (if equipment available)

Unit-2

Arterial Blood Gas Analysis (ABG)

- Performing ABG sample collection and analysis
- Interpreting results and formulating corrective measures for common disorders (respiratory acidosis/alkalosis, metabolic disturbances)

Unit-3

Electrocardiogram (ECG)

- Recording and basic interpretation of standard 12-leadECGtraces
- Recognizing rhythm disturbances relevant to respiratory care

Unit-4

Auscultation & Breath Sound Assessment

- Identifying normal and abnormal lung sounds using stethoscope/simulation tools
- Correlating auscultation findings with PFT and chest exam observations

Unit-5

Chest X-ray/ Radiograph Basics

- Recognizing normal vs pathological patterns (e.g. consolidation, pneumothorax, cardiomegaly)
- Integration with clinical presentation and PFT findings

Unit-6

Equipment Handling & Calibration

- Calibration and QC check soft PFT spirometers, ABG analyzers, ECG machines
- Sterilization and infection control of diagnostic devices

HEALTH AND WELL - BEING

L/T/P/C

1/-/-/1

Course Description:

This course explores the holistic approach to health and well-being, focusing on physical, mental, and social aspects. Students will learn about health promotion strategies, the importance of physical activity, nutrition, mental health awareness, and stress management. The course also addresses the impact of lifestyle choices and societal factors on overall health.

Course Objectives: By the end of the course, students

will be able to:

Understand the physical, mental, and social determinants of

health. Apply strategies for improving and maintaining

physical health.

Recognize the importance of mental well- being and stress management techniques. Understand there

relationship between nutrition and over all health.

Develop practical skills for managing time, stress, and emotions.

Cultivate a balanced approach to achieving long- term health and well-

being.

Unit-1

Introduction to Health and Well-being

Overview of health and well-being

concepts

Dimensions of health: Physical, mental, social, and emotional The impact of lifestyle choices on health

Unit-2

Physical Health and Fitness Importance of physical activity for overall

health

Types of exercise: Aerobic, strength, flexibility, and balance Creating a personal fitness plan

Unit-3

Nutrition and Healthy Eating

Basics of nutrition: Macronutrients and micronutrients Healthy eating habits and food groups Impact of

nutrition on physical and mental health

Unit-4

Mental Health and Emotional Well-being
Understanding mental health: Definitions, stigma, and myths Key aspects of emotional well-being

Building emotional resilience

Unit-5

Stress Management Techniques Understanding stress and its effects on health Mindfulness and relaxation techniques

Time management for stress reduction

Unit-6

Sleep and Recovery

Importance of sleep for physical and mental health Sleep hygiene and healthy sleep

habits Impact of sleep deprivation on over all well-being

Unit-7

Social Health and Relationships The

role of social connections in well-being

Healthy relationships:
Communication, boundaries, and support Community involvement and social well-being

Unit-8

Substance Use and Addiction

The impact of alcohol, tobacco, and drugs on health Understanding addiction and treatment options Prevent measures and harm reduction strategies

Unit-9

Chronic Diseases and Prevention

Common chronic diseases (e.g, diabetes, heart disease) Risk factors and lifestyle modifications for prevention Screening, early detection, and health monitoring

Unit-10

Building Healthy Habits The psychology

of habit formation

Strategies for adopting and maintaining healthy habits Overcoming barriers to healthy behaviour changes

Reference Textbook

Health and Well ness "by S.L. Kaskutas & K.A.A. Nielson

CLINICAL POSTINGS–II

L/T/P/C

-/-/16/8

Posting Areas (Departments):

Students should rotate through the following units:

- Intensive Care Unit (ICU–Medical, Surgical, Neuro, or Cardiac)
- Emergency Department (Advanced exposure)
- BronchoscopySuite
- Sleep Lab (if available)
- Pulmonary Rehab/Physiotherapy Units
- High Dependency Unit (HDU)/Step-down ICU

Unit-1
Advanced Patient Assessment

- Glasgow Coma Scale (GCS)
- ABG (Arterial Blood Gas) basics–sampling technique observation, analysis understanding
- Chest X- ray interpretation–basic abnormalities (e.g. pleural effusion, consolidation)
- Use of scoring systems (e.g, SOFA/APACHE–awareness only)

Unit-2
Ventilation and Oxygen Therapy

- Understand types of oxygen delivery systems:
  - HFNC (High-flow nasal cannula)
  - Non-rebreather masks
  - Venturi masks
- Learn and assist in Non-Invasive Ventilation (NIV):
  - BiPAP and CPAP–mask fitting, pressure settings (observe and assist only)
- Basic knowledge of invasive ventilation (observe ventilator settings and alarms)

Unit-3
Airway Management

- Observe and assist:
  - Suctioning (oropharyngeal, nasopharyngeal)
  - Tracheostomy care and suctioning (under supervision)
- Endotracheal tube (ETT)identification and basic care (observation only)

Unit-4

Bronchoscopy Suite (Observation)

- Set up and cleaning of bronchoscope
- Sterile technique awareness
- Assist with patient preparation
- Observe diagnostic and therapeutic procedures (e.g. biopsy, lavage)

Unit-5

Sleep Studies (Polysomnography)–If Applicable

- Basics of sleep physiology
- Assist in attaching leads and monitoring devices
- CPAP titration (observe only)
- Data recording and software introduction

Unit-6

Rehabilitation and Respiratory Physiotherapy

- Chest physiotherapy techniques: percussion, vibration, postural drainage
- Breathing retraining: diaphragmatic, pursed-lip breathing
- Patient education and compliance monitoring

Vth Semester IInd Year

S.NO	SUBJECTCODE	SUBJECT	L	T	P	C	TOTAL HOURS	Max. Marks		
								INT	EXT	TOTAL
1	BRP3510501	Critical Care in Respiratory Technology	3	-	-	3	3	30	70	100
2	BRP3510502	Applied Respiratory Therapeutics	3	-	-	3	3	30	70	100
3	BRP3510503	Quality Assurance in Respiratory Care	3	-	-	3	3	30	70	100
4	BRP3510504	Respiratory Diagnostics–II Practical	-	-	2	2	4	30	70	100
5	BRP3510505	Clinical Postings-III	-	-	8	8	16	100	-	100
6	BRP3510506VA	Interpersonal Communication	1	-	-	1	1	100	-	100
TOTAL			**10**	-	**10**	**20**	**30**	**320**	**280**	**600**

SEMESTER-V

CRITICAL CARE IN RESPIRATORY TECHNOLOGY

L/T/P/C

3/-/-/3

1. Arterial Blood Gas (ABG) & Monitoring

- Sampling techniques and quality control protocols
- Interpretation of blood gas values and acid-base disturbances
- Dynamic patient monitoring: SpO_2, $EtCO_2$, ventilator wave form trends

2. Mechanical Ventilation

- **Invasive Ventilation**: indications, ventilator settings, modes (VC, PC, SIMV, PRVC)
- Alarm management and troubleshooting ventilator-related events
- Weaning protocols and criteria for ventilator liberation

3. Non-Invasive Ventilation (NIV)

- NIV modalities: CPAP, BiPAP
- Patient selection criteria, contraindications, and monitoring response
- NIV interface selection and managing complications

4. Advanced Respiratory Support Techniques

- **High-Flow Nasal Oxygen Therapy (HFNOT)**
- **Extracorporeal Membrane Oxygenation (ECMO)**principles and applications
- Emerging modalities such as IABP and oxygen up take support systems

5. Critical Care Patient Management

- Respiratory care considerations in ICU including sedation, infections, infection control
- Multidisciplinary coordination with nursing, physiotherapy, and physicians
- Equipment maintenance and safety protocols in critical care environments

Recommended Resources:

- **Egan's Fundamental of Respiratory Care**–especially chapters on mechanical ventilation, ABG interpretation
- Institutional critical care standard operating procedures (SOPs) for ventilator management and infection control
- Peer-reviewed articles and institutional guide lines on ECMO, HFNOT, and NIV protocols

APPLIED RESPIRATORY THERAPEUTICS

L/T/P/C

3/-/-/3

Unit-1

Mechanical Ventilation (including ARDS, weaning)

- Physiology of ventilation, lung compliance, dead space
- Indications/contraindications for ventilatory support
- Modes of invasive & non- invasive ventilation: CPAP, BiPAP, pressure/volume control, high-frequency ventilation
- Ventilator alarms, troubleshooting, wave for analysis
- Weaning protocols and criteria, failure risks

Unit-2

Aerosol Therapy & Medication Delivery

- Inhaler types: MDI, DPI, nebulizers (jet, ultrasonic)
- Indications, dosages, and proper techniques
- Aerosol pharmacotherapy: bronchodilators, corticosteroids, mucolytics

Unit-3

Chest Physiotherapy & Pulmonary Rehabilitation

- Techniques: postural drainage, percussion, vibration, breathing exercises
- Goals: secretion clearance, lung expansion, exercise tolerance
- Components of rehabilitation: endurance training, breathing retraining, patient education

Unit-4

Special Populations & Settings

- Pediatric and neonatal ventilation & therapies
- Home respiratory care: oxygen delivery, home ventilators, safety
- Transport/emergency respiratory care protocols

Unit-5

Life Support & CPR Certification

- Basic Life Support (BLS), Cardiopulmonary Resuscitation training
- Advanced Cardiovascular Life Support (ACLS)overview

Recommended Texts & Resources

- Egan’s Fundamentals of Respiratory Care

QUALITY ASSURANCE IN RESPIRATORY CARE

L/T/P/C

3/-/-/3

Unit-1

Introduction & Fundamentals

- Definition & scope of QA and QC in health care and respiratory care
- Structure of quality systems: ISO standards, SOPs, internal audits
- Regulatory requirements (biomedical equipment, safety norms)

Unit-2

Equipment Calibration & Maintenance

- Routine checks for ventilators, PFT machines, oxygen devices
- Calibration: spirometers, gas analyzers, pressure sensors
- Preventive maintenance, troubleshooting, documentation

Unit-3

Performance Monitoring & Control Charts

- Using control charts and statistical metrics
- Identifying trends, variability, and nonconformance
- Root cause analysis and corrective measures

Unit-4

Clinical Audits & Competency Assurance

- Clinical audits of if protocols (e.g. ventilator set up, infection control)
- Peer review, incident reporting, incident investigations
- Staff training programs, competency check lists

Unit-5

Risk Management & Patient Safety

- Identifying hazards: equipment failure, alarm fatigue, medication errors
- Reporting systems, handling ADRs, safety protocols
- Continuous improvement cycles (PDCA/PDSA)

Unit-6

Documentation, Data Management& Reporting

- Audit records, maintenance logs, calibration records
- Data collection and analysis using software or spreadsheets
- Preparing QA reports for administrative or regulatory use

Unit-7

Emerging Trends & Case Studies

- Automation in QA, remote monitoring, IoT-based equipment tracking
- Recent incidents or QA failures in respiratory care
- Best practices and quality bench marks in ICU and rehab centers

Suggested Resources &References

Some relevant textbooks and guide lines for this course, which align with broad er respiratory QA standards:

- **"Clinical Engineering Handbook"**–covers equipment QA practices
- **Respiratory therapy QA chapters** in standard textbooks: e.g. "Principles and Practice of Mechanical Ventilation

RESPIRATORY DAIGNOSTICS–II PRACTICAL

L/T/P/C

-/-/4/2

Unit-1

Spirometry & Lung Volume Testing

- Patient instruction: Acceptable technique, reproducibility, maneuver coaching.
- Perform and interpret FVC, FEV_1, flow– volume loops
- Use plethysmograph or gas dilution methods for lung volume determination.
- Calibrate spirometer, record normal values, check quality control.

Unit-2

Diffusion & Gas Exchange Studies (DLCO, Blood Gases)

- Conduct carbon monoxide diffusion (DLCO) testing.
- Perform arterial blood gas (ABG) sampling and interpretation (PO_2, PCO_2, pH, HCO_3–).
- Correlate findings with clinical scenarios: restrictive vs. obstructive disease profiles.

Unit-3

Diffusion Capacity & Exercise Testing

- Supervise standardized six- minute walk test (6MWT) or incremental shuttle walk.
- Monitor pre/post SpO_2, heartrate, exertional dyspnea scales.
- Record exercise responses and integrate findings in to reports.

Unit-4

Advanced Pulmonary Function Testing Techniques

- Maximal voluntary ventilation (MVV), respiratory muscle strength tests (MIP, MEP).
- Bronchial provocation testing (e.g. methacholine, histamine challenge)–under indirect supervision.
- Post-bronchodilator reversibility testing and response evaluation.

Unit-5

Chest Imaging Correlations

- Correlate PFT patterns with chest X-ray and CT findings.
- Practice basic assessment of imaging including silhouette tesigns, lung volumes, interstitial patterns.

Unit-6

Quality Control & Equipment Maintenance

- Daily/weekly QC checks on PFT systems; log maintenance, calibration records.
- Troubleshoot common errors: leaks, equipment drift, ambient conditions.

Unit-7

Reporting, Documentation & Clinical Integration

- Prepare structured diagnostic reports: summary of findings, interpretation, and recommendations.
- Develop competency check lists and patient report templates.
- Participate in simulated interdisciplinary case discussions (for instance, ventilator weaning, COPD management).

INTER PERSONAL COMMUNICATION

L/T/P/C

1/-/-/1

COURSE DESCRIPTION:

This course explores the fundamental principles, theories, and techniques of interpersonal communication. Studentswillexaminebothverbalandnon-verbalcommunicationstrategies and apply these skills to improve personal and professional interactions. Through class discussions, role-playing, and group activities, students will develop a better understanding of effective communication in various social contexts.

COURSE OBJECTIVES:

- By the end of the course, students will:
- Understand the theories and principles of interpersonal communication.
- Develop effective verbal and non-verbal communication skills.
- Analyze and enhance communication in various interpersonal relationships (e.g, friend ships family, workplace).
- Improve listening, empathy, and conflict-resolution skills.
- Understand cultural and gender influences on communication.
- Apply communication skills in real-world scenarios.

Unit1

- Introduction to Interpersonal Communication
- Overview of interpersonal communication theory.
- Key principles: sender, message, receiver, feedback, noise. Importance of communication in daily life.

Unit2

- Verbal Communication
- The role of language in communication.
- Choosing words carefully: Clarity, precision, and ambiguity. Influence of culture and context on verbal communication.

Unit3

- Non-Verbal Communication
- Body language, facial expressions, and gestures. Space, posture, and touch in communication.
- The role of non-verbal cues in conveying motions

Unit4

- Listening Skills
- Types of listening: Active, passive, reflective. Barriers to effective listening.
- Developing empathy through listening.

Unit5

- Self-Disclosure and Relationship Development The importance of self- disclosure in relationships. The Johari Window model.
- How self-disclosure affects trust and intimacy.

Unit6

- Conflict in Interpersonal Communication Types of conflict: Productive vs. destructive. Conflict management styles.
- Strategies for resolving conflict in healthy ways.

Unit7

- Cultural and Gender Differences in Communication
- Cultural influences on communication styles. Gender communication differences.
- Strategies for effective cross-cultural communication.

Unit8

- Communication in Close Relationships
- Communication patterns in romantic relationships, family, and friendships.
- Managingexpectationsandmaintaininghealthycommunicationinintimaterelationships.

Unit9

- Communication in the Workplace
- Interpersonal communication in professional settings.
- Navigatingprofessionalrelationshipsandmaintainingboundaries.Communicationand leadership.

Unit10

- Digital Communication
- The role of technology in interpersonal communication. The impact of social media on relationships.
- Pros and cons of digital communication tools.
- The Ethics of Communication
- Ethical dilemmas in communication.
- Honesty, transparency, and privacy in conversations. Balancing openness with respect for others' boundaries.

Evaluation and Grading:

Assignments:50

Final exam (internal50marks)

Reference Text book:

"Interpersonal Communication: Everyday Encounters"(Author: JuliaT.Wood,9thEdition

CLINICAL POSTINGS–III

L/T/P/C

-/-/16/8

Departments:

1. Medical ICU(MICU)
2. Surgical ICU(SICU)
3. Cardiac ICU (CCU)/ Cath Lab(observation)
4. Respiratory ICU/ Pulmonology Ward
5. Operation Theatre (Anesthesia support and airway handling)
6. Bronchoscopy and Interventional Pulmonology Suite
7. Sleep Lab (Active involvement)
8. Ventilator Workshop/Bio medical Unit

1. **Advanced Critical Care Skills**

- Initiation and monitoring of:
  - **Invasive mechanical ventilation**
  - **Non-invasive ventilation** (BiPAP/CPAP)–full setup and troubleshooting
- Monitor and interpret:
  - **ABG reports**
  - **Ventilator wave and alarms**
- Endotracheal suctioning and ETT care (under supervision)

2. **Airway Management**

- Oro/nasopharyngeal and tracheal suctioning (independently under supervision)
- Tracheostomy tube care and replacement (observe and assist)
- Observe intubation techniques in emergency andOR

3. **Ventilator Handling**

- Set up of:
  - Adult mechanical ventilators (e.g., Dräger, Hamilton, Servo)
  - NIV machines and humidification systems
- Circuit connections and disconnections
- Alarm handling and basic troubleshooting
- Modes of ventilation (Volume control, Pressure control, SIMV, CPAP, BiPAP)

4. **Bronchoscopy Unit**

- Pre-procedure preparation
- Handling and cleaning of bronchoscope
- Patient monitoring during procedure
- Assist with sedation monitoring and oxygen supplementation

5. **Sleep Lab and Home Ventilation**

- Conduct overnight **Polysomnography** (under supervision)
- Identify sleep apnea and CPAP titration
- Mask fitting, patient education
- Basics of **home NIV devices** setup and care

6. **Interdisciplinary Collaboration**

- Work with:
  - Anesthesiologists during air way management in OT
  - Pulmonologists for bronchoscopy and ventilation protocols
  - Physiotherapists for respiratory rehab
- Documentation and case discussions in ICU rounds

IIIyear–VI semester

S.NO	SUBJECTCODE	SUBJECT	L	T	P	C	TOTAL HOURS	Max. Marks		
								INT	EXT	TOTAL
1	BRP3510601	Advanced Respiratory Care	3	-	-	3	3	30	70	100
2	BRP3510602	Mechanical Ventilation Techniques	3	-	-	3	3	30	70	100
3	BRP3510603	Pulmonary Rehabilitation	3	-	-	3	3	30	70	100
4	BRP3510604	Advanced Respiratory Technology– Practical	-	-	2	2	4	30	70	100
5	BRP3510605	Clinical Postings-IV	-	-	6	6	12	100	-	100
6	BRP3510606	Research Methodology & Biostatistics	3	-	-	3	3	30	70	100
7	BRP3510607VA	Art of Being a Better Person	1	-	-	1	1	100	-	100
TOTAL			**13**	**-**	**20**	**21**	**29**	**350**	**350**	**700**

SEMESTER-VI

ADVANCED RESPIRATORY CARE

L/T/P/C

3/-/-/3

Unit I:

Mechanical Ventilation & ICU Management

- Initiation & Indications: when to start ventilation, contraindications
- Ventilator Settings & Modes: volume vs. pressure modes, PEEP, FiO_2
- Monitoring & Alarms: ABG interpretation, wave form analysis, dealing with alarms
- Weaning Strategies: criteria for weaning, protocols, failure management
- Special Topics: neonatal ventilation, non-invasive ventilation, home mechanical ventilation, transport ventilation, complications, high-altitude/hyperbaric scenarios

Unit II

Advanced Respiratory Care Procedures

- Advanced airway management (endotracheal and tracheostomy tube care, extubation protocols)
- Aerosol therapy, nebulization protocols, inhaler (MDI/DPI) usage
- Chest physiotherapy techniques (postural drainage, percussion, vibration)
- Pulmonary hygiene, humidification, suctioning methods

Unit III

ICU Patient Management & Emerging Trends

- Emergency respiratory care procedures (acute airway obstruction, ARDS, drowning, pulmonary edema)
- Use of pharmacotherapy relevant to ventilated patients (e.g., neuromuscular blockers, sedation protocols, steroids, nebulized meds)
- Emerging topics: sleep apnea management, hyper baric care, high-altitude physiology

Unit IV

Research Project/Capstone

- Conduct and report as mall-scale research or quality improvement project in respiratory care—this might include ventilator protocol benchmarking, patient outcomes analysis, or device evaluation

Unit V

Management, Ethics &Professional Development

- Administrative topics: hospital respiratory care services management, departmental workflows, inventory control
- Ethical and legal considerations: patient consent, confidentiality, end-of-lifecare decisions
- Professional growth: preparing for certifications, case study presentation, communication skills, leadership in respiratory care teams

Recommended Reference Texts &Resources

- Egan's Fundamentals of Respiratory Care — widely used by RT students
- YouTube channels: **Respiratory Coach**, **Respiratory Therapy Zone**—excellent for mechanical ventilation and critical care concepts

MECHANICAL VENTILATION TECHNIQUES

L/T/P/C

3/-/-/3

Unit I

Introduction to Mechanical Ventilation (Week1–2)

- Definition and indications
- Positive vs. negative pressure ventilation
- Invasive vs. non-invasive ventilation
- Types of ventilators (pneumatic, electronic, microprocessor-based)
- Basic terms: Tidal volume, respiratory rate, PEEP, FiO_2, I: E ratio

Unit II

Modes of Ventilation (Week3–5)

- Control modes: Volume-Controlled Ventilation (VCV), Pressure-Controlled Ventilation (PCV)
- Assist/Control(A/C),SIMV, Pressure Support Ventilation (PSV)
- Spontaneous breathing trials (SBT)
- Hybrid and advanced modes: PRVC, APRV, BiPAP, CPAP
- High-frequency ventilation(introductory concept)

Unit III

Ventilator Settings & Monitoring (Week6–8)

- Initial ventilator setup
- Adjusting parameters based on ABG and clinical condition
- Humidification and temperature control
- Monitoring: Airway pressures, wave forms, graphics interpretation
- Alarms: Types, causes, and troubleshooting

Unit IV

Patient- Ventilator Interactions & Troubleshooting (Week9–11)

- Asynchrony: Causes, types, and management
- Auto-PEEP, barotrauma, volutrauma
- Leak management

- Troubleshooting ventilator issues
- Emergency disconnection and manual ventilation

Unit V

Weaning & Complications (Week 12–13)

- Criteria for weaning and extubation
- Methods of weaning: T-piece, SBT, SIMV, PSV
- Complications: VAP, pneumothorax, oxygen toxicity, ventilator dependence
- Ethical considerations: DNR, withdrawal of ventilator support

PULMONARY REHABILITATION

L/T/P/C

3/-/-/3

Unit I

Introduction to Pulmonary Rehabilitation

- Definition, goals, and scope
- History and evolution of pulmonary rehabilitation
- Indications and contraindications
- Multidisciplinary team approach
- Role of respiratory therapists in rehab programs

Unit II

Patient Assessment and Program Design

- Patient selection criteria
- Initial assessment: Medical history, physical exam, functional capacity
- Assessmenttools:6-minutewalktest(6MWT),spirometry, dyspnea scales
- Individualized goal setting
- Designing a comprehensive rehabilitation plan

Unit III

Exercise Training in Pulmonary Rehab

- Exercise physiology in pulmonary disease
- Types of exercise: Aerobic, resistance, flexibility breathing exercises
- Principles of exercise prescription: FITT (Frequency, Intensity, Time, Type)
- Monitoring during exercise: Pulse oximetry, heart rate, Borg scale
- Safety considerations and emergency protocols

Unit IV

Education and Psychosocial Support

- Patient and family education: Disease, medication, inhaler techniques
- Nutrition and lifestyle modification
- Smoking cessation strategies
- Psychological support: Anxiety, depression, coping mechanisms
- Energy conservation and self-care techniques

Unit V

Program Implementation and Outcome Evaluation

- Setting up a pulmonary rehab center: Equipment and space requirements
- Home-based vs. hospital-based rehab programs
- Documentation and progress stracking
- Evaluating outcomes: QOL scores, exercise tolerance, readmission rates
- Long-term maintenance and follow-up

Unit VI

Special Populations and Emerging Trends

- Rehabilitation in asthma, COPD, ILD, post-COVID, bronchiectasis
- Pediatric and geriatric considerations
- Tele-rehabilitation and digital tools in PR
- Recent research and guide lines in pulmonary rehabilitation

ADVANCED RESPIRATORY TECHNOLOGY–PRACTICAL

L/T/P/C

-/-/4/2

Unit-1

Advanced Mechanical Ventilation

- Setup, connection, calibration of ventilators
- Mode selection: AC, SIMV, Pressure Control, NIV
- Ventilator wave for interpretation and alarm management
- Weaning protocols

Unit-2

Basic Intensive Care Procedures

- Arterial blood gas sampling (ABG), analysis and interpretation
- End-tidal CO_2 (capnography)monitoring
- Chest tube management: troubleshooting and care

Unit-3

Pulmonary Function and Sleep Study Diagnostics

- Spirometry maneuvers including bronchodilator response
- Full PFT: lung volumes, DLCO
- Introduction to polysomnography setup (nasal cannula, oximetry, sleep staging)

Unit-4

Chest Physiotherapy & Pulmonary Rehabilitation Techniques

- Postural drainage, percussion, vibration demonstrations
- Use of incentive spirometer, IPPB machines
- Educating patients on home devices (e.g. nebulizers, CPAP /BiPAP)

Unit-5

Neonatal &Pediatric Ventilatory Support (brief exposure)

- Interface choice: neonatal mask, prongs
- Basic settings adjustment for neonates/infants

RESEARCH METHODOLOGY AND BIOSTATISTICS

L/T/P/C

3/-/-/3

1. **Introduction to Research Methodology**

Meaning of research; Objectives of research; Motivation in research; Types of researches and research approaches; Criteria for good research; Problems encountered by researchers in India

2. **Identifying Research Problems**

Research problem: Conceptualizing Research: Research questions, hypotheses, constructs, variables

Testing of hypothesis: Basic concepts concerning testing of hypothesis; Limitations of testing of hypothesis

3. **Ethical issues in Research**

Introduction to research ethics (Historical back ground, Nuremberg, Belmont Report)
Ethical principles: Autonomy, beneficence, non-maleficence, justice
Informed Consent
Privacy & Confidentiality: Data protection, anonymity, GDPR (General Data Protection Regulation) basics Vs, Digital Personal Data Protection Act 2023 of India Ethical Review process: Role of IRB/IEC, applications.
Conflict of Interest: Financial, personal, institutional conflicts
Animal research ethics: 3 Rs, ethics of animal experimentation
Components of ethical research plan: Plagiarism and Academic Misconduct (Fabrication, falsification, retractions); Authorship and Publication Ethics

4. **Research Design**

Meaning of research design and its need.
Quantitative vs. Qualitative Design,
Experimental Designs: Randomized control trials, pre-posttests
Quasi-Experimental Designs: Non-randomized designs, time series
Non-Experimental Designs: Correlational, cross-sectional, case studies

5. **Basic concepts of Biostatistics Introduction**:

Definition and characteristics of statistics
Importance of study of statistics; Branches of statistics; Statistics and health sciences; Descriptive and inferential statistics
Variables and their types

Tabulation of data:

Basic principles of graphical representations
Types of diagrams- histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, non- probability curve

Measures of central tendency: Need for measure of central tendency; Definition and calculation of mean- ungrouped and grouped; Definition and calculation of

Median; Definition and calculation of mode; Comparison of mean, median, and mode
Probability and standard deviation: Meaning of probability or standard deviation; The binomial distribution; The normal distribution; Divergence from normality-skewness and kurtosis

6. **Types of Data:** Qualitative data; Quantitative data

7. **Research tools and data collection methods**
Measurement and scaling techniques: Measurement in research; Scales in research sources of error in measurements; Technique of developing measurement tools; Meaning of scaling and its classification; Important scaling techniques
Methods of data collection: Collection of primary data; Collection of data through questionnaires and schedules; Differences between questionnaires and schedules

8. **Sampling Methods**

Sampling fundamentals: Need for sampling, and some fundamental definitions; Important sampling distributions
Sampling design: Criteria for selecting procedure; Implications for sampling design; Steps in sampling design; Different types of sampling designs

9. **Developing a research proposal**

Introduction to Research Proposal; Selecting a Research Problem; Review of Literature; Formulating Research Objectives and Hypotheses; Research Questions; Theoretical or Conceptual Framework; Research Design and Methodology; Sampling Techniques and Sample Size; Data Collection Methods; Data Analysis Plan; Ethical Considerations; Limitations and Delimitations; References and Bibliography; Appendices (e.g., consent forms, tools, questionnaires)

RECOMMENDEDBOOKS:

1. Methods in biostatistics by Mahajan
2. Research methodology by CRK other
3. Text book of biostatistics by Sundar Rao
4. Text book of biostatistics and research methodology by U. Satyanarayana
5. Creswell, J.W.& Creswell. (2023). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches
6. Shamo, A.E. &Resnik, D.B. (2015). Responsible Conduct of Research.
7. Creswell.(2023). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches

ART OF BEING A BETTER PERSON

L/T/P/C

1/-/-/1

Course Description:

This course explores what it means to live ethically, compassionately, and meaningfully as a human being. Students will engage in discussions about moral philosophy, empathy, self-awareness, and how to cultivate kindness, responsibility, and social engagement in everyday life.

Course Objectives:

- By the end of the course, students will:
- Understand foundation a ethical principles that guide human behavior.
- Cultivate motional intelligence and empathy.
- Learn practical strategies for self- improvement and kind ness.
- Understand their role in society and how to make a positive impact.
- Reflect on personal actions, relationships, and contributions to the community.

Unit1

Introduction to Being a Good Human

Defining "goodness" and ethical living

Overview of moral philosophies: Utilitarianism, Deontology, Virtue Ethics The role of self- awareness in personal growth

Activity: Reflective journaling on what "being good" means to you.

Unit2

The Power of Empathy Understanding

empathy vs. sympathy

The science behind empathy and its benefits for social connections Techniques for cultivating empathy in everyday life

Activity: Empathy-building exercises and discussions.

Unit3

Emotional Intelligence (EQ) What is Emotional

Intelligence? (Self-awareness, self-regulation, motivation, empathy, and social skills) The role of EQ in personal and professional relationships

Strategies to improve emotional intelligence

Activity: Self-assessment of emotional intelligence and EQ development exercises.

Unit4

Compassion and Kindness

The science of kindness: How kindness benefits us and others

Practicing kindness in small, everyday actions Overcoming barriers

to kindness (e.g, stress, biases, indifference) Activity: "Random Acts

of Kindness "challenge.

Unit5

Personal Integrity and Honesty

The importance of integrity in personal and professional life Consequences of dishonesty and lack of integrity

How to align actions with values Activity: Case study discussion on

ethical dilemmas and decision-making.

Unit6

Building Positive Relationships

Communication skills for healthy relationships Setting boundaries and respecting others 'boundaries Conflict resolution and forgiveness

Activity: Role- playing scenarios to practice healthy communication.

Unit7

Responsibility and Accountability

The concept of personal responsibility in life Accountability in both personal and community contexts How to take ownership of mistakes and learn from them Activity: Reflect on past mistakes and plan for growth.

Unit8

Contributing to the Community and Society

The role of individuals in building strong communities Volunteering, activism, and social responsibility

The impact of small, positive actions on a larger scale Activity: Brain

storming session on potential ways to contribute to the local community.

Unit9

Practicing Gratitude and Contentment

The psychological and emotional benefits of gratitude Practicing contentment in a consumer-driven worldTechniquesforcultivatingamindsetofabundanceActivity:Gratitudejournal and daily reflection.

Unit10

Living with Purpose and Meaning

Discovering personal values and purpose

The intersection of passion, skills, and service Creating a life plan that aligns with core values Activity: Create a personal mission statement.

Week11

Over coming Negative Traits: Greed, Anger, and Envy The psychology behind negative emotions and traits How greed, anger, and envy affect our well-being

Strategies for managing and transforming negative emotions Activity: Mind fulness

meditation and reflection exercises.

Bringing It All Together:
ALifeofGoodnessReviewofkeylearningsfromthecourseCreatingavisionforcontinuouspersonalgrowth

How to maintain a positive and ethical life in a challenging world

Activity: Final reflection paper or presentation on how students will apply the course's principles to their life.

Reference Text book How to Win Friends and Influence People "by

Dale Carnegie The Seven Habits of Highly Effective People "by

Stephen R. Covey

CLINICAL POSTINGS – IV

L/T/P/C
-/-/16/8

Posting Areas (Departments):

Students should now be integrated in to **real-time critical care teams** and specialized units:

1. Medical and Surgical ICU
2. Neonatal ICU (NICU) & Pediatric ICU (PICU)
3. Cardiothoracic ICU/Cath Lab
4. Pulmonology Ward and OPD
5. Bronchoscopy and Interventional Pulmonology
6. Sleep Medicine Unit
7. Emergency Department (Advanced postings)
8. Ventilator Workshop/ Biomedical Engineering Unit
9. Home Care and Long-Term Ventilation Programs

1. **Independent Clinical Skills**

- Set up and full management of **mechanical ventilators**
- Adjust ventilator parameters based on:
  - ABG results
  - Lung pathology (COPD, ARDS, pneumonia, neuromuscular disorders)
  - Vital signs and ventilator waveforms
- **Weaning protocols** and spontaneous breathing trials (under supervision)

2. Advanced Airway Management

- ETT suctioning and cuff pressure monitoring
- Tracheostomy care, change, and emergency management
- Assisting in **re- intubation** during emergency (observe/assist)

3. **Monitoring and Interpretation**

- **Arterial blood gas (ABG)** interpretation and correlation with ventilator strategy
- **Chest X-ray** evaluation in ventilated patients
- Understand and document **ventilator graphics**: flow, pressure, volume loops

4. **Neonatal and Pediatric Respiratory Care**

- Basics of neonatal respiratory support:
  - CPAP, HFNC, Mechanical ventilation
- Handling infant inter faces and masks
- Thermoregulation, humidification, and oxygen control in NICU
- Common neonatal respiratory disorders (RDS, MAS)

5. **Bronchoscopy and Interventional Pulmonology**

- Assist in **diagnostic and therapeutic bronchoscopy**
- Pre-and post-bronchoscopy patientcare
- Introduction to **EBUS**, biopsy tools, and foreign body retrieval (observe only)

6. **Sleep Medicine and Home Care**

- Conducting and scoring **polysomnography**
- Long- term ventilation: CPAP/BiPAP titration
- Interface selection and patient counseling
- Exposure to **tele monitoring and home ventilator setup**

7. **Emergency and Trauma Management**

- Emergency ventilation (Ambu bagging, O_2 therapy, NIV initiation)
- Work a long side ER team during respiratory emergencies (e.g, asthma, COPD exacerbation, pneumothorax)
- CPR (Observe and assist in code blue I fallowed by hospital protocol)

8. **Clinical Decision-Making& Documentation**

- Ventilator progress notes and daily documentation
- Presenting patient cases in rounds
- Participating in **multidisciplinary team discussions**

VIIth Semester IVth Year

Course code	Course title	Credits/week			Hours/semester			Assessment		Total
BRP3510701	Internship	**L**	**P**	**C**	**L**	**T/P**	**Total**	**INT**	**EXT**	
		2	2	22	30	900	930	-	100	100
	Project	-	06	06		270	270		100	100
Total		2	26	28	30	1170	1200	-	200	200

INTERNSHIP – I **L/T/P/C**

2/-/2/22

Clinical Posting Areas (Departments):

Interns should rotate across **all major and specialty units** where respiratory care is practiced:

- Medical ICU (MICU)
- Surgical ICU (SICU)
- Cardiac ICU (CCU)/Cardiothoracic ICU
- Emergency Department
- Neonatal ICU (NICU) & Pediatric ICU (PICU)
- Respiratory Ward/ Pulmonology OPD
- Sleep Lab & Home Ventilation Unit
- Operation Theatre (OT)/Anesthesia Support
- Bronchoscopy & Interventional Pulmonology Suite
- Rehabilitation Unit/ Respiratory Physiotherapy

1. **Independent Respiratory Care Execution**

- **Initiate, monitor, and adjust**:
  - Invasive mechanical ventilation (based on ABG, clinical condition, waveforms)
  - Non-invasive ventilation (BiPAP, CPAP)–full autonomy under RT supervision
- Apply **weaning protocols**, spontaneous breathing trials
- Perform patient assessments: vitals, breath sounds, SpO_2, ventilator parameters

2. **Advanced Airway Management**

- Tracheostomy care: tub exchange, cuff pressure monitoring, suctioning
- Endotracheal suctioning, ETT care
- Prepare and assist for intubation (observe procedure)

3. **ABG Sampling and Interpretation**

- Perform ABG sampling (if institutionally allowed)
- Analyze ABG reports and suggest ventilator modifications to supervising RT or physician

4. **Neonatal and Pediatric Respiratory Support**

- Setup and monitor neonatal CPAP and HFNC
- Assist in ventilator management for neonates and children
- Recognize and report signs of neonatal respiratory distress

5. **Sleep and Home Respiratory Care**

- Conduct and report **overnight polysomnography**
- Perform **CPAP/BiPAP titration**
- Educate patients on **home oxygen therapy**, NIV, and device handling

6. **Bronchoscopy & Interventional Procedures**

- Prepare patients for bronchoscopy
- Assist in bronchoscope handling, sterilization, and sedation monitoring
- Observe advanced procedures (EBUS, foreign body removal)

7. **Emergency and Acute Respiratory Care**

- Rapid response to respiratory emergencies: bag- mask ventilation, oxygen therapy, NIV initiation
- Participate in **Code Blue** (CPR–if BLS/ACLS certified)
- Manage acute asthma, COPD exacerbations, pulmonary embolism support

PROJECT I

- Should undertake extensive literature search from reputed journals in their specialization.
- Formulate a research question.
- Design a research study and get it approved from all scientific committees
- Student need to get a review article done based on the literature search.

VIIIth Semester IVth Year

Course code	Course title	Credits/week			Hours/semester			Assessment		Total
BRP3510801	Internship	**L**	**P**	**C**	**L**	**T/P**	**Total**	**INT**	**EXT**	
		2	2	22	30	900	930	-	100	100
	Project	-	06	06		270	270		100	100
Total		2	26	28	30	1170	1200	-	200	200

INTERNSHIP–II **LTPC**
2/-/2/22

Clinical Postings

Students spend significant time (often 6–12 months intern ship) rotating through hospital and diagnostic environments, including:

- **Intensive Care Units (Adult ICU)**—managing ventilators, respiratory therapies, and monitoring critically ill patients
- **Neonatal & Pediatric Critical Care**—ventilator management, airway care, neonatal ventilation techniques
- **Pulmonary Function Testing (PFT) Lab**—spirometry, gas diffusion, interpreting test results
- **General Respiratory Care Areas**—oxygen therapy, aerosol therapy, chest physiotherapy, airway management
- **Sleep Laboratory**—sleep studies, CPAP/BiPAP setup and monitoring
- **OutpatientClinics/HomeCare/Transport(ambulance/land-airtransport)**—alternate site therapy, home ventilation, extended care units

Core Learning Objectives & Skills

During this period, students are expected to:

Advanced Ventilator Management

- Understand ventilation mechanics: airway resistance, compliance, failed oxygenation/ventilation
- Master ventilator settings and monitoring (vitals, ABG,ET-CO_2, wave form analysis)
- Handle ventilator alarms, troubleshoot tubing, cuffs, leakage, circuit malfunction
- Learn initiation, weaning strategies, neonatal ventilation modes, and non-invasive ventilation (NIV) including CPAP/BiPAP, home setups

Critical Care Patient Management

- Care for patients with ARDS, COPD, COVID-19, pulmonary edema, shock, poisoning, trauma
- Provide chest physical therapy, pulmonary rehabilitation, suctioning
- Manage sedation, drugs (neuromuscular blockers, anesthetic gases, bronchodilators, steroids)

Pulmonary Diagnostics & Laboratory Skills

- Conduct spirometry, diffusion tests, lung volume measurements, interpret PFT results
- Manage oxygen therapy, aerosol/nebulization, hygiene protocols of equipment
- Monitor ABG interpretation, fluid/electrolyte management, nutritional needs

Specialty Rotations

- Neonatal/pediatric care: initiation and maintenance of ventilators, surfactant therapy
- Sleep lab: diagnose and manage sleep apnea, acclimatize to PFT in sleep settings

Professional & Soft Skills

- Patient monitoring, bedside assessments, infection control practices
- Record-keeping, documentation, hospital protocols, teamwork with doctors and nurses
- Communication skills, patient counseling, ethical and legal awareness

PROJECT II

L/T/P/C
-/-/20/10

- As continuation of project I, students should do an independent research project.
- They should submit the Dissertation/Thesis and defend it