MOHAN BABU UNIVERSITY

Sree Sainath Nagar, Tirupati – 517 102

MBU
MOHAN BABU
UNIVERSITY
DREAM. BELIEVE. ACHIEVE

SCHOOL OF PARAMEDICAL, ALLIED AND HEALTH CARE SCIENCES

BPT - Bachelor of Physiotherapy

CURRICULUM AND SYLLABUS

(From 2022-23 Admitted Students)

FULLY FLEXIBLE CHOICE BASED CREDIT SYSTEM (FFCBCS)

MOHAN BABU UNIVERSITY

Vision

To be a globally respected institution with an innovative and entrepreneurial culture that offers transformative education to advance sustainability and societal good.

Mission

- Develop industry-focused professionals with a global perspective.
- Offer academic programs that provide transformative learning experience founded on the spirit of curiosity, innovation, and integrity.
- Create confluence of research, innovation, and ideation to bring about sustainable and socially relevant enterprises.
- Uphold high standards of professional ethics leading to harmonious relationship with environment and society.

SCHOOL OF PARAMEDICAL ALLIED AND HEALTH CARE SCIENCES

Vision

To be the global center of excellence for paramedical and allied health science education, research, innovation, incubation, consultancy and public service.

Mission

- Inspire the experts of paramedical and allied health sciences of tomorrow to take on the public health challenges of our society.
- Train the students with fundamental knowledge of paramedical and allied health sciences, skills set and positive attitude for creating innovative solutions to serve industry and community through congenial learning environment with contemporary academic programs, state of the art infrastructure facilities and community health programs.
- Facilitate budding paramedical and allied health science experts with the best research-innovation-incubation-start-up ecosystem to realize their fullest potential for sustainable businesses.
- Encourage faculty and staff to excel in their respective domains of expertize and demonstrate the best of their abilities by way of continuing education, research support and consultancy.

Bachelor of Physiotherapy

PROGRAM EDUCATIONAL OBJECTIVES

After a few years of graduation, the graduates of BPT will:

PEO1. Evolve as an entrepreneur or be employed by acquiring skills in patient care handling including communication skills, confidence, Clinical reasons, Counselling, and research.

PEO2. Demonstrate professional autonomy in physiotherapy practice at hospitals, nursing homes, sports teams, fitness centers, Community Rehabilitation, Health planning boards, and health promotions services in both private and public sectors as well as in independent physiotherapy clinics

PEO3. Embolden to pursue further qualifications to attain a senior position in the professional field and also to keep abreast with recent advances, new technology, and research.

PROGRAM OUTCOMES

On successful completion of the Program, the graduates of the BPT Program will be able to:

PO1. **Knowledge:** Integrate concepts from the biological, physical, behavioral, and clinical sciences into physical therapy services.

PO2. **Analysis:** Students will execute high-order skills in analysis, critical evaluation, and/or professional application of clinical and practical skills in Physiotherapy.

PO3. **Tools & Techniques:** To create, select, and apply appropriate techniques, resources and modern tools with an understanding of the limitations in Health care system.

PO4. **Environment and Sustainability:** Understand the impact of Health care professionals in environmental contexts and demonstrate the knowledge for sustainable development.

PO5. **Ethics and Society:** Function safely and effectively while adhering to legal, ethical and professional standards of practice for the sustainable development of society.

PO6. **Individual and teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and multidisciplinary settings.

PO7. **Effective Communication:** Communicate effectively on Paramedical & allied Health care activities with the treating patient, community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO8. **Project and Finance Management**: Demonstrate knowledge and understanding the management principles and apply these to one's own work to manage projects in multidisciplinary health care system.

PO9. **Entrepreneurship:** Entrepreneur and leadership skills to practice independently as well as in collaboration with the interdisciplinary healthcare team.

PO10. **Life-long learning:** Adapt to the changes and advancements in technology and engage in independent and lifelong learning

Bachelor of Physiotherapy

Basket Wise - Credit Distribution

S. No.	Basket	Credits (Min. - Max.)
1	SCHOOL CORE	89-100
2	PROGRAM CORE	104-114
3	PROGRAM ELECTIVE	10-26
4	UNIVERSITY ELECTIVE	3-12
	TOTAL CREDITS	**Min. 217**

SCHOOL CORE (89-100 Credits)

Course Code.	Title of the Course	Lecture	Tutorial	Practical	Project based Learning	Credits	Pre-requisite
		L	T	P	S	C	
22PT102001	Anatomy-I	6	-	4	-	8	-
22PT102002	Physiology-I	5	-	2	-	6	-
22LG101406	Professional English	2	-	-	-	2	-
22PT102003	Sociology	3	-	2	-	4	
22PT101001	General and Clinical Psychology	3	-	-	-	3	-
22CC101019	National Health Care Delivery System and Medical Records Management	4	-	-	-	4	-
22DF102015	Medical Biochemistry-I	3	-	1	-	3.5	-
22PT102004	Anatomy-II	4	1	2	-	6	Anatomy-I
22PT102005	Physiology -II	4	1	2	-	6	Physiology-I
22DF102020	Medical Biochemistry-II	3	-	1	-	3.5	Medical Biochemistry-I
22CC101005	Medical Terminology and record management	2	-	-	-	2	-
22DF102021	Principles of Ethics, Healthcare Quality and Patient Safety	3	-	2	-	4	-
22CS102402	Basic computers and information sciences	3	-	2	-	4	-
22DF102006	Healthcare Quality and patient safety	2	-	2	-	3	-
22DF102008	Clinical Microbiology	3	-	2	-	4	-
22DF102025	Research methodology and Biostatistics	3	-	2	-	4	-
22PT111001	Clinical Training – I	-	-	-	-	4	-
22PT111002	Clinical Training – II	-	-	-	-	4	Clinical Training – I

Course Code.	Title of the Course	Lecture	Tutorial	Practical	Project based Learning	Credits	Pre-requisite
22PT111003	Clinical Training – III	-	-	-	-	4	Clinical Training – II
22PT111004	Clinical Training – IV	-	-	-	-	4	Clinical Training – III
22PT111005	Clinical Training - V	-	-	-	-	4	Clinical Training – IV
22DF101001	Research Methodology and Biostatistics for Health Professionals	4	-	-	-	4	-
22PT108001	Capstone Project	-	-	-	-	4	-
22PT111006	Clinical Internship	-	-	-	-	20	-

Mandatory Courses (Min. 4 Credits to be earned, Earned Credits will not be considered for CGPA)							
22LG101402	Telugu	2	-	-	-	2	-
22LG101404	Sanskrit	2	-	-	-	2	-
22CE107601	Environmental Science	2	-	-	-	2	-
22AB107602	Yoga	2	-	-	-	2	
22AB107601	NSS Activity	2	-	-	-	2	

PROGRAM CORE (104-114 Credits)

Course Code.	Title of the Course	Lecture	Tutorial	Practical	Project based Learning	Credits	Pre-requisite
		L	T	P	S	C	
22PT101002	Introduction to Health Care System and Physiotherapy Role	2	-	-	-	2	-
22PT101003	Basic Ethics and Regulation of Physiotherapy	2	-	-	-	2	-
22DF102010	Pathology for Physiotherapy	3	-	2	-	4	-
22PT102012	Biomechanics-I	3	1	2	-	5	-
22PT102013	Exercise Therapy-I	4	1	4	-	7	-
22PT105001	Biophysics	-	1	2	-	2	-
22PT102014	Electro Therapy-I	3	-	4	-	5	-
22PT102015	Exercise Therapy-II	4	1	6	-	8	Exercise Therapy-I
22PT102016	Electro Therapy-II	3	-	4	-	5	Electro Therapy-I
22PT101007	Pharmacology	3	-	-	-	3	-
22PT102017	Biomechanics-II	5	-	2	-	6	Biomechanics-I
22PT101010	General Medicine, Paediatrics and Psychiatry	4	-	-	-	4	-
22PT101008	General Surgery, Obstetrics and Gynaecology	4	-	-	-	4	-
22PT101009	Community Medicine	4	-	-	-	4	-
22PT101012	Clinical Orthopaedics and Traumatology	4	-	-	-	4	-
22PT102020	Physiotherapy in Orthopaedics and sports	4	-	6	-	7	-
22PT102024	Clinical reasoning and Evidence based Physiotherapy	1	-	2	-	2	-
22PT101013	Clinical Neurology and Neurosurgery	4	-	-	-	4	-

Course Code.	Title of the Course	Lecture	Tutorial	Practical	Project based Learning	Credits	Pre-requisite
22PT102021	Electro Diagnostics	2	-	2	-	3	-
22PT102022	Physiotherapy in Neurology	4	-	6	-	7	-
22PT201010	Clinical cardiovascular and pulmonary	4	-	-	-	4	-
22PT102023	Physiotherapy in cardiovascular and pulmonary conditions	4	-	6	-	7	-
22DF102003	Medical Biochemistry	3	-	2	-	4	-
22PT101006	Ergonomics and Health Promotion	2	-	-	-	2	-
22PT102018	Physiotherapy for women and childcare	2	-	2	-	3	-

PROGRAM ELECTIVE (10-26 Credits)

Course Code	Title of the Course	Lecture	Tutorial	Practical	Project Based Learning	Credits	Pre-requisite
		L	T	P	S	C	
22PT101011	Health Promotion and Fitness	2	-	-	-	2	-
22PT102026	Physiotherapy administration and Teaching skills	1	-	2	-	2	-
22PT101017	Hand Rehabilitation	2	-	-	-	2	-
22PT101014	Sports Physiotherapy	2	-	-	-	2	-
22PT102028	Physiotherapy in ICU	2	-	2	-	3	-
22PT102029	Neurodevelopmental technique	1	-	2	-	2	-
22PT101016	Geriatrics Physiotherapy	2	-	-	-	2	-
22PT102025	Rehabilitation Medicine	2	-	2	-	3	-

University Elective (3-12 Credits)

Course Code	Title of the Course	Lecture	Tutorial	Practical	Project Based Learning	Credits	Pre-requisite
		L	T	P	S	C	
22EC101701	AI in Healthcare	3	-	-	-	3	-
22DS101701	Bioinformatics	3	-	-	-	3	-
22SS101701	Constitution of India	3	-	-	-	3	-
22CM101702	Cost Accounting and Financial Management	3	-	-	-	3	-
22MG101701	Entrepreneurship for Micro, Small and Medium Enterprises	3	-	-	-	3	-
22CB101703	Forensic Science	3	-	-	-	3	-
22SS101704	Indian History	3	-	-	-	3	-
22SS101705	Indian Tradition and Culture	3	-	-	-	3	-
22ME101704	Managing Innovation and Entrepreneurship	3	-	-	-	3	-
22LG201701	Personality Development	3	-	-	-	3	-
22CS101702	Web Design Fundamentals	3	-	-	-	3	-
22SS101706	Women Empowerment	3	-	-	-	3	-

Note:

1. If any student has chosen a course or equivalent course from the above list in their regular curriculum then, he/she is not eligible to opt the same course/s under University Elective.
2. The student can choose courses from other disciplines offered across the schools of MBU satisfying the pre-requisite other than the above list.

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT102001	**ANATOMY -I**	6	-	4	-	8

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on the structure of human body which is essential for clinical studies.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the basics of anatomy.

CO2. Study and Apply the Clinical knowledge on the Upper and Lower Extremity.

CO3. Demonstrate the features of Thorax & Vertebral column

CO4. Understand the basics of general histology

CO5. Demonstrate the concepts of anatomy in embryology.

CO6. Work independently or in team to solve problems with effective communication.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	1	-	-	-	2	-	-	-	-
CO2	3	2	2	-	-	1	-	-	-	**-**
CO3	3	3	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	-	-
CO5	3	3		-	-	3	3	-	-	2
CO6	-	-	-	-	-	3	3	-	-	3
Course Correlation Mapping	**3**	**3**	**2**	**-**	**-**	**2**	**3**	**-**	**-**	**2**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: INTRODUCTION ***(10 Periods)***

Introduction of Anatomy: Medical terminology, Anatomical positions, Axis and Planes, Skeleton - Axial and Appendicular skeleton, Joints, Muscles, Nerves and its Clinical importance.

Systemic - Nervous system, Digestive system, Urinary system, Reproductive system, Respiratory system.

Module 2: UPPER EXTREMITY ***(20 Periods)***

Bones: Clavicle, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges**.**

Muscles: Pectoral muscles, scapular muscles, Deltoid muscle, muscles of arm, muscles of forearm and hand

Nerves: Brachial plexus, Redial nerve, median nerve, Ulnar nerve, axillary nerve and musculocutaneous

Blood vessels: subclavian artery, axillary artery, brachial artery, radial artery, ulnar artery, and arterial arches of hand. Venous drainage of upper limb, lymphatic drainage of upper limb.

Joints: Shoulder joint, elbow joints, radio ulnar joint, wrist joint and joints of the hand.

Regional: Breast, pectoral region, axilla, front of arm, back of arm, cubital fossa, front of fore arm, back of fore arm, palm and dorsum of hand.

Module 3: LOWER EXTREMITY ***(20 Periods)***

Bones: Hip bone, femur, tibia, fibula, patella, tarsals, metartarsals and Phalanges, & arches of foot.

Muscles: Gluteal muscles, muscles of thigh, muscles of leg and foot.

Nerves: Lumbosacral plexus, coccygeal plexus, sciatic nerve, common peroneal nerve, tibial nerve, femoral nerve, saphenous nerve, obturator nerve and sural nerve.

Blood vessels: femoral artery, popliteal artery, tibial artery, and arterial arches of foot. Venous drainage of the lower limb and lymphatic drainage of lower limb

Joints: Hip Joint, Knee joint, Ankle joint, joints of the foot

Regional: Gluteal region, inguinal region, front and back of the thigh, Femoral triangle, medial side of the thigh (Adductor canal), lateral side of the thigh, popliteal fossa, anterior and posterior compartment of leg, sole of the foot.

Module 4: THORAX & VERTEBRAL COLUMN ***(20 Periods)***

Bones: Cervical, thoracic, lumbar, sacral and coccygeal vertebrae (typical & atypical), ribs (typical & atypical), and sternum.

Muscles: Intercostals, serratus anterior muscle, latissimus dorsi muscle, and diaphragm.

Nerves: intercostal nerve.

Blood vessels: intercostal vessels, azygous system of veins, aorta, and pulmonary trunk.

Joints: joints of thorax and its movements.

Soft parts: mediastinum & its contents, pleura & lungs, pericardium & heart, trachea, oesophagus, & thoracic duct.

Module 5: GENERAL HISTOLOGY **(10 Periods)**

Microscope, Cell, common objects, study of the basic tissues of the body; Epithelium, Connective Tissue, Cartilage; Bone; Muscular tissue; Nervous Tissue; Blood vessels, lymphoid tissue, Glands, Teeth, Skin and its appendages.

Module 6: GENERAL EMBRYOLOGY **(10 Periods)**

Cell division, Gametes, gametogenesis, fertilization and formation of the Germ layers and their derivations, pharyngeal arches & its derivatives.

Development of skin, Fascia, blood vessels, lymphatic.

Development of bones, axial and appendicular skeleton and muscles.

Total Periods: 90

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Upper Extremity including surface anatomy.
2. Lower Extremity including surface anatomy.
3. Demonstration of thoracic viscera and vertebral column.
4. Demonstration of general histology slides.
5. Demonstration of general embryology charts.

RESOURCES

BOOKS:

1. B.D Chaurasia's Human Anatomy-Regional and applied; CBS publishers, vol 1,2,3,4 Edition 9(2022).
2. Snell[Richard S],Clinical Anatomy for medical students; 6th Edition , 2021
3. Inderbir Singh's book of Anatomy; vol 1,2,3, 3rd Edition,2020
4. Inderbir Singh's Text book of Human Histology, Jaypee Publishers, 10th Edition, 2022
5. Inderbir Singh's Text book of Human Embryology, Jaypee Publishers, 12th Edition, 2022
6. A.k. Datta, Essentials of human anatomy; Current books international publishers; Volume: 1,2,3,4; 10th Edition 2019.
7. Richard Tunstall and Susan standring, Gray's Anatomy - The anatomical basis of clinical practice, Elsevier publishers, 42nd Edition 2020.
8. Rachel koshi, Cunningham's manual of practical Anatomy, Oxford University Press publishers, Volume - 1,2,3; 16th Edition 2017.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=f6rZw7QkGLw
2. https://www.youtube.com/watch?v=15k5fajCN_w
3. https://www.youtube.com/watch?v=UMTDmP81mG4
4. https://www.youtube.com/watch?v=WPjqgaMmOTE
5. https://www.youtube.com/watch?v=0GSRbmcNh3A
6. https://www.youtube.com/watch?v=4YKvVeVMmEE

WEB RESOURCES:

1. https://byjus.com/biology/anatomy-and-physiology/
2. https://www.histologyguide.com/about-us/sorenson-atlas-of-human-histology-chapters-1-and-14.pdf

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT102002	**PHYSIOLOGY-I**	5	-	2	-	6

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed in-depth discussion on fundamental reactions of living organisms specific to human body. It emphasizes the concepts of cell, primary tissue, connective tissue, skin, muscle, nervous tissue, blood, lymphoid tissues, respiration, blood vessels, circulation, cardiac cycle, systemic circulation, gastrointestinal tract, kidneys, uterus, urinary tract, pregnancy and endocrine system.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the basic concepts of General physiology of cell and body fluids

CO2. Apply various techniques for estimation of blood cells.

CO3. Understand the classification and mechanism of nerve muscle physiology.

CO4. Analyze the mechanism of cardiovascular system and its effects during exercises

CO5. Demonstrate the various mechanisms of respiration with appropriate technique.

CO6. Work independently or in team to solve problems with effective communication.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	3	-	-	-	-	-	-	-
CO2	3	3	2	-	-	-	-	-	-	-
CO3	3	3	2	-	-	-	-	-	-	-
CO4	3	3	2	-	-	1	-	-	-	-
CO5	3	3	-	-	-	1	-	-	-	-
CO6	-	-	-	-	-	3	3	-	-	2
Course Correlation Mapping	**3**	**3**	**2**	**-**	**-**	**2**	**3**	**-**	**-**	**2**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: GENERAL PHYSIOLOGY *(10 Periods)*

General Physiology: Cell structure and functions, cell junction, Transport across the cell membrane, Homeostasis, fluid & electrolyte balance, acid – base balance.

Module 2: BLOOD & BODY FLUIDS *(20 Periods)*

Introduction: Composition and functions of blood, body fluids, Plasma: Composition, Plasma proteins, Haemopoiesis-Erythropoiesis, Leukopoiesis and Thrombopoiesis.

RBC: Count and its variations, Haemoglobin –structure, function and derivatives, Anemia, types of Jaundice, PCV, ESR.

Blood indices: MCV, MCHC and MCH

WBC: Classification, Morphology, functions, count, its variation of each, Immunity.

Platelets: Morphology, functions, count, its variations

Blood Groups: Landsteiner's law, Types, significance, determination, Erythroblastosis foetalis.

Lymph: Composition, formation, circulation and functions.

Reticulo-endothelial system

Others: Hemostatic mechanisms, Blood coagulation–factors, mechanisms, disorders, Anticoagulants, Blood Transfusion: Cross matching, Indications and complications.

Module 3: NERVE MUSCLE PHYSIOLOGY *(15 Periods)*

Introduction: Muscle-Classification**,** structure of skeletal muscle, properties of skeletal muscle, changes during muscle contraction- Resting membrane potential, Action potential, smooth muscle**. Nerve**-Structure and functions of neurons, Classification, Neuroglia, Properties of nerve, transmission of impulse through nerve fiber, Nerve injury – degeneration and regeneration.

Neuromuscular junction: Structure, Neuromuscular transmission, myasthenia gravis. Excitation- Contraction coupling.

Electromyogram & Disorders of skeletal muscle.

Endurance of a muscle.

Module 4: CARDIOVASCULAR SYSTEM *(15 Periods)*

Cardiac muscle & its properties**,** types of circulation - systemic and pulmonary**.**
Cardiac cycle- atrial events, ventricular events, pressure changes, volume changes; Heart sounds, Cardiac murmur, Electrocardiogram, Arrhythmia**,** Artificial pacemaker, Cardiac output – stroke volume, minute volume, cardiac index, ejection fraction, variations in cardiac output, factors maintaining cardiac output, measurement of cardiac output, cardiac catheterization; Heart rate – normal values, regulation of heart rate, factors affecting heart rate; Blood pressure – arterial pressure, venous pressure, variations, determinants, regulation, measurement, applied physiology; Coronary circulation, foetal circulation, cerebral circulation, hemorrhage, circulatory shock, Heart failure, Windkessel effect, and Autoregulation.

Cardiovascular changes during exercise.

Module 5: RESPIRATORY SYSTEM ***(15 Periods)***

Physiological anatomy of respiratory tract, pulmonary circulation.

Mechanics of respiration- muscles, movements, respiratory pressures, compliance; Ventilation-pulmonary and alveolar ventilation, dead space, ventilation-perfusion ratio; Pulmonary function tests - lung volumes & capacities and its measurements, vital capacity; Transport of respiratory gases - oxygen and carbon dioxide transport, dissociation curves, respiratory quotient; Regulation of respiration - Nervous and chemical mechanism; Disturbances of respiration - Apnea, hyperventilation, hypoventilation, hypoxia, oxygen toxicity, hypercapnea, hypocapnea, asphyxia, dyspnea, periodic breathing, cyanosis, CO poisoning, atelectasis, pneumothorax, pneumonia, asthma, tuberculosis, emphysema, pleural effusion, pulmonary oedema; High altitude & space physiology, Deep sea physiology, effects of exposure to heat and cold.

Reflexes: Cough reflex, sneezing reflex.

Artificial respiration.

Effects of exercise on respiration

Total Periods: 75

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Study of Microscope and its uses
2. Determination of RBC count
3. Determination of WBC count
4. Differential leukocyte count
5. Estimation of haemoglobin
6. Calculation of blood indices
7. Determination of blood groups
8. Determination of bleeding time
9. Examination of Radial pulse.
10. Recording of blood pressure
11. Examination of chest for lungs
12. Determination of vital capacity & lung volumes by spirometer
13. Examination of chest for heart
14. Recording of blood pressure

RESOURCES

BOOKS:

1. Guyton and hall-Text book of medical physiology-Elsevier publisher, 14th Edition, 2020
2. Chaudhuri -Concise Medical Physiology-Central Publishers of books, 2019
3. K.Sembulingam -Text book of Physiology, JP publishers-9th Edition, 2022
4. Anil baransinghamahapatra, gargisingha Mahapatra, Essentials of Medical Physiology, Current Books International Publishers, 5th Edition, 2021
5. G K Pal, Text book of medical physiology, Elsevier Publishers, 4th Edition, 2021
6. A K Jain, text book of physiology, Avichal Publishing Company, Vol – 1 & 2, 9th Edition

7. D Venkatesh, H Sudhakar, Text book of medical physiology, Wolters Kluwer India publishers, 3rd Edition, 2015

VIDEO LECTURES:

1. https://youtu.be/It_cV56Dxtk
2. https://youtu.be/VIrdH_3RKKk

WEB RESOURCES:

1. https://library.medschl.cam.ac.uk/e-books/
2. https://www.ncbi.nlm.nih.gov/

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22LG101406	**PROFESSIONAL ENGLISH**	2	-	-	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course deals with selected literary works of eminent writers, exercises on speaking, reading comprehension skimming and scanning, vocabulary, grammar, pronunciation, and conversation practice.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate knowledge of literary works of various pieces of eminent writers.

CO2. Adapt general and technical vocabulary in communication.

CO3. Apply grammatically correct English in writing.

CO4. Analyze texts using reading techniques.

CO5. Apply different communication styles in various situations.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	-	3	-	-	-
CO2	2	2	-	-	-	-	3	-	3	-
CO3	2	2	-	-	3	-	3	-	3	-
CO4	2	3	2	-	2	-	3	-	3	-
CO5	2	2	-	-	3	-	3	-	3	-
Course Correlation Mapping	**2**	**2**	**2**	**-**	**3**	**-**	**3**	**-**	**3**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: BE THE BEST OF WHATEVER YOU ARE BY DOUGLAS MALLOC ***(06 Periods)***

Be the Best of Whatever You Are– A motivational poem, Reading Comprehension, Grammar, Vocabulary, Pronunciation, Language Games, and Conversation Practice, Letter writing.

Module 2: 'ON SAYING PLEASE' SHORT ESSAY BY A. G. GARDINER ***(06 Periods)***

On Saying Please – A Short Essay, Reading Comprehension, Grammar Vocabulary, Pronunciation, Language Games, and Conversation Practice, Email writing.

Module 3: 'IF YOU FORGET ME' POEM BY PABLO NERUDA ***(06 Periods)***

If you Forget Me - A Poem, Reading Comprehension, Grammar, Pronunciation, Language Games and Conversation Practice, essay writing.

Module 4: 'AFTER THE SUNSET' SHORT STORY BY BHOOPAL ***(06 Periods)***

After the Sunset–A Short Story, Reading Comprehension, Grammar, Pronunciation, Language Games, and Conversation Practice, case studies.

Module 5: 'MAN'S PERIL' ESSAY BY BERTRAND RUSSEL ***(06 Periods)***

Man's Peril - An Essay, Reading Comprehension, Vocabulary, Grammar, Pronunciation, Language Games, and Conversation Practice, report writing.

Total Periods: 30

EXPERIENTIAL LEARNING

1. Discuss the role of Health care in nation-building?
2. List out the important vocabulary used most in Health care.
3. Small courtesies play a major role in creating an impression on other people. List out a few examples.
4. Prepare a PowerPoint presentation on the present scenario in higher education and jobs in India.
5. Being a shopkeeper and persuading a customer to buy a product which is introduced newly in the market. Prepare a conversation.
6. The English language has a rich vocabulary. List out the homophones and homonyms and write down the pronunciation and meaning of those words.
7. Describe a situation in your college where teamwork is needed and explain the strategies to manage the team effectively.
8. Write about the importance of IELTS and TOEFL exams.
9. Prepare a report on the medical camp conducted on your campus.
10. Write a letter to the concerned asking permission to attend clinical classes.
11. Prepare a E mail to justify the need of new medical equipment to your hospital.

RESOURCES

TEXT BOOKS:

1. G. Damodar "English Language for Undergraduate Students", Cambridge University-2019.

REFERENCE BOOKS:

1. Meenakshi Raman & Sangeetha Sharma, *Technical Communication*, Oxford University Press, New Delhi, 2012.
2. Ashraf Rizvi*, Effective Technical Communication*, McGraw-Hill Education (India) Pvt. Ltd., New Delhi, 2018

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=WnOOKO0CdaM
2. https://www.youtube.com/watch?v=H6Nlz8qmcFc
3. https://www.youtube.com/watch?v=-lTliZO85YM
4. https://www.youtube.com/watch?v=048YjXwgHWE
5. https://www.youtube.com/watch?v=XLLQm7Grmcc

WEB RESOURCES:

1. https://www.researchgate.net/publication/331773456_RK_Narayan's_A_Snake_in_the_Grass_and_Stephen_Leacock's_With_the_Photographer_-_A_Comparative_Study
2. https://www.researchgate.net/publication/331773456_RK_Narayan's_A_Snake_in_the_Grass_and_Stephen_Leacock's_With_the_Photographer_-_A_Comparative_Study
3. https://smartenglishnotes.com/2020/07/17/on-saying-please-summary-analysis-and-questions-and-answers/
4. http://www.emcp.com/product_catalog/school/litLink/Grade09/U09-04forgetme/
5. https://englishlanguage-lit.blogspot.com/2021/05/after-sunset-short-story-by-bhoopal.html
6. https://www.taylorfrancis.com/chapters/mono/10.4324/9781003090359-31/man-peril-bertrand-russell?context=ubx&refId=1d767e2d-ceb1-4537-9de5-6417eab47d1e

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT102003	**SOCIOLOGY**	3	-	2	-	4

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: 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.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand concepts and relation to anthropology and phycology.

CO2. Identify and understand basics of nature of socialization, Social Groups and Family with clinical aspects.

CO3. Analyse the concepts of Health hazards to Community and culture.

CO4. Understand the social problems of disabled & Social Security.

CO5. Work independently or in team to solve problems with effective communication.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	1	-	-	-	-
CO3	3	2	-	-	-	1	-	-	-	-
CO4	3	2	-	-	-	1	-	-	-	-
CO5	-	-	-	-	-	3	3	-	-	1
Course Correlation Mapping	**3**	**2**	**1**	**-**	**-**	**2**	**3**	**-**	-	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: INTRODUCTION TO SOCIOLOGY *(10 Periods)*

Introduction: Meaning, Definition and scope of sociology, Its relation to Anthropology, Psychology, Social Psychology. Methods of Sociological investigations- Case study, social survey, questionnaire, Interview and opinion poll methods. Importance of sociology with special reference to Health Care Professionals.

Social Factors in Health and disease situations: Meaning of social factors, Role of social factors in health and illness.

Module 2: SOCIALIZATION AND SOCIAL GROUPS *(12 Periods)*

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

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

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

Module 3: COMMUNITY AND CULTURE *(11 periods)*

Community: Rural community, Meaning and characteristics, Health hazards in rural areas, health hazards among tribal communities

Urban community: Meaning and characteristics, Health hazards in urban areas.

Culture and Health: Concept of Health, Concept of Culture

Module 4: SOCIAL PROBLEMS OF DISABLED AND SOCIAL SECURITY *(12 Periods)*

Social Problems of disabled: Consequences with reference to
sickness and disability, remedies; Population explosion, Poverty and unemployment, Beggary, Juvenile delinquency, Prostitution, Alcoholism, Problems of women in employment, Geriatric problems, Problems of underprivileged, social welfare programs.

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

Social worker: Meaning of Social Work, The role of a Medical Social Worker**.**

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXERCISES:

1. Survey on Social Economic Status of Rural areas
2. Field work on Life style and Social Groups in Rural areas
3. Awareness Programs on Hygienic and Disease in Community

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in CHO.)

REFERENCE BOOKS

1. P. Ganesh, Textbook of Socialogy, EMMESS Publisher, 1st Edition, 2021
2. K.P. Neeraja, Textbook of Socialogy for Phisiotheraphy, Jaypee Publishers, 2nd Edition, 2021
3. Neelam Kumari, Socialogy for Phisiotheraphy, Jaypee Publishers, 2nd Edition, 2021
4. Özkaya, N., Leger, D. L. Fundamentals of Biomechanics: Equilibrium, Motion, and Deformation, India: 4th Edition, 2019

VIDEO LECTURES:

1. https://youtu.be/Hom9MUgy-Vc
2. https://youtu.be/tqPTvnXXzKs

WEB RESOURCES:

1. https://www.asanet.org/wp-content/uploads/savvy/introtosociology/Documents/Field%20of%20sociology033108.htm
2. https://pressbooks.bccampus.ca/socialprocesses/chapter/chapter-1-an-introduction-to-sociology/

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT101001	GENERAL AND CLINICAL PSYCHOLOGY	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on various behavioural patterns of individuals, theories of development, normal and abnormal aspects of motor, social, emotional and language development, communication and interaction skills appropriate to various age groups.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the fundamental concepts of psychology and its branches.

CO2. Acquire knowledge on basic concepts of growth and development of personality.

CO3. Apply the concepts of Attention, Perception and Sensation to assess the psychology of humans.

CO4. Understand the fundamental concepts of conflicts, frustration and its type.

CO5. Analyse the theoretical concepts of Intelligence and Emotions.

CO6. Acquire knowledge on basic theories of learning and types of personality.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	-	-	1	-	-	-	-
CO2	3	3	-	-	-	-	-	-	-	-
CO3	2	3	1	-	-	1	-	-	-	-
CO4	3	2	2	-	-	-	-	-	-	-
CO5	3	2	2	-	-	-	-	-	-	-
CO6	2	2	-	-	-	2	-	-	-	-
Course Correlation Mapping	**3**	**2**	**2**	-	**-**	**1**	-	-	-	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: INTRODUCTION TO PSYCHOLOGY ***(07 Periods)***

Schools: Structuralism, functionalism, behaviourism, Psychoanalysis.

Methods: Introspection, observation, inventory and experimental method.

Branches: pure psychology and applied psychology; Psychology and physiotherapy

Module 2: GROWTH AND DEVELOPMENT **(08 Periods)**

Life span: Different stages of development (Infancy, childhood, adolescence, adulthood, middle age, old age).

Heredity and environment: Role of heredity and environment in physical and psychological development, "Nature v/s Nurture controversy

Module 3: ATTENTION, PERCEPTION AND SENSATION **(08 Periods)**

Sensation: Vision, Hearing, Olfactory, Gustatory and Cutaneous sensation, movement, equilibrium and visceral sense.

Attention: Types of attention, Determinants of attention (subjective determinants and objective determinants).

Perception: Gestalt principles of organization of perception (principle of figure ground and principles of grouping), factors influencing perception (past experience and context).

Illusion and hallucination: Different types.

Module 4: MOTIVATION, FRUSTRATION AND CONFLICT **(08 Periods)**

Motivation: Motivation cycle (need, drive, incentive, reward), Classification of motives, Abraham Maslow's theory of need hierarchy

Frustration: sources of frustration

Conflict: types of conflict, Management of frustration and conflict

Module 5: INTELLIGENCE AND EMOTIONS **(08 Periods)**

Three levels of analysis of emotion (physiological level, subjective state, and overt behaviour).

Theories of emotion

Stress and management of stress.

Intelligence: Theories of intelligence, Distribution of intelligence, Assessment of intelligence

Reasoning: Deductive and inductive reasoning.

Problem solving: Rules in problem solving (algorithm and heuristic)

Creative thinking: Steps in creative thinking, traits of creative people.

Module 6: PERSONALITY AND LEARNING ***(06 Periods)***

Factors effecting learning.

Theories of learning: trial and error learning, classical conditioning, Operant conditioning, insight learning, social learning theory.

The effective ways to learn: Massed/Spaced, Whole/Part, Recitation/Reading, Serial/Free recall, Incidental/Intentional learning, Knowledge of results, association, organization, and mnemonic methods.

Personality

Approaches to Personality: type & trait, behaviouristic, psychoanalytic and humanistic approach.

Personality Assessment: observation, situational test, questionnaire, rating scale, interview, and projective techniques.

Defence Mechanisms: denial of reality, rationalization, projection, reaction formation, identification, repression, regression, intellectualization, undoing, introjection, acting out.

Total Periods: 45

EXPERIENTIAL LEARNING

1. Demonstration of various behavioral patterns and disorders.
2. Illustration on psychosocial disorders.
3. Demonstration of different personalities and disorders.
4. Analysis of intelligence quotient.
5. A clinical study on counselling the patient.
6. Demonstrating the concepts of problem solving in psychosocial problems.

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in CHO.)

RESOURCES

BOOKS:

1. Robert A Baron -Text Book Psychology, Jaypee Publishers, 2020
2. T.Ramalingam, Psychology for Physiotherapist – Jaypee Publishers 2nd Edition, 2019
3. Niraj Ahuja-Text Book of Psychiatry-Jaypee Publishers, 4th Edition, 2019

VIDEO LECTURES:

1. www.britannica.com
2. www.alliant.edu

WEB RESOURCES:

1. www.psychology.com
2. http://www.guides.lib.uw.edu

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22CC101019	**NATIONAL HEALTH CARE DELIVERY SYSTEM AND MEDICAL RECORDS MANAGEMENT**	4	-	-	-	4

Pre-Requisite	-
Anti-Requisite	Medical Terminology and record management
Co-Requisite	-

COURSE DESCRIPTION: This course provides a detailed discussion on word roots, prefixes, suffixes basic medical terms, medical abbreviations to human body systems and record-keeping methods in health care and medical ethics and law. Health care system, AYUSH, vital events of life and epidemiology in India.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Demonstrate basic knowledge on roots, prefixes and suffixes to form medical terms in health care system

CO2 Apply advanced tools and techniques to maintain patient health details in medical system and Design a standard protocol by applying medical law and ethics.

CO3 Understand the basic concepts in health care delivery system and health policies

CO4 Acquire knowledge on various AYUSH systems and Analyze the Vital events of life and its impact on demography.

CO5 Work individually or in teams to solve problems with effective communication.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	-	-	-	-	-	-	-
CO2	3	2	-	1	-	1	-	-	1	-
CO3	2	2	-	-	-	1	-	-	1	-
CO4	2	2	-	1	-	1	-	-	1	1
CO5	-	-	-	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**2**	**-**	**1**	**-**	**-**	**-**	**-**	**1**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module1: INTRODUCTION TO MEDICAL TERMINOLOGY (15 Periods)

Derivation of medical terms, define word roots, prefixes, and suffixes, Conventions for combined morphemes and the formation of plurals, Basic medical terms, Form medical terms utilizing roots, suffixes, prefixes, and combining roots. Interpret basic medical abbreviations/ symbols , utilize diagnostic, surgical, and procedural terms and abbreviations related to the integumentary system, musculoskeletal system, Respiratory system, cardiovascular system, nervous system, and endocrine system.

Module2: MEDICAL ETHICS & RECORD KEEPING (15 Periods)

Medical ethics – Definition, Basic principles of medical ethics – Confidentiality, Malpractice and negligence – Rational and irrational drug therapy, Autonomy and informed consent – Right of patients, Care of the terminally ill- Euthanasia, Development of a standardized protocol to avoid sentinel events, Standard procedures in record keeping, interpret medical orders/reports, Data entry and management on electronic health record system, Advanced tools to maintain records in Health care.

Module3: NATIONAL HEALTHCARE DELIVERY SYSTEM & NATIONAL HEALTH POLICIES (15 Periods)

Healthcare delivery system in India at primary, secondary and tertiary care Community participation in healthcare delivery system, Health system in developed countries, Private Sector, National Health Mission, National Health Policy Issues in Health Care Delivery System in India achievements and constraints in various National Heath programme. National Health Programme, Background objectives, action plan, targets, operations.

Module4: AYUSH SYSTEM OF MEDICINE, DEMOGRAPHY & VITAL STATISTICS (15 Periods)

Ancient scientists of bharat, introduction to Ayurveda, Naturopathy, Unani, Siddha, Homeopathy, Need Course for integration of various system of medicine. Demography & its concept, Vital events of life & its impact on demography, Significance and recording of vital statistics, Census & its impact on health policy.

Total Periods:60

EXPERIENTIAL LEARNING

1. Demonstration of various levels of health care system
2. Presentation of health care programs.
3. Illustration on ayush system of medicine and it's practice.
4. A clinical overview on demography and vital statistics.
5. Discussion on medical terminology of different body systems.
6. Write about basic principles of medical ethics.
7. Write about electronic health record system.

RESOURCES

1. Adam Brown "Medical Terminology Easy Guide for Beginners" Create Space Independent Publishing Platform, Edition 1, 2016.
2. GD Mogli "Medical records organization and management" Jaypee Brothers Medical Publishers, Edition2, 2016.
3. Francis, Hospital Care Management, 4th Edition, 2019
4. Sharon B. Buchbinder, Introduction to Health Care Management, 2nd Edition, 2011

VIDEOLECTURES:

1. https://www.youtube.com/watch?v=_bDatJxhfkQ
2. https://www.youtube.com/watch?v=9iMhc2OU-go
3. https://youtu.be/It_cV56Dxtk
4. https://youtu.be/VIrdH_3RKKk

WEB RESOURCES:

1. https://library.medschl.cam.ac.uk/e-books/
2. https://www.ncbi.nlm.nih.gov/
3. https://blog.ipleaders.in/medical-laws-conflict-ethic
4. https://www.gponline.com/medico-legal-importance-good-records/article/89

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22DF102015	**MEDICAL BIOCHEMISTRY-I**	3	-	1	-	3.5

Pre-Requisite -

Anti-Requisite Medical Biochemistry

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on basic concepts of Biochemistry and understand the structural, functional and metabolic properties of biomolecules

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. To Develop basic knowledge of Cell Biology and Chemistry of Carbohydrate

CO2. To understand about the functions and classification of Lipids and Amino Acids

CO3. To Learn the importance and properties of Enzymes and Nucleic Acid Chemistry

CO4. Ability to learn the different types of Nutrition and importance of Balanced Diet

CO5. Understand the biochemical chemical process of Digestion, Absorption and in Muscle Contraction.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	1	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	1	-	-	-	-
CO4	3	2	-	2	-	-	-	-	-	-
CO5	3	2	-	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**2**	**-**	**2**	**-**	**1**	**-**	**-**	**-**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

MODULE 1: CELL BIOLOGY AND CARBOHYDRATE CHEMISTRY *(09 Periods)*

Cell Biology -Introduction, Cell structure, Cell membrane structure and function, various types of absorption. Intracellular organelles and their functions, briefly on cytoskeleton., Carbohydrate Chemistry –Definition, general classification with examples, Glycosidic bond, Structures, composition, sources, properties and functions of Monosaccharides, Disaccharides, Oligosaccharides and Polysaccharides. Glycosaminoglycan (mucopolysaccharides)

MODULE 2: LIPIDS AND AMINO ACIDS *(10 Periods)*

Lipid Chemistry – Definition, general classification and functions of Lipids, Definition, classification, properties and functions of Fatty acids, Triacylglycerol, Phospholipids, Cholesterol, Essential fatty acids and their importance, Lipoproteins: Definition, classification, properties, Sources and function Ketone bodies., Amino-acid Chemistry –Amino acid chemistry: Definition, Classification, Peptide bonds, Peptides: Definition, Biologically important peptides. Protein chemistry: Definition, Classification, Functions of proteins. Catabolism of amino acids - Introduction, transamination, deamination, Fate of ammonia, transport of ammonia, Urea cycle b. Specialized products formed from amino acids - from glycine, arginine, methionine, phenylalanine and tyrosine.

MODULE 3: ENZYMES AND NUCLEIC ACID CHEMISTRY *(08 Periods)*

Enzymes – Definition, Active site, Cofactor (Coenzyme, Activator), Proenzyme. Classification with examples, Factors effecting enzyme activity, Enzyme inhibition and significance, Isoenzymes, Diagnostic enzymology (clinical significance of enzymes)., Nucleotide chemistry: Nucleotide composition, functions of free nucleotides in body. Nucleic acid (DNA and RNA) chemistry: Difference between DNA and RNA, Structure of DNA (Watson and Crick model), Functions of DNA. Structure and functions of tRNA, rRNA, mRNA.

MODULE 4: NUTRITION AND BALANCED DIET *(08 Periods)*

Introduction, Importance of nutrition Calorific values, Respiratory quotient – Definition, and its significance Energy requirement of a person - Basal metabolic rate: Definition, Normal values, factor affecting BMR Special dynamic action of food. Physical activities - Energy expenditure for various activities. Calculation of energy requirement of a person., Balanced diet:Recommended dietary allowances, Role of carbohydrates in diet: Digestible carbohydrates and dietary fibers. Role of lipids in diet. Role of proteins in diet: Quality of proteins - Biological value, net protein utilization, Nutritional aspects of proteins-essential and non- essential amino acids. Nitrogen balance.Nutritional disorders.

MODULE 5: BIOCHEMISTRY OF DIGESTION, ABSORPTION AND MUSCLE CONTRACTION *(10 Periods)*

Digestion and Absorption - General characteristics of digestion and absorption, Digestion and absorption of carbohydrates, proteins and lipids. Disorders of digestion and absorption – Lactose intolerance., Contractile elements in muscle, briefly on the process of muscle contraction, Energy for muscle contraction.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

QUALITATIVE TESTS OF MONOSACCHARIDES (GLUCOSE AND FRUCTOSE)

1. Molisch's test
2. Fehling's test
3. Benedict's test
4. Seliwanoff's test

QUALITATIVE TESTS OF LIPIDS

5. Solubility tests
6. Emulsification tests
7. Saponification tests

QUALITATIVE TESTS OF PROTEINS

8 Isoelectric precipitation tests

9 Heat coagulation tests

RESOURCES

TEXT BOOKS:

1. U. Satyanarayana, U. Chakrapani "Biochemistry" Elsevier, 2020.
2. Vasudevan DM. "Textbook of Biochemistry for Medical Students" Jaypee Brothers Medical Publishers. 2019
3. Indumati V, Sowbhagya Lakshmi." Integrated Textbook of Biochemistry" Paras Medical Publishers2021.
4. Naik Pankaja. "Essentials of Biochemistry" Jaypee Brothers Medical Publishers. 2017
5. Agrawal Poonam "Concepts In Biochemistry With Clinical Approach For Undergraduate Medical Students" CBS Publishers & Distributors Pvt Ltd, 2020
6. Harpreet Kaur "Medical Biochemistry For Physiotherapy Students" First Edition. Jaypee Brothers Medical Publishers. 2018

REFERENCE BOOKS:

1. MN Chatterjea, Rana Shinde "Textbook of Medical Biochemistry" Jaypee Brothers Medical Publishers (P) Ltd 2018
2. Denise R. Ferrier "Lippincott's Illustrated Reviews Biochemistry" Seventh, North American Lippincott Williams and Wilkins 2016.
3. Prasad R Manjeshwar "Textbook of Biochemistry for Physiotherapy Students" New Revised 6th edition 2019-2020.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=F59RwK9hya8
2. https://www.youtube.com/watch?v=OKLxwCdkBn8
3. https://www.youtube.com/watch?v=jcz99_-JcZ8

WEB RESOURCES:

1. https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/health_science_students/medicalbiochemistry.pdf
2. https://www.qmul.ac.uk/library/media/library/using-the-library/media-folder-images-library/Principles-Of-Biochemistry-Introductory-Series.pdf
3. https://rajneeshrajoria.weebly.com/uploads/4/9/0/6/49069889/biochemistry_bicm101.pdf

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT102004	**ANATOMY -II**	4	1	2	-	6

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on the Macroscopic & Microscopic structure and functions of the human body and its Development which is essential for clinical studies.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate anatomical knowledge of the abdomen & pelvis in clinical practice.

CO2. Apply anatomical knowledge in clinical practice.

CO3. Demonstrate the features of the Thorax & Vertebral column

CO4. Understand the basics of general histology

CO5. Demonstrate the concepts of anatomy in embryology.

CO6. Work independently or in a team to solve problems with effective communication.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	1	-	-	-	2	-	-	-	-
CO2	3	2	2	-	-	1	-	-	-	**-**
CO3	3	3	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	-	-
CO5	3	3		-	-	3	3	-	-	2
CO6	-	-	-	-	-	3	3	-	-	3
Course Correlation Mapping	**3**	**3**	**2**	**-**	**-**	**2**	**3**	**-**	**-**	**2**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: ABDOMEN & PELVIS *(10 Periods)*

Introduction to abdomen and its Surface anatomy.

Osteology – Lumbar vertebra, sacrum, Coccyx, and Bony Pelvis.

Wall of abdomen - Anterior abdominal wall, Posterior abdominal wall, and Inguinal canal.

Muscles of abdomen & Pelvis – External oblique, Internal oblique, Transverse abdominus, Rectus abdominus, Iliacus, Psoas major & minor, Quadratus lumborum, Erector spinae & other paraspinal muscles, and Pelvic floor muscles.

Contents of Abdomen - Abdominal cavity & Peritoneum, Diaphragm, Oesophagus, Stomach, Small & Large intestine, Caecum & Appendix, Liver & Extrahepatic Biliary apparatus, Pancreas, Spleen, Kidney & Ureter, and Suprarenal gland.

Pelvic cavity & its contents – Urinary bladder & Urethra, Male reproductive organs, Female reproductive organs, Rectum & Anal canal.

Perineum – Male and Female perineum.

Module 2: HEAD & NECK *(15 Periods)*

Osteology – Skull, Mandible, Cervical vertebra, and Hyoid bone.

Head - Scalp, Temple, Face; Salivary glands: Parotid region – Parotid gland, Sub-mandibular region – Submandibular gland, Sublingual gland; Temporal region – Muscles of mastication & Infra-temporal regions, muscles of facial expression, Structures: Eyeball & Muscles of eyeball, Lacrimal apparatus, Mouth & Pharynx, Tonsil, Tongue, Nose & Paranasal sinuses, Ear, Pituitary gland, and Sensory organs.

Neck – Triangles of the neck (Anterior & Posterior), Structures: Thyroid & Parathyroid glands, Thymus, Larynx, Trachea, and Oesophagus.

Blood vessels: Carotid arteries, Internal jugular vein, Vertebral arteries, Facial artery & Vein, Lymphatic drainage of head & neck.

Module 3: NEURO-ANATOMY *(15 Periods)*

Introduction: Divisions of nervous system, Neuron, Neuroglial cells, Synapse, Reflex arc, receptors & its types, and Parts of the nervous system.

Brain: Meninges**,** Cisterns, Cerebrospinal fluid, Cerebrum; Brainstem - Midbrain, Pons, Medulla oblongata and Cerebellum; Ventricles of brain – Lateral ventricle, Third ventricle, and Fourth ventricle, Reticular formation, Cranial Nerves – I to XII, and Circle of Willis.

Spinal cord: Structure, Functions, Ascending tracts, Descending tracts, Spinal nerves, and Blood supply.

Module 4: SYSTEMIC HISTOLOGY *(10 Periods)*

Respiratory system: Nasal cavity, Larynx, Trachea, and Lungs.

Digestive system: Oral cavity, Teeth, Tongue, Salivary glands – Parotid, Sub-mandibular, Sub-lingual, Pharynx, Oesophagus, Stomach, Small intestine – Duodenum, Jejunum, Ileum, Large Intestine – Ceacum, appendix, Colon, Liver, Gall bladder, and Pancreas.

Nervous system: Cerebrum, Cerebellum, and Spinal cord.

Urinary system: Kidney, Ureter, Urinary bladder, and Urethra.

Male reproductive system: Testis, Vas deferens, Prostate, and Male urethra.

Female reproductive system: Mammary gland, Ovary, Uterus, Cervix, and Vagina.

Endocrine system: Pituitary, Thyroid, and Adrenal gland.

Skin: Thick skin, and Thin skin.

Eye: Cornea, and Retina.

Lymphoid organs: Lymph node, Spleen, Thymus, and Palatine tonsil.

Module 5: SYSTEMIC EMBRYOLOGY (10 Periods)

Development of Face, Nose, and Palate.
Development of Tongue & Thyroid.
Development of Digestive system & Digestive glands.
Development of Nervous system.
Development of Heart & Blood vessels.
Development of Respiratory system.
Development of Urinary system.
Development of Genital system.
Development of Endocrine glands.
Development of Eye & Ear.
Development of Lymphoid organs.
Application of Embryology in clinical practice.

Total Periods: 60

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Upper Extremity including surface anatomy.
2. Lower Extremity including surface anatomy.
3. Demonstration of thoracic viscera and vertebral column.
4. Demonstration of general histology slides.
5. Demonstration of general embryology charts.

RESOURCES

BOOKS:

1. B.D Chaurasia's Human Anatomy-Regional and applied; CBS publishers,vol 1,2,3,4 Edition 9(2022).
2. Snell[Richard S],Clinical Anatomy for medical students; 6thEdition , 2021
3. Inderbir Singh's book of Anatomy;vol 1,2,3, 3rd Edition,2020
4. Inderbir Singh's Text book of Human Histology, Jaypee Publishers, 10thEdition, 2022
5. Inderbir Singh's Text book of Human Embryology, Jaypee Publishers, 12thEdition, 2022
6. A.k. Datta, Essentials of human anatomy; Current books international publishers; Volume: 1,2,3,4; 10th Edition 2019.
7. Richard Tunstall and Susan standring, Gray's Anatomy - The anatomical basis of clinical practice, Elsevier publishers, 42ndEdition 2020.
8. Rachel koshi, Cunningham's manual of practical Anatomy, Oxford University Press publishers, Volume - 1,2,3; 16thEdition 2017.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=f6rZw7QkGLw
2. https://www.youtube.com/watch?v=15k5fajCN_w
3. https://www.youtube.com/watch?v=UMTDmP81mG4
4. https://www.youtube.com/watch?v=WPjqgaMmOTE
5. https://www.youtube.com/watch?v=0GSRbmcNh3A
6. https://www.youtube.com/watch?v=4YKvVeVMmEE

WEB RESOURCES:

1. https://byjus.com/biology/anatomy-and-physiology/
2. https://www.histologyguide.com/about-us/sorenson-atlas-of-human-histology-chapters-1-and-14.pdf

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT102005	**PHYSIOLOGY- II**	4	1	2	-	6

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed in-depth discussion of the fundamental reactions of living organisms specific to the human body. It emphasizes the concepts of cells, primary tissue, connective tissue, skin, muscle, nervous tissue, gastrointestinal tract, kidneys, uterus, urinary tract, pregnancy, and endocrine system.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the basic concepts of gastrointestinal physiology.

CO2. Understand the mechanisms of urine formation and its significance

CO3. Correlate the mechanisms of hormonal action and their influence on the human body.

CO4. Gain knowledge about various neurological pathways.

CO5. Understand the importance of special senses and the role of exercise in physical and mental well-being.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	2	-	-	-	-	-	-	-	-	-
CO2	3	2	-	2	-	-	-	-	-	2
CO3	3	2	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	-	2
CO5	3	-	-	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**2**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: DIGESTIVE SYSTEM ***(10 Periods)***

Introduction: Physiological anatomy and nerve supply of alimentary canal. Enteric nervous system, Salivary Secretion: Saliva: Composition. Functions. Regulation. Mastication (in brief)

Swallowing: Definition. Different stages. Function.

Stomach: Functions. Gastric juice: Gland, composition, function, regulation. Gastrin: Production, function and regulation. Peptic ulcer. Gastric motility. Gastric emptying. Vomiting.

Pancreatic Secretion: Composition, production, function. Regulation.

Liver: Functions of liver. Bile secretion: Composition, functions and regulation. Gall bladder: Functions.

Intestine: Succus entericus: Composition, function and regulation of secretion. Intestinal motility and its function and regulation.

Mechanism of Defecation.

Module 2: RENAL PHYSIOLOGY ***(12 Periods)***

Introduction: Physiological anatomy. Nephrons – cortical and juxtamedullary. Juxtaglomerular apparatus. Glomerular membrane. Renal blood flow and its regulation. Functions of kidneys.

Mechanism of Urine Formation: Glomerular Filtration: Mechanism of glomerular filtration. GFR normal value and factors affecting. Renal clearance. Inulin clearance. Creatinine clearance.

Tubular Reabsorption: Reabsorption of Na+, glucose, HCO3-, urea and water. Filtered load. Renal tubular transport maximum. Glucose clearance: TmG. Renal threshold for glucose.

Tubular Secretion: Secretion of H+ and K+. PAH clearance.

Mechanism of concentrating and diluting the Urine: Counter-current mechanism. Regulation of water excretion. Diuresis. Diuretics.

Micturition: Mechanism of micturition. Cystometrogram. Atonic bladder, automatic bladder.

Acid-Base balance (very brief)

Artificial Kidney: Principle of haemodialysis.

Skin and temperature regulation.

Module 3: ENDOCRINOLOGY AND REPRODUCTIVE SYSTEM ***(12 Periods)***

Introduction: Major endocrine glands. Hormone: classification, mechanism of action. Functions of hormones

Pituitary Gland: Anterior Pituitary and Posterior Pituitary hormones: Secretory cells, action on target cells, regulation of secretion of each hormone. Disorders: Gigantism, Acromegaly, Dwarfism, Diabetes insipidus. Physiology of growth and development: hormonal and other influences.

Pituitary-Hypothalamic Relationship.

Thyroid Gland: Thyroid hormone and calcitonin: secretory cells, synthesis, storage, action and regulation of secretion. Disorders: Myxedema, Cretinism, Grave's disease.

Parathyroid hormones: secretory cell, action, regulation of secretion. Disorders: Hypoparathyroidism. Hyperthyroidism. Calcium metabolism and its regulation.

Adrenal Gland: Adrenal Cortex: Secretory cells, synthesis, action, regulation of secretion of Aldosterone, Cortisol, and Androgens. Disorders: Addison's disease, Cushing's syndrome, Conn's syndrome, Adrenogenital syndrome.

Adrenal Medulla: Secretory cells, action, regulation of secretion of adrenaline and noradrenaline. Disorders: Phoechromocytoma.

Endocrine Pancreas: Secretory cells, action, regulation of secretion of insulin and glucagon. Glucose metabolism and its regulation. Disorder: Diabetes mellitus.

Calcitrol, Thymus and Pineal gland (very brief).

Local Hormones. (Briefly)

Module 4: NERVOUS SYSTEM ***(16 Periods)***

Introduction: Organization of CNS – central and peripheral nervous system. Functions of nervous system. Synapse: Functional anatomy, classification, Synaptic transmission. Properties.

Sensory Mechanism: Sensory receptors: function, classification and properties. Sensory pathway: The ascending tracts – Posterior column tracts, lateral spinothalamic tract and the anterior spinothalamic tract – their origin, course, termination and functions. The trigeminal pathway. Sensory cortex. Somatic sensations: crude touch, fine touch, tactile localization, tactile discrimination, stereognosis, vibration sense, kinesthetic sensations. Pain sensation: mechanism of pain. Cutaneous pain –slow and fast pain, hyperalgesia. Deep pain. Visceral pain – referred pain. Gate control theory of pain. tabes dorsalis, sensory ataxia.

Motor Mechanism: Motor Cortex. Motor pathway: The descending tracts – pyramidal tracts, extrapyramidal tracts – origin, course, termination and functions. Upper motor neuron and lower motor neuron. Paralysis, monoplegia, paraplegia, hemiplegia and quadriplegia.

Reflex Action: components, Bell-Magendie law, classification and Properties. Monosynaptic and polysynaptic reflexes, superficial reflexes, deep reflexes. Stretch reflex– structure of muscle spindle, pathway, higher control and functions. Inverse stretch reflex.

Muscle tone – definition, and properties hypotonia, atonia and hypertonia. UMNL and LMNL

Spinal cord Lesions: Complete transection and Hemisection of the spinal cord.

Cerebellum: Functions. Cerebellar ataxia.

Posture and Equilibrium: Postural reflexes – spinal, medullary, midbrain and cerebral reflexes.

Thalamus and Hypothalamus: Nuclei. Functions. Thalamic syndrome

Reticular Formation and Limbic System: Components and Functions.

Basal Ganglia: Structures included and functions. Parkinson's disease.

Cerebral Cortex: Lobes. Brodmann's areas and their functions. Higher functions of cerebral cortex – learning, memory and speech.

EEG: Waves and features. Sleep: REM and NREM sleep.

CSF: Formation, composition, circulation and functions. Lumbar puncture and its significance. Blood brain barrier. Hydrocephalus.

ANS: Features and actions of parasympathetic and sympathetic nervous system.

Module 5: SPECIAL SENSES AND EXERCISE PHYSIOLOGY ***(10 Periods)***

Vision: Introduction: Functional anatomy of eye ball. Functions of cornea, iris, pupil, aqueous humor – glaucoma, lens – cataract, vitreous humor, rods and cones. Photopic vision. Scotopic vision.

Visual Pathway and the effects of lesions.

Refractive Errors: myopia, hypermetropia, presbyopia and astigmatism.

Visual Reflexes: Accommodation, Pupillary and Light. Visual acuity and Visual field. Light adaptation. Dark adaptation. Color vision – color blindness. Nyctalopia.

Audition: Physiological anatomy of the ear. Functions of external ear, middle ear and inner ear. Structure of Cochlea and organ of corti. Auditory pathway. Types of Deafness. Tests for hearing. Audiometry.

Taste: Taste buds. Primary tastes. Gustatory pathway.

Smell: Olfactory membrane. Olfactory pathway.

Vestibular Apparatus: Crista ampullaris and macula. Funcions. Disorders

Physiology of exercise –Effects of acute and chronic exercise on O2 transport, Muscle strength/power/endurance, B.M.R. /R.Q.,Hormonal and metabolic effect , Cardiovascular system, Respiratory system, Body fluids and electrolyte, Effect of gravity / altitude /acceleration / pressure on physical parameters. Physiology of Age

Total Periods: 60

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Study of Microscope and its uses
2. Collection of blood sample
3. Determination of RBC count
4. Determination of WBC count
5. Differential leukocyte count
6. Estimation of haemoglobin
7. Determination of blood groups
8. Determination of bleeding time clotting time
9. Determination of ESR
10. Determination of PCV

RESOURCES

BOOKS:

1. Guyton and hall, Text book of medical physiology, Elsevier publishers, edition 14, 2020.
2. Chaudhuri, Concise medical physiology, New central book agency, edition 11, 2011
3. K.Sembulingam, Essentials of medical physiology, JP publishers, Edition 9, 2022.
4. Ganongs, Review of medical physiology, Mc Graw Hill/India, edition 26, 2019.
5. AK Jain, Textbook of physiology, Avichal publishing company, vol-1&2, edition 10, 2023.

VIDEO LECTURES:

1. https://youtu.be/It_cV56Dxtk
2. https://youtu.be/VIrdH_3RKKk

WEB RESOURCES:

1. https://library.medschl.cam.ac.uk/e-books/
2. https://www.ncbi.nlm.nih.gov/

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22DF102003	**MEDICAL BIOCHEMISTRY**	3	-	2	-	4

Pre-Requisite -

Anti-Requisite Medical Biochemistry-I
Medical Biochemistry-II

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on basic concepts of Biochemistry and understands the structural, functional, and metabolic properties of biomolecules

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the Basic knowledge of carbohydrates and lipids and their metabolisms

CO2. Knowledge about the proteins and DNA structure

CO3. To Enhance the Ideology on Vitamins and Minerals on functional and structural concepts

CO4. Analyze different types of enzymes and understand the nutrition

CO5. Understand the nature and types of Acid-base Balance and Clinical Chemistry

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**P8**	**PO9**	**PO10**
CO1	3	2	-	1	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	1	-	-	-	-
CO4	3	2	-	2	-	-	-	-	-	-
CO5	3	2	-	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**2**	**-**	**2**	**-**	**1**	**-**	**-**	**-**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: CARBOHYDRATE AND LIPIDS ***(15 Periods)***

Introduction, Cell structure, Cell membrane structure, and function,

Carbohydrate Chemistry – Definition, general classification with examples, Structures, composition, sources, properties, and functions of Monosaccharides, Disaccharides, Oligosaccharides, and Polysaccharides. Metabolism of carbohydrates

Lipid Chemistry – Definition, general classification, and functions of Lipids, Definition, classification, properties and functions of Fatty acids, Triacylglycerol, Phospholipids, Cholesterol, Essential fatty acids, and their importance, Lipoproteins: Definition, classification, properties, Sources, and function Ketone bodies. Metabolism of lipids.

Module 2: PROTEINS AND NUCLEIC ACID ***(06 Periods)***

Amino-acid Chemistry – Amino acid chemistry: Definition, Classification, Peptide bonds, Peptides: Definition, Biologically important peptides,

Protein chemistry: Definition, Classification, Functions of proteins, properties, and structure of proteins. Metabolisms Proteins

Nucleotide and Nucleic acid Chemistry - Nucleic acids: Purines and pyrimidine-Structure of DNA – Watson & Crick model of DNA Structure of RNA – Types of RNA

Module 3: VITAMINS AND MINERALS ***(08 Periods)***

Fat-soluble vitamins(A, D, E, K) – Water soluble vitamins – B-complex vitamins. Definition, classification - Sources, Coenzyme forms, functions, RDA, digestion, absorption and transport, deficiency, and toxicity.

Mineral -Definition, Sources, RDA, Digestion, absorption, transport, excretion, functions, disorder of Individual minerals - Calcium, phosphate, iron, Magnesium, fluoride, selenium, molybdenum, copper.

Module 4: ENZYMES AND NUTRITION ***(08 Periods)***

Enzymes – Definition, Active site, Cofactor (Coenzyme, Activator), Proenzyme. Classification with examples, Factors affecting enzyme activity, Enzyme inhibition and significance, Isoenzymes, Diagnostic enzymology (the clinical significance of enzymes)

Nutrition – Introduction, Importance of nutrition Calorific values, Respiratory quotient Definition, and its significance Energy requirement of a person - Basal metabolic rate: Definition, Normal values, factor affecting BMR Special dynamic action of food. A balanced diet, Nutritional disorders. Marasmus – Kwashiorkor.

Module 5: ACID-BASE BALANCE AND CLINICAL CHEMISTRY ***(08 Periods)***

Acid-Base balance – Definition of Acids, bases and buffers, pH. Buffer systems of the body, bicarbonate buffer system Role of lungs and kidneys in acid-base balance, Acid-base imbalance.

Clinical Biochemistry - Normal levels of blood and urine constituents, Relevance of blood and urine levels of Glucose, Urea, Uric acid, Creatinine, Calcium, Phosphates, pH, and Bicarbonate.

Role of biochemistry in the diagnosis of diseases, inborn errors of metabolism, disorders of kidney and liver (diagnostic tests), coagulation disorders, disorders of calcium and phosphorus metabolism, and endocrine disorders.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

QUALITATIVE TESTS OF MONOSACCHARIDES (GLUCOSE AND FRUCTOSE)

1. Molisch's test
2. Fehling's test
3. Benedict's test
4. Seliwanoff's test

QUALITATIVE TESTS OF LIPIDS

1. Solubility tests
2. Emulsification tests
3. Saponification tests

QUALITATIVE TESTS OF PROTEINS

1. Isoelectric precipitation tests
2. Heat coagulation tests

RESOURCES

TEXT BOOKS:

1. U. Satyanarayana, U. Chakrapani "Biochemistry" Elsevier, 2020.
2. Vasudevan DM. "Textbook of Biochemistry for Medical Students" Jaypee Brothers Medical Publishers. 2019
3. Indumati V, Sowbhagya Lakshmi." Integrated Textbook of Biochemistry" Paras Medical Publishers2021.
4. Naik Pankaja. "Essentials of Biochemistry" Jaypee Brothers Medical Publishers. 2017
5. Agrawal Poonam "Concepts In Biochemistry With Clinical Approach For Undergraduate Medical Students" CBS Publishers & Distributors Pvt Ltd, 2020

REFERENCE BOOKS:

1. MN Chatterjea, Rana Shinde, Textbook of Medical Biochemistry.
2. Lippincott's Illustrated Reviews Biochemistry.
3. Prasad R Manjeshwar." Textbook of Biochemistry for Physiotherapy Students" Sheetal Distributors. 2020

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=F59RwK9hya8
2. https://www.youtube.com/watch?v=OKLxwCdkBn8
3. https://www.youtube.com/watch?v=jcz99_-JcZ8

WEB RESOURCES:

1. https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/health_science_students/medicalbiochemistry.pdf
2. https://www.qmul.ac.uk/library/media/library/using-the-library/media-folder-images-library/Principles-Of-Biochemistry-Introductory-Series.pdf
3. https://rajneeshrajoria.weebly.com/uploads/4/9/0/6/49069889/biochemistry_bicm101.pdf

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22DF102020	MEDICAL BIOCHEMISTRY-II	3	-	1	-	3.5

Pre-Requisite -

Anti-Requisite Medical Biochemistry

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on metabolic process involved through carbohydrates, proteins, lipids, vitamins and minerals.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. To Understand the Basic knowledge of carbohydrates its metabolisms

CO2. To Develop Basic knowledge about the Lipids and Cholesterol Metabolism

CO3. To Enhance the concepts Importance of Vitamins and Minerals Metabolism

CO4. Ability to explore to the Biochemistry of Connective Tissue and Hormonal Actions

CO5. Understand the nature and types of Acid base Balance and Clinical Chemistry

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	-	1	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	1	-	-	-	-
CO4	3	2	-	2	-	-	-	-	-	-
CO5	3	2	-	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**2**	**-**	**2**	**-**	**1**	**-**	**-**	**-**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: **CARBOHYDRATE METABOLISM** ***(08 Periods)***

Carbohydrate Metabolism - Introduction, Glycolysis – Aerobic, Anaerobic Citric acid cycle, Substrate level phosphorylation. Glycogen metabolism – Glycogenesis, Glycogenolysis, Metabolic disorders glycogen, Gluconeogenesis, Cori cycle. Hormonal regulation of glucose, Glycosuria, Diabetes mellitus.

MODULE 2: LIPID AND CHOLESTEROL METABOLISM ***(10 Periods)***

Lipid Metabolism - Introduction to lipid metabolism, Lipolysis, Oxidation of fatty acids -oxidation of fatty acids, Lipogenesis - Denovo synthesis of fatty acids, chain elongation, desaturation, triacylglycerol synthesis, fat metabolism in adipose tissues.

Ketone body metabolism: Ketone body formation (ketogenesis), utilization (ketolysis), ketosis,

Cholesterol metabolism: synthesis, degradation, cholesterol transport e. Hypercholesterolemia and its effects (atherosclerosis and coronary heart diseases) Hypocholesterolemic agents, Common hyperlipoproteinemia, Fatty liver

MODULE 3: VITAMINS AND MINERALS METABOLISM ***(12 Periods)***

Vitamins - Definition, classification according to solubility, Individual vitamins - Sources, Coenzyme forms, functions, RDA, digestion, absorption and transport, deficiency and toxicity. Mineral Metabolism. Definition, Sources, RDA, Digestion, absorption, transport, excretion, functions, disorder of Individual minerals - Calcium, phosphate, iron, Magnesium, fluoride, selenium, molybdenum, copper. Phosphate, calcium and iron in detail.

MODULE 4: BIOCHEMISTRY OF CONNECTIVE TISSUE AND HORMONAL ACTIONS ***(05 Periods)***

Biochemistry of Connective tissue - Introduction, various connective tissue proteins: Collagen, elastin - Structure and associated disorders. Glycoproteins, Proteoglycans.

Hormone Action - a. Definition, classification, Mechanism of hormone action. Receptors, signal transduction, second messengers and cell function.

MODULE 5: CLINICAL BIOCHEMISTRY AND ACID-BASE BALANCE ***(10 Periods)***

Acid-Base balance - Acids, bases and buffers, pH. Buffer systems of the body, bicarbonate buffer system Role of lungs and kidneys in acid base balance, Acid base imbalance.

Electrolyte balance - Osmolarity. Distribution of electrolytes. Electrolyte balance: Role of aldosterone, rennin angiotensin system and ANF.

Clinical Biochemistry - Normal levels of blood and urine constituents, Relevance of blood and urine levels of Glucose, Urea, Uric acid, Creatinine, Calcium, Phosphates, pH and Bicarbonate. Liver function tests, Renal function tests.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Liver Function Test
2. Kidney Function Test
3. Thyroid function test
4. Gastric function test
5. Pancreatic function tests
6. Thyroid function test
7. Radioisotopes & there clinical applications.
8. coagulation and prothrombin time
9. Lipid profile
10. Diabetic profile test

RESOURCES

TEXT BOOKS:

1. U. Satyanarayana, U. Chakrapani "Biochemistry" Elsevier, 2020.
2. Vasudevan DM. "Textbook of Biochemistry for Medical Students" Jaypee Brothers Medical Publishers. 2019
3. Indumati V, Sowbhagya Lakshmi." Integrated Textbook of Biochemistry" Paras Medical Publishers2021.
4. Naik Pankaja. "Essentials of Biochemistry" Jaypee Brothers Medical Publishers. 2017
5. Agrawal Poonam "Concepts In Biochemistry With Clinical Approach For Undergraduate Medical Students" CBS Publishers & Distributors Pvt Ltd, 2020
6. Harpreet Kaur "Medical Biochemistry For Physiotherapy Students" First Edition. Jaypee Brothers Medical Publishers. 2018

REFERENCE BOOKS:

1. MN Chatterjea, Rana Shinde "Textbook of Medical Biochemistry" Jaypee Brothers Medical Publishers (P) Ltd 2018
2. Denise R. Ferrier "Lippincott's Illustrated Reviews Biochemistry" Seventh, North American Lippincott Williams and Wilkins 2016.
3. Prasad R Manjeshwar "Textbook of Biochemistry for Physiotherapy Students" New Revised 6th edition 2019-2020.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=VzAjOPzUIP4
2. https://www.youtube.com/watch?v=ppqpUVaasNc
3. https://www.youtube.com/watch?v=0M-B2dOfcUo

Web Resources:

1. http://www.oup.com/us/static/companion.websites/9780199730841/McKee_Chapter8_Sample.pdf
2. https://www.qmul.ac.uk/library/media/library/using-the-library/media-folder-images-library/Principles-Of-Biochemistry-Introductory-Series.pdf
3. https://resources.wfsahq.org/wp-content/uploads/uia-13-ACID-BASE-BALANCE.pdf

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22CC101005	MEDICAL TERMINOLOGY AND RECORD MANAGEMENT	2	-	-	-	2

Pre-Requisite -

Anti-Requisite National Health Care Delivery System and Medical Records Management

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on word roots, prefixes, suffixes basic medical terms, medical abbreviations to human body systems and record-keeping methods in health care and medical ethics.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate basic knowledge on roots, prefixes and suffixes to form medical terms in health care system

CO2. Understand the basic procedural terms and medical abbreviations to human body for improving communication and reporting between health care providers effectively

CO3. Understand the basic procedural terms and medical abbreviations to human body for improving communication and reporting between health care providers effectively

CO4. Apply advanced tools and techniques to maintain patient health details in medical system.

CO5. Demonstrate a standard protocol by applying medical ethics apply to avoid sentinel events.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	-	-	-	-	-	-	-	-	2
CO2	3	1	-	-	-	-	-	-	-	-
CO3	3	1	-	-	-	-	-	-	-	-
CO4	3	-	-	-	-	2	2	-	-	-
CO5	2	-	1	-	2	-	-	-	2	-
Course Correlation Mapping	**3**	**1**	**1**	**-**	**2**	**2**	**2**	**-**	**2**	**2**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module1: INTRODUCTION OF MEDICAL TERMINOLOGY ***(10 Periods)***

Derivation of medical terms, define word roots, prefixes, and suffixes, Conventions for combined morphemes and the formation of plurals, Basic medical terms, Form medical terms utilizing roots, suffixes, prefixes, and combining roots.

Module 2: MEDICAL TERMINOLOGY IN VARIOUS SYSTEMS-1 ***(06 Periods)***

Interpret basic medical abbreviations/symbols, integumentary system, nervous system and musculoskeletal system

Module 3: MEDICAL TERMINOLOGY IN VARIOUS SYSTEMS-2 ***(06 Periods)***

Interpret basic medical abbreviations/symbols, Respiratory system, cardiovascular system, and endocrine system.

Module 4: RECORD KEEPING ***(05 Periods)***

Standard procedures in record keeping, Interpreting medical orders/reports, Data entry and management on electronic health record system, Advanced tools to maintain records in Health care.

Module 5: MEDICAL ETHICS AND LAW ***(03 Periods)***

Medical ethics – Basic principles of medical ethics – Rational and irrational drug therapy, Care of the terminally ill- Euthanasia, Development of a standardized protocol to avoid sentinel events.

Total Periods: 30

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Demonstration of the role of medical terminology in the health care system.
2. Discussion on various types of systems.
3. Demonstration of working respective department in health care.
4. Demonstration of ethics in the medical system
5. Illustration of taking care of record keeping.

RESOURCES

TEXT BOOKS:

1. BD Chaurasiya "Hand book of General Anatomy" CBS publishers & Distributors Edition 6,2019.
2. Adam Brown "Medical Terminology Easy Guide for Beginners" CreateSpace Independent Publishing Platform, Edition 1, 2016.
3. GD Mogli "Medical records organization and management" Jaypee Brothers Medical Publishers, Edition2, 2016.

REFERENCE BOOKS:

1. Stedmans, pocket Medical Dictionary" Wolters Kluwer India Pvt. Ltd, Edition 1, 2009.
2. Rampi Gupta "CM Francis, Medical Ethics" Jaypee Brothers Medical Publishers, Edition 4, 2020.

VIDEO LECTURES:

1. Medical Law and Ethics Introduction - YouTube
2. Basic Principles in Medical Ethics - CRASH! Medical Review Series - YouTube
3. https://www.youtube.com/watch?v=04Wh2E9oNug.
4. https://www.youtube.com/watch?v=ZeMZLhoywO0
5. https://www.youtube.com/watch?v=cL0mP3IfmHE.
6. https://www.youtube.com/watch?v=wnOjrwCALuI

WEB RESOURCES:

1. Medical laws : A study of their conflict with Ethics - iPleaders
2. Introduction to Medical Terminology (openmd.com)

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22DF102021	PRINCIPLES OF ETHICS, HEALTHCARE QUALITY AND PATIENT SAFETY	3	-	2	-	4

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course is designed to provide an overview of ethical principles, Legal aspects, Quality assurance and management, infection control and prevention, Antibiotic resistance, and disaster management.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Apply NABH guidelines to improve the quality of patient care in the health care system.

CO2. Identification of suitable evidence-based infection control principles and techniques to control and prevent disease in the healthcare environment

CO3. Identify barriers and opportunities in the health care system based on contextual knowledge of microbial antibiotic resistance.

CO4. Demonstrate knowledge of different disaster management techniques to make patient health safety

CO5. Work independently or in teams to solve problems with effective communication.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	-	-	-	3	2	-	-	2
CO2	3	2	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	-	-	1
CO4	3	2	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	3	-	-	-	-
Course Correlation Mapping	**3**	**2**	**-**	**-**	**-**	**3**	**2**	**-**	**-**	**2**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: QUALITY ASSURANCE, MANAGEMENT AND ETHICS *(15 Periods)*

Concepts of Quality of Care, Quality Improvement Approaches, Standards and Norms, Quality Improvement Tools, and Introduction to NABH guidelines. The historical background pertaining to ethics in health profession, the four principles of bioethics, List the guidelines pertaining to ethical practice of physiotherapy profession. the constitution and guiding principles of World Confederation of Physical Therapy (WCPT)/World Physiotherapy Outline the roles and responsibilities of physiotherapists laid down by WCPT / World Physiotherapy Outline the guidelines for ethical practice envisioned by WCPT / World Physiotherapy Outline the organizational structure and practice guidelines laid down by Indian Association of Physiotherapists (IAP)

Module 2: INFECTION CONTROL, PREVENTION & LEGAL ASPECTS *(15 Periods)*

Evidence-based infection control principles and practices [such as Sterilization, Disinfection, Effective hand hygiene, and use of Personal Protective Equipment (PPE)], Prevention & control of common healthcare-associated infections, Hospital infection control program. The legal complexities in medico legal cases (MLC) including onus of proof and patient confidentiality, Outline the legal aspects pertaining to medical negligence, liability, reportage of abuse and management of disgruntled/ difficult patient's ethical aspects in private practice, the legal aspects in private practice.

Module 3: ANTIBIOTIC RESISTANCE *(10 Periods)*

Antibiotic Resistance: History of antibiotics, way of resistance happens and spreads, Types of resistance, actions to fight resistance, Antibiotic sensitivity, Consequences of antibiotic resistance & Antimicrobial Stewardship – Barriers and opportunities.

Module 4: DISASTER PREPAREDNESS AND MANAGEMENT *(05 Periods)*

The principles of on-site disaster management, Fundamentals of emergency management, Psychological impact management, Resource management, Preparedness, and risk reduction.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXERCISES:

1. Demonstration of NABH guidelines
2. Demonstration of Vital signs
3. Demonstration of proper use of Personal protective equipment (PPE)
4. Demonstration of evidence-based infection control principles and practices [such as Sterilization, Disinfection, Effective hand hygiene, and use of Personal Protective Equipment (PPE)
5. Discussion on various types of Antibiotics
6. Demonstration of how Resistance Happens and Spreads
7. Demonstration of ethics to be practiced by a health care professional

8. Demonstration of guidelines for ethical practice of physiotherapy profession.
9. Demonstration of guidelines of WCPT.
10. Demonstration of guidelines framed by IAP.
11. Complexities of medico-legal cases (MLC)

RESOURCES

TEXT BOOKS:

1. Girdhar J Gyani Alexander Thomas, Handbook of healthcare quality and patient safety, Jaypee brothers medical publisher.2nd edition,2017.
2. Y. Anjaneyulu and R Marayya "Quality Assurance and Quality Management" BSP Books Private Limited, 2018.
3. Deepak Tripathi "Quality management" Jaico Publishing House, Edition 1, 2009.
4. Apurba S Sastry, Deepashree "Essentials of Hospital infection control" Jaypee Brothers Medical Publisher, Edition 1, 2019.
5. NidhiGaubaDhawan and AmbrinaSarar Khan "Disaster management and preparedness" CBS Publisher, 2014.
6. Kavitha Raja, Sivakumar T, Ethical issues : perspectives for the physiotherapists, 2nd Edition, 2019
7. Gireesh Kumar KP and Eng "Handbook of antibiotics" Paras Medical Books, Edition 1, 2014.

REFERENCE BOOKS:

1. Alan R. Hauser "Antibiotics for Clinicians" LWW Exclusive NP, Standard Edition, 2019.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=zSyICkGZ6iM
2. https://www.youtube.com/watch?v=LZapz2L6J1Q
3. https://www.youtube.com/watch?v=yHs0GyLNSLg
4. https://www.youtube.com/watch?v=KwAKjtkpdP4

WEB RESOURCES:

1. https://www.sciencedirect.com/science/article/pii/B9780123735935000227
2. https://www.who.int/teams/integrated-health-services/infection-prevention-control
3. https://www.uicc.org/what-we-do/thematic-areas-work/antimicrobial-resistance-amr-and-its-impact-cancer-care
4. https://www.techtarget.com/searchsoftwarequality/definition/quality-assurance

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22CS102402	BASIC COMPUTERS AND INFORMATION SCIENCES	3	-	2	-	4

Pre-Requisite -
Anti-Requisite -
Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion and hands-on experience on basics of computer science and information science concepts of the I/O devices, CPU (central processing unit) memory, Storage devices and Introduction of windows operating systems and MS office and having the knowledge of computer networks, Internet and its applications.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate knowledge on Basics of computer I/O devices, Processor and memory.
CO2. Prepare the Documents using the word processors.
CO3. Prepare the work sheet and Slide Presentations using the Excel and presentation tool.
CO4. Demonstrate the knowledge on Operating Systems usage and its types.
CO5. Interconnect two or more computers for Information sharing and access the Internet.
CO6. Work independently or in teams to solve problems with effective communication

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	-	-	-	-	-	-	-	-
CO2	3	2	2	-	-	-	-	-	-	-
CO3	3	2	3	-	-	-	-	-	-	-
CO4	2	2	3	-	-	-	-	-	-	-
CO5	3	2	2	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	3	3	-
Course Correlation Mapping	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**3**	**3**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT:

Module 1: INTRODUCTION TO COMPUTERS *(09 Periods)*

Introduction, characteristics of computers, block diagram of computers, generations of computers, computer languages, Input-output devices: Input devices (keyboard, point and draw devices, data scanning devices, digitizer, electronic card reader, voice recognition devices, vision-input devices), output devices (monitors, pointers, plotters, screen image projector, voice response systems),Processor and memory: Central Processing Unit (CPU), main memory.

Module 2: STORAGE DEVICES AND WORD PROCESSOR *(09 Periods)*

Storage Devices: Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass storage devices, Introduction to word processor: Introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge.

Module 3: INTRODUCTION TO SPREADSHEET AND PRESENTATIONS *(09 Periods)*

Introduction to Excel: Introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs, Introduction to PowerPoint: Introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs.

Module 4: COMPUTER NETWORKS AND INTERNET APPLICATIONS *(09 Periods)*

Computer networks: Introduction, types of networks (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network, Internet and its Applications: Definition, brief history, basic services (E-Mail, File Transfer Protocol, telnet, the World Wide Web (WWW)), www browsers, use of the internet, Application of Computers in clinical settings.

Module 5: INTRODUCTION OF OPERATING SYSTEM *(09 Periods)*

Introduction to Operating System, Characteristics of Operating System, Types of Operating System and its components, Installation of windows OS, History of OS and features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing, minimizing and maximizing, etc.).

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXERCISES

1. Demonstrate of basic hardware of Computers and laptops.
2. Demonstrate about the I/O Devices and CPU.
3. Create and Design Admission/Enquiry Forms.
4. Create Student Id Card using shapes, text and colors.
5. Create Chart and show the product price comparison between years.
6. Insert the Image into various shapes
7. Calculate students marks percentage using spreadsheet.
8. Create slides about yourself using with all the details.
9. What are the steps to connect Internet
10. How to send an Email? Explain the steps in detail.

RESOURCES

TEXT BOOKS:

1. Priti Sinha and Pradeep K "Computer Fundamentals" BPB Publications, Edition 6, 2004.
2. James Bernstein "Office for the WebMade Easy" Independently published, Edition 1, 2021.

REFERENCE BOOKS:

1. Pete Matheson "Microsoft Office 365 for Beginners"
2. Dr Sabah Sayed "Fundamentals of Computer Science" Imperial College Press, 2009.

SOFTWARE/TOOLS:

1. Software: MS Office/ Window Operating System

VIDEO LECTURES:

1. Computer Fundamentals - Basics for Beginners - Bing video
2. https://youtu.be/-AP1nNK3bRs

WEB RESOURCES:

1. https://www.udemy.com/**computer**-**basics**/online-course
2. *https://www.educba.com/excel/courses/ms-office-course*

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22DF102006	**HEALTHCARE QUALITY AND PATIENT SAFETY**	2	-	2	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course is designed to provide an overview of Quality assurance and management, infection control and prevention, Antibiotic resistance, and disaster management.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Apply NABH guidelines to improve the quality of patient care in the health care system.

CO2 Identification of suitable evidence-based infection control principles and techniques to control and prevent disease in the healthcare environment

CO3 Identify barriers and opportunities in the health care system based on contextual knowledge of microbial antibiotic resistance.

CO4 Demonstrate knowledge of different disaster management techniques to make patient health safety

CO5 Work independently or in teams to solve problems with effective communication.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	-	-	3	2	-	-	2
CO2	3	2	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	-	-	1
CO4	3	2	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	3	-	-	-	-
Course Correlation Mapping	**3**	**2**	**-**	**-**	**-**	**3**	**2**	**-**	**-**	**2**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: QUALITY ASSURANCE AND MANAGEMENT ***(07 Periods)***

Concepts of Quality of Care, Quality Improvement Approaches, Standards and Norms, Quality Improvement Tools, and Introduction to NABH guidelines.

Module 2: INFECTION CONTROL AND PREVENTION ***(10 Periods)***

Evidence-based infection control principles and practices [such as Sterilization, Disinfection, Effective hand hygiene, and use of Personal Protective Equipment (PPE)], Prevention & control of common healthcare-associated infections, Hospital infection control program

Module 3: ANTIBIOTIC RESISTANCE ***(08 Periods)***

Antibiotic Resistance: History of antibiotics, way of resistance happens and spreads, Types of resistance, actions to fight resistance, Antibiotic sensitivity, Consequences of antibiotic resistance & Antimicrobial Stewardship – Barriers and opportunities.

Module 4: DISASTER PREPAREDNESS AND MANAGEMENT ***(05 Periods)***

The principles of on-site disaster management, Fundamentals of emergency management, Psychological impact management, Resource management, Preparedness, and risk reduction.

Total Periods: 30

EXPERIENTIAL LEARNING

LIST OF EXERCISES:

1. Demonstration of NABH guidelines
2. Demonstration of Vital signs
3. Demonstration of proper use of Personal protective equipment (PPE)
4. Demonstration of evidence-based infection control principles and practices [such as Sterilization, Disinfection, Effective hand hygiene, and use of Personal Protective Equipment (PPE)
5. Discussion on various types of Antibiotics
6. Demonstration of how Resistance Happens and Spreads

RESOURCES

TEXT BOOKS:

1. Girdhar J Gyani Alexander Thomas, Handbook of healthcare quality and patient safety, Jaypee brothers medical publisher.2nd edition,2017.
2. Y. Anjaneyulu and R Marayya "Quality Assurance and Quality Management" BSP Books Private Limited, 2018.
3. Deepak Tripathi "Quality management" Jaico Publishing House, Edition 1, 2009.
4. Apurba S Sastry, Deepashree "Essentials of Hospital infection control" Jaypee Brothers Medical Publisher, Edition 1, 2019.
5. NidhiGaubaDhawan and AmbrinaSarar Khan "Disaster management and preparedness" CBS Publisher, 2014.
6. Gireesh Kumar KP and Eng "Handbook of antibiotics" Paras Medical Books, Edition 1, 2014.

REFERENCE BOOKS:

1. Alan R. Hauser "Antibiotics for Clinicians" LWW Exclusive NP, Standard Edition, 2019.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=zSyICkGZ6iM
2. https://www.youtube.com/watch?v=LZapz2L6J1Q
3. https://www.youtube.com/watch?v=yHs0GyLNSLg
4. https://www.youtube.com/watch?v=KwAKjtkpdP4

WEB RESOURCES:

1. https://www.sciencedirect.com/science/article/pii/B9780123735935000227
2. https://www.who.int/teams/integrated-health-services/infection-prevention-control
3. https://www.uicc.org/what-we-do/thematic-areas-work/antimicrobial-resistance-amr-and-its-impact-cancer-care
4. https://www.techtarget.com/searchsoftwarequality/definition/quality-assurance

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22DF102008	**CLINICAL MICROBIOLOGY**	3	-	2	-	4

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides details on the Morphology of Bacteria, Principles and practices of Sterilization, Basic knowledge of Immunology, Identification of Bacteria, Diseases caused by bacteria, Viruses, and Fungi, Laboratory Diagnosis, and preventive Measures to be taken.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Apply knowledge on Principles of Sterilization and disinfection Techniques, Students will know how to grow bacteria in the laboratory, Identify the bacteria & basic Immunology of the Human Body.

CO2. Learn the Morphology, cultural characteristics, Infections caused, Laboratory Diagnosis, and Treatment of various Disease-causing bacteria in Humans.

CO3. Morphology, a disease caused and lab diagnosis of various fungi affecting Humans.

CO4. General properties of viruses and diseases caused lab diagnosis and prevention of Various viruses affecting Humans.

CO5. Classification, pathogenesis, lab diagnosis, and prevention of various disease-causing parasites in humans.

CO6. Work individually or in teams to solve problems with effective communication.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	2	2	-	2	1	-	2	3
CO2	3	2	2	-	1	2	-	-	2	-
CO3	3	2	-	-	-	2	-	-	2	1
CO4	2	2	2	-	-	-	-	-	2	1
CO5	3	2	2	-	1	2	-	-	2	2
CO6	2	1	-	-	-	-	-	-	2	-
Course Correlation Mapping	**3**	**2**	**2**	**2**	**1**	**2**	**1**	**-**	**2**	**2**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: GENERAL MICROBIOLOGY ***(10 Periods)***

Morphology and classification of microorganisms, Growth, nutrition and multiplication of bacteria, Sterilization and Disinfection - Principles and use of equipment's of sterilization namely hot air oven, autoclave and serum inspissator, pasteurization, antiseptics and disinfectants. Culture Media, Methods of Identification of Bacteria. Immunology - antigen, Antibodies, Immunity, vaccines, types of vaccine and immunization schedule. Hospital acquired infection - Causative agents, transmission methods, prevention and control of hospital Acquired infections.

Module 2: SYSTEMIC BACTERIOLOGY ***(15 Periods)***

Classification of bacteria, morphology, infections caused, lab diagnosis, treatment and prevention of common bacterial infections. Staphylococcus, Streptococcus, Pneumococcus, Neisseria, Corynebacterium diphtheriae, Clostridium, Enterobacteriaceae - Shigella, Salmonella, Klebsiella, E.coli, Proteus, Vibrio cholerae, Pseudomonas ,Spirochetes, Mycobacteria.

Module 3: MYCOLOGY ***(06 Periods)***

Morphology, disease caused and lab diagnosis of following fungi. Candida, Cryptococcus, Dermatophytes, opportunistic fungi (Aspergillus, Zygomycetes and Penicillium)

Module 4: VIROLOGY ***(10 Periods)***

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

Module 5: PARASITOLOGY ***(04 Periods)***

Classification, pathogenesis, lab diagnosis and prevention of Entamoeba, Giardia, Malaria, Hookworm, Roundworm and Filarial worms.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Compound microscope and its application in microbiology.
2. Demonstration of sterilization equipment's: hot air oven, autoclave, bacterial filters. Demonstration of commonly used culture media, nutrient broth, nutrient agar, blood agar, chocolate agar, Macconkey medium, L J media, Robertson cooked meat media, MacConkey agar with LF & NLF, Nutrient agar with staph colonies. Anaerobic culture, Methods and Antibiotic susceptibility test.
3. Demonstration of common serological tests: Widal, VDRL, ASLO, CRP, RF, Rapid tests for HIV, Hbsag and HCV.
4. Grams staining.
5. Acid fast staining.
6. Principles and practice of Biomedical waste management.

RESOURCES

TEXT BOOKS:

1. Anathanarayana&Panikar: Medical Microbiology - Revised 10th edition University Press.
2. Textbook of Microbiology - Baveja, 5th edition, Arya Publications
3. Textbook for Laboratory technicians by RamnikSood. Jaypee Publishers

REFERENCE BOOKS:

1. Bailey & Scott's Diagnostic Microbiology
2. Textbook of Medical Mycology by Jagdish Chander

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=_Fk1D7FIIg4
2. https://www.youtube.com/watch?v=F7TBfCJTZ54
3. https://www.youtube.com/watch?v=_waCHq1AaNk

WEB RESOURCES:

1. https://www.cdc.gov/infectioncontrol/index.html
2. https://www.who.int/teams/integrated-health-services/infection-prevention-control
3. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8325443/

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22DF102025	RESEARCH METHODOLOGY AND BIOSTATISTICS	3	-	2	-	4

Pre-Requisite -

Anti-Requisite Research Methodology and Biostatistics for Health Professionals

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed Knowledge on the basic principles of research and methods applied to draw inferences from the research findings. The students will also be made aware of the need of biostatistics and understanding of data, sampling methods, in addition to being given information about the relation between data and variables.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Understand concepts of research methodology.

CO2 Collect data for research in various methods.

CO3 Analyse research data by using biostatistics

CO4 Write their research or review papers to publish in journal

CO5 Work individually or in teams to solve problems with effective communication

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	-	1	-	3	1	-	-	-
CO2	1	1	2	-	2	-	-	-	3	-
CO3	1	1	2	-	1	-	-	1	-	1
CO4	2	1	2		2					1
CO5	1	2	2	-	3	2	1	-	-	-
Course Correlation Mapping	**1**	**1**	**2**	**1**	**2**	**3**	**1**	**1**	**3**	**1**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: FOUNDATIONS OF RESEARCH ***(10 Periods)***

Definition Research, Introduction to research methods, Objectives of Research, Identifying research problem, Types of Research & Research Approaches, Research Methods vs Methodology Ethical issues in research, Research design.

Module 2: RESEARCH PROBLEM AND DATA COLLECTION ***(09 Periods)***

Research Problem, Measurement & Scaling Techniques, Types of Data, Research tools and Data Research Problem, Measurement & Scaling Techniques, Types of Data, Research tools and Data collection methods, Sampling methods, randomization, crossover design, placebo, blinding techniques, Developing a research proposal.

Module 3: INTRODUCTION TO BIOSTATICS ***(09 Periods)***

Meaning, Definition, and Characteristics of Statistics, Importance of the Study of Statistics, Understanding of data in biostatistics, Statistics in Health Science, How & where to get relevant data, Relation between data & variables, Type of variables: defining data sets.

Module 4: DATA ANALYSIS AND DISSEMINATION ***(09 Periods)***

Basic Principles of Data Graphical Representation, Analysis of variance & covariance. Measures of central tendency include mean, median, and mode. Probability and standard distributions include binomial and normal distributions. Sample size calculation, Sampling techniques address sampling need, criteria, procedures, design errors, variation, and tests of significance. Statistical significance involves parametric and non-parametric tests.

Module 5: SCIENTIFIC WRITING ***(08 Periods)***

Introduction, reviewing literature, formulating research problems and proposals, integrating theory and data and understanding citation and referencing. types of reports, formal report layout, and journal standards (impact factor, citation index). importance of communicating science, challenges in scientific writing, plagiarism and its detection and writing scientific papers.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. To practice problems on various biostatistics tools
2. Demonstrate types of data collection from hospital.
3. To determine research statistics tools.
4. Analyze data by using SPSS.

RESOURCES

TEXT BOOKS:

1. S.P. Gupta, Statistical Methods, Sultan Chand & Sons, Edition 46,2023.
2. C.R. Kothari, Research Methodology, New age International Publisher, Edition 4, 2019.

REFERENCE BOOKS:

1. Himanshu Tyagi, Biostatistics Buster, Jaypee Brothers Medical Publishers, Edition 1,2011.
2. Bratati Banerjee, Mahajans Methods in Bistatistical for medical students and research workers, Jaypee Brothers Medical Publishers, Edition 9, 2018.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=d77eQz0_Sfk
2. https://www.youtube.com/watch?v=yOU_s0xzc-Y
3. https://www.youtube.com/watch?v=txIS0N0l9xU&list=PLEIbY8S8u_DK7i4Fj6Hgq8sn_l42k9H1L
4. https://www.youtube.com/watch?v=1Q6_LRZwZrc

WEB RESOURCES:

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8764821/
2. https://www.scribbr.com/category/methodology/
3. https://www.easybiologyclass.com/biostatistics-introduction-significance-applications-and-limitations-of-statistics/

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT1110XX	**CLINICAL TRAINING**	-	-	-	-	Refer Below

Note: Each Clinical Training carries 4 Credits

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: The students will be trained on bed side approach, patient assessment, performing special tests, identifying indications for treatment, ruling out contraindications, decision on treatment parameters, dosage and use relevant outcome measures under supervision.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Assess the patient illness by proper examination.

CO2. Identify the patient clinical condition and advise appropriate physiotherapy treatment.

CO3. Work individually and in teams following ethical practice.

CO4. Record the clinical studies for future advancements.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	3	1	**-**	**-**	**-**	-	**-**	**-**	**-**
CO2	3	1	3	-	-	-	-	-	-	-
CO3	-	-	-	3	3	-	2	-	-	-
CO4	3	1	-	-	3	3	-	2	-	-
Course Correlation Mapping	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**-**	**-**

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT108001	CAPSTONE PROJECT	-	-	-	-	4

Note:

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course deals with research projects, and critical analysis of clinical practices by cultivating research skills.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Formulate problem based on the review program specific literature on a chosen topic.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	1	1	3	-	2	1	-
Course Correlation Mapping	**3**	**3**	**3**	**1**	**1**	**3**	**-**	**2**	**1**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

MANDATORY COURSES

Course Code	Course Title	L	T	P	S	C
22LG101402	**తెలుగు**	2	-	-	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: తుమ్మల సీతారామమూర్తి-**ఎక్కట్లు,** తిక్కన-**నాడీజంఘోపాఖ్యానం,** పోతన-**ధ్రువోపాఖ్యానం,** దువ్వూరి రామిరెడ్డి - **కృషీ వలుడు, మరియు తెలుగు వ్యాకరణం మీద అవగాహన.**

COURSE OUTCOMES: కోర్సువిజయవంతంగాపూర్తిచేసినతర్వాత,విద్యార్థులువీటినిచేయగలరు:

CO1. విద్యార్థులలో మానవీయ విలువలు పెరిగి నైతిక వలువలతో జీవించడం

CO2. సమాజంలో మనకు చేతనైన సాయం చెయ్యడం ప్రతి మనిషి బాధ్యత అనే సందేశం

CO3. త్రికరణ శుద్ధితో కృషి చేస్తే ఏదైనా సాధించ వచ్చు అనే సందేశం

CO4. వ్యవసాయ రంగం గూర్చి విద్యార్థులలో అవగాహన కలగడం

CO5. తెలుగు వ్యాకరణం

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	-	-
CO4	3	-	-	-	-	-	-	-	-	-
CO5	3	-	-	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

పాఠ్య ప్రణాళిక

Module 1: **ఎక్కట్లు** – తుమ్మల సీతారామమూర్తి *(06 Periods)*

సత్ప్రవర్తన, సచ్ఛీలత, సన్మార్గం, సమసమానత్వం గూర్చి వివరించడం.

Module 2: **నాడీజంఘోపాఖ్యానం** – తిక్కన *(06 Periods)*

సహాయం చేసినివారిని మరచి పోరాదు. చేసిన మేలు మరచిన వారి జీవితం ఎంత హీనంగా ఉంటుందో తెలియజేయడం.

Module 3: **ధ్రువోపాఖ్యానం** – పోతన *(06 Periods)*

ఎటువంటి కష్టాలకు సమస్యలకు కుంగి పోకుండా దీక్షతో పట్టుదలతో కృషితో అనుకున్నది సాధించాలని తెలియజేయడం.

Module 4: **కృషీ వలుడు** – దువ్వూరి రామిరెడ్డి *(06 Periods)*

సమాజానికి వెన్నెముక అయిన రైతు యొక్క కష్టాలను త్యాగాలను వివరించడం.

Module 5: **సంధులు, సమాసాలు, అలంకారాలు.** *(06 Periods)*

తెలుగు భాష యొక్క మూలాలను తెలుసుకోవడం.

Total Periods: 30

RESOURCES

TEXT BOOKS:

1. **ఎక్కట్లు – కవి తుమ్మల సీతారామమూర్తి చౌదరి.**
2. **నాడీజంఘోపాఖ్యానం – కవి తిక్కన. (మహాభారతం – శాంతి పర్వం – తృతీయా శ్వాసం – 472 నుండి 511 పద్యాల** వరకు).
3. **ధ్రువోపాఖ్యానం** – కవి పోతన (ఆంధ్ర మాహాభాగవతం – చతుర్థ స్కంధం – 216 నుండి 277 పద్యాల వరకు)
4. కృషీ వలుడు – కవి దువ్వూరి రామిరెడ్డి

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=5jX20h6HWzg
2. https://www.youtube.com/watch?v=FFtPSPByBmk
3. https://www.youtube.com/watch?v=nQHF_pgTfL8
4. https://www.youtube.com/watch?v=IEERKL3Q2Cs

Web Resources:

1. http://teluguvignanamvinodam1.blogspot.com/2021/06/maha-bharatam-in-telugu-pdf-free-download_25.html
2. https://www.freegurukul.org/blog/ramayanam-pdf/

EXPERIENTIAL LEARNING

The experiential learning components will be detailed in CHO.

MANDATORY COURSES

Course Code	Course Title	L	T	P	S	C
22LG101404	SANSKRIT	2	-	-	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: अस्मिन् पाठ्यक्रमे संस्कृत गद्य, पद्य, व्याकरमेन सह महाभारतम् अपि च रामायणस्य कान्श्चन खण्डानां मेलनं भवति। अयं पाठ्यक्रमः छात्राणां कृते विभिन्न संस्कृत ग्रन्थानां अपि च साहित्यस्य समालोचनात्मक विश्लेषण करणमपि शिक्षयति। संपूर्ण पाठ्यक्रमे अस्मिन्, छात्राः देवनागरी लिपेः लिखनं अधिगच्छति, संस्कृतस्य शब्दानां उच्चारणं तथा हृदिस्थं करिष्यति, अपि च प्राथमिक व्याकरण पठिष्यति तेन ते संस्कृते सरल वाक्यानां निर्माणं कर्तुं प्रभवन्ति।

COURSE OUTCOMES: पाठ्यक्रमस्य सफलसमाप्तेः अनन्तरं छात्राः

CO-PO Mapping Table:

Course Outcomes	Program Outcomes
CO1	कर्तव्यपरक शैक्षणिक वृत्तिपरक तथा शोधकर्तृणां निर्माणार्थं छात्राणां संज्ञानात्मक, प्रभावशाली तथा व्यवहारिक क्षमतानां आकार प्रदानार्थं सहायतां करोति।
CO2	सामाजिक परिवर्तने भागग्रहणार्थं सक्षमाः भवितुं छात्रेषु सेवायाः धारणा संचारः करोति।
CO3	समकालीन समस्या-समाधान स्थितिषु प्राचीन भारतीय ज्ञानस्य अनुप्रयोगस्य ज्ञानप्राप्तिः। सामान्य रूपेण तथा विशेष रूपेण अभ्यसने तथा तस्य मूल्यांकनस्य संदर्भे च नैतिक उपयुक्ततायाः एकः दृढतर भावनायाः विकासनार्थम्।
CO4	प्राचीन साहित्यतः प्राथमिक जीवनं तथा अवधारणानां ज्ञानप्रदानं यत् कालातीतः जातः तथापि इदानीमपि समाजाय अनुवर्तते। आवेदनस्य प्रमुख क्षेत्रेषु प्राथमिक कौशलस्य अधिग्रहणे सुगमकरणम् उदा- नेतृत्वे, संचारे, अनुसंधान योग्यतायां, व्यवहार संशोधने इत्यादि।
CO5	सामाजिक विविधतायाः कृते सम्मान-विकसितं करनं तथा सामाजिक अपि च सांस्कृतिक प्रासंगिकतायाः अध्ययने अभिवृद्धि करनम्।

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-
CO3	3	-	-	-	-	-	-	-	-
CO4	3	-	-	-	-	-	-	-	-
CO5	3	-	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module-1: प्राचीन पद्यसाहित्यम् **(06 Periods)**

1.आर्य पादुका पट्टाभिषेकः - वल्मीकिः – श्रीमद्रामायणम्

2. गङ्गावतरणम् - वेदव्यासः – महाभारतम्

Module-2: चम्पूकाव्यम् **&** आधुनिक पद्यकाव्यम् **(06 Periods)**

3.गङ्गावतरणम् - भोजराजः - चम्पूरामायणम्

4. मोहापनोदः - श्री पमिडिपाटि पट्टाभिरामारावः – मूलकथा-'धर्मसौहृदम्' इति संस्कृत पद्यकाव्यम्

Module-3: गद्यसाहित्यम् **(06 Periods)**

5. अत्युत्कटैः पापपुण्यैः इहैव फलमश्नुते - नारायणपण्डितः - हितोपदेशः

6. शूद्रकवीरवरकथा - हितोपदेशः

Module-4: शब्दाः **(6 Periods)**

देव, कवि, भानु, पितृ, धातृ, गो, रमा, मति

Module 5: महाकवि, शास्त्रकाराः **(6 Periods)**

1.पाणिनिः 2.कौटिल्यः 3.भरतमुनिः 4.भारविः 5.माघः 6.भवभूतिः 7.शङ्कराचार्यः 8.दण्डी

Total Periods: 30

EXPERIENTIAL LEARNING:

The experiential learning components will be detailed in CHO.

RESOURCES

TEXT BOOKS:

1.विश्वभारती 2,संस्कृत भारती 3.अमृतवाणी

REFERENCE BOOKS:

1.रामायणम् 2.महाभारतम् 3.अष्टाध्यायी 4.अमरकोशः

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=bh-14xfMeYk
2. https://www.youtube.com/watch?v=6xFkoOpzsvs

Web Resources:

1. https://www.forum.universityupdates.in/threads/ou-sanskrit-2nd-semester-study-material.33659/
2. https://chnhu.ac.in/study_mat_sanskrit.php

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22CE107601	**ENVIRONMENTAL SCIENCE**	2	-	-	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on natural resources, ecosystems, biodiversity, environment pollution and control, social issues and environment, human population and environment.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Analyze natural resources to solve complex environmental problems and natural resource management considering society, environment and sustainability.

CO2. Analyze ecosystems and biodiversity to solve complex environmental problems by following environmental ethics considering society, environment and sustainability besides communicating effectively in graphical form.

CO3. Analyze various types of pollution and their control measures to solve environmental problems through appropriate tools and techniques following latest developments considering society, ethics, environment and sustainability.

CO4. Analyze social issues and its impact on environment, environmental acts to solve complex environmental problems considering society, environment and sustainability besides communicating effectively in graphical form.

CO5. Analyze human population and its impact on environment to solve complex environmental problems through team work and using appropriate tools and techniques considering ethics, society, environment and sustainability.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	-	2	-	-	1	-	1
CO2	3	2	-	-	2	2	1	1	-	1
CO3	3	2	2	1	2	2	2	-	-	-
CO4	3	2	2	2	2	-	-	2	-	1
CO5	3	2	2	2	2	2	2	-	-	1
Course Correlation Mapping	**3**	**2**	**2**	**2**	**2**	**2**	**2**	**1**		**1**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: NATURAL RESOURCES ***(07 Periods)***

Multidisciplinary nature of environment; Natural Resources: Renewable and non-renewable resources; Forest, Water, Mineral, Food and Energy resources -Causes, Effects, Remedies, Case studies; Role of an individual in conservation of natural resource and equitable use of resources for sustainable lifestyles.

Module 2: ECOSYSTEMS AND BIODIVERSITY ***(07 Periods)***

Ecosystems: Concept of an ecosystem, Structure and function of an ecosystem - Producers, Consumers, Decomposers; Food chains, Food webs, Ecological pyramids – Types; Characteristic features, Structure and functions of forest ecosystem, Desert ecosystem, Aquatic ecosystem.

Biodiversity: Concept and value of biodiversity, Role of biodiversity in addressing new millennium challenges, Hot spots of biodiversity, Threats to biodiversity, Man-wild life conflicts, Endemic, Endangered and extinct species of India, Conservation of biodiversity – In-situ and ex-situ.

Module 3: ENVIRONMENTAL POLLUTION AND CONTROL ***(06 Periods)***

Causes, Adverse effects and control measures of pollution - Air pollution, Water pollution, Soil pollution, Noise pollution, Thermal pollution, Nuclear pollution, Solid waste management – Urban waste, industrial waste; Latest developments in pollution control, Hazards and disaster management – Floods, Earthquakes, Tsunamis, Case studies.

Module 4: SOCIAL ISSUES AND THE ENVIRONMENT ***(06 Periods)***

Sustainable development, Urban problems related to energy, Environmental ethics –Issues, Solutions; Global warming, Acid rain, Ozone layer depletion, Nuclear accidents and case studies, Wasteland reclamation, Consumerism and waste products, Concept of green technologies, Environment justice: National Green Tribunal and its importance; Environment protection act, Air act, Water act, Wildlife protection act, Forest conservation act, Issues involved in enforcement of environmental legislation, Public environmental awareness.

Module 5: HUMAN POPULATION AND THE ENVIRONMENT ***(04 Periods)***

Population growth, Population characteristics and variation among nations, Population explosion, Family welfare program, Environment and human health, Human rights, Value education, HIV/AIDS, Women and child welfare, Role of information technology in environment and human health; Case studies - Field Work/Assignment/Seminar on Environmental assets – Water bodies/Forest/Grassland/Hill/Mountain.

Total Periods: 30

EXPERIENTIAL LEARNING

1. Visit a nearby villages and know the status of availability of local resources that can be improved through proper education.
2. Make an awareness program in the villages for the development of natural resources, ecosystems and biodiversity.
3. Prepare a document by visiting a local urban waste dumping yard near to the Tirupati city.
4. Visit a local village and find a barren land and make the land into a useful land by planting plants or providing the soil and fertilizers required to improve the soil.
5. Visit a local zoological park and identify the species variety and variability.

(Note: It's an indicative one. The course instructor may change the activities and the sameshall be reflected in CHO.)

RESOURCES

TEXT BOOKS:

1. Anubha Kaushik and Kaushik, C.P., *Perspectives in Environmental Studies*, New Age International (P) Ltd. Publications, 6th Edition, 2018.
2. Erach Barucha, *Environmental Studies,* Orient Blackswan, 3rd Edition, 2021.

REFERENCE BOOKS:

1. Cunningham, W. P. and Cunningham, M. A., *Principles of Environmental Science*, TataMcGraw-Hill Publishing Company, New Delhi, 8th Edition, 2016.
2. Benny Joseph, *Environmental Studies*, Tata McGraw-Hill, 2nd Edition, 2009.
3. Anji Reddy, M., *Text Book of Environmental Science and Technology*, BS Publications,Revised Edition, 2014.
4. Rajagopalan, R., *Environmental Studies*, Oxford University Press, 3rd Edition, 2015.

VIDEO LECTURES:

1. http:// nptel.ac.in/courses/109/104/109104047
2. https://www.youtube.com/watch?v=mIPBPG-5dUw

WEB RESOURCES:

1. https://nptel.ac.in/courses/122102006
2. https://www.flame.edu.in/academics/ug/program-structure/major-minor courses/environmental-studies
3. https://www.tutorialspoint.com/environmental_studies/environmental_studies_environment.htm

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT101002	**INTRODUCTION TO HEALTH CARE SYSTEM AND PHYSIOTHERAPY ROLE**	2	-	-	-	2

Pre-Requisite -
Anti-Requisite -
Co-Requisite -

COURSE DESCRIPTION: This course deals with the main features of Indian health care delivery system and its comparing with the other systems of the world.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the basic concepts in health care delivery system.
CO2. Acquire knowledge on various AYUSH systems.
CO3. Identify the Vital events of life and its impact on demography.
CO4. Understand the principles and methods of epidemiology.
CO5. Identify the role of Physiotherapy Profession in health care community.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	1	-		-	-	-
CO2	3	1	-	-	2	-	1	-	-	-
CO3	3	2	-	-	1	-	1	-	-	-
CO4	3	-	-	-	1	-		-	-	-
CO5	3	-	-		1	-	1	-	-	2
Course Correlation Mapping	**3**	**1**	**-**	**-**	**1**	**-**	**1**	**-**	**-**	**2**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: INTRODUCTION TO HEALTHCARE DELIVERY SYSTEM ***(05 periods)***

Healthcare delivery system in India at primary, secondary and tertiary care Community participation in healthcare delivery system , Health system in developed countries, Private Sector, National Health Mission , National Health Policy Issues in Health Care Delivery System in India

National Health Programme- Background objectives, action plan, targets, operations, achievements and constraints in various National Heath Programme

Module 2: INTRODUCTION TO AYUSH SYSTEM OF MEDICINE ***(06 periods)***

Introduction to Ayurveda, Naturopathy, Unani, Siddha, Homeopathy, Need for integration of various system of medicine.

Module 3: DEMOGRAPHY AND VITAL STATISTICS ***(06 periods)***

Demography & its concept , Vital events of life & its impact on demography, Significance and recording of vital statistics, Census & its impact on health policy

Module 4: EPIDEMIOLOGY ***(05 Periods)***

Principles of Epidemiology, Natural History of disease, Methods of Epidemiological studies, Epidemiology of communicable & non-communicable diseases, disease transmission, host defence immunizing agents, cold chain, immunization, disease monitoring and surveillance.

Module 5: COMPONENTS OF PHYSIOTHERAPY PROFESSION **(08 Periods)**

History of medical therapeutics, Introduction and history of physiotherapy

1.Role of physiotherapy in meeting health care needs in India

a. Needs versus Demands
b. Physiotherapist as Educator
c. Typical job settings
d. Common problems and solutions

2.Rehabilitation

a. Introduction to Rehabilitation, Definitions of Rehabilitation, Principals of Rehabilitation, its aim and objectives
b. Concept of disability (including mental illness), definitions and classification.
c. Difference between incidence and prevalence, prevalence and incidence of disability
d. History of disability rehabilitation
e. Introduction to locomotor disability, disability and general medical conditions.
f. Global ,National, State and local legislations concerning disability and development Poverty, disability and development programs
g. Schemes and concessions for persons with disabilities, Advocacy and rights of persons with disabilities.
h. Role of community in the prevention of disabilities

Total Periods: 30

EXPERIENTIAL LEARNING

1. Demonstration of various levels of health care system.
2. Presentation of health care programs.
3. Illustration on ayush system of medicine and it's practice.
4. A clinical overview on demography and vital statistics.
5. A clinical based epidemiological study and survey of communicable and non-communicable diseases.
6. Demonstration of physiotherapy role in health care system and rehabilitation.
7. A case study on physiotherapy role and responsibilities.

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in CHO.)

RESOURCES

BOOKS:

1. Francis, Hospital Care Management, 4th Edition, 2019
2. Sharon B. Buchbinder, Introduction to Health Care Management, 2nd Edition, 2011
3. Fandis S, Health Service Management, Analysis& Management, Wasworth publishing, 3rd Edition, 2019

VIDEO LECTURES:

1. https://youtu.be/It_cV56Dxtk
2. https://youtu.be/VIrdH_3RKKk

WEB RESOURCES:

1. https://library.medschl.cam.ac.uk/e-books/
2. https://www.ncbi.nlm.nih.gov/

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT101003	**BASIC ETHICS AND REGULATION OF PHYSIOTHERAPY**	2	-	-	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on principles of ethics in clinical practice, academics, research scope and challenges for health care professionals.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Acquire knowledge on the ethical principles for governing practices in physiotherapy

CO2. Understand the guidelines laid by statutory/ governing bodies for the practice of physiotherapy

CO3. Identify the attributes of a good leader and relate in context of physiotherapy

CO4. Analyse the ethical dilemmas arising out of patient evaluation and management

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	1	-	-	3	-	-	-	-	2
CO2	3	1	-	-	3	-	-	-	-	2
CO3	3	2	-	-	2	-	2	-	-	2
CO4	3	3	-	-	2	-	-	2	-	-
Course Correlation Mapping	**3**	**2**	**-**	**-**	**3**	**-**	**2**	**2**	**-**	**2**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: BIOETHICS OF PHYSIOTHERAPY ***(10 Periods)***

The historical background pertaining to ethics in health profession, the four principles of bioethics, List the guidelines pertaining to ethical practice of physiotherapy profession. the constitution and guiding principles of World Confederation of Physical Therapy (WCPT)/World Physiotherapy Outline the roles and responsibilities of physiotherapists laid down by WCPT / World Physiotherapy Outline the guidelines for ethical practice envisioned by WCPT / World Physiotherapy Outline the organizational structure and practice guidelines laid down by Indian Association of Physiotherapists (IAP)

Module 2: LEGAL ASPECTS IN CLINICAL PRACTICE **(05 Periods)**

The legal complexities in medico legal cases (MLC) including onus of proof and patient confidentiality, Outline the legal aspects pertaining to medical negligence, liability, reportage of abuse and management of disgruntled/ difficult patients ethical aspects in private practice, the legal aspects in private practice.

Module 3: LEADERSHIP IN PHYSIOTHERAPY **(05 Periods)**

Outline the characteristics of leadership required in physiotherapy profession, Outline the role of emotional intelligence in physiotherapy practice, Explain mentorship program and Outline the need for mentioning in physiotherapy profession.

Module 4: ETHICAL ISSUES IN TREATING VULNERABLE POPULATION **(10 Periods)**

The characteristics of leadership required in physiotherapy profession , Outline the role of emotional intelligence in physiotherapy practice , mentorship program and Outline the need for mentioning in physiotherapy profession

Total Periods: 30

EXPERIENTIAL LEARNING

1. Demonstration of ethics to be practiced by a health care professional
2. Demonstration of guidelines for ethical practice of physiotherapy profession.
3. Demonstration of guidelines of WCPT.
4. Demonstration of guidelines framed by IAP.
5. Complexities of medico-legal cases (MLC)
6. Demonstrating the characteristics of leadership in physiotherapy practice.
7. A clinical review on ethical issues in treating vulnerable population.

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in CHO.)

RESOURCES

BOOKS:

1. Kavitha Raja, Sivakumar T, Ethical issues : perspectives for the physiotherapists, 2nd Edition, 2019
2. Donald L.gabard,Mike W.Martin-physical therapy ethics,2nd Edition.
3. Laura L. swisher ,carol Krueger brophy-Legal and ethical issuses in physical therapy
4. Essentials of community physiotherapy and ethics-rajendra Rajput
5. Ethics in physical therapy -Nancy R. Kirsch

VIDEO LECTURES:

1. https://youtu.be/It_cV56Dxtk
2. https://youtu.be/VIrdH_3RKKk

WEB RESOURCES:

1. https://library.medschl.cam.ac.uk/e-books/
2. https://www.ncbi.nlm.nih.gov/

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22DF102010	**PATHOLOGY FOR PHYSIOTHERAPY**	3	-	2	-	4

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on basic concepts of pathology and understanding disease biology.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate basic knowledge of events of cell Injury and Inflammation

CO2. Understand the concepts of Immunopathology and Infectious Diseases

CO3. Understand the pathophysiology of Neoplasia and Circulatory disturbances.

CO4. Knowledge of systemic pathology and disease biology.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**P8**	**PO9**	**PO10**
CO1	3	-	-	-	-	1	1	-	-	-
CO2	3	1	-	-	-	-	-	-	3	-
CO3	3	1	3	-	-	-	-	-	-	1
CO4	3	1								1
Course Correlation Mapping	**3**	**1**	**3**	**-**	**-**	**1**	**1**	**-**	**3**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: CELL INJURY AND INFLAMMATION *(08 Periods)*

Cell injuries: - Aetiology and Pathogenesis with a brief recall of important aspects of normal cell structure. - Reversible cell injury: Types, Sequential changes, Cellular swellings, vacuolation, Hyaline changes, Mucoid changes. - Irreversible cell injury: Types of Necrosis & Gangrene, Autolysis. - Pathologic calcification: Dystrophic and Metastatic. Intracellular Accumulations.

Inflammation and Repair - Acute inflammation: features, causes, vascular and cellular events, Inflammatory cells and Mediators. - Chronic inflammation: Causes, Types, Classification nonspecific and granulomatous with examples. -Wound healing by primary and secondary union, factors promoting and delaying the process. Healing in specific site including bone healing.

Module 2: IMMUNOPATHOLOGY AND INFECTIOUS DISEASES *(09 Periods)*

Immunopathology –General concepts. Hypersensitivity: type and examples, antibody and cell-mediated tissue injury with examples. Secondary immunodeficiency. Auto-immune disorders: Basic concepts and classification, SLE. AIDS-Aetiology, Modes of transmission, Diagnostic procedures, handling of infected material, and health education.

Infectious diseases – Bacterial: Tuberculosis, Leprosy and Syphilis, Pyogenic, Diphtheria, Gram-negative infection, Bacillary dysentery.

Viral: Poliomyelitis, Herpes, Rabies, Measles, HIV infection, H1N1, Ebola, and Covid19,

Fungal disease: opportunistic infections,

Parasitic diseases: Malaria, Filaria, Amoebiasis, Kala-azar, Cysticercosis, Hydatid cyst.

Module 3: NEOPLASIA AND CIRCULATORY DISTURBANCES *(06 Periods)*

Neoplasia: Definition, classification, Biological behavior: Benign, Malignant, Carcinoma, Sarcoma, Grades and Stages, Local and Distant spread.

Carcinogenesis: Environmental carcinogens, chemical, viral, occupational. Heredity and cellular oncogenes and prevention of cancer.

epithelial tumors Eg. Squamous papilloma, Squamous cell carcinoma, Malignant melanoma.

mesenchymal tumors Eg: Fibroma, Lipoma, Neurofibroma, Fibrosarcoma, Liposarcoma, Rhabdo-myosarcoma, Teratoma.

Circulatory Disturbances - Hyperemia/Ischemia and Haemorrhage - Edema: Pathogenesis and types. - Chronic venous congestion: Lung, Liver, Spleen, Systemic Pathology - Thrombosis and Embolism: Formation, Fate and Effects. – Infarction: Types, Common sites. - Shock: Pathogenesis, types, morphologic changes.

Genetic Disorders –Basic concepts of genetic disorders and some common examples and congenital malformation.

Module 4: SYSTEMIC PATHOLOGY-I ***(10 Periods)***

Hematopathology- Anemia: Classification, clinical features & lab diagnosis (brief idea). - Hemostatic disorders, Vascular and Platelet disorders & lab diagnosis. - Coagulopathies - (i) Inherited (ii) Acquired with lab diagnosis. - Leukocytic disorders: Leukocytosis, Leukopenias, Leukemoid reaction. - Leukemia: Classification, clinical manifestation, pathology, and Diagnosis.

Hepato Biliary Pathology:- Jaundice: Types, aetiopathogenesis and diagnosis.

Endocrine pathology - Non-neoplastic lesions of Thyroid: Thyrotoxicosis, myxedema,

Dermatopathology: - Skin tumors: Squamous cell carcinoma, Basal cell carcinoma, Melanoma. Congenital Myopathy & myasthenia gravis.

Module 5: SYSTEMIC PATHOLOGY-II ***(12 Periods)***

Respiratory Pathology:- Pneumonia, Bronchitis, Bronchiectasis, Asthma, Tuberculosis, Carcinoma of lungs, Occupational lung diseases

Cardiovascular Pathology:- Congenital Heart diseases: Atrial septal defect, Ventricular septal defect, Fallot's tetralogy, Patent ductus arteriosu,. Endocarditis, Rheumatic Heart disease.

Vascular diseases: Atherosclerosis, Monckeberg's medial calcification. - Ischemic heart Disease: Myocardial infarction.

Musculoskeletal System - Osteomyelitis: acute, chronic, tuberculous, mycetoma - Metabolic diseases: Rickets/ Osteomalacia, osteoporosis, Hyperparathyroidism, Paget's disease. - Tumours Classification: Benign, Malignant, Metastatic and synovial sarcoma. - Arthritis: Suppurative, Rheumatoid. Osteoarthritis, Gout, Tuberculous.

Neuropathology - Inflammations and Infections: TB Meningitis, Pyogenic Meningitis, viral meningitis and Brain Abscess, Tuberculosis, Cysticercosis.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Collection of blood and anticoagulants used.
2. Discussion about parts of the microscope and different types of microscopes used in pathology.
3. Staining of the slide by Leishman method.
4. Study of peripheral blood smear.
5. Estimation of hemoglobin by Sahli's method and discussion of other methods used.
6. Erythrocyte sedimentation Rate
7. Identification of various instruments in pathology lab & their uses (eg. Neubar chamber, RBC, WBC, pipette etc.).
8. Bleeding Time, Clotting Time.

RESOURCES

TEXT BOOKS:

1. Harsh Mohan "Textbook of Pathology with Pathology Quick Review" Jaypee Brothers Medical Publishers, 8th Edition, 2019.
2. Ramadas Nayak " Textbook of Pathology for BPT Students" Jaypee Brothers Medical Publishers, 1st Edition, 2018
3. Harsh Mohan, "Essential Pathology for Physiotherapy Students" Jaypee Brothers Medical Publishers 1st Edition 2018.

REFERENCE BOOKS:

1. David J. Magee, James E. Zachazewski, William S. Quillen, Robert C. Manske, "Pathology and Intervention in Musculoskeletal Rehabilitation" Saunders Publisher Pvt. Ltd. 2nd Edition, 2018.
2. Vinay Kumar, Abul K. Abbas, Jon C. Aster, Manoj K. Singh. Robbins and Cotran Pathologic Basis of Disease (Two Vol Set), 10e, Publisher Elsevier Health Science, South Asia Edition, 2020.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=-Ph2uhw9BhE
2. https://www.youtube.com/watch?v=JcGKDDvk5AQ
3. https://www.youtube.com/watch?v=LaG3nKGotZs

WEB RESOURCES:

1. https://www.aai.org/AAISite/media/Education/HST/Archive/Riina_Caroline_Presentation.pdf
2. https://drnaitiktrivedi.com/wp-content/uploads/2020/04/1.-CELL-INJURY-AND-CELLULAR-ADAPTATION.pdf
3. https://www.pearson.com/content/dam/one-dot-com/one-dot-com/us/en/higher-ed/en/products-services/course-products/fremgen-6e-info/pdf/Sample_ch04_final.pdf

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT102012	**BIOMECHANICS -I**	3	1	2	-	5

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion about the knowledge of Structure and enables the student to have a better understanding of the principles of biomechanical application in musculoskeletal function and dysfunction.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate the Foundational Concepts of Biomechanical Applicationsto Joint Structure and Function.

CO2. Understand the basic concepts of Muscle and Joint Structure and Function.

CO3. Analyze and Evaluate the Axial Skeletal JointComplexes.

CO4. Demonstrate the Integrated Function of the Shoulder and Elbow Complexes.

CO5. Assess the Functional Position of the Wrist and Hand.

CO6. Work independently and in teams to solve problems with effective communications.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	1	2	-	-	2	-	-	-	-
CO2	3	2	3	-	-	2	-	-	2	1
CO3	3	3	3	-	-	2	-	-	2	1
CO4	3	3	3	-	-	2	-	-	2	1
CO5	3	3	3	-	-	2	-	-	-	1
CO6	3	2	1	-	-	2	-	-	-	-
Course Correlation Mapping	**3**	**3**	**3**	**-**	**-**	**2**	**-**	**-**	**2**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: FOUNDATIONAL CONCEPTS OF BIOMECHANICS ***(06 Periods)***

Kinematics and Kinetics- Descriptions of Motion, Forces- Force Vectors, Force of Gravity, Newton's Laws of Motion, Torque, Equilibrium, concurrent force system Parallel Force Systems, Lever Systems, Mechanical Advantage, Pulley system, Limitations to Analysis of Forces by Lever Systems, Force Components.

Module 2: JOINT AND MUSCLE STRUCTURE AND FUNCTION ***(07 Periods)***

Joint Structure and Function:- Materials Used in Human Joints-Structure of Connective Tissue, Specific Connective Tissue Structure, General Properties of Connective Tissue, Properties of Specific Tissues, Complexities of Human Joint Design: Synarthroses, Diarthroses, Kinematic Chains, General Changes- Disease, Injury, Immobilization, Exercise, and Overuse.

Muscle Structure and Function:- Muscle Structure-Composition of a Muscle Fiber, The Contractile Unit, The Motor Unit, Muscle Structure , Muscular Connective Tissue, Muscle Function: Muscle Tension, Classification of Muscles, Factors Affecting Muscle Function, Effects of Immobilization, Injury and Aging.

Module 3: AXIAL SKELETAL JOINT COMPLEXES ***(12 Periods)***

The Temporomandibular Joint:- Structure and Functions of Temporomandibular Joint, Relationship with the Cervical Spine, Age-Related Changes in the Temporomandibular Joint, Dysfunctions- Inflammatory Conditions , Capsular Fibrosis, Osseous Mobility Conditions, Articular Disk Displacement, Degenerative Conditions.

The Vertebral Column:- Structure, Functions and Muscles of the Cervical, Thoracic, Lumbar and Sacral Regions, Effects of Aging

The Thorax and Chest Wall:- Structure and Function-Rib Cage, Muscles Associated With the Rib Cage, Coordination and Integration of Ventilatory Motions, Developmental Aspects of Structure and Function-Differences Associated with the Neonate, Differences Associated with the Elderly, Pathological Changes in Structure and Function- COPD

Module 4: UPPER EXTREMITY OF SHOULDER AND ELBOW JOINT COMPLEXES ***(12 Periods)***

The Shoulder Joint Complex:- Components of the Shoulder Complex-Sternoclavicular Joint, Acromioclavicular Joint, Scapulothoracic Joint, Glenohumeral Joint, Integrated Function of the Shoulder Complex- Scapulothoracic and Glenohumeral Contributions, Sternoclavicular and Acromioclavicular Contributions, Structural Dysfunction, Muscles.

The Elbow Joint Complex:- Structure, Functions and Muscles of the Elbow Joint -Articulating Surfaces on the Humerus, the Radius and Ulna, Axis of Motion, Range of Motion, Muscle Action- Stability Mobility and Stability of the Elbow Complex- Functional Activities, Relationship to the Hand and Wrist, Effects of Age and Injury- Age, Injury

Module 5: UPPER EXTREMITY OF WRIST AND HAND JOINT COMPLEXES ***(08 Periods)***

The Wrist Complex:- Structure and Functions of Radiocarpal and Midcarpal Joints of the Wrist Complex

The Hand Complex: Carpometacarpal Joints, Metacarpophalangeal Joints and Interphalangeal Joints of the Fingers, Structure of the Thumb, Prehension: Power Grip, Precision Handling, Functional Position of the Wrist and Hand.

Total Periods: 45

EXPERIMENTAL LEARNING

LIST OF EXPERIMENTS:

1. How to design the contributions of Sternoclavicular and Glenohumeral joints.
2. Demonstrate the Biomechanical Applicationsto Joint Structure and Function.
3. Analyze and evaluate the Axial Skeletal and Upper Extremity JointComplexes.
4. Assess the Age-Related Changes in the Temporomandibular joint.
5. Evaluate the Functional Position of the Wrist and Hand.
6. Trace out the Prehension activities of griping and handling.

RESOURCES:

BOOKS:

1. Pamela K. Levangie & Cynthia C ,Joint Structure & Function, Sixth edition, 2019
2. Jim Richards , Clinical Biomechanics-, Elsevier,2nd edition, 2022.
3. Peggy A.Houglum, Dolores B. Bertoti, Brunnstrom's Clinical Kinesiology –, 6th ed./revised 2012.
4. Pavan kumar G & Ilona Gracie De Souza ,Textbook of Biomechanics & Kinesiology-, Jaypee Brothers, 1st Edition,2022.
5. Katrin Kroemer Elbert, Henrike B.Kroemer, Textbook of Ergnonomics-, Anne D. Kroemer Hoffman,3rd Edition, 2018.
6. Gavriel Salvendy Waldemar Karwowski ,Handbook of Human Factors and Ergonomics,1ST Edition,2021

VIDEO LECTURES:

1. https://youtu.be/auogbJFitmI
2. https://youtu.be/8IZ_w6hhpQ
3. https://youtu.be/p2e5VBcGbcQ
4. https://youtu.be/UPg-3i4EnXc
5. https://youtu.be/TqJW2P7eehQ

WEB RESOURCES:

1. https://www.sciencedirect.com/journal/clinical-biomechanics
2. https://fadavispt.mhmedical.com/content.aspx?bookid=2148&sectionid=162869570
3. http://www.lavoisier.eu/books/medicine/clinical-kinesiology and biomechanics/description_4849221
4. https://journals.indexcopernicus.com/issues/21690/72183
5. https://www.letpub.com/index.php?journalid=1797&page=journalapp&view=detail
6. https://journals.physiology.org/journal/jn
7. https://www.frontiersin.org/articles/10.3389/fneur.2021.770791/full
8. https://www.mdpi.com/2077-0383/11/14/4184

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT102013	**EXERCISE THERAPY-I**	4	1	4	-	7

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course helps student to understand different types of exercises for the benefit of patient in different situations and conditions both in health and disease or disorder.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understanding principle of exercise applications and demonstration of various starting and derived positions.

CO2. Analyzing method of testing- goniometry, manual muscle testing, Anthropometric measurement, measurement of limb length and functional tests and acquire a skill of assessing on model.

CO3. Applying and evaluating free exercises, active and passive movements and demonstrate the skills.

CO4. Demonstration the skills of relaxation and describe resisted exercises

CO5. Understanding therapeutic massage and acquire techniques of massage therapy and soft tissue manipulation.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**P8**	**PO9**	**PO10**
CO1	3	3	3	-	-	3	-	2	-	-
CO2	3	3	3	-	-	3	-	2	3	-
CO3	3	3	3	-	-	3	-	2	-	1
CO4	3	3	3	-	-	3	-	2		1
CO5	3	3	3	-	-	3	-	2		
Course Correlation Mapping	**3**	**3**	**3**	**-**	**-**	**3**	**-**	**2**	**3**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: INTRODUCTION TO EXERCISE THERAPY AND MECHANICS *(10 Periods)*

The aims of Exercise Therapy, The techniques of Exercise Therapy, Approach to patient's problems, Assessment of patient's condition – Measurements of Vital parameters, Starting Positions Fundamental positions & derived Positions, Planning of Treatment, parallelogram of forces, **Levers**: 1st, 2nd and 3rd order, Their examples in the human body and their practical application in physiotherapy, Forces applied to the body levers, Pulleys: Fixed, Movable, Springs; Series, Parallel, Tension, Elasticity: Hook's law, definitions of: Speed, Velocity, Work, Energy, Power, Acceleration, Momentum, Friction and Inertia. Muscle Work : Isotonic (concentric, eccentric) isometric (static), Group actions : Agonist (Prime movers) Antagonists, synergists, fixators, Angle of muscle pull, mechanical efficiency of the muscle.

Module 2: METHODS OF TESTING *(13 Periods)*

Functional tests, **Measurement of Joint range**: ROM-Definition, Normal ROM for all peripheral joints & spine, Goniometer-parts, types, principles, uses, Limitations of goniometry, Techniques for measurement of ROM for all peripheral joints **Tests for neuromuscular efficiency-** Electrical tests, Manual Muscle Testing: Introduction to MMT, Principles & Aims, Indications & Limitations, Techniques of MMT for group &individual: Techniques of MMT for upper limb / Techniques of MMT for lower limb / Techniques of MMT for spine, Anthropometric Measurements: Muscle girth – biceps, triceps, forearm, quadriceps, calf Static power Test, Dynamic power Test, Speed test ,Tests for Co-ordination, Tests for sensation, Measurement of Limb Length: true limb length, apparent limb length, segmental limb length, **Pelvic Tilt**: Describe the following: Normal pelvic tilts, alterations from normal, anterior tilt (forward), posterior tilt (backward), lateral tilt, Muscles responsible for alterations and pelvic rotation, Identification of normal pelvic tilt, pelvic rotation and altered tilts and their corrective measures.

Module 3: PASSIVE AND ACTIVE MOVEMENTS *(15 Periods)*

Causes of immobility, Classification of Passive movements, Specific definitions related to passive movements, Principles of giving passive movements, Indications, contraindications, effects of uses ,Techniques of giving passive movements. **Active Movements -**Definition of strength, power & work, endurance, muscle Actions, Physiology of muscle performance: structure of skeletal muscle, chemical & mechanical events during contraction &relaxation, muscle fiber type, motor unit, force gradation, Causes of decreased muscle performance, Physiologic adaptation to training: Strength & Power, Endurance, Types of active movements, **Free Exercise**: Classification, principles, techniques, indications, contraindications, effects and uses , **Active Assisted Exercise:** principles, techniques, indications, contraindications, effects and uses Assisted-Resisted Exercise: principles, techniques, indications, contraindications, effects and uses. **Suspension theraphy**

Module 4: RESISTED EXERCISES *(12 Periods)*

Resisted Exercise: Definition, principles, indications, contraindications, precautions & techniques, effects and uses ,Types of resisted exercises: Manual and Mechanical resistance exercise, Isometric exercise, Dynamic exercise: Concentric and Eccentric, Dynamic exercise: Constant versus variable resistance, Isokinetic exercise, Open Chain and Closed-Chain exercise. **Specific exercise regimens-** Isotonic: de Lormes, Oxford, MacQueen, Circiut weight training-Isometric: BRIME (Brief Resisted Isometric Exercise), Multiple Angle Isometrics Isokinetic regimens **Relaxation-** Definitions: Muscle Tone, Postural tone, Voluntary Movement, Degrees of relaxation, Pathological tension in muscle, Stress mechanics, types of stresses, Effects of stress on the body mechanism, Indications of relaxation, Methods & techniques of relaxation-Principles & uses: General, Local, Jacobson's, Mitchel's, additional methods

Module 5: MASSAGE AND RE-EDUCATION OF MUSCLE ***(10 Periods)***

Describe the term 're-education of muscles' and the techniques, 'spatial summation' and 'temporal summation ,Demonstrate the various re-education techniques and facilitating methods for various groups of muscles, Functional reeducation- lying to sitting :activities on the mat/bed, movement and stability at floor level; sitting activity and gait; lower limb and upper limb activities. History and Classification of Massage Technique ,Principles, Indications and Contraindications ,Technique of Massage ,Manipulations & Physiological and Therapeutic Uses of Specific Manipulations

Total Periods: 60

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Identify the muscle work force equilibrium levers in human body application
2. Demonstrate the passive movements and passive mobilization
3. Demonstrate the relaxation techniques in various positions
4. Understand the relaxed passive movements progressive resisted exercises skill to Merits and demerits of manual muscle testing
5. Applications of ROM on various joints and assessing the movements

RESOURCES

TEXT BOOKS:

1. Dena Gardner, The Principles of Exercise Therapy , CBS publishers , 4th edition, 1953
2. Carolyn Kishnar, Allen Colby, Therapeutic Exercise –Foundations and techniques, F.A. Davis, 8th edition, 17th October 2022
3. S. Lakshmi Narayana, Text book of Therapeutic Exercises, Jaypee brothers medical publishers, 1st edition, 2016.

REFERENCE BOOKS:

1. Margareet Hollis, Practical Exercise therapy, Black well scientific publications, 3rd edition, 1989.
2. Sheetal Patel, Essential of exercise therapy, , Jaypee brothers medical publishers, 1st edition, 2022.

VIDEO LECTURES:

1. http://youtu.com/OqBgM73Azo0
2. https://youtu.be/qGZR2WuWa6Q
3. https://youtube.com/watch?v=Wb0kkzkcUVs&feature=share
4. https://youtu.be/6MJfasoJiEE
5. https://youtu.be/CYTlRXpRXAU
6. https://youtu.be/bW76x_lQncA
7. https://youtu.be/wk7KKhQilIQ

WEB RESOURCES:

1. https://www.physio-pedia.com/Therapeutic_Exercise
2. https://www.slideshare.net/Umeammara/pelvic-tilt
3. https://www.physio-pedia.com/Pelvic_Tilt

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT105001	**BIOPHYSICS**	-	1	2	–	2

Pre-Requisite -
Anti-Requisite -
Co-Requisite -

COURSE DESCRIPTION: This course provides the concept and basic principles to know electrotherapy equipment is given under this topic.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate knowledge on current electricity and its chemical effects in human body tissue.

CO2. Operate various measuring instruments like Cathode Ray Oscilloscope and advanced oscilloscope.

CO3. Apply the knowledge of electrical supply and their dangers, precaution, first aid and initial management of electric shock.

CO4. Understand the characteristics of various power supplies.

CO5. Apply Knowledge of basic electricity in various application related to human body.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	1	1	-	-	-
CO2	3	1	-	-	-	-	-	-	3	-
CO3	3	1	3	-	-	-	-	-	-	1
CO4	3	1	-	-	-	-	-	-	3	-
CO5	3	1	3	-	-	-	-	-	-	1
Course Correlation Mapping	**3**	**1**	**3**	**-**	**-**	**1**	**1**	**-**	**3**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Electricity: Definition and types, therapeutic uses. Basic Physics of construction working.
2. To understand the basic principle of Magnetism, its transmission, magnetic field, effects and forces
3. Measurements with A Cathode Ray Oscilloscope.
4. To get familiar with working knowledge of the following Instruments (a) Cathode Ray Oscilloscope (b) The Multimeter Structure (c) Function generator (d) Regulated power supply
5. Ohms law, its application to AC and DC currents.
6. Fuse: construction, working and application.
7. To understand electric currents its physical principle and their relevance to physiotherapy practice
8. To understand about the thermal agents its physical principle, transmission, difference between superficial and deep heat.
9. To find the conductivity of various liquid agents.
10. To understand about electric shock, causes, types and precautions.
11. To understand about Earthing.
12. To understand about Electric currents.
13. To study about AC and DC power supply.
14. To Study of Rectifier circuit.
15. To understand about first aid and initial management.

RESOURCES

TEXT BOOKS:

1. Val Robertson, Alex Ward, John Low, Ann Reed. "Electrotherapy explained: Principles & practice" Butterworth-Heinemann publishers, 4th edition, 2006, ISBN: 978-0750688437.
2. Sheila Kitchen, Sarah Bazin. "Electrotherapy:EvidenceBasedPractice" Churchill Livingstone, 11th edition, 2002, ISBN: 9780443072161
3. M.H. Cameron. "Physical Agents in Rehabilitation: From Research to Practice" Saunders, 4th edition,2012, ISBN: 978-1455728480

REFERENCE BOOKS:

1. Angela Forster. "Clayton's Electrotherapy: Theory & Practice" BS Publishers & Distributors, 8th edition, 2007, ISBN: 978-8123908595
2. Joseph Kahn. "Principles and Practice of Electro Therapy" Churchill Livingstone, 4th edition, 2000, ISBN: 978-0443065538
3. Roger M. Nelson, Karen W Hayes, Dean P. Currier. "Clinical Electrotherapy" Appleton & Lange publishers, 3rd edition, 1999, ISBN: 9780838514917

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=3TR_DS_7z2w&list=PLbRMhDVUMngfdEXVcdf_ijj2Eub-UHs_y
2. https://www.youtube.com/watch?v=0pFF1oAYgQI
3. https://www.youtube.com/watch?v=phMeKhUdM7k

WEB RESOURCES:

1. https://www.studysmarter.co.uk/explanations/physics/electricity/basics-of-electricity/#:~:text=The%20movement%20of%20electric%20charges,or%20non%2Drenewable%20energy%20sources.
2. https://ncert.nic.in/ncerts/l/leph104.pdf
3. https://ccsuniversity.ac.in/bridge-library/pdf/Engg-2704-EICH-Fuse-BEE.pdf

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT102014	**ELECTRO THERAPY –I**	3	-	4	-	5

Pre-Requisite -
Anti-Requisite -
Co-Requisite -

COURSE DESCRIPTION: In this course the student will be able to list the indications, contra indications, dosages of electro therapy modalities, demonstrates the different techniques, and describe their effects on various conditions.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Knowledge on basic types of current used in electrotherapy.

CO2. Application of Low frequency currents and their therapeutic effects in various disorders.

CO3. Understand physiology of Pain control by applying different electrotherapy modalities.

CO4. Application of Medium Frequency currents and their therapeutic effects in various disorders.

CO5. Demonstration of Electro diagnostic tests and the interpretation.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**P8**	**PO9**	**PO10**
CO1	3	2	1	-	-	2	-	-	-	-
CO2	3	2	1	-	-	2	-	-	-	-
CO3	3	2	1	-	-	2	-	-	-	-
CO4	3	2	1	-	-	2	-	-	-	-
CO5	3	2	1	-	-	2	-	-	-	-
Course Correlation Mapping	**3**	**2**	**1**	**-**	**-**	**2**	**-**	**-**	**-**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: INTRODUCTION TO CURRENT ELECTRICITY ***(05 periods)***

Electricity–Definition and types, therapeutic effects, working, importance of currents in treatment. Resting Membrane Potential, Action Potential, Propagation of Action Potential, Accommodation, Motor Unit.

Electric shock causes prevention and Earth shock prevention insulation of proper wiring. **Burns**– Degrees of burns electrical and chemical, precautions prevention and management.

Module 2: LOW FREQUENCY CURRENTS ***(10 periods)***

Faradic Current, Galvanic current-Direct current, Interrupted Direct current, Sinusoidal Current, Didynamic Currents, Technique of application and Physiological and Therapeutic effects. Faradic foot bath, Faradism under pressure.

Iontophoresis – mechanism, biophysical effect, medication dosage, medicated ions used, techniques of application.

Module 3: PAIN GATE THEORY AND TENS ***(10 periods)***

PAIN- Define Pain – types of pain, pain pathway, theories of pain, Gate control theory of pain, pain modulation at various levels..

TENS- Parameter of Tens-Waveform, Frequency, Pulse width, amplitude, Type of Tens-High Frequency Low Intensity Tens or Conventional Tens, Acupuncture like Tens, Brief Intense Tens, Burst Mode Tens, Electrode Placement, Advantage & Disadvantage Uses indications and Contraindication of Tens.

Module 4: MEDIUM FREQUENCY CURRENTS ***(10 periods)***

Interferential current- Definition, Production of interferential current, Types of interferential current- Static interferential current or Classical interferential current (4 pole method), Dynamic interferential current or Iso planar vector field (4 pole method) or Four electrodes with rotating vector, Parameters of IFT : Quadripolar or Bipolar application Vector or Scanning mode Suction versus Plate electrode, Current intensity, Frequency sweep, Amplitude modulated frequency, Treatment duration Indications & contraindication of IFC, Physiological effects of IFC, Dangers of IFC. Technique of application. **Russian currents**.

Module 5: ELECTRODIAGNOSTIC TESTS AND BIO-FEEDBACK ***(10 periods)***

Strength duration curves- Plotting SD graph, diagnosis using electro diagnostic test – FG test and chronaxie, rheobase, SDcurve. Definition, types of current required, frequency, procedure. **Peripheral nerve lesions**- neuropraxia, axonotmesis, neurotmesis, clinical symptoms, signs, aims and treatment. Electro Myography, bio feedback- principles, uses and application. Nerve conduction velocity (NCV).

Total Periods: 45

EXPERIENTIAL LEARNING

1. Demonstrate the technique for patient evaluation – receiving the patient and positioning the patient for treatment using electrotherapy.
2. Demonstrate placement of electrodes for various electrotherapy modalities
   Electrical stimulation for the muscles supplied by the peripheral nerves
3. Collection of materials required for treatment using electrotherapy modalities and testing of the apparatus.
4. Demonstrate the treatment methods using Interferential therapy and medium frequency currents.
5. Plotting of SD curve with chronaxie and rheo-based.
   Demonstrate FG test.
6. Demonstrate the technique, the students must practice all the technique taught to them on models/each other.

RESOURCES

TEXT BOOKS:

1. Low and Reed,4th edition,2008, Electrotherapy Explained.
2. Forster and Palastanga,8th edition,2005, Clayton's Electrotherapy.
3. Mitra-JAYPEE BROTHERS,1st edition,2006, Handbook of Practical Electrotherapy.
4. JAGMOHAN SINGH,3rd edition,2017,Textbook of Electrotherapy.
5. Virendra Kr. Khokhar,4th edition,2015,Electrotherapy for Physiotherapists.
6. S. KITCHEN,11th edition,2001, Electrotherapy – Evidenced based Practice.

VIDEO LECTURES:

1. https://youtu.be/QVKj9yAr_60?si=HkF8El09TV9-_42G
2. https://youtu.be/rfhGBTUF5Ys?si=pC6SRp3DiMqDUC0H
3. https://youtu.be/B3xIvdf3ogo?si=RZoaZbuEzbDDBnPO
4. https://youtu.be/a54Sks3apT4?si=kLXEuniozqIJxM-6
5. https://youtu.be/fhNV7uu1lec?si=0TP8dwE71gnhztIH
6. https://youtu.be/9VFt2VtpbQc?si=FivHlOgGhwkI7P0-

WEB RESOURCES:

1. https://www.britannica.com/technology/thermionic-valve
2. https://www.physio-pedia.com/Gate_Control_Theory_of_Paintext
3. https://sarvanshikhalora.in/russian-current-physiological-and-therapeutic-effects/
4. He M.L., Xiao Z.M., Lei M., Li TS., Wu H., Liao J. Continuous passive motion for preventing venous thromboembolism after total knee arthroplasty. Cochrane Database Syst Rev. 2014 Jul 29;(7):CD008207.
5. Gil-González S., Barja-Rodríguez R., López-Pujol A., Berjaoui H., Fernández-Bengoa J., Erquicia J., Leal-Blanquet J., Pelfort X. Continuous passive motion not affect the knee motion and the surgical wound aspect after total knee arthroplasty. J Orthop Surg Res. 2022 Jan 15;17(1):25.
6. Painhealth Pain Types https://painhealth.csse.uwa.edu.au/pain-module/pain-types/

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT102015	**EXERCISE THERAPY-II**	4	1	6	-	8

Pre-Requisite 22PT102013 Exercise Therapy-I

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course helps student to understand different types of exercises for the benefit of patient in different situations and conditions both in health and disease or disorder.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Analyzing method of PNF Techniques, passive stretching, joint mobility and acquire a skill of assessing on model.

CO2. Understanding types of mobility aids and demonstration of Crutch Walking, Training with Walk frames, Tripods and Quadripods.

CO3. Demonstrating the assessment of posture and describe muscles responsible for abnormal posture.

CO4. Applying and evaluating different pathological gaits and demonstration of determinants of gait

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	1	-	-	-	-	-	-	-	-
CO2	3	1	-	2	-	-	-	-	-	1
CO3	3	1	-	-	1	-	-	-	-	1
CO4	3	-	-	3	-	-	-	-	-	-
Course Correlation Mapping	**3**	**1**	**-**	**3**	**1**	**-**	**-**	**-**	**-**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSECONTENT

Module1: Joint Mobility ***(15 Periods)***

Joint ranges, individual joint structures, joint movements, (physiological and accessories), causes of joint range limitations, prevention of joint stiffness, positioning (Physiological resting position),Passive range of movement, methods of relaxation, active exercises, manual mobilization techniques. Forced passive movements: Passive Stretching. Muscle strengthening techniques (PNF): Hold - relax, slow-reversal, rhythmic stabilization, repeated contractions.Soft Tissue Manipulation, Accessory movements: Posterior glide, anterior glide, superior and inferior glide, traction and approximation of major peripheral joints and vertebral joints, Indications and contra-indications for mobilization of individual joints and demonstrate practically the various mobilization techniques for individual joints and teaching home programme.

Module2: Mobility Aids ***(15 Periods)***

Definition and types of mobility aids, their application ,Crutch Walking: Components of a crutch, types of crutches, characters of a good crutch, preparing a patient for crutch walking, crutch walking muscles, measurement of crutches (axilliary piece, hand piece), crutch stance, crutch palsy, types of crutch walking : Three point, four point, two point and paraplegic crutch gait. Demonstrate crutch measurement (standing and lying positions) and various types of crutch walking over even ground, stairs and ramps,Training with Walk frames, Tripods and Quadripods, Elbow crutches, measurements and gait training. **coordination:** balance (static and dynamic), mechanism of neuromuscular co-ordination, incoordination due to : Lower motor neuron lesions (flaccidity) Upper motor neuron lesions (spasticity) Cerebellar lesions, Loss of kinaesthetic sense (tabes dorsalis, syringomyelia, leprosy), Imbalance due to muscular disease.

Module3: Posture ***(15 Periods)***

Posture (static and dynamic), Definition of good posture, muscles responsible for good posture, postural mechanisms, definition of abnormal posture mechanisms, definition of abnormal posture (Kyphosis, Scoliosis, Lordosis, Kypho-scoliosis, Kypholordosis), Assessment of posture (inspection, measurement length of legs, width of pelvis, plumb line - R.O.M. of trunk in flexion, extension, side flexion and rotation). postural correction: Strengthening of muscles, mobilization of trunk, relaxation, active correction of the deformities, passive correction (traction) postural awareness. Demonstrate practically, identification of abnormal posture and postural corrective measures. **complication of bed rest:** Describe the complications of patients on prolonged bed rest, Burger's exercises, maintenance exercises for patients on prolonged bed rest.

Module4: Gait ***(15 Periods)***

Define gait and centre of gravity of the human body. walking cycle: Stance (heel strike, foot flat, mid stance and push off), swing (acceleration, mid swing and deceleration). Determinants of gait (pelvic rotation, pelvic tilt, hip flexion, lateral displacement of pelvis, knee flexion in stance phase, normal foot pattern during walking). pathological gaits: Gluteus medius gait, gluteus maximus gait, hip flexor weakness gait, Quadriceps weakness gait, foot drop gait, hemiplegic gait, ataxic gait, waddling gait, equinous gait, calcaneus gait, equinovarus gait. **Hydrotherapy:** Hydrostatic pressure, upward thrust of water, buoyancy, indications and contra-indications for hydro-therapy, dress for patients and therapists and necessary hydrotherapy equipments, Types of hydrotherapy: Sterile pool, contrast bath, whirlpool bath, hubbard tank, Construction of hydrotherapy tank: Design, construction, safety features, cleaning the pool, water heating systems, hygiene of patient and pool.

Total Periods: 60

EXPERIENTIAL LEARNING

1. Identify the abnormal postures and their corrections in human body application
2. Demonstrate the passive mobilization and passive stretching
3. Demonstrate the different walking aids and crutch walking
4. Understand the Determinants of gait and various pathological gaits in human body.
5. Applications of Joint mobilizations on various joints and assessing the movements

RESOURCES

TEXTBOOKS:

1. Principles of Exercise Therapy – Dena Gardener.
2. Therapeutic Exercise foundation & techniques – Kisner.
3. Text Book of Therapeutic Exercise - S. Lakshmi Narayana.
4. Principle of Exercise Testing and Interpretation - Kalrlman Wasswerman.
5. Practical Exercise Therapy – Hollis.

VIDEOLECTURES:

1. https://www.youtube.com/watch?v=Imu1kk_gOKA
2. https://www.youtube.com/watch?v=RrcMaeSb45I
3. https://www.youtube.com/watch?v=WFdW0Zdj_9o
4. https://www.youtube.com/watch?v=fEG5_3VWFOU

WEBRESOURCES:

1. https://www.physiotherapy-treatment.com/pnf-techniques.html
2. https://www.physio-pedia.com/Stretching
3. https://mobilephysiotherapyclinic.in/joint-mobilization/
4. https://mobilephysiotherapyclinic.in/joint-mobilization/
5. https://www.physio-pedia.com/Gait

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT102016	**ELECTRO THERAPY –II**	3	-	4	-	5

Pre-Requisite 22PT102014 Electro Therapy-I

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: In this course the student will learn the principles, technique and effects of electrotherapy as a therapeutic modality in the restoration of physical function.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Analyze the various treatment methods using the clinical application of high frequency current modalities.

CO2. Demonstrate ultrasound for different regions various methods of application

CO3. Application of treatment techniques using SWD and MWD.

CO4. Understand the techniques of IRR, UVR for various conditions and techniques of application of LASER.

CO5. Apply the advance techniques of treatment and clinical application of superficial heat and cold therapy modalities for treating the patient.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	1	-	-	2	-	-	-	-
CO2	3	2	1	-	-	2	-	-	-	-
CO3	3	2	1	-	-	2	-	-	-	-
CO4	3	2	1	-	-	2	-	-	-	-
CO5	3	2	1	-	-	2	-	-	-	-
Course Correlation Mapping	**3**	**2**	**1**	**-**	**--**	**2**	**-**	**-**	**-**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSECONTENT

Module1: INTRODUCTION TO HIGH FREQUENCY CURRENT (10 PERIODS)

Introduction to high frequency current, Electro Magnetic Spectrum, SWD: Define short wave, Frequency & Wavelength of SWD, Principle of Production of SWD, Circuit diagram & Production of SWD, Methods of Heat Production by SWD treatment, Types of SWD Electrode, Placement & Spacing of Electrodes, Tuning, Testing of SWD Apparatus, Physiological & Therapeutic effects, Indications & Contraindications, Dangers, Dosage parameters. Pulsed Electro Magnetic Energy, Micro Wave Diathermy: Define Microwave, Wave length & Frequency, Production of MW, Applicators, Dosage Parameters, Physiological & Therapeutic effects, Indications & Contraindications, Dangers of MWD

Module2: ULTRASOUNDIC THERAPHY AND MECHANICAL AGENTS (10 PERIODS)

Ultrasound: Define Ultrasound, Frequency, Piezo Electric effects: Direct, Reverse, Production of US, Treatment Dosage parameters: Continuous & Pulsed mode, Intensity, US Fields: Near field, far field, half value distance, Attenuation, Coupling Media, Thermal effects, Nonthermal effects, Principles & Application of US: Direct contact, Water bag, Water bath, Solid sterile gel pack method for wound. Uses of US, Indications & Contraindications, Dangers of Ultrasound. Phonophoresis: Define Phonophoresis, Methods of application, commonly used drugs, Uses. Dosages of US. Traction– effects of spinal traction, adverse effects, application techniques, clinical assessment case study. Compression – effects of external adverse effects, application electronic traction, precautions, indications and contra-indications, Safety considerations in electrotherapy

Module3: ACTINOTHERAPY (13 PERIODS)

IRR: Define IRR, wavelength & parameters, Types of IR generators, Production of IR, Physiological & Therapeutic effects, Duration & frequency of treatment, Indication & Contraindication. UVR: Define UVR, Types of UVR, UVR generators: High pressure mercury vapour lamp, Water cooled mercury vapour lamp, Kromayer lamp, fluorescent tube, Theraktin tunnel PUVA apparatus. Physiological & Therapeutic effects. Sensitizers & Filters. Test dosage calculation. Calculation of E1, E2, E3, E4 doses. Indications, contraindications. Dangers Dosages for different therapeutic effects, Distance in UVR lamp. LASER: Define LASER. Types of LASER. Principles of Production. Production of LASER by various methods. Methods of application of LASER. Dosage of LASER. Physiological &Therapeutic effects of LASER. Safety precautions of LASER. Classifications of LASER Energy density & power density.

Module4 SUPERFICIAL HEATING AND COLD MODALITIES (12 PERIODS)

Wax Therapy: Principle of Wax Therapy application – latent Heat, Composition of Wax Bath Therapy unit, Methods of application of Wax, Physiological & Therapeutic effects, Indications & Contraindication, Dangers. 9. Contrast Bath: Methods of application, Therapeutic uses, Indications & Contraindications. 10. Moist Heat Therapy: Hydro collator packs – in brief, Methods of applications, Therapeutic uses, Indications & Contraindications. 11. Fluidotherapy: Construction, Method of application, Therapeutic uses, Indications & Contraindications. 12. Cryotherapy: Define- Cryotherapy, Principle- Latent heat of fusion, Physiological & Therapeutics effects, Techniques of Applications, Indications & Contraindications, Dangers, and Methods of application with dosage. 13. EMG and Nerve Conduction Velocity test, Biofeed back

Total Periods: 45

EXPERIENTIAL LEARNING

1. Demonstrate the technique for patient evaluation – receiving the patient and positioning the patient for treatment using electrotherapy.
2. Demonstrate placement of electrodes for various electrotherapy modalities
   Electrical stimulation for the muscles supplied by the peripheral nerves
3. Collection of materials required for treatment using electrotherapy modalities and testing of the apparatus.
4. Demonstrate the technique, the students must practice all the technique taught to them on models/each other.
5. Study a case technique of treatment and clinical application of superficial heat and cold therapy modalities
6. Evaluate the clinical application of various high frequency current
7. Trace out the various modalities in high frequency current and mechanical agents
8. Assessment of clinical conditions and the techniques used for the treatment and diagnostic modalities in electro therapy

RESOURCES

TEXTBOOKS:

1. Low and Reed, Electrotherapy Explained, Elsevier India, 4th edition,2008.
2. Forster and Palastanga, Clayton's Electrotherapy, CBS Publishers, 8th edition,2005.
3. Mitra, Handbook of practical electrotherapy, Jaypee brothers' medical publishers ,1st edition,2006.
4. Jagmohan singh, Textbook of Electrotherapy, Jaypee brothers' medical publishers, 3rd edition,2023.
5. Virendra Kr. Khokhar, Electrotherapy for Physiotherapists ,TOP Publications, 4th edition,2015.
6. S. Kitchen, Electrotherapy – Evidenced based Practice, Visionias publications, 11th edition,2014.

VIDEOLECTURES:

1. https://youtu.be/a54Sks3apT4?si=kLXEuniozqIJxM-6
2. https://youtu.be/fhNV7uu1lec?si=0TP8dwE71gnhztIH
3. https://youtu.be/9VFt2VtpbQc?si=FivHlOgGhwkI7P0-
4. https://www.youtube.com/watch?v=w_uSsFeA_lc
5. https://www.youtube.com/watch?v=EjJ5nX_jM-w

WEBRESOURCES:

1. Jacopo martellucci electrical stimulations for pelvic floor disorders, jan 1st 2014 https://link.springer.com/chapter/10.1007/978-3-319-06947-0_4
2. Chueh-Hung Wu, in Braddom's Rehabilitation Care: A Clinical Handbook, 2018 https://www.sciencedirect.com/topics/medicine-and-dentistry/electrotherapy
3. Physiopedia
4. Therapeutic Ultrasound – Physiopedia Introduction Ultrasound (US) is a form of mechanical energy (not electrical), and therefore, strictly speaking, not really electrotherapy at all, but does fall into the Electro Physical Agents grouping. Mechanical vibration at increasing frequencies is known as Sound Energy. The normal human sound range is from 16 Hz to something approaching 15-20,000 Hz (in children and young adults).
5. Lambert I, Tebbs SE, Hill D, Moss HA, Davies AJ, Elliott TSJ (2000). Interferential therapy machines as possible vehicles for cross-infection. J Hosp Infect. 44(1), 59-64
6. Val Robertson, Alex Ward, John Low John Low Ann Reed, Electrotherapy Explained: Principles and Practice. 4th Edition. Butterworth-Heinemann,2006
7. Tim Watson, Electrotherapy: evidence-based practice. Physiotherapy essentials. 12th edition, Churchill Livingstone,2008
8. Saunders HD. Lumbar traction*. J Ortho Sports Phys Ther. 1979; 1(1): 36-45. (LEVEL 1A)
9. Pellecchia GL. Lumbar traction: a review of the literature. Journal of Orthopedic& Sports Physical Therapy. 1994 Nov;20(5):262-7. (LEVEL 1A)
10. He M.L., Xiao Z.M., Lei M., Li TS., Wu H., Liao J. Continuous passive motion for preventing venous thromboembolism after total knee arthroplasty. Cochrane Database Syst Rev. 2014 Jul 29;(7):CD008207.
11. Gil-González S., Barja-Rodríguez R., López-Pujol A., Berjaoui H., Fernández-Bengoa J., Erquicia J., Leal-Blanquet J., Pelfort X. Continuous passive motion not affect the knee motion and the surgical wound aspect after total knee arthroplasty. J Orthop Surg Res. 2022 Jan 15;17(1):25.

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT101007	PHARMACOLOGY	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on the basic principles and concepts of pharmacology and summarizes the pharmacological actions, side effects, indications and contraindications of various drugs used in management of diseases. Upon completion of this course student able to understand the mechanism of actions and appropriate drug selection.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. To recall the basic principles and concepts of pharmacology.

CO2. To illustrate the process of autonomic and neuropharmacology.

CO3. To make use of pharmacology principles in movement disorders management.

CO4. To categorize the actions and side effects of drugs in cardiovascular diseases.

CO5. To prioritize the rational pharmacological agent for infection and immunity diseases.

CO6. To elaborate the knowledge for drug selection in geriatrics and gastrointestinal diseases.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	-	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	2	-	-	-	-
CO3	3	2	-	-	-	2	-	-	-	-
CO4	3	2	-	-	-	2	-	-	-	-
CO5	-	-		-	-	2	3	-	2	2
CO6	-	-	-	-	-	-	3	-	2	2
Course Correlation Mapping	**3**	**2**	**-**	**-**	**-**	**2**	**3**	**-**	**2**	**2**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: Introduction and Neuropharmacology ***(13 Periods)***

General Pharmacology – Introduction, Definitions, Classification of drugs, Sources of drugs, Routes of drug administration, Distribution of drugs, Metabolism and Excretion of drugs Pharmacokinetics, Pharmacodynamics, Factors modifying drug response, Adverse effects.

Autonomic Nervous system – The Sympathetic and Parasympathetic Systems, Receptors, Somatic Nervous System, Cholinergic and Anti-Cholinergic drugs, Adrenergic and Adrenergic blocking drugs, Peripheral muscle relaxants.

Neuropharmacology – Sedative-Hypnotic Drugs: Barbiturates, Benzodiazepines, Antianxiety Drugs: Benzodiazepines, Other Anxiolytics, Drugs Used in Treatment of Mood Disorders: Monoamine Oxidase Inhibitors, Tricyclic Antidepressants, Atypical Antidepressants, Lithium, Antipsychotic drugs.

Module 2: Cardiovascular Pharmacology ***(14 Periods)***

Disorders of Movement - Drugs used in Treatment of Parkinson 's disease, Antiepileptic Drugs, Spasticity and Skeletal Muscle Relaxants.

Cardiovascular Pharmacology – a. Drugs used in the treatment of heart failure: Digitalis, Diuretics, Vasodilators, ACE inhibitors Antihypertensive Drugs: Diuretics, Beta Blockers, Calcium Channel Blockers, ACE Inhibitors, Central Acting Alpha Agonists, Peripheral Alpha Antagonists, Direct acting Vasodilators, Antiarrhythmic Drugs, Drugs used in the treatment of vascular disease and tissue ischemia : Vascular Disease, Hemostasis Lipid-Lowering agents, Antithrombotics, Anticoagulants and Thrombolytics Ischemic Heart Disease – Nitrates, Beta-Blockers, Calcium Channel Blockers, Cerebral Ischemia, Peripheral Vascular Disease.

Module 3: Chemotherapy and Gastrointestinal pharmacology ***(18 Periods)***

Inflammatory/Immune Diseases - Non-narcotic Analgesics and Nonsteroidal Anti-Inflammatory Drugs: Acetaminophen, NSAIDs, Aspirin, Nonaspirin NSAIDs, drug Interactins with NSAIDs, Glucocorticoids: Pharmacological Uses of Glucocorticoids, adverse effects, Physiologic Use of Glucocorticoids, Drugs Used in Treatment of Arthritic Diseases: Rheumatoid Arthritis, Osteoarthritis, Gout, Drugs Used in the Treatment of Neuromuscular Immune/Inflammatory Diseases: Myasthenia gravis, Idiopathic Inflammatory Myopathies, systemic lupus Erythematous, Scleroderma, Demyelinating Disease, Respiratory Pharmacology: Obstructive Airway Diseases, Drugs used in Treatment of Obstructive airway Diseases, Allergic Rhinitis.

Digestion and Metabolism - Gastrointestinal Pharmacology: Peptic Ulcer Disease, Constipation, Diarrhea Drugs Used in Treatment of Diabetes Mellitus: Insulin, Oral Hypoglycemics.

Geriatrics - Pharmacology and the geriatric Population: Adverse effects of special concern in the Elderly, Dementia, Postural hypotension.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF ACTIVITIES:

1. Word hunting.
2. Case studies.
3. Drug indication and contraindication matching.
4. Drug interaction identification.

RESOURCES

BOOKS:

1. Dr. K. Srivastava, Pharmacology for physiotherapy, Avichal publishing company,.1st edition, 2020.
2. K Mukhopadhyay, Undergraduate Pharmacology for students of pharmacy and allied health students, CBS publshers, 3rd edition, 2019.
3. James M. Ritter,Rang and Dale's Pharmacology, Relx India Pvt.Ltd, 9th edition, 2019.
4. Peter N Bennett, Clinical Pharmacology, Churchill Livingstone, 10th edition, 2007.
5. Padmaja Uday Kumar, Medical Pharmacology, CBS publishers, 7th edition, 2021.
6. Dr.Y. Narasimha rao, A Textbook of Pharmacology-I, NOTION Press, 2024.
7. KD Tripathi, Essentials of Medical Pharmacology, Jaypee publishers, 8th edition, 2023.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=piM6Qw_115w
2. https://www.youtube.com/watch?v=cI8G2KSQdMo
3. https://www.youtube.com/watch?v=I5m-tbE4Lcs
4. https://www.youtube.com/watch?v=caJZweuzQO8
5. https://www.youtube.com/watch?v=iO-M7jq-zuY
6. https://www.youtube.com/watch?v=qhiMmNZjHRg
7. https://www.youtube.com/watch?v=lkrTOSUTvAg

WEB RESOURCES:

1. https://alison.com/course/introduction-to-pharmacology
2. https://www.edx.org/learn/medicine/doane-university-introduction-to-pharmacology
3. https://rlmc.edu.pk/themes/images/gallery/library/books/Pharmacology/GENERAL%20PRINCIPLES%20OF%20PHARMACOLOGY.pdf

PROGRAMME CORE

Course Code	Course Title	L	T	P	S	C
22PT102017	**BIOMECHANICS-II**	5	-	2	-	6
Pre-Requisite	22PT102012 Biomechanics-I					
Anti-Requisite	-					
Co-Requisite	-					

COURSE DESCRIPTION: This course provides a detailed discussion about the knowledge of Structure and enables the student to have a better understanding of the principles of biomechanical application in musculoskeletal function and dysfunction.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate the Biomechanical applications weight bearing concept to hip complex

CO2. Understand the concept of forces transmission and stabilizing factors of knee complex

CO3. Analyze and Evaluate the mechanics involvement in ankle complex

CO4. Identify the Integrated Functions of the Posture control mechanics in human body

CO5. Assess the Functional Position of the Gait training in relation to the kinematic and kinetic version

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	1	2	-	-	2	-	-	-	-
CO2	3	2	3	-	-	2	-	-	-	-
CO3	3	3	3	-	-	2	-	-	-	-
CO4	3	3	3	-	-	2	-	-	-	-
CO5	3	3	3	-	-	2	-	-	-	-
Course Correlation Level	**3**	**3**	**3**	**-**	**-**	**2**	**-**	**-**	**-**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: The Hip Complex ***(15 Periods)***

Introduction-Structure of the Hip Joint: Articular Surface, Articular Congruence, Hip Joint Capsule and Ligaments, Structural Adaptations to Weight-Bearing. Function of the Hip Joint: Motion of the Femur on the Acetabulum, Motion of the Pelvis on the Femur, Coordinated Motions of the Femur, Pelvis, and Lumbar Spine, Hip Joint Musculature. Hip Joint Forces and Muscle Function in Stance: Bilateral Stance, Unilateral Stance, Reduction of Muscle Forces in Unilateral Stance.

Hip Joint Pathology: Arthrosis, Fracture, Bony Abnormalities of the Femur.

Module 2: The Knee Complex ***(15 Periods)***

Introduction - Structure of the Tibiofemoral Joint: Tibiofemoral Alignment and Weight-Bearing Forces-Menisci, Joint Capsule, Ligaments, Iliotibial Band, Bursae. Tibiofemoral Joint Function: Joint Kinematics, Muscles-Stabilizers of the Knee. Patellofemoral Joint: Patellofemoral Articular Surfaces and Joint Congruence, Motions of the Patella, Patellofemoral Joint Stress, Frontal Plane Patellofemoral Joint Stability, Weight-Bearing vs. Non–Weight-Bearing Exercises with Patellofemoral Pain. Effects of Injury and Disease-Tibiofemoral Joint, Patellofemoral Joint

Module 3: The Ankle and Foot Complex ***(20 Periods)***

Introduction, Definitions of Motions, Ankle Joint- Structure and Function, The Subtalar Joint, Transverse Tarsal Joint, Tarsometatarsal Joints, Metatarsophalangeal Joints, Interphalangeal Joints, Plantar Arches: Structure and Function of the Arches, Muscular Contribution to the Arches, Muscles of the Ankle and Foot: Extrinsic Musculature, Intrinsic Musculature, Deviations from Normal Structure and Function.

Module 4: Integrated Functions of Posture and Gait ***(25 Periods)***

Introduction - Static and Dynamic Postures: Postural Control, Major Goals and Basic Elements of Control. Kinetics and Kinematics of Posture: Inertial and Gravitational Forces, Ground Reaction Forces, Coincident Action Lines, Sagittal Plane. Analysis of Standing Posture: Sagittal Plane Alignment and Analysis, Deviations from Optimal Alignment in the Sagittal Plane, Frontal Plane Optimal Alignment and Analysis- Deviations from Optimal Alignment in the Frontal Plane. Analysis of Sitting Postures- Muscle Activity, Intradiscal Pressures and Compressive Loads on the Spine, Seat Interface Pressures. Analysis of Lying Postures-Intradiscal Pressures, Surface Interface Pressures Effects of Age, Pregnancy, Occupation, and Recreation on Posture. Kinematics: Gait Terminology, Phases of the Gait Cycle, Joint Motion, Determinants of Gait. Kinetics-Ground Reaction Force, Center of Pressure, Kinetic Analysis- Internal and External Forces, Moments, and Conventions, Energy Requirements, Mechanical Energy of Walking-Mechanical Energy: Kinematic Approach, Mechanical Power and Work, Muscle Activity, Ground Reaction Force: Sagittal Plane Analysis Kinematics and Kinetics of the Trunk and Upper Extremities-Stair and Running Gaits Effects of Age, Gender, Assistive Devices, and Orthoses. Abnormal Gait- Structural and Functional Impairment.

Total Periods: 75 Hours

Experimental Learning:

LIST OF EXPERIMENTS:

1. How to design the contributions of hip joint weight bearing transformation balance and co ordination in human body mechanics.
2. Demonstrate the Biomechanical Applications to weight bearing and stabilizing factors of knee joint.
3. Analyze and evaluate the Mechanics involved in ankle complex related to daily activities.
4. Assess the integrated functions of posture mechanics muscles involved sitting & standing
5 Evaluate the waking and running in gait mechanics with involved phases and muscles during activity.

RESOURCES:

BOOKS:

1. Pamela K. Levangie & Cynthia C ,Joint Structure & Function, Sixth edition, 2019
2. Jim Richards , Clinical Biomechanics-, Elsevier,2nd edition, 2022.
3. Peggy A.Houglum, Dolores B. Bertoti, Brunnstrom's Clinical Kinesiology –, 6th ed./revised 2012.
4. Pavankumar G &Ilona Gracie De Souza, Textbook of Biomechanics & Kinesiology-, Jaypee Brothers, 1st Edition,2022.
5. Katrin Kroemer Elbert, Henrike B.Kroemer, Textbook of Ergnonomics-, Anne D. Kroemer Hoffman,3rd Edition, 2018.
6. Gavriel Salvendy Waldemar Karwowski ,Handbook of Human Factors and Ergonomics,1ST Edition,2021

VIDEO LECTURES:

1. https://youtu.be/H0SoMQ_L7-k?si=0c9aA1mBwih3m6vJ
2. https://youtu.be/wRYDftnsK3w?si=LHd8KnsPAeuRDvJk
3. https://youtu.be/kxHDSGGhGKQ?si=9d2pcHy2Qe1P-A3z
4. https://youtu.be/8VZz5M2dcto?si=I7j3FpYSLNp2eRtM
5. https://youtu.be/tzLdNYQcrac?si=STa7wgy-uY-canv2
6. https://youtu.be/QB0tJajDvMw?si=Xeb38cieh9t1c1Zr

WEB RESOURCES:

1. https://www.sciencedirect.com/journal/clinical-biomechanics
2. https://fadavispt.mhmedical.com/content.aspx?bookid=2148&sectionid=162869570
3. http://www.lavoisier.eu/books/medicine/clinical-kinesiology-andbiomechanics/description_4849221
4. https://journals.indexcopernicus.com/issues/21690/72183
5. https://www.letpub.com/index.php?journalid=1797&page=journalapp&view=detail
6. https://journals.physiology.org/journal/jn
7. https://www.mdpi.com/2077-0383/11/14/4184
8. https://www.frontiersin.org/articles/10.3389/fneur.2021.770791/full

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT101010	GENERAL MEDICINE, PEDIATRICS AND PSYCHIATRY	4	-	-	-	4

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provide the knowledge about relevant aspects of general medicine and able to list the etiology, pathology, clinical features and treatment methods for various medical conditions.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate a general understanding of the diseases that therapists would encounter in their practice.

CO2. Understand Etiology, Pathophysiology, Signs &Symptoms &Management of the various Endocrinal, Metabolic, Geriatric &Nutrition Deficiency conditions.

CO3. Understand the limitations imposed by the diseases on any therapy.

CO4. Acquire skill of clinical examination of a neonate /child with respect to neurological, Musculoskeletal, Respiratory & Cardiovascular conditions

CO5. knowledge on the pathological & etiological factors, signs / symptoms & management of various Psychiatric conditions.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	1	-	-	1	-	-	-	1
CO2	3	2	1	-	-	1	-	-	-	**1**
CO3	3	2	1	-	-	1	-	-	-	1
CO4	3	2	1	-	-	1	-	-	-	1
CO5	3	2	1	-	-	1	-	-	-	1
Course Correlation Mapping	**3**	**2**	**1**	**-**	**-**	**1**	**-**	**-**	**-**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: INFECTION AND POISONING ***(10 Periods)***

Effects of Infection on the body, Pathology, source and spread of infection, vaccinations, generalized infections, rashes and infection, food poisoning and gastroenteritis, sexually transmitted diseases, HIV infections and Aids. Clinical features, general management, common agents in poisoning, pharmaceutical agents, drugs of misuse, chemical pesticides, Envenomation.

Module 2: ENDOCRINE, FOOD & NUTRITION DISORDERS ***(10 Periods)***

Common presenting symptoms of endocrine disease, common classical disease presentations, clinical features and its management; Diabetes Mellitus- Etiology and pathogenesis, clinical manifestations, management and Complications of diabetes. Assessment – Nutritional and Energy requirements; Deficiency diseases – clinical features and treatment; Protein Energy Malnutrition- Clinical features and treatment; Obesity and its related disorders- Causes, Complications, benefits of weight loss, management of Obesity – diet, exercise and medications.

Module 3: DISEASE OF BLOOD, DIGESTIVE SYSTEM AND SKIN ***(15 Periods)***

Examination of Blood disorders, types, Clinical features and Management of Anaemia and Haemophilia, complications of repeated haemorrhages, Complications due to therapy. Etiology, clinical features, diagnosis, complications and treatment of - Reflux Oesophagitis, Achlasia Cardia, Carcinoma of Oesophagus, GI bleeding, Peptic Ulcer disease, Carcinoma of Stomach, Pancreatitis, Malabsorption Syndrome, Ulcerative Colitis, Peritonitis, Infections of Alimentary Tract.

Aetiology, clinical features, diagnosis, complications and treatment of the following Liver conditions - Viral Hepatitis, Wilson's Disease, Alpha1-antitrypsin deficiency, Tumors of the Liver, Gall stones, Cholycystitis.

Examination, clinical manifestations and management of the following skin conditions- Leprosy, Psoriasis, Pigmentary Anomalies, Vasomotor disorders, Dermatitis, Coccal and Fungal Parasitic and Viral infections.

Module 4: PAEDIATRICS ***(15 Periods)***

Problems and management of LBW infants, Perinatal problems, Congenital abnormalities and Respiratory conditions of childhood, Cerebral Palsy – causes, complications, clinical manifestations, treatment. Spina Bifida – management and treatment. Epilepsies – types, diagnosis, and treatment. Recognizing developmental delay, common causes of delay. Orthopaedic and Neuromuscular disorders in childhood, clinical features, and management. Sensory disorders – problems resulting from loss of vision and hearing. Learning and behavioural problems – Hyperactivity, Autism, Challenging behaviours, educational delay, the Clumsy Child.

Module 5: PSYCHIATRY DISORDERS ***(10Periods)***

Etio-pathogenesis, manifestations, and management of psychiatric illnesses - Anxiety neurosis, Depression, Obsessive compulsive neurosis, Psychosis, Maniac-depressive psychosis, Post-traumatic stress disorder, Psychosomatic reactions, Stress and Health, theories of Stress – Illness, Drug dependence and alcoholism, Somatoform and Dissociate Disorders – conversion reactions, Somatization, Dissociate Amnesia, and Dissociate Fugue, Personality disorders, Child psychiatry - manifestations, and management of childhood disorders -attention deficit syndrome and behavioural disorders, Geriatric psychiatry. Psychiatric illness and physiotherapy.

Total Periods:60

RESOURCES

BOOKS:

1. A T Ramalingam, Principles of physiotherapy in general medical and surgical conditions. Paras medical publishers, 2016.
2. Sandeep Goyal, Essentials of Psychiatry, Wolters Kluwer(india) Pvt. Ltd.,10th Edition, 2020.
3. Vinod K. Paul, Ghai essential paediatrics, CBS publishers and distributors Pvt. Ltd.,10th Edition, 2023.
4. Hall, Davidsons Principles & Practice of Medicine, RELX India private limited, 23rd Edition, 2017.
5. Loscalzo, Harrisons principles of internal medicine, Mc Graw hill/Medical, 21st Edition,2022.

VIDEO LECTURES:

1. https://youtu.be/6qVltlqe4f0
2. https://youtu.be/HmM1wFYgpsE
3. https://youtu.be/eAFPYcyQQqM

WEB RESOURCES:

1. https://internalmedicineteaching.org/resources.html
2. https://www.revenuexl.com/general-pediatrics-practices-resources
3. https://www.psychiatricmedicine.com/resources

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT101008	**GENERAL SURGERY, OBSTETRICS AND GYNAECOLOGY**	4	-	-	-	4

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on the various aspects of general surgery, Obstetrics and the student will be able to list the indications for surgery, etiology, clinical features, and surgical methods for various conditions.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Elaborate broad outline of surgical therapy imparted in those diseases in which physical therapy will be an important component of overall management.

CO2. Understand the normal &abnormal physiological events during the Puberty, Pregnancy, Labor, Peurperium, & Pre, Peri & Post Menopause.

CO3. Knowledge on common complications during Pregnancy, Labor, Puerperium & Pre, Peri &Post Menopausal stage &various aspects of Urogenital Dysfunction &the management.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	1	1	-	1	1	1	-	-	1
CO2	3	1	1	-	1	1	1	-	-	**1**
CO3	3	1	1	-	1	1	1	-	-	1
Course Correlation Mapping	**3**	**1**	**1**	**-**	**1**	**1**	**1**	**-**	**-**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: Introduction to General surgery – Problems and Management ***(15 Periods)***

Fluid, Electrolyte and Acid-Base disturbances – diagnosis and management, Nutrition in the surgical patient, Wound healing – basic process involved in wound repair, basic phases in the healing process, clinical management of wounds, factors affecting wound healing, Scars – types and treatment. Hemostasis – components, hemostatic disorders, factors affecting bleeding during surgery. Transfusion therapy in surgery – blood components, complications of transfusion; Surgical Infections, General Post – Operative Complications and its management, Types of anaesthesia and its effects on the patient, Types of Incisons; Clips Ligatures and Sutures; Overview and Drainage systems and tubes used in Surgery.

Module 2: General Surgery - I ***(15 Periods)***

Thoracic Trauma situations – Airway obstruction, Pneumothorax, Haemothorax, Cardiac Tamponade, Tracheobronchial disruption, Aortic disruption, Diaphragmatic disruption, Esophageal disruption, Cardiac and Pulmonary Contusions.

Surgical Oncology – Cancer – definition, types, clinical manifestations of cancer, Staging of Cancer, surgical procedures involved in the management of cancer. Disorders of the Chest Wall, Lung, and Mediastinum.

Thoracic surgeries – Thoracotomy – Definition, Types of Incisions with emphasis to the site of incision, muscles cut and complications, Lung surgeries- Pneumonectomy, Lobectomy, segmentectomy – Indications, Physiological changes, and Complications, Thoracoplasty, Pleurectomy, Pleurodesis and Decortication of the Lung. Cardiac surgeries – An overview of the Cardio-Pulmonary Bypass Machine – Extracardiac Operations, Closed Heart surgery, Open Heart surgery. Transplant Surgery – Heart, Lung, and Kidney – Indications, Physiological changes, and Complications.

Module 3: General Surgery - II ***(15 Periods)***

Diseases of the Arteries and Veins- Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases, Arteriosclerosis, Atherosclerosis, Aneurysm, Buerger's disease, Raynaud's Disease, Thrombophlebitis, Deep Vein Thrombosis, Pulmonary Embolism, Varicose Veins.

Indication, Incision, Physiological changes, and Complications following Common operations like Cholecystectomy, Colostomy, Ileostomy, Gastrectomy, Hernias, Appendicectomy Mastectomy, Nephrectomy, Prostectomy.

Burn- Definition, Classification, Causes, Prevention, Pathological changes, Complications, Clinical Features and Management. Skin Grafts – Types, Grafting Procedures, Survival of Skin Graft, Flaps – Types and uses of Flaps.

ENT- Common problems of ear, otitis media, Otosclerosis, functional achonia and deafness, management facial palsy classification, medical and surgical management of lower motor neuron type of facial palsy.

Ophthalmology- Ophthalmologic surgical conditions, refraction's, conjunctivitis, glaucoma, corneal ulcer, iritis, cataract, retinitis, detachment of retina, defects of extra-ocular muscles surgical management.

Module 4: Obstetrics and Gynaecology ***(15 Periods)***

Anatomy and physiology of the female reproductive organs, menstrual cycle, Hormonal disorders, pregnancy- Diagnosis, abortion, physiological changes, importance of antenatal care

exercises, high risk pregnancy, prenatal common complications, musculoskeletal disorders, multiple childbirth, and normal labour. Childbirth complications, investigation and management, Normal puerperium, lactation and importance of post-natal exercises, Family planning. Medical termination of pregnancy, Infection of female genital tract including sexually transmitted diseases, low backache, Prolapse of uterus and vagina, Principle of common gynaecological operations – hysterectomy, Dilation & Curretage, Dilation & Evacuation, Pop smear, Menopause- Its effect on emotions and musculoskeletal system, Urogenital dysfunction – pre and post-natal condition, Sterility- Pathophysiology, investigations, management, Malnutrition and deficiencies in females. Surgical procedures involving childbirth, Definition, Indications and Management of the following surgical procedures – pelvic repair, caesarian section, nephrectomy, Hysterosalphyngography, Dilatation and Curettage, Laproscopy, Colposopy, Hysterectomy, Carcinoma of female reproductive organs – surgical management in brief Mastectomy – Simple, radical. Hysterectomy. Incontinence – Types, Causes, Assessment and Management.

Total Periods:60

RESOURCES

BOOKS:

1. Ahmed Emad, Physiotherapy in general surgery; Lambert academic publication, 2015.
2. T Y Shekar, Simplified general surgery for medical students; Paras medical books, 2021
3. Y M Mala; Case discussions on obstetrics and gynaecology, Jaypee publications, 2nd Edition,2019.
4. N. Hephzibah Kirubamani, Undergraduate manual of clinical cases in obstetrics and gynaecology, Elsevier, 2nd Edition, 2021.

VIDEO LECTURES:

1. https://youtu.be/5BoaZmvbi20
2. https://youtube.com/playlist?
3. https://youtu.be/jmvEVhyYpOE

WEB RESOURCES:

1. https://guides.hsict.library.utoronto.ca/c.php?g=429705&p=2934240
2. https://obgyn.onlinelibrary.wiley.com/

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT101009	**COMMUNITY MEDICINE**	4	-	-	-	4

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on the various aspects of health and disease list the methods of health administration, health education and disease preventive measures.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Be aware of the physical, social, psychological, economic, and environmental health determinants of health and disease.

CO2. Acquire knowledge of Demography and objectives of national family welfare programmes and national population policy

CO3. Demonstrate an understanding of the influence of social and environmental factors on the health of the individual and society

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	1	1	-	-	1	-	-	-	-
CO2	3	1	1	-	-	1	-	-	-	**-**
CO3	3	1	1	-	-	1	-	-	-	-
Course Correlation Mapping	**3**	**1**	**1**	**-**	**-**	**1**	**-**	**-**	**-**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: Epidemiology, Health, and Disease ***(10 Periods)***

Concepts of Health, well-being, Spectrum and Determinants of Health, Concept and natural history of Disease, disease control and prevention, Modes of Intervention, Population Medicine, The role of socio-economic and cultural environment in health and disease, Principles of Epidemiology and Epidemiological methods: Components and Aims, Basic measurements, Methods, Uses of Epidemiology, Infectious disease epidemiology, Dynamics and modes of disease transmission, Host defences and Immunizing agents, Hazards of Immunization, Disease prevention and control, Disinfection. Screening for Disease: Concept of screening, Aims and Objectives, Uses and types of screening. Epidemiology of communicable disease, chronic non-communicable diseases and conditions.

Module 2: Health care system in India ***(10 Periods)***

Public health administration- an overview of the health administration set up at Central and state levels. The national health programme-highlighting the role of social, economic and cultural factors in the implementation of the national programmes. Health problems of vulnerable groups- pregnant and lactating women, infants and pre-school children, occupational groups. Health programmes in India: Vector borne disease control programme, National leprosy eradication programme, National tuberculosis programme, National AIDS control programme, National programme for control of blindness, Iodine deficiency disorders (IDD) programme, Universal Immunisation programme, Reproductive and child health programme, National cancer control programme, National mental health programme. National diabetes control programme, National family welfare programme, National sanitation and water supply programme, Minimum needs programme. Demography and Family Planning: Demographic cycle, Fertility, Family planning-objectives of national family planning programme and family planning methods, A general idea of advantage and disadvantages of the methods.

Module 3: Prevention, Nutrition, Environment and Health ***(10 Periods)***

Preventive Medicine in Obstetrics, Paediatrics and Geriatrics: MCH problems, Antenatal, Intranatal and post-natal care, Care of children, Child health problems, Rights of child and National policy for children, MCH services and indicators of MCH care, social welfare programmes for women and children, Preventive medicine and geriatrics. Nutrition and Health: Classification of foods, Nutritional profiles of principal foods, Nutritional problems in public health, Community nutrition programmes. Environment and Health: Components of environment, Water and air pollution and public health: Pollution control, Disposal of waste, Medical entomology.

Module 4: Hospital and Disaster Management ***(15 Periods)***

Hospital waste management: Sources of hospital waste, Health hazards, Waste management. Disaster Management: Natural and man-made disasters, Disaster impact and response, Relief phase, Epidemiologic surveillance and disease control, Nutrition, Rehabilitation, Disaster preparedness.

Module 5: Types of Health disorders and education **(15 Periods)**

Occupational Health: Occupational environment, Occupational hazards, Occupational diseases, Prevention of occupational diseases. Social security and other measures for the protection from occupational hazard accidents and diseases. Details of compensation acts. Mental Health: Characteristics of a mentally healthy person, Types of mental illness, Causes of mental ill health,

Prevention, Mental health services, Alcohol and drug dependence. Emphasis on community aspects of mental health. Role of Physiotherapist in mental health problems such as mental retardation. Health Education: Concepts, aims and objectives, Approaches to health education, Models of health education, Contents of health education, Principles of health education, Practice of health education.

Total Periods:60

RESOURCES

BOOKS:

1. K. Park, Parks Textbook of preventive and social medicine, Bhanarsidas Bhanot publishers, 2021.
2. Indranil saha, Textbook of preventive and social medicine, Jaypee publishers, 4th Edition, 2013.

VIDEO LECTURES:

1. https://youtu.be/M6r7rcigY2Q
2. https://youtu.be/FavrnLw2sB0
3. https://youtu.be/FF2k67kx5sU

WEB RESOURCES:

1. https://ihatepsm.com/
2. https://edurev.in/v/21497/Community-Medicine-Defined-Medicine

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT101012	**CLINICAL ORTHOPAEDICS AND TRAUMATOLOGY**	4	-	-	-	4

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides to demonstrate an understanding of orthopedic conditions causing disability, list the etiology, clinical features and methods of investigations and management.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Conduct an appropriate basic examination of the musculoskeletal system, including history and physical examination

CO2.

CO3. Understand the common traumatic and orthopedic conditions, which commonly cause disability

CO4. Able to recognize afflictions, deformities and disabilities arising in Neuromuscular Pediatric Orthopaedics, infective diseases of joints, spinal conditions

CO5. Rehabilitation of surgical management; Arthroplasty, Arthrodesis; Soft tissues injuries etc.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	3	3	-	1	2	1	-	-	-
CO2	3	3	-	-	-	-	-	-	-	**1**
CO3	3	3	2	-	-	-	-	-	-	1
CO4	3	2	1	-	-	-	-	-	-	1
Course Correlation Mapping	**3**	**3**	**2**	**-**	**-**	**2**	**1**	**-**	**-**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: Traumatology - I ***(10 Periods)***

Introduction to orthopedics, Clinical examination in an orthopedic patient, Common investigative procedures, Radiological and Imaging techniques in Orthopedics. Fracture: definition, types, signs and symptoms, Fracture healing, Complications of fractures, Conservative and surgical approaches, Principles of management – reduction (open/closed, immobilization etc.). Subluxation/ dislocations – definition, signs and symptoms, management (conservative and operative). Fractures of Upper Limb - causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures: Fractures of clavicle and scapula, Fractures of greater tuberosity and neck of humerus, Fracture shaft of humerus, Supracondylar fracture of humerus, Fractures of capitulum, radial head, olecranon, coronoid, and epicondyles, Side swipe injury of elbow, Both bone fractures of ulna and radius, Fracture of forearm – monteggia, galaezzi fracture –dislocation, Chauffer's fracture, Colle's fracture, Smith's fracture, Scaphoid fracture, Fracture of the metacarpals, Bennett's fracture, Fracture of the phalanges (Proximal and middle), Dislocations of Upper Limb – Anterior dislocation of shoulder – mechanism of injury, clinical feature, complications, conservative management (Kocher's and Hippocrates maneuver), surgical management (putti plat, bankart's) etc., Recurrent dislocation of shoulder, Posterior dislocation of shoulder – mechanism of injury, clinical features and management, Posterior dislocation of elbow – mechanism of injury, clinical feature, complications & management.

Module 2: Traumatology - II ***(10 Periods)***

Fracture of Cervical Spine - Mechanism of injury, clinical feature, complications (quadriplegia), Management- immobilization (collar, cast, brace, traction), Management for stabilization, management of complication (bladder and bowel, quadriplegia), Clay shoveller's fracture, Hangman's fracture, Fracture odontoid, Fracture of atlas, Fracture of Thoracic and Lumbar Regions - Mechanism of injury, clinical features, and management, conservative and surgical of common fractures around thoracic and lumbar regions, Fracture of coccyx, Fracture of Rib Cage - Mechanism of injury, clinical features, management for Fracture Ribs, Fracture of sternum. Fractures and Dislocations of Lower Limb- Fracture of Pelvis and Lower Limb - causes, classification, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures- Fracture of pelvis, Fracture neck of femur, Fractures of trochanters, Fracture shaft femur, Supracondylar fracture of femur, Fractures of the condyles of femur, Fracture patella, Fractures of tibial condyles, Both bones fracture of tibia and fibula, Dupuytren's fracture, Maisonneuve's fracture, Pott's fracture, **Bimalleolar fracture, Trimalleolar fracture, Fracture calcaneum, Fracture of talus**, Fracture of metatarsals, stress fractures, jone's fracture, Fracture of phalanges, Dislocations of Lower Limb - mechanism of injury, clinical features, complications, management of the following dislocations of lower limb - Anterior dislocation of hip, Posterior dislocation of hip, Central dislocation of hip, Dislocation of patella, Recurrent dislocation of patella.

Module 3: Soft Tissue Injuries ***(15 Periods)***

Define sprains, strains, contusion, tendinitis, rupture, tenosynovitis, tendinosis, bursitis. Mechanism of injury of each, clinical features, managements- conservative and surgical of the following soft tissue injuries- Meniscal injuries of knee, Cruciate injuries of knee, Medial and lateral collateral injuries of knee, Lateral ligament of ankle, Wrist sprains, Strains - quadriceps, hamstrings, calf, biceps, triceps etc. Contusions- quadriceps, gluteal, calf, deltoid etc. Tendon ruptures-Achilles, rotator cuff muscles, biceps, pectorals etc. Hand Injuries - mechanism of injury, clinical features, and management of the following – Crush injuries, Flexor and extensor injuries. Burn injuries of hand. Periarthritic shoulder (adhesive capsulitis), Rotator cuff tendinitis,

Supraspinatus Tendinitis, Infraspinatus Tendinitis, Bicipital Tendinitis, Subacromial Bursitis, Tennis Elbow, Golfer's Elbow, Olecranon Bursitis (student's elbow), Triceps Tendinitis, De Quervain's Tenosynovitis, Ganglion, Trigger Finger/ Thumb, Mallet Finger, Carpal Tunnel Syndrome, Dupuytren's Contracture, IT Band Syndrome, Piriformis Syndrome, Trochanteric Bursitis, Osteochondritis Dissecans, Prepatellar and Suprapatellar Bursitis, Popliteal Tendinitis, Patellar Tendinitis, Chondromalacia Patella, Plica Syndrome, Fat Pad Syndrome (Hoffa's syndrome) Ankle Sprains, Plantar Fasciitis / Calcaneal Spur, Tarsal Tunnel Syndrome, Achilles Tendinitis, Metatarsalgia, Morton's Neuroma, Amputations - Definition, levels of amputation of both lower and upper limbs, indications, complications.

Module 4: Deformities and Orthopaedic surgery ***(10 Periods)***

Clinical features, complications, medical and surgical management of the following Congenital and Acquired deformities- CTEV, CDH, Torticollis, Scoliosis, Flat foot, Vertical talus, Hand anomalies- syndactyly, polydactyly and ectrodactly, Arthrogryposis multiplex congenita (amyoplasia congenita), Limb deficiencies- Amelia and Phocomelia, Klippel feil syndrome, Osteogenesis imperfecta(fragile ossium), Cervical rib, Acquired Torticollis, Kyphosis, Lordosis, Genu varum, Genu valgum, Genu recurvatum, Coxa vara, Pes cavus, Hallux rigidus, Hallux valgus, Hammer toe, Metatarsalgia, Arthrodesis, Arthroplasty (partial and total replacement), Osteotomy, External fixators, Spinal stabilization surgeries (Harrington's, Luque's, Steffi plating) etc , Limb re attachments.

Module 5: Neuromuscular, Bone, and Joint Disorders (15 Periods)

Cerebral palsy, Poliomyelitis, Spinal Dysraphism, Leprosy. Infective conditions - Osteomyelitis (Acute / chronic), Brodie's abscess, TB spine and major joints like shoulder, hip, knee, ankle, elbow etc. Arthritic conditions - Pyogenic arthritis, Septic arthritis, Syphilytic infection of joints. Bone Tumors - classification, clinical features, management - medical and surgical of the following tumors – Osteoma, Osteosarcoma, Osteochondroma, Enchondroma, Ewing's sarcoma, Gaint cell tumor, Multiple myeloma, Metastatic tumors. Perthes disease, Slipped Capital Femoral Epiphysis and Avascular Necrosis. Metabolic Bone Diseases – Rickets, Osteomalacia, Osteopenia, Osteoporosis, Osteoarthritis, Rheumatoid arthritis, Ankylosing spondylitis Gouty arthritis, Psoriatic arthritis, Hemophilic arthritis, Still's disease (juvenile rheumatoid arthritis), Charcot's joints. Connective Tissue Disorders- Systemic Lupus Erythematosis, Scleroderma, Dermatomyositis, Poliomyelitis, Mixed connective tissue Disease (MCTD). Cervico brachial syndrome, Thoracic outlet syndrome, Vertebro- basilar syndrome, Scalenus syndrome, Costo clavicular syndrome, Levator scapulae syndrome, Piriformis syndrome. Prolapsed interverbral disc (PID), Spinal Canal Stenosis, Spondylosis (cervical and lumbar), Spondylolysis, Spondylolisthesis, Lumbago/ Lumbosacral strain, Sacralisation, Lumbarisation, Coccydynia, Hemivertebra.

Total Periods:60

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Clinical examination of Fractures.
2. Clinical examination of soft tissue injuries.
3. Clinical examination of Neuro-musculoskeletal disorders.
4. Clinical examination of joint disorders.
5. Clinical examination of Geriatric disorders.

Practicum includes ward rounds, case discussion and OPD / ward work.

RESOURCES

BOOKS:

1. Solomon, Louis, David Warwick, Selvadurai Nayagam, and Alan G. Apley. Apley's System of Orthopaedics and Fractures. London: Hodder Arnold, An Hachette UK Company, 2010.
2. Joseph, Benjamin. Paediatric Orthopaedics: A System of Decision-Making. 2016.
3. Azar, Frederick M, James H. Beaty, and S T. Canale. Campbell's Operative Orthopaedics. Philadelphia: Elsevier, 2017.
4. Watson – Jones ,Fracture and Joint injuries ,4th
5. McRae, Ronald. Clinical Orthopaedic Examination,Elsevier, 2016.
6. Staheli, Lynn T. Practice of Pediatric Orthopedics, Lippincott Williams & Wilkins, 2006.
7. Maheshwari, J, and Vikram A. Mhaskar. Essentials of Orthopedics , DL: Jaypee Brothers Medical Publishers ,jaypee, 2015.

VIDEO LECTURES:

1. https://youtu.be/vJ3zB7mNpBg
2. https://youtu.be/jkLL5TFniwY
3. https://youtu.be/9gmM9SCvaKE
4. https://youtu.be/EB5zxdAQGzU
5. https://youtu.be/xcxszTKUM5o

WEB RESOURCES:

1. https://www.aaos.org
2. https://www.mayoclinic.org
3. https://www.clevlandclinic.org
4. https://www.orthobullets.com

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT102020	PHYSIOTHERAPY IN ORTHOPAEDICS AND SPORTS	4	-	6	-	7

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides to identify disabilities due to musculoskeletal dysfunction, plan and set treatment goals and apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore musculoskeletal function.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate sound knowledge in evaluation of Musculo-skeletal pathologies using tests and examinations

CO2. Plan appropriate rehabilitation interventions for patients with disorders of musculoskeletal system

CO3. Identify disability due to musculo skeletal dysfunction, set treatment goals and apply their skills gained in exercise therapy, electrotherapy and massage in clinical situations to restore musculoskeletal function.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	2	-	1	2	-	-	-	1
CO2	3	2	2	-	1	1	-	-	-	**1**
CO3	3	3	2	-	1	1	-	-	-	1
Course Correlation Mapping	**3**	**3**	**2**	**-**	**1**	**2**	**-**	**-**	**-**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: Physiotherapy - Traumatology - I ***(15 Periods)***

Introduction to orthopedics, Clinical examination in an orthopedic patient, Common investigative procedures, Radiological and Imaging techniques in Orthopedics. Fracture: definition, types, signs and symptoms, Fracture healing, Complications of fractures, Conservative and surgical approaches, Principles of management – reduction (open/closed, immobilization etc.). Subluxation/ dislocations – definition, signs and symptoms, management (conservative and operative). Fractures of Upper Limb - causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures: Fractures of clavicle and scapula, Fractures of greater tuberosity and neck of humerus, Fracture shaft of humerus, Supracondylar fracture of humerus, Fractures of capitulum, radial head, olecranon, coronoid, and epicondyles, Side swipe injury of elbow, Both bone fractures of ulna and radius, Fracture of forearm – monteggia, galaezzi fracture –dislocation, Chauffer's fracture, Colle's fracture, Smith's fracture, Scaphoid fracture, Fracture of the metacarpals, Bennett's fracture, Fracture of the phalanges (Proximal and middle), Dislocations of Upper Limb – Anterior dislocation of shoulder – mechanism of injury, clinical feature, complications, conservative management (Kocher's and Hippocrates maneuver), surgical management (putti plat, bankart's) etc., Recurrent dislocation of shoulder, Posterior dislocation of shoulder – mechanism of injury, clinical features and management, Posterior dislocation of elbow – mechanism of injury, clinical feature, complications & management.

Module 2: Physiotherapy - Traumatology - II ***(10 Periods)***

Fracture of Cervical Spine - Mechanism of injury, clinical feature, complications (quadriplegia), Management- immobilization (collar, cast, brace, traction), Management for stabilization, management of complication (bladder and bowel, quadriplegia), Clay shoveller's fracture, Hangman's fracture, Fracture odontoid, Fracture of atlas, Fracture of Thoracic and Lumbar Regions - Mechanism of injury, clinical features, and management, conservative and surgical of common fractures around thoracic and lumbar regions, Fracture of coccyx, Fracture of Rib Cage - Mechanism of injury, clinical features, management for Fracture Ribs, Fracture of sternum. Fractures and Dislocations of Lower Limb- Fracture of Pelvis and Lower Limb - causes, classification, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures- Fracture of pelvis, Fracture neck of femur, Fractures of trochanters, Fracture shaft femur, Supracondylar fracture of femur, Fractures of the condyles of femur, Fracture patella, Fractures of tibial condyles, Both bones fracture of tibia and fibula, Dupuytren's fracture, Maisonneuve's fracture, Pott's fracture, Bimalleolar fracture, Trimalleolar fracture, Fracture calcaneum, Fracture of talus, Fracture of metatarsals, stress fractures, jone's fracture, Fracture of phalanges, Dislocations of Lower Limb - mechanism of injury, clinical features, complications, management of the following dislocations of lower limb - Anterior dislocation of hip, Posterior dislocation of hip, Central dislocation of hip, Dislocation of patella, Recurrent dislocation of patella.

Module 3: Physiotherapy in Soft Tissue Injuries ***(10 Periods)***

Define sprains, strains, contusion, tendinitis, rupture, tenosynovitis, tendinosis, bursitis. Mechanism of injury of each, clinical features, managements- conservative and surgical of the following soft tissue injuries- Meniscal injuries of knee, Cruciate injuries of knee, Medial and lateral collateral injuries of knee, Lateral ligament of ankle, Wrist sprains, Strains - quadriceps, hamstrings, calf, biceps, triceps etc. Contusions- quadriceps, gluteal, calf, deltoid etc. Tendon ruptures-Achilles, rotator cuff muscles, biceps, pectorals etc. Hand Injuries - mechanism of injury, clinical features, and management of the following – Crush injuries, Flexor and extensor injuries. Burn injuries of hand. Periarthritic shoulder (adhesive capsulitis), Rotator cuff tendinitis,

Supraspinatus Tendinitis, Infraspinatus Tendinitis, Bicipital Tendinitis, Subacromial Bursitis, Tennis Elbow, Golfer's Elbow, Olecranon Bursitis (student's elbow), Triceps Tendinitis, De Quervain's Tenosynovitis, Ganglion, Trigger Finger/ Thumb, Mallet Finger, Carpal Tunnel Syndrome, Dupuytren's Contracture, IT Band Syndrome, Piriformis Syndrome, Trochanteric Bursitis, Osteochondritis Dissecans, Prepatellar and Suprapatellar Bursitis, Popliteal Tendinitis, Patellar Tendinitis, Chondromalacia Patella, Plica Syndrome, Fat Pad Syndrome (Hoffa's syndrome) Ankle Sprains, Plantar Fasciitis / Calcaneal Spur, Tarsal Tunnel Syndrome, Achilles Tendinitis, Metatarsalgia, Morton's Neuroma, Amputations - Definition, levels of amputation of both lower and upper limbs, indications, complications.

Module 4: Physiotherapy - Deformities and Orthopaedic surgery ***(10 Periods)***

Clinical features, complications, medical and surgical management of the following Congenital and Acquired deformities- CTEV, CDH, Torticollis, Scoliosis, Flat foot, Vertical talus, Hand anomalies- syndactyly, polydactyly and ectrodactly, Arthrogryposis multiplex congenita (amyoplasia congenita), Limb deficiencies- Amelia and Phocomelia, Klippel feil syndrome, Osteogenesis imperfecta(fragile ossium), Cervical rib, Acquired Torticollis, Kyphosis, Lordosis, Genu varum, Genu valgum, Genu recurvatum, Coxa vara, Pes cavus, Hallux rigidus, Hallux valgus, Hammer toe, Metatarsalgia, Arthrodesis, Arthroplasty (partial and total replacement), Osteotomy, External fixators, Spinal stabilization surgeries (Harrington's, Luque's, Steffi plating) etc , Limb re attachments.

Module 5: Physiotherapy - Neuromuscular, Bone, and Joint Disorders ***(15 Periods)***

Cerebral palsy, Poliomyelitis, Spinal Dysraphism, Leprosy. Infective conditions - Osteomyelitis (Acute / chronic), Brodie's abscess, TB spine and major joints like shoulder, hip, knee, ankle, elbow etc. Arthritic conditions - Pyogenic arthritis, Septic arthritis, Syphilytic infection of joints. Bone Tumors - classification, clinical features, management - medical and surgical of the following tumors – Osteoma, Osteosarcoma, Osteochondroma, Enchondroma, Ewing's sarcoma, Gaint cell tumor, Multiple myeloma, Metastatic tumors. Perthes disease, Slipped Capital Femoral Epiphysis and Avascular Necrosis. Metabolic Bone Diseases – Rickets, Osteomalacia, Osteopenia, Osteoporosis, Osteoarthritis, Rheumatoid arthritis, Ankylosing spondylitis Gouty arthritis, Psoriatic arthritis, Hemophilic arthritis, Still's disease (juvenile rheumatoid arthritis), Charcot's joints. Connective Tissue Disorders- Systemic Lupus Erythematosis, Scleroderma, Dermatomyositis, Poliomyelitis, Mixed connective tissue Disease (MCTD). Cervico brachial syndrome, Thoracic outlet syndrome, Vertebro- basilar syndrome, Scalenus syndrome, Costo clavicular syndrome, Levator scapulae syndrome, Piriformis syndrome. Prolapsed interverbral disc (PID), Spinal Canal Stenosis, Spondylosis (cervical and lumbar), Spondylolysis, Spondylolisthesis, Lumbago/ Lumbosacral strain, Sacralisation, Lumbarisation, Coccydynia, Hemivertebra.

Total Periods:60

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Assessment of upper limb and lower limb fractures, dislocations, and Physiotherapy management.
2. Assessment of Spinal fractures, dislocations, and Physiotherapy management.
3. Assessment of soft tissue injuries and physiotherapy management.
4. Assessment of post orthopaedic surgeries and physiotherapy management
5. Assessment of Neuromuscular, bone, joint disorders, and physiotherapy management.

RESOURCES

BOOKS:

1. Praksh P. Kotwal, Essentials of orthopaedics and applied physiotherapy, Elsevier India, 4th Edition, 2020.
2. Mega Sandeep sheth, Physiotherapy in orthopaedic and rheumatology conditions, Jaypee medical publishers, 1st Edition, 2022.
3. Anne – Marie Hassan Kamp, Physiotherapy in orthopaedics: A problem solving approach, Churchill Livingstone, 2nd Edition, 2005.
4. Lucinda S. Chipchase, In patient physiotherapy management of orthopaedic surgery, Butterworth-Heinnemann, 2001.

VIDEO LECTURES:

1. https://www.youtube.com/c/orthoTV
2. https://youtu.be/pNg9SG3PheY
3. https://youtu.be/hm5dx2Ar2l0

WEB RESOURCES:

1. https://www.physio-pedia.com/Lectures_and_Presentations
2. https://www.coursera.org/courses?query=physical%20therapy

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT101013	**CLINICAL NEUROLOGY AND NEUROSURGERY**	4	-	-	-	4

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on the etiology, pathology, clinical features and treatment methods for various neurological conditions.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand Etiology, Pathophysiology, Signs &Symptoms &Management of the various Neurological and Paediatric conditions.

CO2. Acquire skill of clinical examination of Neurological System.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	3	2	-	1	2	-	-	-	2
CO2	3	3	2	-	1	1	-	-	-	**2**
Course Correlation Mapping	**3**	**3**	**2**	**-**	**1**	**2**	**-**	**-**	**-**	**2**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: Introduction – Neuroanatomy and physiology ***(Periods 10)***

Review the basic anatomy of the brain and spinal cord including: Blood supply of the brain and spinal cord, circle of Willis, anatomy of the visual pathway, cranial nerves connections of the cerebellum and, long tracts of the spinal cord, pyramidal and extra pyramidal system, spinal nerve, the brachial and lumbar plexuses and cranial nerves. Neurophysiologic basis of: tone and disorders of tone and posture, bladder control, muscle contraction and movement and pain pathway. Neurological assessment- Principles of clinical diagnosis, higher mental function, assessment of brain & spinal cord function, evaluation of cranial nerves and evaluation of autonomic nervous system.

Module 2: Brain and Spinal cord diseases ***(Periods 15)***

Functions of tracts, definition, aetiology, risk factors, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders – Spinal cord injury, Compression by IVD prolapse, Spinal epidural abscess, Transverse myelitis, Viral myelitis, Syringomyelia, Spina bifida, Sub acute combined degeneration of the cord, Hereditary spastic paraplegia, Radiation myelopathy, Progressive encephalomyelitis, Conus medullaris syndrome, Bladder & bowel dysfunction, and Sarcodosis. Meningitis, Encephalitis, Poliomyelitis and Post polio syndrome. Complications of systemic infections on nervous system – Septic encephalopathy, AIDS, Rheumatic fever, Brucellosis, Tetanus, and Pertussis. Motor neuron diseases- Amyotrophic lateral sclerosis, Spinal muscular atrophy, Hereditary bulbar palsy, Neuromyotonia and Post-irradiation lumbosacral polyradiculopathy. Brain tumors and spinal tumors, Head injuries, Cerebral palsy, Hydrocephalus, Arnold-chiari malformation, Basilar impression, Klippel-Feil syndrome, Achondroplacia, Cerebral malformations, Autism, Dandy walker syndrome and Down's syndrome.

Module 3: Movement disorders ***(Periods 10)***

Definition, etiology, risk factors, pathophysilogy, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders – Cerebro-vascular diseases, Parkinson's disease, Dystonia, Chorea, Ballism, Athedosis, Tics, Myoclonus and Wilson's disease. Myasthenia gravis, Eaton-Lambert syndrome, and Botulism. Muscular dystrophy, Myotonic dystrophy, myopathy, Non-dystrophic myotonia. Congenital ataxia, Friedreich's ataxia, Ataxia talengiectasia, Metabolic ataxia, Hereditary cerebellar ataxia, Tabes dorsalis and Syphilis.

Module 4: Neuropathy disorders ***(Periods 15)***

Classification of Polyneuropathies, Hereditary motor sensory neuropathy, hereditary sensory and Autonomic neuropathies, Amyloid neuropathy, acute idiopathic Polyneuropathies. Guillain-Barre syndrome – Causes, clinical features, management of GBS, Chronic Idiopathic Polyneuropathies, diagnosis of polyneuropathy, nerve biopsy. RSD, Nerve tumors, Brachial plexus palsy, Thoracic outlet syndrome, Lumbosacral plexus lesions, Phrenic & Intercostal nerve lesions, Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy, Musculocutaneous nerve palsy, Anterior & Posterior interosseous nerve palsy, Axillary nerve palsy, Long thoracic nerve palsy, Suprascapular nerve palsy, Sciatic nerve palsy, Tibial nerve palsy, Common peroneal nerve palsy, Femoral nerve palsy, Obturator nerve palsy, Pudental nerve palsy. Trigeminal nerve, trigeminal neuralgia, trigeminal sensory neuropathy, lesions in facial nerve, facial palsy, bell's palsy, hemi facial spasm, Glossopharangial neuralgia, lesions of Vagus nerve, lesions of spinal accessory nerve, lesions of hypoglossal nerve. Dysphagia – swallowing mechanisms, causes of dysphagia,

symptoms, examination, and management of dysphagia.

Module 5: Miscellaneous Disorders (Periods 10)

Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, and complications- Multiple sclerosis, Epilepsy, Dyssomnias, Parasomnias, Dementia, Obsessive-compulsive disorders, Perceptual disorders and Speech disorders, Deafness, vertigo, and imbalance, Encephalopathy, Alcohol toxicity, Recreational drug abuse, Toxic gases & Asphyxia, Therapeutic & diagnostic agent toxicity, Metal toxicity, Pesticide poisoning, Environmental & physical insults, Pant & Fungal poisoning, Animal poisons, & Complications of organ transplantation. Introduction, Indications and Complications of following Neuro surgeries: Craniotomy, Cranioplasty, Stereotactic surgery, Deep brain stimulation, Burr-hole, Shunting, Laminectomy, Hemilaminectomy, Rhizotomy, Microvascular decompression surgery, Endarterectomy, Embolization, Pituitary surgery, Ablative surgery - Thalamotomy and Pallidotomy, coiling of aneurysm, Clipping of aneurysm, and Neural implantation.

Total Periods:60

RESOURCES

BOOKS:

1. Roger Bannister, Brain and Bannisters Clinical Neurology, Oxford university press, 7th Edition, 2013.
2. Hall, Davidsons Principles & Practice of Medicine, RELX India private limited, 23rd Edition, 2017.
3. Allan H. Ropper, Adams and victors principles of neurology, Mc Graw Hill/ Medical, 12th Edition, 2023.
4. Lindsay, Neurology and Neurosurgery Illustrated, Elsevier, 5th Edition, 2010.

VIDEO LECTURES:

1. https://youtu.be/fIsxfNKZqoQ
2. https://youtu.be/CX7rMbsTc1cw
3. https://youtu.be/ObMszxsS7ew
4. https://youtu.be/a332htjTrtk

WEB RESOURCES:

1. https://neurologyresidents.com/neurology-lectures/
2. https://www.lecturio.com/medical/topics/neurology/

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT102021	**ELECTRO DIAGNOSTICS**	2	-	2	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course is concentrating on the information about diseases by passively recording the electrical activity of body parts or by measuring their response to external electrical stimuli.

COURSE OUTCOMES: After successful completion of the course students will be able to

CO1. Knowledge on nerve and muscle as a base for understanding the electro-diagnostic assessment

CO2. Apply skills of electro-diagnosis (SD Curve), observe needle and surface EMG and NCV studies and analyze test results

CO3. Demonstrate the technique for plotting strength–duration curves.

CO4. Identify normal vs abnormal EMG patterns and describe equipment/electrodes used in EMG.

COs and POs Mapping Table

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	3	1	-	-	-	-	-	-	-
CO2	3	3	1	-	-	-	-	-	-	-
CO3	3	3	1	-	-	-	-	-	-	-
CO4	3	3	1	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**3**	**1**	**-**	**--**	**-**	**-**	**-**	**-**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSECONTENT

MODULE 1: BASICS OF MUSCLE & NERVE PHYSIOLOGY ***(07 PERIODS)***

Physiology of muscle contraction, Motor unit & recruitment pattern, Size principle, Electrophysiology of muscle & nerve, Physiology of resting membrane potential, Action potential & propagation of action potential

MODULE 2: SENSORY & ELECTRICAL DIAGNOSTIC PRINCIPLES ***(08 PERIODS)***

Faradic & Galvanic tests, Strength Duration Curve & SD Curve tests, Sensory tests: vibration threshold, pain threshold & pain tolerance

MODULE 3: STRENGTH–DURATION CURVES & PARAMETERS ***(08 PERIODS)***

Principle of Strength–Duration curves, Technique of plotting SD curves, Interpretation of normal curves, Chronaxie & Rheobase

MODULE 4: ADVANCED NERVE & MUSCLE DIAGNOSTICS ***(07 PERIODS)***

Strength Duration Curves - Principle of S-D curves, Technique of plotting, Interpretation of normal curves, Chronaxie and Rheobase. Nerve Conduction Studies - Principles , Technique, Reporting, Interpretation, F wave, H reflex. Electromyography - Basic components like C.R.O., Filter, Amplifier & Preamplifier, and Types of Electrodes, Needle EMG- Normal & Abnormal E.M.G. pattern, Surface EMG.

TOTAL PERIODS:30

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. SD- curve graphs for innervated, partially innervated and denervated muscles.
2. EMG studies and interpretation in different diseases.
3. NCV studies and interpretation in different diseases.

RESOURCES

TEXTBOOKS:

1. O'Sullivan, S. B., Schmitz, T. J., & Fulk, G. Physical rehabilitation, FA Davis, 2019.
2. Forster A, Clayton EB, Palastanga N. Clayton's electrotherapy: theory and practice. Bailliŕe Tindall;1985.
3. Robertson V, Ward A, Low J, Reed A, MCSP D. Electrotherapy explained: principles and practice. Elsevier Health Sciences; 2006.
4. U K Misra, J Kalita : Clinical Neuro Physiology; 4 th Edition.

VIDEO LECTURES:

1. https://youtu.be/pxB5aOqCDU4
2. https://youtu.be/szVZrrdy1mE
3. https://youtu.be/lsP1g4Tfvbc
4. https://youtu.be/r4DnJIRJJOc

WEB RESOURCES:

1. https://www.mossrehab.com/electrodiagnostics
2. https://neuropathycommons.org/diagnosis/electromyography-nerve-conduction

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT102022	**PHYSIOTHERAPY IN NEUROLOGY**	4	-	6	-	7

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course serves to integrate the knowledge gained by the students in Clinical Neurology, with the skills gained in exercise therapy, electrotherapy, thus enabling them to apply these in clinical situations of dysfunction due to pathology in the nervous system.

COURSE OUTCOMES: After successful completion of the course students will be able to

CO1. Apply to provide adequate knowledge about the neurological conditions and assessment.

CO2. Demonstrate the list of differential diagnoses consistent with typical case presentations and treatments.

CO3. Evaluate to perform independent physiotherapy Paediatric Neurological Condition and approaches.

CO4. Analyse the diagnostic modalities in clinical neurological conditions.

COs and POs Mapping Table

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	1	-	-	2	-	-	-	-
CO2	3	2	1	-	-	2	-	-	-	-
CO3	3	2	1	-	-	2	-	-	-	-
CO4	3	2	1	-	-	2	-	-	-	-
Course Correlation Mapping	**3**	**2**	**1**	**-**	**--**	**2**	**-**	**-**	**-**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSECONTENT

MODULE1: ANATOMY, PATHOPHYSIOLOGY & ASSESSMENTS *(12 PERIODS)*

Review the structure and function of – neuron, synapse, supporting tissue
Review the organization and function of - cerebral hemispheres, cerebellum, spinal cord, peripheral nerves, pyramidal system, extrapyramidal system. Review the factors influencing alpha motor neuron activity. Review the neurological basis of muscle tone and movement and demonstrate the following - hypotonia, hypertonia - spasticity and rigidity, ataxia, athetosis, chorea, Neural Plasticity. Principles of Assessment- Review the Assessment Principles as follows: Skills in history taking, Assessment of higher functions, cortical sensations, cranial nerves, dorsal column sensation and pain & temperature sensations. Assessment of motor function: grading of muscle power, voluntary control, assessment of range of movement, balance and coordination, Assessment of superficial and deep reflexes, Assessment of reflex maturation in terms of stimulus position, negative/positive reactions and their significance, Assessment of gait-both normal and abnormal (spastic, ataxic and paralytic patterns) emphasis should be placed on teaching accurate assessment techniques and various recording methods eg. colour coding on body charts, graphs etc. Assessment of balance, coordination and bladder.

MODULE2: TREATMENT PRINCIPLES *(13 PERIODS)*

Principles of Treatment Review the treatment principles as follows: Sensory re-education: hypersensitivity, hyposensitivity, and anaesthesia. Treatment of altered tone: hypertonicity and hypotonicity. Motor re-education : strengthening exercises coordination exercises, joint mobilization exercises, use of equilibrium and labyrinthine systems, use of PNF patterns, controlled sensory stimulation to bias the spindle cells (e.g.) vibration, tactile, ice etc., use of stretch to elicit movement (facilitation), light joint compression (inhibition) use of reflex activity to improve motor function, phytogenic sequence of motor behaviour. Treatment to improve function: Free exercises gait training with and without aids, activities of daily living, mat exercises and exercises and recreation. Review the use of ambulatory aids in neurological conditions in spastic upper motor neuron lesions, in lower motor neuron lesions, in dorsal column dysfunction and cerebellar dysfunction. Review the use of splints and braces in spastic upper motor neuron and in flaccid lower motor neuron lesions in both upper and lower limbs.
Review the management of chronic pain in neurological conditions with respect to the types of pain, treatment modalities available, selection criteria for each modality and possible complications.

MODULE:3 PEADIATRIC NEUROLOGICAL CONDITIONS & INTEGRATED APPROACHES (*17 PERIODS)*

Management of Paediatric Neurological Condition - Assessment options in paediatrics, Identification of motor/sensory dysfunction in paediatrics including weakness, abnormal tone, motor control deficit and lack of endurance. Clinical approaches to motor/sensory dysfunction in paediatrics including weakness, abnormal tone, postural and motor control deficits and lack of endurance. Application of assessment and treatment approaches in paediatric conditions including. Cerebral palsy, Developmental delay, Brachial Plexus Injury (Erb's Palsy, Klumpky's paralysis), Spina bifida, Head Injury, Muscular dystrophy (all types), Poliomyelitis. Integrated neuromuscular control and physiotherapeutic prevention, curative and rehabilitative measures for sensory motor development, pain control, postural readjustment/control using following hypothetical theories. Motor development (Bobath's) approach and Sensory Integration, Motor re-learning programme (MRP), Brunnstorm and Roods approach. Merits and Demerits of each approach to be explained.

MODULE:4 ADULT NEUROLOGICAL CONDITIONS ***(18 PERIODS)***

Assessment options in adult neurological patients, Identification of motor, sensory, postural dysfunction in adult neurological patients including weakness, abnormal tone, motor control deficits and lack of endurance. Clinical approaches to motor, sensory, postural dysfunction in adult neurological patients including weakness, abnormal tone, postural and motor control deficits and lack of endurance. Application of assessment and treatment approaches in adult neurological conditions including: Stroke b. Monoplegia, Brain Tumour, Parkinsonism, Cerebellar lesions, Amyotrophic Lateral Sclerosis, Spinal Cord lesions, Space-occupying lesion in spine, Muscular dystrophies, Head injury, Gullian-Barrie-Syndrome, Peripheral nerve lesions/injuries, VII cranial nerve palsy, Low back pain syndrome, Brachial neuralgia, Laminectomy, Neuro Intensive care unit patients, Multiple sclerosis.

TOTAL PERIODS:60

EXPERIENTIAL LEARNING

1. Practical demonstration of assessment and physiotherapy management to be demonstrated in the class and students must practice on each other / model before applying them in clinic under supervision.
2. Practical exams and assignments are given to evaluate the students.
3. Understand the techniques of neuro rehabilitation approaches.
4. Evaluate the neuro patient illness by proper examination and treatment.
5. Trace out the differential diagnosis and diagnosis of various Neurology conditions

RESOURCES

TEXTBOOKS:

1. P A Downie, Cash's Text Book of Neurology for Physiotherapist, Jaypee brothers medical publishers, 4th edition, 1993.
2. Rolando T. Lazaro, Umphreds Neurological Rehabilitation, Mosby, 7th edition, 2019.
3. Megha Sandeep sheth, Physiotherapy in neurological conditions, Jaypee medical publishers, 1st edition, 2022.
4. Susan Edwards, Neurological physiotherapy A problem solving approach, Churchill Livingstone, 2001.
5. Raj, Physiotherapy in neuro- conditions, Jaypee medical publishers, 1st edition, 2006

VIDEO LECTURES:

1. https://youtu.be/ftRGw2BhSlw
2. https://youtu.be/XbI9-uSwtBg
3. https://youtu.be/cRLB7WqX0fU
4. https://youtu.be/WovsOgA7cGs
5. https://youtu.be/ZBHrsNt3Yao

WEB RESOURCES:

1. https://www.udemy.com/course/physiotherapy-in-neurological-patients-and-bobath-concept/
2. https://www.threespiresphysiotherapy.co.uk/neurological-physiotherapy/online-video-physiotherapy-sessions-for-neurological-conditions/
3. https://www.physio-pedia.com/Neurological_Physiotherapy_in_Private_Practice
4. https://www.physiospot.com/2018/07/09/free-educational-resources-for-neuro-physiotherapists/
5. https://www.physio.co.uk/treatments/neurological-rehabilitation/neurological-physiotherapy.php
6. https://www.physiopedia.com/Neuropathies?utm_source=physiopedia&utm_medium=related_articles&utm_campaign=ongoing_internal#share

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT201010	**CLINICAL CARDIOVASCULAR AND PULMONARY**	**4**	**-**	**-**	**-**	**4**

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion about cardio-thoracic conditions and cardio-thoracic pathology.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate the differences between cardiac condition and respiratory condition

CO2. Assessing the patient based on special tests

CO3. Evaluate the patient condition based on investigations.

CO4. Analyze and evaluate the patient with intensive care.

CO5. Tracing the surgical condition of cardiopulmonary

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	-	-	-	-	-	-	-	-
CO2	3	2	2	-	-	-	-	-	-	-
CO3	3	2	3	-	-	-	-	-	-	-
CO4	2	2	3	-	-	-	-	-	-	-
CO5	3	2	2	-	-	-	-	-	-	-
Course Correlation Mapping	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSECONTENT

Module 1: INTRODUCTION TO CARDIOPULMONARY CONDITIONS-I ***(12 Periods)***

Anatomical and Physiological differences between the Adult and Pediatric lung. Anatomy of the thoracic cage, Anatomy of the lungs, bronchi and bronchopulmonary segments, Relationship of the bony thorax and the lungs to each other and to the abdominal contents.Briefly describe the variations in the bony cage in the following conditions: Cervical ribs: thoracic outlet syndrome, Rickets - rickety rosary, Depression deformities: pectus excavatum, Protrusion deformities: pectus carinatum (pigeon chest),Scoliosis, Kyphosis,Rare deformities: sternal clefts, absent sternum, Poland syndrome, fused ribs, absent ribs, Jenune's disease; movements of the thorax: Bucket handle, pump handle: List the muscles of respirations involved in inspiration and expiration (including accessory muscles of respiration); List the mechanical factors involved in breathing. Describe briefly factors affecting lung compliance and airway resistance; Describe in detail the cough reflex; List the factors affecting diffusion of oxygen and carbon-dioxide in the lungs.

Module 2: INTRODUCTION TO CARDIOPULMONARY CONDITIONS-II ***(12 Periods)***

Explain ventilation, perfusion and their inter relationship. Describe the physiological control of respiration and highlight the function of the medullary and pontine respiratory centres and central and peripheral chemoreceptors; Pulmonary function assessment: Briefly describe the pulmonary function tests and their use; briefly outline the basis and value of blood gas analysis. Brief the anatomy of the heart and its blood supply and briefly outline the electrical activity or the myocardium and normal ECG; Describe the mechanism for maintenance of blood pressure; Fundamentals of ECG recording and basic interpretation; Briefly describe the principles of Echocardiography: M-mode, Doppler (trans thoracic and trans oesophageal echocardiography); Briefly outline the principles of cardio vascular stress testing; Basics of arrhythmias, syncope and its management; Principles, indication and methodology of temporary and permanent pacemarker implantation; Fundamentals of cardiac catheterization: angioplasty, percutaneous balloon mitral valvotomy, pulmonary valvotomy, aortic valvotomy, device closure of patent ductus arteriosus, atrial septal defects, ventricular septal defects; Outline the energy expenditure of various common daily activities.

Module 3: CARDIAC SURGERY ***(11 Periods)***

Introduction to cardiac surgery: define extra cardiac operations, closed intra-cardiac operations and open cardiac operations. Principles of cardiopulmonary bypass and its complications. Define hypothermia and deep circulatory arrest. Myocardial preservation techniques during cardiopulmonary bypass. Principles of left heart bypass (left aorta femoral bypass), femoral bypass, Gotts shunt, minimally access surgery, port access surgery, Cardiac conditions requiring closed heart surgery: Congenital diseases: Patent ductus arteriosus, coarctation of aorta, Acquired heart diseases: mitral stenosis. Cardiac conditions requiring open heart surgery, briefly describe clinical presentations and management of the following conditions: a.Congenital diseases: atrial septal defect, ventricular septal defects, pulmonary stenosis, tetralogy of Fallot, double outlet right ventricle, transposition vessels, AV canal defect. b.Acquired diseases: mitral stenosis, mitral regurgitation, aortic stenosis, aortic regurgitation, and mixed valvular Coronary artery disease vallutar lesionstation, pathophysiology and management PTCA and stenting, off purin cadronanyn teatery bypass surgery (OPCAB), on pums coronary artery bypass gratincoronary artery byive direct coronary artery bypass (MIDCAB).Intra aortic balloon pump: principles, Indications, advantages and disadvantages. Fundamental principles of ventricular assist devices;Cardiac transplantation;Principles of robotic surgery in cardiac surgery

Module 4: THORACIC SURGERY ***(15 Periods)***

Pathophysiology of various forms of chest trauma. Cardiac tamponade.
Briefly the clinical features and management of the following: simple and multiple rib fractures, flail chest, stove in chest, pneumothorax, hemothorax, hemopneumothorax. Lung contusion, laceration, injury to heart, great vessels and injury to the tracheo-bronchial tree. Empyema thoracis: definition, causes, management. Briefly describe intercostals drainage, rib resection, decortication and window operation.Pulmonary Tuberculosis: clinical presentation, pathology, and management. List the manifestations of pulmonary tuberculosis and briefly describe tuberculoma, bronchiectasis sicca, bronchostenosis. Clinical presentation of destroyed lung and management. Management of hemoptysis. Define massive hemoptysis and the strategies involved in the management of patients with massive hemoptysis including bronchial artery embolization, cryoablation. Outline briefly the clinical features and management of the following suppurative lesions of the lung; bronchiectasis, lung abscess, bronchopneumonia & aspergillosis. Outline briefly the clinical features and management of carcinoma lung. Outline the extent, and complications of the following surgical Incisions: anterolateral thoracotomy, posterolateral thoracotomy and median sternotomy. Describe and define the following and the post-operative management of patients who have undergone wedge resection, segmentectomy, lobectomy, bilobectomy. pneumonectomy, pleuropneumonectomy & tracheostomy. Describe in detail the preopertive assessment and management of a patient posted for thoracotomy. One lung anaesthesia: principle, indications and contraindications. Video - assisted thoracoscopy surgery: principle, indications, contraindications advantages. and Describe the principles of cardio-pulmonary resuscitation, cardiac massage, artifical respiration, defibrillators and their uses. Advanced life support system

Module 5: INTENSIVE CARE ***(10 Periods)***

Outline briefly the principles of various ventilators and their use. Tracheostomy: definition, indications, procedure, complications and advantages. Describe in detail the following post-operative procedures: management of endotracheal / endonasal tube, tracheal suction.
Weaning the patient from the ventilator, extubation technique, post extubation care.
MISCELLANEOUS and RECENT ADVANCES: Briefly outline the management of a patient after a myocardial infarction. Briefly outline the management of a patient with chronic obstructive airway disease. Transcatheter aortic and mitral valve implantation.

Total Periods: 60 Hours

Experimental Learning

LIST OF EXPERIMENTS:

1. Demonstrate the patient condition based on assessment
2. Differentiate between similar conditions
3. Assess the clinical condition of patient by assessment format
4. Evaluate the patient with clinical symptoms
5. How to predict the patient condition by physical examination

RESOURCES:

TEXTBOOKS:

1. BS. Cheema, clinical cardiology and electro cardiography, CBS publishers and distributors Pvt. Ltd., 2023.
2. Marcus Flather, cardiovascular clinical trials- putting evidence into practice, BMJ books, 1st edition, 2012.
3. Hemanth IK, Clinical pearls in pulmonology, Jaypee medical publishers, 1st edition, 2017.
4. Pallav L Shah, Essentials of clinical pulmonology, CRC press, 1st edition, 2020.

VIDEO LECTURES:

1. https://youtu.be/03qvN5pjCTU?feature=shared
2. https://youtu.be/TPe76uMBRjg?feature=shared
3. https://youtu.be/vx2gb488Hvw?feature=shared
4. https://youtu.be/ 1AQsrrYHpDM?feature=shared
5. https://youtu.be/cSJxstCVITY ?feature=shared
6. https://youtu.be /cCPyWFK0IKs?feature= shared
7. https://youtu.be /WSi42C9Nzv8?feature= shared
8. https://youtu.be /ITCF8y7e1Bw?feature= shared
9. https://youtu.be /qogBXXddCbk?feature= shared
10. https://youtu.be /NpgmPs5B3f4?feature= shared
11. https://youtu.be/g4Y2DWc -80c?feature=shared

WEB RESOURCES:

1. https://www.thoracic.org
2. https://www.who.int
3. https://www.brighamandwomens.org
4. https://my.clevelandclinic.org
5. https://training.seer.cancer.gov

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT102023	PHYSIOTHERAPY IN CARDIOVASCULAR AND PULMONARY	4	-	6	-	7

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion about clinical conditions and disorders of cardiopulmonary.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate the Physiotherapy management of cardio pulmonary

CO2. Assessing the Preoperative and Postoperative Physiotherapy management

CO3. Evaluate the Physiotherapy Management of Cardiac diseases and Cardiac pulmonary surgeries

CO4. Analyze and evaluate the Cardio pulmonary surgeries

CO5. Work independently and in teams to solve problems with effective communications.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	-	-	-	-	-	-	-	-
CO2	3	2	2	-	-	-	-	-	-	-
CO3	3	2	3	-	-	-	-	-	-	-
CO4	2	2	3	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	3	3	-
Course Correlation Mapping	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**3**	**3**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

Course Content

Module 1: Physiotherapy management of cardio pulmonary ***(15 Periods)***

Physiotherapy management of cardio pulmonary:- Artificial respiration, Exercise planning and prescription, Cardio Pulmonary resuscitation, procedures and techniques, Effects to chest physiotherapy, Adjuncts to chest physiotherapy, Physiotherapy techniques in relation with chest physiotherapy, Paediatric cardiopulmonary physiotherapy , Vascular defects of heart and postoperative management, Risk factors in cardiopulmonary disorders , Cardiopulmonary complications and physiotherapy management,Prescription of postoperative and physiotherapy management, Physiotherapeutic interventions for relief of pain.

Module 2: Preoperative and Postoperative Physiotherapy management ***(15 Periods)***

Apart from the above student should learn the physiotherapy interventions and recent advances in the physiotherapy management of following conditions (preoperative and Postoperative):- Neonates with respiratory diseases: Pulmonary diseases in immature babies, neonatal distress, Birth asphyxia, broncho pulmonary dysphasia, Nickity Wilson syndrome, Bronchial stenosis; Children with respiratory dysfunction: COPD, Asthma, Cystic fibrosis, Immunological deficits, Pertussis; Peripheral vascular disorders, Arterial pathological conditions, Venous pathological conditions; Lymphatic lung disorders:-Obstructive lung disorders: COPD Chronic bronchitis, Emphysema, Bronchiectasis, asthma, Cystic fibrosis (early stages); Restrictive lung disorders.

Module 3: Physiotherapy Management of Cardiac diseases and Cardiac pulmonary surgeries ***(15 Periods)***

Physiotherapy management of Cardiac diseases:- Congenital heart diseases, Valvular heart disorders, Rheumatic heart disease, Diseases of the myocardium, Tumours of the heart and lung, Ischemic heart diseases.Physiotherapy Management after cardiac pulmonary surgeries :- Trauma to the chest,Lung abscess, Broncho pneumonia, Destroyed lung, Carcinoma of lung, pulmonary embolism, interstitial lung diseases, Occupational lung disorders, Management of cardiopulmonary complications in burns patient, Surgical Conditions:Thoracoplasty, Empyema thoracis, Rib Resection, Decortication Window Operation, Omentoplasty, Surgeries to thoracic wall, surgeries in Cardiac Conditions, Vascular conditions and pulmonary conditions.

Module 4: Physiotherapy Evaluation of Cardio pulmonary ***(15 Periods)***

Physiotherapy Evaluation of Cardio pulmonary :-Physiotherapy Evaluation of Cardiac conditions, Pre-Operative evaluation of pulmonary surgeries, Post-Operative evaluation of Pulmonary surgeries, Pre-Operative evaluation of Cardiac Surgeries, Post-Operative evaluation of Cardiac Surgeries

Total Periods: 60 Hours

Experimental Learning

LIST OF EXPERIMENTS:

1. Differences between cardio and respiratory diseases
2. Functional Pathways of organ function at disease condition
3. Cancer patient condition at recovery stages
4. Special tests used for specific conditions
5. Surgical procedure for specific conditions

RESOURCES:

TEXTBOOKS:

1. Joanne Watchie, Cardiovascular and pulmonary physical therapy, Saunders, 2nd edition, 2009.
2. Ellen Hillegass, Essentials of cardiopulmonary physical therapy, Elsevier, 5th edition, 2022.
3. Elizabeth Dean, Cardiovascular and pulmonary physical therapy – Evidence to practice, Mosby, 5th edition, 2012.
4. William E Deturk, Cardiovascular and pulmonary physical therapy- An evidence based approach, Mc Graw Hill, 2011 .
5. Enrico Clini, Textbook of pulmonary rehabilitation, Springer international, 2019.

VIDEO LECTURES:

1. https://youtu.be/03qvN5pjCTU?feature=shared
2. https://youtu.be/TPe76uMBRjg?feature=shared
3. https://youtu.be/vx2gb488Hvw?feature=shared
4. https://youtu.be/ 1AQsrrYHpDM?feature=shared
5. https://youtu.be/cSJxstCVITY? feature=shared
6. https://youtu.be /cCPyWFK0IKs?feature= shared
7. https://youtu.be /WSi42C9Nzv8?feature= shared
8. https://youtu.be /ITCF8y7e1Bw?feature= shared
9. https://youtu.be /qogBXXddCbk?feature= shared
10. https://youtu.be /NpgmPs5B3f4?feature= shared
11. https://youtu.be/g4Y2DWc -80c?feature=shared

WEB RESOURCES:

1. https://www.thoracic.org
2. https://www.who.int
3. https://www.brighamandwomens.org
4. https://my.clevelandclinic.org
5. https://training.seer.cancer.gov

PROGRAMME CORE

Course Code	Course Title	L	T	P	S	C
22PT101006	**ERGONOMICS AND HEALTH PROMOTION**	2	-	-	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course helps students to understand how people in the working environment interact with systems, equipment and their physical, psychophysiological dimensions in work

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Understanding principles, ergonomics Acts and anthropometric measurement

CO2 Knowledge on conditions related to upper limb,lower limb, spine injuries.

CO3 Analysis of lifting, seating, computer and assistive technology and environmental design

CO4 Evaluation of fitness tests, learning skills of stretchings, aerobics, strengthening exercises

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	3	2	-	-	-	1		-	-
CO2	3	3	3	-	2	3	-	2	3	2
CO3	3	2	3	-	3	3	-	-	1	1
CO4	3	3	3	-	-	3	2	2	-	1
Course Correlation Mapping	**3**	3	**3**	**-**	**2**	3	-	2	**3**	**1**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module -1 Introduction To Ergonomics ***(05 Periods)***

Definition, history, principles, objectives, domains, disciplines, OSHA, NIOSH ,workman compensation acts, Role of ergonomist. Human body system and senses, posture, basic biomechanics. Anthropometry: Measurements ,tools,of anthropometry, Body composition assessment.

Module- 2 Musculo skeletal disorders ***(07 Periods)***

Upper limb: conditions related to shoulder, wrist, elbow, hand. Lower limb: conditions related to hip, knee, ankle. Conditions related to spine.

Module- 3 Workspace modification ***(10 Periods)***

Environmental design, lifting analysis, seating analysis, computer and assistive technology, designing for hand tool, work place evaluation tools, job safety analysis, psychosocial risk factors, manual material handling, job hazard analysis , prevention and control, heavy work and evaluating physical work load ,Mental work load measurement, organizing shift work

Module -4 HEALTH PROMOTION ***(08 Periods)***

Health promotion: Prevention practice: a holistic perspective for physiotherapy, Physiotherapist role for a healthy community, physical activity, Aging and physiological function, body metabolism, warmup, fitness testing, Fitness training, Assessment of energy expenditure, Health, fitness, and wellness issues during childhood and adolescence, Health, fitness, and wellness during adulthood, Women's health issues: focus on pregnancy:

Total Periods: 30

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. Assessment of body composition and Anthropometry
2. Analysis of lifting, seating, computer and assistive technology in work space
3. Assessment of energy expenditure, demonstration of warm up,aerobics and strengthening exercises
4. Evaluation of Fitness in the individuals and organizing of shift work

RESOURCES

TEXTBOOKS:

1. Pamela McCauley Bush ,Ergonomics foundation principles and ergonomics, taylor and francis publication ,1st edition 2011
2. R.S.Bridger ,Introduction to human factors and ergonomics, , taylor and francis publication,4th edition 2017
3. Shrawan kumar, Ergonomics for rehabilitation professionals, taylor and francis publication CRC press,1st edition,2017
4. Jennie Naidoo,jane wills, Foundation for health promotion,Elsevier, 4th edition 2016
5. carolyn chambers clark, Health promotion in communities holistic and wellness approaches,springer publishing company,2001
6. Anastasia snelling, Introduction to health promotion,Jossey-bass,1st edition,2014

VIDEO LECTURES:

1. https://youtu.be/wYvqHJ7FNAM?si=MVhIvBibE3NSKdqJ
2. https://youtu.be/nmJok2GYQ3I?si=vdBmXXsCUyzTnKdd
3. https://youtu.be/yfTEQLSc6Ao?si=0DZYhvEj-ucjLn4t
4. https://youtu.be/n-iAK4vusqk?si=XCea_xHCOGm9ubo1
5. https://youtu.be/OyK0oE5rwFY?si=JEQW7Kn-P9yY_Dmz

WEB SOURCES:

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5844133/
2. https://www.ncbi.nlm.nih.gov/books/NBK580551/
3. https://pdfs.semanticscholar.org/007d/2bb75838ce2d59a6a9dc331c09da585ffa33.pdf
4. https://www.researchgate.net/publication/293245039_Anthropometry_and_its_application_to_ergonomics/

PROGRAM ELECTIVE

Course Code	Course Title	L	T	P	S	C
22PT102026	PHYSIOTHERAPY ADMINISTRATION AND TEACHING SKILLS	1	-	2	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course is concentrating on the teaching, clinical practice, administration, and management skills in the physiotherapy profession**.**

COURSE OUTCOMES: After successful completion of the course students will be able to

CO1. Assess the patient illness by proper examination Ethical rules and guidelines for physiotherapist

CO2. Basic principles of general fitness record the clinical studies for future advancements.

CO3. Formulate based on the general principles of management, personnel management.

CO4. Demonstrate teaching capabilities on discipline specific topics and career Development.

Cos and Pos Mapping Table

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	2	1	-	-	2	-	-	-	-
CO2	2	2	1	-	-	2	-	-	-	-
CO3	2	2	1	-	-	2	-	-	-	-
CO4	2	2	1	-	-	2	-	-	-	-
Course Correlation Mapping	**2**	**2**	**1**	**-**	**--**	**2**	**-**	**-**	**-**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSECONTENT

MODULE1: PHYSIOTHERAPY AS A PROFESSION ***(03 PERIODS)***

History of physiotherapy, Ethical rules and guidelines for physiotherapist, Scope of professional conduct, Rules of professional conduct -Physiotherapy as a professional, Relationship with patients, Relationship at health care institution i.e., hospital, clinics etc., Relationship with colleagues and peers, Relationship with medical & other professionals, Empathy, Confidentiality and Responsibility.

MODULE2: PHYSICAL EDUCATION ***(05 PERIODS)***

Basic principles of general fitness-warming up exercise-aerobics-cooling down exercise. Group and recreational activities - general fitness exercise-warm up- stretching mobility-strengthening-cool down exercise. Diet & nutrition in general digestion, food for athlete, slimming diets, ideal body weight and obesity

MODULE:3 MANAGEMENT STUDIES FOR PHYSIOTHERAPY (05 *PERIODS)*

Branches of management - Principles of health sector management. General principles of management - Theories of management. Personnel management - Polices and procedure basic concepts and theories. Financial issues including budget and income generation. Principles of an organizational chart

MODULE:4 MANAGEMENT SKILLS ***(02 PERIODS)***

Organization of a department - planning, space, manpower, materials, basic requirements.

Resource and quality management - planning with change and coping with change.

Self-Management - Preparing for first job, Time management, Career Development

TOTAL PERIODS:15

EXPERIENTIAL LEARNING

1. How to improve the standards and future challenges of physiotherapy practice
2. physiotherapy as a profession, physical education,
3. How to develop management studies for physio therapy, management skills.
4. Demonstration of various teaching methods in physiotherapy education

RESOURCES

TEXTBOOKS:

1. Katherine K.Johnson: Bio ethics in Physical therapy; Cognella, Inc., publisher, 2022.
2. Barbara: Ethics in Rehabilitation; Slack publishers, 2nd Edition, 2012.
3. John Heick & Rolando T. Lazaro Goodman and Snyder's Differential Diagnosis for Physical Therapists, 7th Edition- 2022
4. Basanta Kumar Nanda ,Textbook of Physiotherapy ,1st Edition 2023

VIDEO LECTURES:

1. https://youtu.be/bf1Wzy1amuw
2. https://youtu.be/iFwZrNAeHks
3. https://youtu.be/zU5_4kc0GjY
4. https://www.youtube.com/watch?v=GkP5lEWi1ns
5. https://www.google.com/search?q=physiotherapy+skills+videolectures

WEB RESOURCES:

1. Worldwide Physical Therapy Practice - Brazil - Physiopedia
2. Diversity of Private Physiotherapy Practice - Physiopedia
3. Modes of Communication - Physiopedia
4. Using Empathy in Communication - Physiopedia
5. Physiotherapy communication approaches in management of obesity and overweight - Physiopedia
6. Communication in Healthcare - Physiopedia

PROGRAM CORE

Course Code	Course Title	L	T	P	S	C
22PT102018	**PHYSIOTHERAPY FOR WOMEN AND CHILDCARE**	2	-	2	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course helps students to understand the structural and functional changes in women before during and after the pregnancy, and the support of physiotherapy during these times makes the women strong and fit for delivery.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the physiological events, complications and management during puberty, pregnancy, and menopause.

CO2. Assess function of women with respect to neurological, musculoskeletal & respiratory function.

CO3. Assess function of women with respect to neurological, musculoskeletal & respiratory function.

CO4. Apply physiotherapy approaches to treat & train patients with gynecological problems.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	3	2	-	-	-	-	-	-	1
CO2	3	3	2	-	-	-	-	-	-	1
CO3	3	3	2							1
CO4	3	3	2							1
Course Correlation Mapping	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**1**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSECONTENT

Module 1: BASIC SCIENCE ***(10 Periods)***

Anatomical and Physiological Variations Associated with Puberty – Physical and Psychological health of adolescent girls, Anatomical and Physiological Variations Associated with Pregnancy, Normal/ Abnormal / multiple gestations, Common Complications during pregnancy: Anaemia, PIH, Eclampsia, Diabetes, Hepatitis, TORCH infection or HIV.

Module 2: PHYSIOTHERAPY ROLE IN CHILD'S HEALTH (05 Periods)

Development of the foetus, Physiology of Labour, Normal – Events of Ist, IInd & IIIrd Stages of labour, Complications during labour & management, Caesarean section- elective/ emergency & post-operative care Infertility - Management with emphasis on PCOS/PCOD.

Module 3: PHYSIOTHERAPY ROLE IN WOMEN'S HEALTH (10 Periods)

Ante natal and Post Natal Physiotherapy, Urogenital Dysfunction Uterine prolapse – Classification & Management (Conservative / Surgical) Cystocoele, Rectocoele, Enterocoele, Urethrocoele Incontinence, malignancy and their therapeutic interventions.

Module 4: PHYSIOTHERAPY IN GYNEOCOLOGY ***(05 Periods)***

Gynecological Surgeries (Pre- and Post-Surgical Management), Physiotherapy for Pre, Peri, Post-Menopausal Women, Anatomical and Physiological variations associated with Menopause, Complications, Management, Pelvic Inflammatory Diseases - special emphasis to low back pain due to Gynecological / Obstetrical conditions, Legal rights and benefits related to health.

Total Periods:30

EXPERIENTIAL LEARNING

1. Assessment and evaluation of the Gynecology patient.
2. Adverse effects of pregnancy and its prevention.
3. Early physiotherapy interventions (mobilization & stimulation of activities) passive and active treatments to be used, and parameters to be monitored during pregnancy.
4. Physiotherapy in women's health and fitness.

RESOURCES

TEXTBOOKS:

1. Margaret Polden, Physiotherapy in obstetrics and gynaecology, Butterworth-Heinemann Ltd, 1990.
2. Megha Sandeep Sheth M, Physiotherapy in obstetrics and gynaecology, Jaypee medical publishers, 2023.
3. Jean M Irion, Womens health in physical therapy, Lippincott Williams and wilkins, 1st edition, 2009.

VIDEOLECTURES:

1. https://youtu.be/C4PEZKzZFuQ
2. https://youtu.be/xjn_9AluQnA
3. https://youtu.be/5oslM6Pe9AU

WEB RESOURCES:

1. https://www.physiospot.com/2022/03/10/womens-health-courses-available-now-on-physioplus/
2. https://www.womens-health-physio.co.uk/2011/10/womens-health-physiotherapy-video-conditions-related-to-pregnancy/
3. https://www.mummysphysio.com/2020/10/28/womens-health-physiotherapy-sessions-video-online-postnatal-rehabilitation-at-home-london/
4. https://www.motherhoodindia.com/the-role-of-physiotherapy-in-womens-health/

PROGRAM ELECTIVE

Course Code	Course Title	L	T	P	S	C
22PT102025	**REHABILITATION MEDICINE**	2	-	2	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course will enable the students to understand their role in the management of disability, Palliative care, Geriatrics, and women's health.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand concept of team approach in rehabilitation.

CO2. Demonstrate appropriate goals in treatment and rehabilitation.

CO3. Knowledge on various mobility aids and their application.

CO4. Acquire skills for the evaluation of disability and planning for prevention and rehabilitation.

CO5. Identify with clinical reasoning the prevailing contextual factors, causing high risk responsible for various dysfunctions and morbidity related to geriatrics, and women health.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	1	1	-	-	1	-	-	-	1
CO2	3	1	1	-	-	1	-	-	-	**1**
CO3	3	1	1	-	-	1	-	-	-	1
CO4	3	3	2	-	1	1	-	-	-	1
CO5	3	2	1	-	-	1	-	-	-	1
Course Correlation Mapping	**3**	**2**	**2**	**-**	**1**	**1**	**-**	**-**	**-**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: INTRODUCTION OF REHABILITATION AND PHYSIOTHERAPY ***(05 Periods)***

Rehabilitation – aims, principles, team members, role of team members and teamwork involved in rehabilitation. Physiotherapy techniques - Joint mobilization and manipulation, reducing spasm, assisting weak muscles, increasing endurance, Muscle re-education, strengthening muscles, Increasing co-ordination. Social implications - disability for the individual and for the community.

Module 2: COMMUNICATION, BEHAVIOURAL PROBLEMS, AND CBR VS IBR ***(05 Periods)***

Identify communication and behavioural problems, classify these and outline principles of treatment and training. CBR module and compare this with an institution based rehabilitation system.

Module 3: MOBILITY AIDS, ORTHOTIC AND PROSTHETIC DEVICES ***(03 Periods)***

Indications, types of mobility aids, and their functions - wheelchairs, walkers, crutches. Orthosis- types, indications, contraindications, and prescribing orthosis. Prosthesis – types, function, methods of pre and post training.

Module 4: DISABILITY EVALUATION ***(08 Periods)***

Principles of disability evaluation and its use. legal aspects of disability, terms of compensation for disability and benefits available to the disabled. Methods and team involvement in pre-vocational evaluation and training. architectural barriers and possible modifications, with reference to rheumatoid

arthritis, cerebrovascular accident, spinal cord injury, and other disabling conditions Parkinson's disease, amputation, muscular dystrophy, cerebral palsy, poliomyelitis, peripheral nerve lesions, Hansen's disease, multiple sclerosis.

Module 5: GERIATRICS, WOMEN'S HEALTH, AND PALLIATIVE CARE (09 Periods)

The ageing body, theories of ageing, physiological changes in ageing, examination, and treatment approach and role of physiotherapy in geriatrics. Role of physiotherapy in – Antenal education, Postnatal care, Pre & Post operative care in various abdominal and gynecological surgeries, Post menopausal management. pelvic floor rehabilitation. palliative care – team members role, palliative care in terminal illness.

Total Periods: 30

RESOURCES

BOOKS:

1. S Sunder, Textbook of rehabilitation, Jaypee brothers, 4th edition, 2019.
2. Walter R. Frontera, Delisa's Physical medicine, and rehabilitation: Principles and practice, Lippincott Williams and Wilkins, 5th edition, 2010.
3. Randall and Broddom , Hand Book of Physical Medicine and Rehabilitation, Elsevier, 2004.

VIDEO LECTURES:

1. https://youtu.be/lJBhJzUomuE
2. https://youtu.be/OlYlZSfBZbM
3. https://youtu.be/As1YN-6a0xw
4. https://youtu.be/xckzwFZ_BXk
5. https://youtu.be/p4j1KmSC0DY
6. https://youtu.be/iyfldFelaSk

WEB RESOURCES:

1. https://www.stoneclinic.com/rehabilitation-and-fitness-videos
2. https://www.physio-pedia.com/Introduction_to_Rehabilitation
3. https://study.com/academy/lesson/what-are-pre-vocational-skills.html

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22EC101701	**AI IN HEALTHCARE**	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on Concepts of Artificial Intelligence (AI) in Healthcare; The Present State and Future of AI in Healthcare Specialties; The Role of Major Corporations in AI in Healthcare; Applications of AI in Healthcare.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Understand the fundamental concepts of AI in Healthcare sector.

CO2 Analyse the present state and future of AI in Healthcare specialties for different scenarios.

CO3 Apply design concepts and metrics for AI in Healthcare.

CO4 Demonstrate basic concepts and terminologies of future applications of Healthcare in AI.

CO5 Develop AI applications through AI techniques for healthcare

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	2	-	-	-	-	-	-
CO2	2	3	-	2	-	2	2	-	-	-
CO3	2	-	2	2	-	-	-	-	-	-
CO4	2	-	-	-	2	2	-	-	-	-
CO5			3							
Course Correlation Mapping	2	-	3	2	2	2	2	-	-	-

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: INTRODUCTION TO ARTIFICIAL INTELLIGENCE IN HEALTHCARE ***(08 Periods)***

Introduction to AI in Healthcare, Benefits & Risks, AI in the health sector, AI versus human intelligence, The future of AI in health sector, AI & Neural networks.

Module 2: THE PRESENT STATE & FUTURE OF AI IN HEALTHCARE SPECIALTIES ***(10 Periods)***

Artificial Intelligence in: preventive healthcare, Radiology, Pathology, Surgery, Anesthesiology, Psychiatry, Cardiology, Pharmacy, Dermatology, Dentistry, Orthopedics, Ophthalmology.

Module 3: THE ROLE OF MAJOR CORPORATIONS IN AI IN HEALTHCARE ***(08 Periods)***

IBM Watson, The role of Google & Deep mind in AI in Healthcare, Baidu, Facebook & AI in Healthcare, Microsoft & AI in Healthcare.

Module 4: FUTURE OF HEALTHCARE IN AI ***(10 Periods)***

Evidence-based medicine, personalized medicine, Connected medicine, Virtual Assistants, Remote Monitoring, Medication Adherence, Accessible Diagnostic Tests, Smart Implantables, Digital Health and Therapeutics, Incentivized Wellness, Block chain, Robots, Robot-Assisted Surgery, Exoskeletons, Inpatient Care, Companions, Drones, Smart Places, Smart Homes, Smart Hospitals.

Module 5: APPLICATIONS OF AI IN HEALTHCARE ***(09 Periods)***

Case Study 1: AI for Imaging of Diabetic Foot Concerns and Prioritization of Referral for Improvements in Morbidity and Mortality.

Case Study 2: Outcomes of a Digitally Delivered, Low-Carbohydrate, Type 2 Diabetes Self-Management.

Case Study 3: Delivering A Scalable and Engaging Digital Therapy.

Case Study 4: Improving Learning Outcomes for Junior Doctors through the Novel Use of Augmented and Virtual Reality for Epilepsy.

Case Study 5: Big Data, Big Impact, Big Ethics: Diagnosing Disease Risk from Patient Data.

Total Periods: 45

EXPERIENTIAL LEARNING

1. Analyze how the artificial intelligence is used to predict the disease result and Prognosis Assessment of a patient.
2. How does drug discovery happen and how does AI is helping in drug discovery and Labs.
3. Justify that artificial intelligence provide engineering solutions for early detection and Diagnosis of diseases.
4. Demonstrate the prediction of bladder volume of a patient.

(Note: It's an indicative one. Course Instructor may change activities and shall be reflected in course Handout)

RESOURCES

TEXT BOOKS:

1. Dr. Parag Mahajan, *Artificial Intelligence in Healthcare*, MedManthra Publications, First Edition 2019.
2. Arjun Panesar, *Machine Learning and AI for Healthcare Big Data for Improved Health*, Apress Publications, 2019.

REFERENCE BOOKS:

1. Michael Matheny, Sonoo Thadaney Israni, Mahnoor Ahmed, and Danielle Whicher, *Artificial Intelligence in Health Care: The Hope, the Hype, the Promise, the Peril*, National Academy of Medicine Publication, First Edition 2019.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=-aHBwTQQyNU
2. https://intellipaat.com/blog/artificial-intelligence-in-healthcare/

WEB RESOURCES:

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6616181/
2. https://www.ibm.com/topics/artificial-intelligence-healthcare
3. https://builtin.com/artificial-intelligence/artificial-intelligence-healthcare

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22DS101701	**BIOINFORMATICS**	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course focus onBiological Data Acquisition, Databases, Data Processing, Methods of Analysis, Applications of Bio-informatics.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Understand basic biological data acquisition in bioinformatics.

CO2 Identify the proper databases for the information search by choosing the biological databases and also submission and retrieval of data from databases.

CO3 Analyze the results of bioinformatics data using text and sequence-based searching techniques.

CO4 Analyze the secondary and tertiary structures of proteins by applying different alignment programs

CO5 Design biological databases by using contextual knowledge on bioinformatics.

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	-	-	-	-	-	-	-	-	-
CO2	2	3	-	-	-	-	-	-	-	-
CO3	2	3	-	-	-	-	-	-	-	-
CO4	2	3	-	-	-	-	-	-	-	-
CO5	3	2	3	3	3	-	-	-	-	-
Course Correlation Mapping	3	3	3	3	3	-	-	-	-	-

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: BIOLOGICAL DATA ACQUISITION ***(09 Periods)***

Biological information, Retrieval methods for DNA sequence, protein sequence and protein structure information

Module 2: DATABASES ***(09 Periods)***

Format and Annotation: Conventions for database indexing and specification of search terms, Common sequence file formats. Annotated sequence databases - primary and secondary sequence databases, protein sequence and structure databases.

Module 3: DATA PROCESSING ***(09 Periods)***

Data – Access, Retrieval and Submission: Standard search engines; Data retrieval tools – Entrez, DBGET and SRS; Submission of (new and revised) data; Sequence Similarity Searches: Local and global. Distance metrics. Similarity and homology. Scoring matrices, PAM and BLOSUM

Module 4: METHODS OF ANALYSIS ***(09 Periods)***

Dynamic programming algorithms, Needleman-Wunsch and Smith-waterman.Heuristic Methods of sequence alignment, FASTA and BLAST; Multiple Sequence Alignment and software tools for pair wise and multiple sequence alignment, CLUSTAL program, Prediction of Tertiary structure of proteins.

Module 5: APPLICATIONS ***(09 Periods)***

Genome Annotation and Gene Prediction; ORF finding; Phylogenetic Analysis, Genomics, Proteomics, Genome analysis – Genome annotation, DNA Microarray, computer aided drug design (CADD).

Total Periods: 45

EXPERIENTIAL LEARNING

1. Calculate the dynamic programming matrix and one or more optimal alignment(s) for he sequences GAATTC and GATTA, scoring +2 for a match, −1 for a mismatch and with a linear gap penalty of d=2.
2. Determine whether the RNA string GGACCACCAGG should be folded into two substructures.
3. Discuss how to carry out the multiple sequence alignment of the following three sequences: TTTTAAAA, AAAACCCC, CCCCTTTT.

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in course handout.)

RESOURCES

TEXT BOOKS:

1. Lesk, A. K., *Introduction to Bioinformatics*, Oxford University Press, 4th Edition, 2013
2. Dan Gusfield, *Algorithms on Strings, Trees and Sequences: Computer Science and Computational Biology*, Cambridge University Press, 1997.

REFERENCE BOOKS:

1. Baldi, P. and Brunak, S., *Bioinformatics: The Machine Learning Approach*, MIT Press, 2nd Edition, 2001.
2. Mount, D.W., *Bioinformatics Sequence and Genome Analysis*, Cold Spring Harbor Laboratory Press, 2nd Edition, 2004.
3. Tindall, J., *Beginning Perl for Bioinformatics: An introduction to Perl for Biologists*, O'Reilly Media, 1st Edition, 2001.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=liNblw4x50E
2. https://www.youtube.com/watch?v=eZfyWdHnzR0

WEB RESOURCES:

1. https://www.britannica.com/science/bioinformatics
2. https://www.ebi.ac.uk/training/online/courses/bioinformatics-terrified/what-bioinformatics/

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22SS101701	CONSTITUTION OF INDIA	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides and in-depth knowledge about Constitution of India's Preamble and its Philosophy; Union Legislature; Federalism in India; Judiciary and Public Services; Nation Building. The students can gain first-hand information and knowledge about these dynamics and accordingly act based on these sources in their professional and routine activities.

COURSE OUTCOMES: After successful completion of this course, the students will be able to:

CO1: Demonstrate knowledge in the Parliamentary proceedings, Election Commission, Public Services and Foreign Policy of India.

CO2: Apply the reasoning informed by the various aspects of the Constitution and its provisions to assess societal issues and the consequent responsibilities relevant to the professional engineering practice.

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	1	-	-	-	-	3	2	-	-	-
CO2	2	-	-	-	-	3	-	3	-	-
Course Correlation Mapping	**2**	**-**	**-**	**-**	**-**	**3**	**2**	**3**	**-**	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: PREAMBLE AND ITS PHILOSOPHY ***(09 Periods)***

Introduction to Indian Constitution; Evolution of Indian Constitution; preamble and its philosophy

Module 2: UNION LEGISLATURE ***(09 Periods)***

The Parliament, Parliamentary Structure, Process of Legislation; President of India – Powers and Functions; Prime Minister and Council of Ministers; Constitution Amendment Procedure.

Module 3: FEDERALISM IN INDIA ***(09 Periods)***

Centre-State Administrative Relationship; Governors – Powers and Functions; State Legislature - Composition and powers; Chief Ministers - Powers and Functions; The Election Commission – Powers and Functions.

Module 4: JUDICIARY AND PUBLIC SERVICES ***(09 Periods)***

The Union Judiciary - Supreme Court and High Court; Fundamental Rights and Duties All India Services - Central Civil Services -State Services - Local Services.

Module 5: INTERNATIONAL PARTICIPATION ***(09 Periods)***

Foreign Policy of India; International Institutions Influence: UNO, WTO, WHO, SAARC, International Summits: BRICS, NSS, UNEP – India's Role in International Negotiations; Environmentalism in India.

Total Periods: 45

EXPERIENTIAL LEARNING

1. Review newspapers and submit a report on critical analysis of Indian Civil Servants exercise of powers, in the awake of constitutionally assigned authority.
2. Visit your village Panchayat office or Municipality office and generate a report on your observations about maintained Constitutional symbolism.
3. Watch few videos on recent Indian Independence Day and Republic Day celebrations as marked in New Delhi and present a detailed report, by considering the following aspects:
   a. Comparatively analyze the speeches of the President of India and Prime Minister of India as delivered on these two occasions.
   b. Compare these two events relevance in terms of Indian Armed Forces presence.
   c. Observe, compare and analyse 'flag code' relevance as marked in these two events.
4. Watch a few videos on recent 'proceedings' of any state Legislative Assembly session and submit a detailed report.

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in course handout.)

RESOURCES

TEXT BOOKS:

1. Briji Kishore Sharma, *Introduction to the Constitution of India*, Prentice Hall of India, 2005

REFERENCE BOOKS:

1. Mahendra Pal Singh,V. N. Shukla's, *Constitution of India*, Eastern Book Company, 2011.

2. Pandey J. N., *Constitutional Law of India*, Central Law Agency, 1998

VIDEO LECTURES:

1. Doctrine of Basic Structure: https://www.youtube.com/watch?v=cvUf9ZeEe8Y
2. Significance of the Constitution: https://www.youtube.com/watch?v=vr1Dc_-ZKbQ

WEB RESOURCES:

1. The Constitution of India: https://www.youtube.com/watch?v=of2SoO8i8mM
2. Protection of Constitutional Democracy: https://www.youtube.com/watch?v=smJ99cdPrns

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22CM101702	**COST ACCOUNTING AND FINANCIAL MANAGEMENT**	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: Cost accounting; cost sheet & preparation of cost sheet; standard costing & variance analysis; financial management & ratio analysis; introduction to investment**.**

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Demonstrate the concepts of Cost Accounting and Management Accounting and the elements of costing.

CO2 Determine the Cost of Production for pricing decisions.

CO3 Apply the Standard Costing and Variance techniques for the control of the cost of production

CO4 Analyze the Profitability and financial condition of an organization using Ratios.

CO5 Apply Capital Budgeting techniques for making investment decisions in an organization.

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3				2			1		
CO2	3				2			1		
CO3	3				2			1		
CO4	3				2			1		
CO5	3				2			1		
Course Correlation Mapping	**3**				**2**			**1**		

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: COST ACCOUNTING ***(09 Periods)***

Meaning of Cost and Cost Accounting, Objectives, Scope, Advantages, and Disadvantages – Cost Accounting *Vs* Management Accounting – Elements of Costing – Installation of costing system – Material Control, Labor Control, Overhead Control.

Module 2: COST SHEET & PREPARATION OF COST SHEET (09 Periods)

Analysis of Cost – Preparation of cost sheet, estimate, tender, and quotation (Simple problems) – Importance of Costing while pricing the products

Module 3 STANDARD COSTING & VARIANCE ANALYSIS (09 Periods)

Introduction to Standard Costing & Variances – Variance Analysis: Material variances, Labor variances (Simple Problems).

Module 4 FINANCIAL MANAGEMENT & RATIO ANALYSIS (09 Periods)

Meaning, Objectives - Nature and Scope, Importance of FM – Ratio Analysis**:** Types of Ratios: Solvency Ratios, Liquidity Ratios, Turnover Ratios, and Profitability Ratios - Financial Statement Analysis through Ratios (Simple Problems).

Module 5 INTRODUCTION TO INVESTMENT ***(09 Periods)***

Investment - Meaning and Definition- concept of risk and returns - Capital budgeting techniques – Security Analysis and Portfolio Management (Basic concepts).

Total Periods: 45

EXPERIENTIAL LEARNING

1. Prepare a report on the role of cost accountants in the growth of a company.
2. To visit the manufacturing unit to observe how they used various techniques for analyzing the financial health of a company.
3. Prepare a report on factors influencing the form of business organization.
4. Prepare the cost sheet with practical examples of any two manufacturing companies.

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in course handout.)

RESOURCES

TEXT BOOKS:

1. S.P. Jain and K.L. Narang: *Cost Accounting*, Kalyani Publishers, Ludhiana, 10th edition, 2016.
2. I.M. Pandey, *Financial Management*, Vikas Publishing House Pvt. Ltd., 14th edition, 2016.

REFERENCE BOOKS:

1. The Institute of Company Secretaries of India, *Cost and Management Study Material*, New Delhi.
2. CA Saravana Prasath, *Cost Accounting and Financial management*, Wolters Kluwer India Pvt. Ltd., New Delhi, 2018.

VIDEO LECTURES:

1 https://www.youtube.com/watch?v=ESqO8sFgQa0&list=PLLhSIFfDZcUVE2kzOhEubO9rkvUOAgZbz

2 https://www.youtube.com/watch?v=tzasFmP1CpAhttps://www.youtube.com/watch?v=tzasFmP1CpA

WEB RESOURCES:

1 https://www.tutorialspoint.com/accounting_basics/management_versus_cost_accounting.htm

2 https://www.netsuite.com/portal/resource/articles/financial-management/financial-management.shtml

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22MG101701	ENTREPRENEURSHIP FOR MICRO, SMALL AND MEDIUM ENTERPRISES	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: To understand the setting up and management of MSMEs and initiatives of Government and other institutions support for growth and development of MSMEs

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the basic of SME and challenges of MSMEs

CO2. Explain the opportunities to Set-Up SSI/SME Units and role of rural & women entrepreneurship.

CO3. Illustrate roles of various institutions supporting MSMEs.

CO4. Understand Management of MSME, NPA & sickness units

CO5. Evaluate role of Government in Promoting Entrepreneurship

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	1	2	1	-	-	-	-	-	-
CO2	1	1	2	-	-		2		1	
CO3	2	2	1	-	-	-	-	1	-	-
CO4	3	1	2	-	-	-	-	-	-	-
CO5	2	2	1	-	-	1	-	-	-	-
Course Correlation Mapping	**2**	**2**	**2**	**2**	**1**	**1**	**2**	**1**	1	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: Introduction2 ***(07 Periods)***

Concept & Definition, Role of Business in the modern Indian Economy SMEs in India, Employment and export opportunities in MSMEs. Issues and challenges of MSMEs

Module 2: MSME Setting ***(09 Periods)***

Identifying the Business opportunity, Business opportunities in various sectors, formalities for setting up an enterprise - Location of Enterprise – steps in setting up an enterprise – Environmental aspects in setting up, Incentives and subsidies.

Module 3: MSMEs Supporting Institutions ***(09 Periods)***

Forms of Financial support, Long term and Short term financial support, Sources of Financial support, Development Financial Institutions, Investment Institutions, Central level institutions, State level institutions, Other agencies, Commercial Bank – Appraisal of Bank for loans

Module 4: Management of MSME ***(10 Periods)***

Management of Product Line; Communication with clients – Credit Monitoring System - Management of NPAs - Restructuring, Revival and Rehabilitation of MSME, Problems of entrepreneurs – sickness in SMI – Reasons and remedies –– Evaluating entrepreneurial performance

Module 5: Entrepreneurship Promotion ***(10 Periods)***

MSME policy in India, Agencies for Policy Formulation and Implementation: District Industries Centers (DIC), Small Industries Service Institute (SISI), Entrepreneurship Development Institute of India (EDII), National Institute of Entrepreneurship & Small Business Development (NIESBUD), National Entrepreneurship Development Board (NEDB)

Total Periods: 45

EXPERIENTIAL LEARNING

1. Present a case study on MSMEs Business Strategies.
2. Collect the data about nearby MSMEs and Present their structures in a PPT
3. Discuss in the group MSMEs opportunities in terms of Orientation and Develop mentation.

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in course handout.)

RESOURCES

TEXT BOOKS:

1. Vasant Desai, *Small Scale Industries and Entrepreneurship*, Himalaya Publishing House, 2003..
2. Poornima M Charanthimath, *Entrepreneurship Development Small Business Enterprises*, Pearson, 2006.

REFERENCE BOOKS:

1. Suman Kalyan Chaudhury, *Micro Small and Medium Enterprises in India Hardcover*, Raj Publications, 2013.
2. Aneet Monika Agarwal, *Small and medium enterprises in transitional economies, challenges and opportunities*, DEEP and DEEP Publications
3. Paul Burns & Jim Dew Hunt, *Small Business Entrepreneurship*, Palgrave Macmillan publishers, 2010.

VIDEO LECTURES:

1. https://sdgs.un.org/topics/capacity-development/msmes
2. https://blog.tatanexarc.com/msme/msme-schemes-in-india-for-new-entrepreneurs-and-start-ups/

WEB RESOURCES:

4. ncert.nic.in/textbook/pdf/kebs109.pdf
5. https://www.jetir.org/papers/JETIR1805251.pdf

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22CB101703	FORENSIC SCIENCE	3	-		-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed discussion on Concepts of Forensic Science, Tools and Techniques in Forensic Science, Forensic Photography, Crime Scene Management, Crime Scene Management Laws and Forensic Science.

COURSE OUTCOMES: *After successful completion of the course, students will be able to*:

CO1 Understand the basic concepts of Forensic science.

CO2 Apply various tools and techniques in forensic science for crime investigation.

CO3 Understand Forensic Photography fundamentals.

CO4 Perform Crime scene investigation, scene reconstruction and prepare reports.

CO5 Understand Legal aspects of Forensic Science.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3									
CO2	3	3	2	2	2					
CO3	3	3								
CO4	3	3	2	2	2					
CO5	3	3	2	2	2					
Course Correlation Mapping	**3**	**3**	**2**	**2**	**2**					

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: INTRODUCTION ***(09 Periods)***

Introduction, Need, Scope, Concepts and Significance of Forensic Science, History and Development of Forensic Science, Laws and Basic principles of Forensic Science, Branches of forensic science, Organizational set-up of a Forensic Science Laboratory. Investigative strategies. Expert testimony and eye-witness report.

Module 2: TOOLS AND TECHNIQUES IN FORENSIC SCIENCE ***(09 Periods)***

Basic principles of microscopy, spectroscopy, chromatography, Electrophoresis, Enzyme_Linked Immunosorbent Assay (ELISA), Radio Immuno Assay (RIA). Measuring and optical instruments. Research methodologies; Formation of research design on a specific problem. Central tendency and Dispersion. Test of significance. Analysis of variance, Correlation and Regression.

Module 3: FORENSIC PHOTOGRAPHY ***(8 Periods)***

Basic principles of Photography, Techniques of black & white and color photography, cameras, lenses, shutters, depth of field, film; exposing, development and printing techniques; Different kinds of developers and fixers; UV, IR, fluorescence illumination guided photography; Modern development in photography- digital photography, working and basic principles of digital photography; Surveillance photography. Videography and Crime Scene & laboratory photography.

Module 4: CRIME SCENE MANAGEMENT ***(11 Periods)***

Crime scene investigations, protecting and isolating the crime scene; Documentation, sketching, field notes and photography. Searching, handling and collection, preservation and transportation of physical evidences, Chain of custody and Reconstruction of scene of crime. Report writing.

Module 5: LAW AND FORENSIC SCIENCE ***(8 Periods)***

Legal aspects of Forensic Science: Forensic Science in the Criminal Justice System, The Criminal Investigation Process, Production of Evidence: The Subpoena, The Rules of Evidence, Authentication of Evidence: The Chain of Custody, The Admissibility of Evidence, Laboratory Reports, Examples of Analysis and Reports, Expert Testimony, Getting into Court, Testifying, Being a Witness and an Expert, Considerations for Testimony.

Total Periods: 45

EXPERIENCIAL LEARNING

1. Study of Computer Forensics and different tools used for forensic investigation
2. **Identify and list the steps for hiding and extract any text file behind an image file/ Audio file using Command Prompt**

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in course handout.

RESOURCES

TEXT BOOKS:

1. Houck M.M and Siegel J.A, *Fundamentals of Forensic Science*, Elsevier, 2nd edition, 2010.

2. Sharma B.R, *Forensic Science in Criminal Investigation and Trials*, Universal Publishing Co., New Delhi, 2003.

REFERENCE BOOKS:

1. Nanda B.B and Tewari, R.K, *Forensic Science in India- A vision for the Twenty First Century*, Select Publisher, New Delhi, 2001.

2. James, S.H and Nordby, J.J, *Forensic Science- An Introduction to Scientific and Investigative Techniques*, CRC Press, USA, 2003.

3. Saferstein, Criminalistics, *An Introduction of Forensic Science*, Prentice Hall Inc, USA,2007.

4. Barry, A.J. Fisher, *Techniques of Crime Scene Investigation*, CRC Press, NewYork, 7th edition, 2003.

VIDEO LECTURES:

1. https://nptel.ac.in/courses/106106178
2. https://www.youtube.com/watch?v=X5fo1H7bc0g

WEB RESOURCES:

1. https://www.nist.gov/forensic-science
2. https://www.coursera.org/learn/forensic-science

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22SS101704	INDIAN HISTORY	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: Introduction; Ancient India; Classical and Medieval era; Modern India; India after independence.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Demonstrate contextual knowledge in the evolution of ancient and medieval Indian History and acquire an awareness of societal and cultural transformation.

CO2 Analyze the situations before and after Independence and assess the societal reforms implemented in India after Independence.

CO3 Practice culture transformations and appreciate its influence to adapt themselves in global scenarios.

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	-	-	-	-	1	-	-	-	-
CO2	1	2	-	-	-	1	-	-	-	-
CO3	1	1	-	-	-	2	-	-	-	-
Course Correlation Mapping	2	1	-	-	-	2	-	-	-	-

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: INTRODUCTION TO INDIAN HISTORY ***(08 Periods)***

Elements of Indian History; History Sources: Archaeology, Numismatics, Epigraphy & Archival research; Methods used in History; History & historiography; Sociological concepts-structure, system, organization, social institutions, Culture and social stratification (caste, class, gender, power), State& Civil Society.

Module 2: ANCIENT INDIA ***(09 Periods)***

Mohenjo-Daro civilization; Harappa civilization; Mauryan Empire.

Module 3: CLASSICAL & MEDIEVAL ERA ***(12 Periods)***

Classic Era (200 BC - 1200 AD); Hindu - Islamic Era (1200 - 1800 AD).

Module 4: MODERN INDIA ***(06 Periods)***

Age of Colonialism (17th - 19th centuries); First war of Indian Independence; Freedom Struggle (1857-1947)

Module 5: INDIA AFTER INDEPENDENCE (1947 -) ***(10 Periods)***

The Evolution of the Constitution and Main Provisions; Consolidation of India as a Nation; Politics in the States; Indian economy; Modernization and globalization, Secularism and communalism, Nature of development, Processes of social exclusion and Inclusion, Changing Nature of Work and Organization.

Total Periods: 45

EXPERIENTIAL LEARNING

1. Prepare a write-up on how to safeguard ancient monuments.
2. Analyze the most famous historically important place you visited.
3. Prepare a presentation on the ancient Seven Wonders of the World with their significance and how they are destroyed.
4. Prepare a presentation on "Wars of the past not only destroyed people and their livelihood but also the people's tradition and culture."
5. Prepare a poster on " Continents that No Longer Exist" with causes

(Note: It's an indicative one. Course Instructor may change activities and shall be reflected in course Handout)

RESOURCES

TEXT BOOKS:

1. K. Krishna Reddy, *Indian History,* Tata McGraw-Hill, 21st reprint, 2017.

REFERENCE BOOKS:

1. Guha, Ramachandra, *India after Gandhi*, Pan Macmillan, 2007.
2. Romila Thapar, *Early India***,** Penguin India, New Delhi 2002.

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22SS101705	INDIAN TRADITION AND CULTURE	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: Basic traits of Indian Culture; Humanistic Reforms under Jainism and Buddhism; Culture in the medieval period; Socio Religious reforms in Indian Culture; Reform movements for harmonious relations.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Demonstrate knowledge of Vedic and Upanishadic culture and society to consider human aspirations, values and theories.

CO2 Understand the contributions of Buddhism and Jainism to Indian culture.

CO3 Examine the cultural conditions and achievements of India under Mouryas and Guptas.

CO4 Analyze social religious reforms and reform movements.

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	-	-	-	-	1	-	-	-	-
CO2	3	-	-	-	-	1	-	-	-	-
CO3	2	-	-	-	-	3	-	-	-	-
CO4	2	-	-	-	-	3	-	-	-	-
Course Correlation Mapping	**3**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: BASIC TRAITS OF INDIAN CULTURE ***(08 Periods)***

Meaning and definition and various interpretations of culture - Culture and its features - The Vedic and Upanishad culture and society - Human aspirations and values in these societies - Chaturvidhapurushardhas, Chaturashrma and Chaturvarna theory.

Module 2: HUMANISTIC REFORMS UNDER JAINISM AND BUDDHISM ***(09 Periods)***

Salient features of Jainism - contributions of Jainism to Indian culture - Contributions of Aachaarya and Mahaapragya - Buddhism as a humanistic culture - The four noble truths of Buddhism - Contributions of Buddhism to Indian culture.

Module 3: CULTURE IN THE MEDIEVAL PERIOD ***(09 Periods)***

Unifications of India under Mouryas and Guptas and their cultural achievements - Cultural conditions under satavahanas - Contributions to Pallavas and cholas to art and cultural achievements of Vijayanagara rulers

Module 4: SOCIO RELIGIOUS REFORMS IN INDIAN CULTURE ***(09 Periods)***

Western impact on India - Introduction of Western education - social and cultural awakening and social reform movements of Rajaramohan Roy - Dayanandha Saraswathi - Anne Besant (theosophical society).

Module 5: REFORM MOVEMENTS FOR HARMONIOUS RELATIONS ***(09 Periods)***

Vivekananda, Eswarchandravidyasagar and Veeresalingam - emancipation of women and struggle against caste - Rise of Indian nationalism - Mahatma Gandhi – Non-violence and satyagraha and eradication of untouchability.

Total Periods: 45

EXPERIENTIAL LEARNING

1. Identify different cultural festivals of Indian States and prepare a write-up on their uniqueness.
2. India has a rich history with numerous architectural wonders. Prepare a report on any three famous architectural wonders in India.
3. Explore the diverse flavors of Indian cuisine and prepare a poster on the different dishes and their distinctiveness.
4. India is a country of Unity in Diversity. Make a PowerPoint presentation on different traditional dresses of various cultural people.

(Note: It's an indicative one. Course Instructor may change activities and shall be reflected in course Handout)

RESOURCES

TEXT BOOKS:

1. Valluru Prabhakaraiah, *Indian Heritage and Culture*, Neelkamal Publications Pvt. Ltd. Delhi, 1/e, reprint 2015.

REFERENCE BOOKS:

1. L. P. Sharma, *History of Ancient India*, Konark Publishers, Pvt. Ltd. New Delhi, 2010.
2. L. P. Sharma, *History of Medieval India*, Konark Publishers, Pvt. Ltd. New Delhi, 2010.
3. The Cultural Heritage of India Vol-I, II, III, IV, V, The Ramakrishna Mission Institute of Culture, Calcutta

University Elective

Course Code	Course Title	L	T	P	S	C
22ME101704	MANAGING INNOVATION AND ENTERPRENEURSHIP	3	-	-	-	3

Pre-Requisite -
Anti-Requisite -
Co-Requisite -

COURSE DESCRIPTION:
Evolution of entrepreneurship from economic theory Managerial and entrepreneurial competencies; Concepts of Shifting Composition of the Economy Purposeful Innovation &Sources of Innovative Opportunity; The Innovation Process; Innovative Strategies; Entrepreneurial Motivation; Entrepreneurs versus inventors; Ethics and International Entrepreneurship; Strategic Issues in International Entrepreneurship; Problem solving Innovation and Diversification

COURSE OUTCOMES:
After successful completion of the course, students will be able to:

CO1. Demonstrate the principles of innovation process for establishing Industrial ventures.
CO2. Identify and analyze the gaps in an organization for innovation in the context of developed economies
CO3. Develop a comprehensive and well-planned business structure for a new venture.
CO4. Demonstrate knowledge on intellectual property rights, patents, trademarks, copyrights, trade secrets and commercialization of intellectual property.
CO5. Apply ethics in constructive innovation framework and problem solving.

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	1	1		1	1	1	1		
CO2	3	2	1		1					
CO3	3	3	1	1	1					
CO4	3	2	1	1	1	1				
CO5	3	3	3	1	1	1				
Course Correlation Mapping	**3**	**2**	**1**	**1**	**1**	**1**	**1**	**1**		

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: CREATIVITY AND INNOVATION ***(09 Periods)***

Introduction, Levels of innovation, Purposeful innovation and the sources of innovative opportunity, The innovation process, Innovative strategies, Strategies that aim at introducing and innovation, Dynamics of ideation and creativity – Inbound, Outbound; Context and process of new product development, Theories of outsourcing.

Module 2: PARADIGMS OF INNOVATION ***(09 Periods)***

Systems approach to innovation, Innovation in the context of developed economies and Emerging economies, Examining reverse innovation and itsapplication,Performancegap,Infrastructuregap,Sustainabilitygap,Regulatory gap, Preference gap, organizational factors effecting innovation at firm level.

Module 3: SOUCES OF FINANCE AND VENTURE CAPITAL ***(09 Periods)***

Importance of finance, Comparison of venture capital with conventional development capital, Strategies of venture funding, Investment phases, Investment process, Advantages and disadvantages of venture capital, Venture capital developments in India.

Module 4: INTELLECTUAL PROPERTY INNOVATION AND ENTREPRENEURSHIP ***(09 Periods)***

Introduction to Entrepreneurship, Evolution of entrepreneurship from economic theory, Managerial and entrepreneurial competencies, Entrepreneurial growth and development, Concepts, Ethics and Nature of International Entrepreneurship, Intellectual property – forms of IP, Patents, Trademarks, Design registration, Copy rights, Geographical indications, Patent process in India.

Module 5: OPEN INNOVATION FRAME WORK &PROBLEM SOLVING ***(09 Periods)***

Concept of open innovation approach, Difference between open innovations and Cloud innovation approaches, Limitations and Opportunities of open innovation frame work, Global context of strategic alliance, Role of strategic alliance, Problem Identification and Problem Solving, Innovation and Diversification

Total Periods:45

EXPERIENTIAL LEARNING

1. Identify the Innovative Marketing Strategies for Startups
2. Identify the Coca-cola Company Intellectual Property Rights

(Note: It's an indicative one. Course instructor may change the activities and the same shall be reflected in course handout)

CASE STUDIES/ARTICELS:

Contemporary relevant case studies/ Articles will be provided by the course instructor at the beginning.

1. Tesla Inc.: Disrupting the Automobile Industry

   This case study examines how Tesla Inc. disrupted the traditional automobile industry through its innovative electric vehicles and sustainable energy solutions. It discusses the sources of innovative opportunity that Tesla leverages, the ideation and creativity dynamics involved in new product development, and the strategies that the company uses to introduce and market its innovations.

2. Google Inc.: Innovation in Developed Economies

   This case study explores how Google Inc. became a global leader in the technology industry through its innovative search engine, advertising, and cloud computing solutions. It highlights the performance gap that Google addressed, the regulatory and sustainability gaps that it leveraged, and the impact of its innovation strategies on the company's growth and profitability.

3. Flipkart: From Startup to Unicorn

   This case study examines how Flipkart, an Indian e-commerce company, secured venture capital funding to become one of the largest online marketplaces in India. It discusses the importance of finance in entrepreneurship, the advantages and disadvantages of venture capital, and the strategies that Flipkart used to attract venture funding.

4. Patanjali Ayurved: Building a Brand through Intellectual Property

   This case study explores how Patanjali Ayurved, an Indian consumer goods company, built a strong brand through its intellectual property strategies. It discusses the forms of IP that Patanjali leverages, the patent process in India, and the impact of IP on the company's growth and profitability.

5. Procter & Gamble: Innovation through Open Innovation

   This case study analyzes how Procter & Gamble, a global consumer goods company, leveraged open innovation to achieve unprecedented success in product development and marketing. It discusses the difference between open and cloud innovation approaches, the limitations and opportunities of open innovation, and the role of strategic alliances in global innovation.

RESOURCES

TEXT BOOKS:

1. Vinnie Jauhari, Sudhanshu Bhushan, *Innovation Management*, Oxford University Press, 1st Edition, 2014.
2. Drucker, P.F., *Innovation and Entrepreneurship*, Taylor & Francis, 2nd Edition, 2007.

REFERENCE BOOKS:

1. Robert D Hisrich, Claudine Kearney, *Managing Innovation and Entrepreneurship,* Sage Publications,1st Edition, 2014.
2. V.K. Narayanan, *Managing Technology and Innovation for Competitive Advantage,*

Pearson India,1st Edition, 2002.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=wWsl48VLfVY
2. https://www.youtube.com/watch?v=dDpQ9ALKX0U
3. https://www.youtube.com/watch?v=Eu_hkxkJGTg

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22LG201701	**PERSONALITY DEVELOPMENT**	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course gives awareness to students about the various dynamics of personality development.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Demonstrate knowledge in Self-Management and Planning Career

CO2. Analyze the functional knowledge in attitudes and thinking strategies

CO3. Learn and apply soft skills for professional success.

CO4. Function effectively as an individual and as a member in diverse teams

CO5.Communicate effectively in public speaking in formal and informal situations.

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	1	-	-	-	-	-	-	-	-
CO2	2	3	-	-	-	-	-	-	-	-
CO3	2	2	-	-	3	-	-	-	-	2
CO4	1	1	-	-	-	-	-	-	3	3
CO5	-	-	-	-	-	-	-	-	-	3
Course Correlation Mapping	2	2	3	-	3	-	-	-	3	3

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: SELF-ESTEEM & SELF-IMPROVEMENT ***(09 Periods)***

Know Yourself – Accept Yourself; Self-Improvement: Plan to Improve - Actively Working to Improve Yourself- Exercises- case studies

Module 2: DEVELOPING POSITIVE ATTITUDES ***(09 Periods)***

How Attitudes Develop – Attitudes are Catching – Improve Your Attitudes – Exercises- case studies

Module 3 SELF-MOTIVATION & SELF-MANAGEMENT ***(09 eriods)***

Show Initiative – Be Responsible Self-Management; Efficient Work Habits – Stress Management – Employers Want People Who can Think – Thinking Strategies- Exercises- case studies

Module 4 GETTING ALONG WITH THE SUPERVISOR ***(09 Periods)***

Know your Supervisor – Communicating with your Supervisor – Special Communication with your Supervisor – What Should you Expect of Your Supervisor? – What your Supervisor expe

of you - Moving Ahead Getting Along with your Supervisor- Exercises- case studies

Module 5 WORKPLACE SUCCESS ***(09 Periods)***

First Day on the Job – Keeping Your Job – Planning Your Career – Moving Ahead- Exercises-

case studies

Total Periods: 45

EXPERIENTIAL LEARNING

1. List out the self-improvements in you on the charts and explain in detail.
2. Discuss different famous personalities and their attitudes.
3. Describe different personalities with respect to self-motivation and self-management.
4. Imagine you are a supervisor and illustrate different special communications.
5. Assume and Interpret different experiences on the first day of your job.

(Note: It's an indicative one. Course instructor may change the activities and the same shall be reflected in course handout)

RESOURCES

TEXTBOOK:

1. Harold R. Wallace and L. Ann Masters, *Personal Development for Life and Work*, Cengage Learning, Delhi, 10th edition Indian Reprint, 2011. (6th Indian Reprint 2015)
2. Barun K. Mitra, *Personality Development and Soft Skills,* Oxford University Press, 2011.

REFERENCE BOOKS:

1. K. Alex, *Soft Skills*, S. Chand & Company Ltd, New Delhi, 2nd Revised Edition, 2011.
2. Stephen P. Robbins and Timothy A. Judge*, Organizational Behaviour*, Prentice Hall, Delhi, 16th edition, 2014

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=6Y5VWBLi1es
2. https://www.youtube.com/watch?v=H9qA3inVMrA

WEB RESOURCES:

1. https://www.universalclass.com/.../the-process-of-perso...
2. https://www.ncbi.nlm.nih.gov/pubmed/25545842
3. https://www.youtube.com/watch?v=Tuw8hxrFBH8

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22CS101702	WEB DESIGN FUNDAMENTALS	3	-	-	-	3

Pre-Requisite	-
Anti-Requisite	-
Co-Requisite	-

COURSE DESCRIPTION: This course is designed to introduce the student to the technologies and facilities of web design: CSS, javascript, and jquery. Students will understand the web design process and use these software technologies together to produce web design projects.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the fundamentals of HTML 5 and the principles of web design.

CO2. Construct basic websites using HTML and Cascading Style Sheets.

CO3. Build dynamic web pages with validation using Java Script objects and by applying different event handling mechanisms.

CO4. Learn how to use HTML5 and other Web technologies to develop interactive and responsive web pages.

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	-	-	-	-	-	-	-
CO2	3	3	-	-	-	-	2	-	-	-
CO3	3	3	3	-	-	-	-	-	-	-
CO4	2	3	3	-	-	-	-	2	-	-
Course Correlation Mapping	**3**	**3**	**3**	**-**	**-**	**-**	**2**	**2**	-	**-**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: INTRODUCTION ***(09 Periods)***

Elements – Data types - Working with Text - Arranging Text - Displaying Lists - VAR Element - BDO Element - SPAN Element – DIV Element.

Module 2: LINKS AND URLS ***(09 Periods)***

Hyperlinks – URLs - Linking to a Mail System - Creating Tables - Inserting Images in a Web Page – Colors – Form Elements - Multiple-Choice Elements – Multimedia

Module 3: DYNAMIC HTML ***(09 Periods)***

Features of JavaScript - Programming Fundamentals - JavaScript Functions, Events, Image Maps, and Animations – JS Objects - Document Object - Validation, Errors, Debugging, Exception Handling, and Security

Module 4: CASCADING STYLE SHEET ***(09 Periods)***

CSS Syntax - CSS Selectors - Backgrounds and Color Gradients - Fonts and Text Styles - Creating Boxes and Columns - Displaying, Positioning, and Floating an Element - Table Layouts - : Effects, Frames, and Controls in CSS

Module 5: ADVANCED FEATURES OF HTML5 ***(09 Periods)***

Creating Editable Content - Checking Spelling Mistakes - Custom Data Attributes - Client-Side Storage - Drag and Drop Feature - Web Communication –**jQuery -** Fundamentals of jQuery - Callback Functions - jQuery Selectors - jQuery Methods to Access HTML Attributes.

Total Periods: 45

EXPERIENTIAL LEARNING

1. Design a blog layout that includes header, navigation menu, content area, sidebar. Apply appropriate styling to each section.

2. Develop a java script based quiz that presents MCQs to the user and provides immediate feedback on their answers. Keep track of the score and display the final results at the end.

3. Build a web page that displays and image gallery. Each image should be a clickable link that opens the image in a larger view when clicked.

(Note: It's an indicative one. The course instructor may change the activities and the same shall be reflected in course handout.)

RESOURCES

TEXTBOOKS

1. DT Editorial Services, *HTML 5 Black Book*, Dreamtech Press, 2nd Edition, 2016.

REFERENCE BOOKS

1. Jennifer Niederst Robbins, *HTML5 Pocket Reference,* O'Reilly, 5th Edition, 2018.
2. Ben Frain, *Responsive Web Design with HTML5 and CSS3*, Packt, 2nd Edition, 2020.

VIDEO RESOURCES

1. https://www.youtube.com/watch?v=h_RftxdJTzs
2. https://www.youtube.com/watch?v=dlkWNdnO8ek

WEB RESOURCES

1. https://www.w3schools.com/html/
2. https://www.w3schools.com/css/
3. https://www.geeksforgeeks.org/web-technology/
4. https://www.smashingmagazine.com/2021/03/complete-guide-accessible-front-endcomponents/
5. https://css-tricks.com/
6. https://davidwalsh.name/css-optional

UNIVERSITY ELECTIVE

Course Code	Course Title	L	T	P	S	C
22SS101706	**WOMEN EMPOWERMENT**	3	-	-	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: Concept & Framework, Status of Women, Women's Right to Work, International Women's Decade, and Women Entrepreneurship.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Demonstrate the knowledge of the characteristics and achievements of empowered women and women's empowerment techniques by analyzing women's legal and political status.

CO2 Apply the knowledge of women's rights by analyzing various societal issues and obstacles in different fields, including science and technology.

CO3 Demonstrate the knowledge of the significance of women's participation in policy debates, National conferences, and common forums for equality and development by identifying and analyzing issues.

CO4 Analyze the concept of women's entrepreneurship, government schemes, and entrepreneurial challenges and opportunities.

CO-PO Mapping Table

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	1	-	-	1	3	-	1	–	–
CO2	3	1	-	-	-	2	-	-	-	–
CO3	3	1	-	-	-	2	-	-	-	3
CO4	3	1	-	-	-	-	-	-	-	-
Course Correlation Mapping	3	1	-	-	1	3	-	1	–	3

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: CONCEPT & FRAMEWORK ***(09 Periods)***

Introduction– Empowered Women's Characteristics – Achievements of Women's Empowerment **Concept of Empowerment:** Meaning & Concept – Generalizations about Empowerment – Empowerment Propositions – Choices women can make for empowerment – Women's participation in decision making, development process & in Governance. **Framework for Empowerment** – Five levels of equality – Tenets of Empowerment– Elements – Phases and aspects – Techniques – Categories and Models – Approaches.

Module 2: STATUS OF WOMEN ***(09 Periods)***

Legal Status: Present Scenario – Call for Social Change – Significant Trends – Legal & Schemes – Personal Law – Joint Family – Criminal Law – Shift towards Dowry – Deterrent Punishment – Criminal Law (II Amendment) – Discrimination in Employment.

Political Status: Present Scenario – Political Participation & its NatureSocio–economic Characteristics – Political Mobilization: Mass Media – Campaign Exposure – Group Orientation – Awareness of issues and participation – Progress & Future Thrust.

Module 3: WOMEN'S RIGHT TO WORK ***(09 Periods)***

Introduction – Present Scenario – Changes in Policy & Programme – National Plan of Action– Women's Cells and Bureau – Increase in the work participation rate – Discrimination in the labour market – Women in unorganized sector – Issues and Obstacles– Women in Education – Women in Science & Technology – Case Study: Linking Education to Women's Access to resources.

Module 4: WOMEN'S PARTICIPATORY DEVELOPMENT ***(09 Periods)***

Dynamics of social change – conscious participation – Information Explosion – Organized Articulation – National Conference – Common Forums – Participatory Development – New Issues Identified – Role of other Institutions.

Module 5: WOMEN ENTREPRENEURSHIP ***(09 Periods)***

Introduction – Definition – Concept – Traits of women Entrepreneurs – Role of Women Entrepreneurs in India – Reasons for Women Entrepreneurship – Government schemes & Financial Institutions to develop Women Entrepreneurs – Key policy recommendations – Project Planning – Suggestions and measures to strengthen women entrepreneurship – Growth & Future challenges – Training and Opportunities – Case Study: Training Women as Hand–pump Mechanics– Case Study: Literacy for Empowering Craftswomen

Total Periods: 45

EXPERIENTIAL LEARNING

1. Prepare poster presentation on "impact of women's self-help groups on their empowerment and socio-economic development."
2. Prepare a comparative analysis chart on the status of women in various countries.
3. Prepare a presentation on women and cultural responsibilities in different societies.
4. Prepare a presentation on the women of the past, present and future in terms of responsibilities and duties.
5. Prepare a presentation on the great women entrepreneurs of India.

(Note: It's an indicative one. Course Instructor may change activities and shall be reflected in course Handout)

RESOURCES

TEXT BOOKS:

1. SahaySushama, *Women and Empowerment,* Discovery Publishing House, New Delhi, 2013.
2. NayakSarojini, Jeevan Nair, *Women's Empowerment in India*, Pointer Publishers, Jaipur, 2017.

REFERENCE BOOKS:

1. Baluchamy. S, *Women's Empowerment of Women*, Pointer Publishers, Jaipur, 2010.
2. Khobragade Grishma, *Women's Empowerment: Challenges and Strategies Empowering Indian Women*, Booksclinic Publishing, Chhattisgarh, 2020.

WEB RESOURCES:

1. https://www.economicsdiscussion.net/entrepreneurship/women–entrepreneurs–in–india
2. https://www.businessmanagementideas.com/entrepreneurship–2/women entrepreneurs

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22DF101001	RESEARCH METHODOLOGY AND BIOSTATISTICS FOR HEALTH PROFESSIONALS	4	-	-	-	4

Pre-Requisite -

Anti-Requisite 22DF102025 Research Methodology and Biostatistics

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed Knowledge on the basic principles of research and methods applied to draw inferences from the research findings. The students will also be made aware of the need of biostatistics and understanding of data, sampling methods, in addition to being given information about the relation between data and variables.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Understand concepts of research methodology.

CO2 Collect data for research in various methods.

CO3 Analyse research data by using biostatistics

CO4 Write their research or review papers to publish in journal

CO5 Work individually or in teams to solve problems with effective communication

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	-	1	-	3	1	-	-	-
CO2	1	1	2	-	2	-	-	-	3	-
CO3	1	1	2	-	1	-	-	1	-	1
CO4	2	1	2		2					1
CO5	1	2	2	-	3	2	1	-	-	-
Course Correlation Mapping	**1**	**1**	**2**	**1**	**2**	**3**	**1**	**1**	**3**	**1**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSE CONTENT

Module 1: FOUNDATIONS OF RESEARCH ***(10 Periods)***

Definition Research, Introduction to research methods, Objectives of Research, Identifying research problem, Types of Research & Research Approaches, Research Methods vs Methodology Ethical issues in research, Research design.

Module 2: RESEARCH PROBLEM AND DATA COLLECTION ***(09 Periods)***

Research Problem, Measurement & Scaling Techniques, Types of Data, Research tools and Data Research Problem, Measurement & Scaling Techniques, Types of Data, Research tools and Data collection methods, Sampling methods, randomization, crossover design, placebo, blinding techniques, Developing a research proposal.

Module 3: INTRODUCTION TO BIOSTATICS ***(09 Periods)***

Meaning, Definition, and Characteristics of Statistics, Importance of the Study of Statistics, Understanding of data in biostatistics, Statistics in Health Science, How & where to get relevant data, Relation between data & variables, Type of variables: defining data sets.

Module 4: DATA ANALYSIS AND DISSEMINATION ***(09 Periods)***

Basic Principles of Data Graphical Representation, Analysis of variance & covariance. Measures of central tendency include mean, median, and mode. Probability and standard distributions include binomial and normal distributions. Sample size calculation, Sampling techniques address sampling need, criteria, procedures, design errors, variation, and tests of significance. Statistical significance involves parametric and non-parametric tests.

Module 5: SCIENTIFIC WRITING ***(08 Periods)***

Introduction, reviewing literature, formulating research problems and proposals, integrating theory and data and understanding citation and referencing. types of reports, formal report layout, and journal standards (impact factor, citation index). importance of communicating science, challenges in scientific writing, plagiarism and its detection and writing scientific papers.

Total Periods: 45

EXPERIENTIAL LEARNING

LIST OF EXPERIMENTS:

1. To practice problems on various biostatistics tools
2. Demonstrate types of data collection from hospital.
3. To determine research statistics tools.
4. Analyze data by using SPSS.

RESOURCES

TEXT BOOKS:

3. S.P. Gupta, Statistical Methods, Sultan Chand & Sons, Edition 46,2023.
4. C.R. Kothari, Research Methodology, New age International Publisher, Edition 4, 2019.

REFERENCE BOOKS:

1. Himanshu Tyagi, Biostatistics Buster, Jaypee Brothers Medical Publishers, Edition 1,2011.
2. Bratati Banerjee, Mahajans Methods in Bistatistical for medical students and research workers, Jaypee Brothers Medical Publishers, Edition 9, 2018.

VIDEO LECTURES:

1. https://www.youtube.com/watch?v=d77eQz0_Sfk
2. https://www.youtube.com/watch?v=yOU_s0xzc-Y
3. https://www.youtube.com/watch?v=txIS0N0l9xU&list=PLEIbY8S8u_DK7i4Fj6Hgq8sn_l42k9H1L
4. https://www.youtube.com/watch?v=1Q6_LRZwZrc

WEB RESOURCES:

4. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8764821/
5. https://www.scribbr.com/category/methodology/
6. https://www.easybiologyclass.com/biostatistics-introduction-significance-applications-and-limitations-of-statistics/

SCHOOL CORE

Course Code	Course Title	L	T	P	S	C
22PT111006	**CLINICAL INTERNSHIP**	-	-	-	-	20

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course provides a detailed knowledge and hands on training to treat the patient with effective communication and evidence based.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1 Handle and treat the patients

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	2	3	1	-	1	-	1	**1**	**-**
Course Correlation Mapping	**3**	**2**	**3**	**1**	**-**	**1**	**-**	**2**	**1**	**-**

Correlation Levels: 3: High; 2: Medium; 1: Low

B.P.T. INTERNSHIP GUIDELINES:

Internship Goals and Objectives: Internship shall be part of the curriculum of the bachelor of Physiotherapy and shall be called "Rotatory clinical internship"

1. Goals: The goal of the internship programme is to train the Physiotherapy graduate in the patients independently.
2. Objectives- At the end of internship programme the Physiotherapy graduate should have following competencies.
3. Can assess, diagnose, prevent and treat the patients of Physiotherapy independently
4. Opportunity to develop confidence and increase skill in simulation and treatment delivery
5. Effective communicator with patient, families, colleagues and the community.
6. Ability to upgrade themselves with recent advances, treatment procedure and research in the field of Physiotherapy.
7. It is mandatory for the Institution conducting BPT Programme to have its own Physiotherapy clinic fully furnished with all the necessary equipment as per the curriculum of the Programme.
8. Institution shall have to satisfy themselves that satisfactory infrastructure facilities of Physiotherapy exist in the Institute /Hospital where the internship training has to be undertaken. Following parameters / guidelines have been suggested:
    - The hospitals must have separate Physiotherapy department with qualified and registered Physiotherapy professionals (with the respective Physiotherapy Council/ Commission).
    - The Institutes & the Hospitals should have the Physiotherapy section with all the necessary infrastructure facilities.
    - Senior Physiotherapist with sufficient clinical experience should manage the Physiotherapy departments in the Institutessuch a manner that they will be able to assess, diagnose and treat /Hospitals.

PROGRAM ELECTIVE

Course Code	Course Title	L	T	P	S	C
22PT101014	SPORTS PHYSIOTHERAPY	2	-	-	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course helps students to understand different types of exercises, energy transfer during exercise, body composition and various sports injuries and physiotherapy.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Understand the psychosocial factors, environmental factors & individual factors affecting the performance.

CO2. Analyse, the Musculo skeletal and cardiopulmonary dysfunction in terms of Biomechanical, Kinesiological and Biophysical basis & co-relate the same with the provisional diagnosis with clinical reasoning for fitness training & rehabilitation.

CO3. Analyze the body composition regularly and planning diet for the specific sports training.

CO4. Plan rehabilitation protocol for sports specific injuries focusing an early rehabilitation to injuries.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	2	1	-	-	-	-	-	1
CO2	3	3	2	1	-	-	-	-	-	1
CO3	3	3	2	1	1	1	-	-	-	1
CO4	3	3	2	1	-	1	-	-	-	1
Course Correlation Mapping	**3**	**3**	**2**	**1**	**1**	**1**	**-**	**-**	**-**	**1**

COURSECONTENT

Module1: Introduction ***(07 Periods)***

Training the aerobic and anaerobic energy system, Physiological responses, changes & adaptations to various exercises - aerobic exercises & anaerobic exercises in Pulmonary, Cardiovascular, Neuromuscular system, Hormones, Detraining effects of cardiovascular, musculoskeletal, and nervous system, Sports specific training and cross training.

Module2: Musculoskeletal and Cardiopulmonary injuries ***(08 Periods)***

Pre–participation examination, Causes & Mechanism of Sports Injuries, prevention of sports injuries to various structures. Common acute, chronic and overuse injuries in various sports at: - Shoulder girdle, Shoulder, Arm, Elbow, Forearm, Wrist & hand - Pelvis, hip, thigh, knee, leg, ankle & foot- Spine - Head - Thoracic cage and abdomen - Peripheral nerve injuries, injuries to muscles, ligament, tendon, bone, synovial joint structure (with physiological response to injury). Sporting emergencies & first aid, Cardiopulmonary Resuscitation; Shock management, Internal and External bleeding, Splinting, Stretcher use–Handling and transfer, Management of Cardiac arrest, Acute asthma, epilepsy, drowning, burn, medical management of mass participation. Heat stroke and Heat illness.

Module3: Body composition ***(05 Periods)***

Gross size and mass, length and height measurement, circumference of body parts, Skinfold thickness measurements, Different Body composition, Various methods to estimate body composition : water displacement method, under water weighing method, skinfold method, surface anthropometry, bioelectrical impedance analysis, ultrasound assessment of fat, arm X-ray assessment of fat, CT assessment of fat.

Module4: PT management

(10 Periods)

Exercise therapy, manual therapy, and electrotherapy management in various sports injuries.

EXPERIENTIAL LEARNING

1. Taping
2. On field Assessment
3. Evaluation of Physical Fitness: Assessment of strength, power, endurance (muscular & cardiac), VO_2max, flexibility, reaction time and pulmonary function.
4. Assessment of lower limb complex: Pelvis, hip, thigh, knee, leg, ankle, and foot
5. Assessment of upper limb complex: Shoulder girdle, shoulder, arm, elbow, forearm, wrist, and hand

RESOURCES

TEXTBOOKS:

1. , Bernhardt Donna, Churchill Livingstone ,Sport and physical therapy –, London 1995.
2. Bird, S. R., Black, N. Sports Injuries: Causes, Diagnosis, Treatment and Prevention. Cheltenham: Stanley Thomes, 1997
3. Brownstein, B. Functional movement in Orthopaedic and Sports Physical Therapy: Evaluation, Treatment and Outcomes. New York; London: Churchill Livingstone, 1997.
4. Hutson, M.A. Sports Injuries, Recognition and Management. Oxford: Oxford University Press, 2001 (3nd edition).
5. Cash, M. Sport and Remedial Massage Therapy. London: Edbury, 1996

VIDEOLECTURES:

1. https://youtu.be/LtO-DzWj0fc
2. https://youtu.be/aq4TQ_0-oz4
3. https://youtu.be/QAiw_QtDaWI
4. https://youtu.be/xUr6tS7QSdM
5. https://youtu.be/xQgYu4p1hvc
6. https://youtu.be/tBCtVoHTMzU

Web Resources:

1. https://www.pdfdrive.com/
2. https://www.physio-pedia.com/Principles_of_Exercise
3. https://nzihf.ac.nz/personal-training/exercise-principles/
4. https://sirc.ca/blog/environmental-factors-in-exercise-and-sports-performance/
5. https://www.physio-pedia.com/Body_Composition
6. https://www.physio-pedia.com/Exercise_Endocrine_System_Interaction

PROGRAM ELECTIVE

Course Code	Course Title	L	T	P	S	C
22PT102024	**CLINICAL RESONING AND EVIDENCE BASED PHYSIOTHERAPY**	1	-	2	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course helps the students to follow the evidence based practice with clinical reasoning which has to follow entire their career which enhance the professional growth.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Describe the concepts and evolution of Evidence-Based Physiotherapy and knowledge development.

CO2. Identify the qualities, responsibilities, and competencies of an Evidence-Based Practitioner.

CO3. assess and appraise different types of clinical evidence for validity and applicability.

CO4. Apply evidence to clinical decision-making and practice improvement in physiotherapy.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	3	2	1	-	-	-	-	-	1
CO2	3	3	2	1	-	-	-	-	-	1
CO3	3	3	2	1	1	1	-	-	-	1
CO4	3	3	2	1	-	1	-	-	-	1
Course Correlation Mapping	**3**	**3**	**2**	**1**	**1**	**1**	**-**	**-**	**-**	**1**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSECONTENT

Module1: FOUNDATIONS OF EVIDENCE-BASED KNOWLEDGE ***(03 Periods)***

Introduction to Evidence-Based Practice, Concepts of Evidence-Based Physiotherapy Development of Evidence-Based Knowledge

Module2: PROFESSIONALS IN EVIDENCE-BASED PRACTICE ***(04 Periods)***

The Individual Professional, Professionals within a discipline, Professionals across disciplines, Characteristics of an Evidence-Based Practitioner

Module3: SEARCHING AND APPRAISING EVIDENCE ***(04 Periods)***

Finding and Searching the Evidence, Assessing the Evidence, Systematically Reviewing the Evidence, Economic Evaluation of the Evidence

Module4: APPLYING AND COMMUNICATING EVIDENCE IN PRACTICE ***(04 Periods)***

Building Evidence in Practice, Communicating Evidence to Clients, Managers, and Funders, Research Dissemination, Transfer of Knowledge

Total Periods:15

EXPERIENTIAL LEARNING

1. Systematic reviews on specific conditions.
2. Journal presentations.
3. Case studies.
4. Outcome measurement scales.

RESOURCES

BOOKS:

1. Robert Herbert, Practical evidence based physiotherapy, Elsevier, 3rd Edition, 2022.
2. Dianne V Jewel, Guide to evidence based physical therapy practice, Jones and Barlett publishers, Inc. 4th Edition, 2017.

VIDEO LECTURES:

1. https://youtu.be/DBYgVbK25Ts
2. https://youtu.be/hd6LZRD4Jck
3. https://youtu.be/icNZOGLJoyc

WEB RESOURCES:

1. https://www.physio-pedia.com/Evidence_Based_Practice(EBP)_in_Physiotherapy
2. https://www.apta.org/patient-care/evidence-based-practice-resources

PROGRAM ELECTIVE

Course Code	Course Title	L	T	P	S	C
22PT102028	**PHYSIOTHERAPY IN ICU**	2	-	2	-	3

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course helps students to demonstrate the handling of the ventilators, bedridden complications, and other physiotherapy management in the critical care unit.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Assess respiratory failure using clinical parameters and diagnostic tools.

CO2. Describe artificial airway types, indications, and management principles.

CO3. Formulate physiotherapy strategies to minimize adverse effects of bed rest.

CO4. Apply positioning, mobilization, and postural techniques to improve respiratory and functional outcomes.

CO5. Integrate multidisciplinary approaches for patient-specific ICU physiotherapy management.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	3	2	-	-	-	-	-	-	1
CO2	3	3	2	-	-	-	-	-	-	1
CO3	3	3	2	-	-	-	-	-	-	
CO4	3	3	2	-	-	-	-	-	-	
CO5	3	3	2	-	-	-	-	-		
Course Correlation Mapping	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**1**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSECONTENT

Module 1: RESPIRATORY FAILURE – ETIOLOGY, TYPES & ASSESSMENT ***(06 Periods)***

Etiology of respiratory failure, Types of respiratory failure (Type I & Type II), Clinical and diagnostic assessment of respiratory failure, Physiological changes & early warning signs, Medical & physiotherapy considerations in management.

Module 2: ARTIFICIAL AIRWAYS & MECHANICAL VENTILATION ***(06 Periods)***

Artificial airways: ETT, tracheostomy, airway care, Mechanical ventilation basics, Phases of ventilation, Modes of artificial ventilation (CMV, AC, SIMV, PSV, CPAP, BiPAP), Ventilator volumes, pressures & settings, Physiotherapy implications of ventilator settings, Weaning from ventilator – protocols & criteria, Special considerations for ventilated patients

Module 3: EFFECTS OF PROLONGED BED REST IN ICU ***(06 Periods)***

Deleterious effects of immobilization on- Musculoskeletal system, Neurological System- Cardiovascular & respiratory systems, Metabolic & endocrine functions, Urinary & gastrointestinal systems, Integumentary system, Prevention strategies through early mobilization

Module 4: PHYSIOTHERAPY TECHNIQUES & INTERVENTIONS IN ICU ***(06 Periods)***

Oxygen therapy & humidification, Aerosol/ Nebulization therapy, Bronchial hygiene techniques (percussion, vibration, suctioning), Lung re-expansion therapy, Respiratory muscle strengthening, Positioning protocols, Relaxation & chest mobility exercises, Postural retraining, wound care & surgical site physiotherapy, Nutritional aspects in ICU care, Optimizing physical activity (early mobilization protocol),

Module 5: SPECIAL CONSIDERATIONS IN DIFFERENT ICUS ***(06 Periods)***

Neonatal & pediatric ICU physiotherapy, Surgical ICU & postoperative care, ICCU (cardiac ICU) physiotherapy, Burns ICU management, Artificial kidney (Dialysis) ICU physiotherapy, Multisystem complications & coordinated care.

Total Periods:30

EXPERIENTIAL LEARNING

1. Assessment and evaluation of the patient in ICU.
2. Adverse effects of prolong bed rest and ventilation and its prevention.
3. Early physiotherapy interventions (mobilization & stimulation of activities) passive and active treatments to be used, and parameters to be monitored during treatment.
4. Mechanical ventilation training in ICU.

RESOURCES

TEXTBOOKS:

1. Ian Mc conachie, Hand book of ICU therapy, Cambridge university press, 3rd edition, 2014.
2. Chang D W, Clinical application of mechanical ventilation, CENGAGE LEARNING EXCLUSIVE(CBS), 2016.
3. Marinos, The ICU book, Wolters Kluwer, 4th edition, 2013.

VIDEOLECTURES:

1. https://youtu.be/kdD8INZcVcY
2. https://youtu.be/iYUKVuKyZPE
3. https://youtu.be/w_IljK3mJy4
4. https://youtu.be/PcyvHEL8_3I
5. https://youtu.be/Q9JlZI3VGQ0

WEB RESOURCES:

1. https://www.physio-pedia.com/Respiratory_Physiotherapy_Techniques_for_ICU_Patients
2. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7008986/
3. https://www.chelwest.nhs.uk/your-visit/patient-leaflets/icu/role-of-the-physiotherapist-in-the-intensive-care-unit
4. https://www.physio-pedia.com/Physiotherapists_Role_in_ICU
5. https://www.physiospot.com/2021/06/10/intensive-care-physiotherapy-courses-perfect-for-clinicians-who-are-new-to-critical-care-settings/.

PROGRAM ELECTIVE

Course Code	Course Title	L	T	P	S	C
22PT102029	**NEURODEVELOPMENTAL TECHNIQUE**	2	-	-	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course helps students to understand the NDT approach to treat spasticity mainly in Cerebral palsy and other neurological spastic disorders.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Explain the theoretical foundations, principles, and evolution of NDT.

CO2. Identify impairments and set functional goals based on NDT assessment findings.

CO3. Apply NDT interventions to improve postural control, alignment, and motor function.

CO4. Evaluate treatment outcomes and integrate evidence-based approaches with NDT

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	3	2	-	-	-	-	-	-	1
CO2	3	3	2	-	-	-	-	-	-	1
CO3	3	3	2	-	-	-	-	-	-	1
CO4	3	3	2	-	-	-	-	-	-	1
Course Correlation Mapping	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**1**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSECONTENT

Module 1: INTRODUCTION & THEORETICAL FOUNDATIONS OF NDT ***(10 Periods)***

History and evolution of Neurodevelopmental Technique (Bobath Approach), Principles and philosophy of NDT, Motor control, motor learning & neuroplasticity concepts, Normal motor development stages, Postural control & alignment theories

Module 2: ASSESSMENT IN NDT ***(08 Periods)***

NDT clinical assessment framework, Evaluation of tone, posture, balance, and movement patterns, Identifying key points of control, Functional assessments in adults & pediatrics, Problem identification & goal setting

Module 3: NDT INTERVENTION TECHNIQUES ***(06 Periods)***

Handling techniques & facilitation methods, Key points of control and inhibition techniques, improving alignment, postural control & functional abilities, NDT techniques for upper limb, lower limb & trunk, Functional training: gait, sitting, reaching, transitions

Module 4: APPLICATION OF NDT IN CLINICAL CONDITIONS & OUTCOMES ***(06 Periods)***

NDT in Cerebral Palsy, Stroke, TBI, Developmental Delay, Pediatric vs adult NDT applications, Outcome measures & documentation, Integration of NDT with other therapeutic approaches, Evidence-based practice in NDT

Total Periods:30

EXPERIENTIAL LEARNING

1. Assessment and evaluation of cerebral palsy.
2. Adverse effects of stroke and its prevention.
3. Early physiotherapy interventions (mobilization & stimulation of activities) passive and active treatments to be used, and parameters to be monitored during neurological symptoms.
4. Bobath approach towards spasticity.

RESOURCES

TEXTBOOKS:

1. Sue Raine, Bobath concept – Theory and clinical practice in Neurological rehabilitation, Wiley Blackwell, 1st edition, 2009.
2. Gjelsvik, The Bobath concept in adult neurology, Thieme, 2nd edition, 2016.

VIDEOLECTURES:

1. https://youtu.be/z-DNrztQvUI
2. https://youtu.be/LZzQG-YhqI4
3. https://youtube.com/playlist?list=PLjoKqAT2R74pNVPtqz9ChY_eXh6wlvUz3&si=ujXPnXpEyH8hsAS2

WEB RESOURCES:

1. https://www.physio-pedia.com/Bobath_Approach
2. https://www.physio.co.uk/treatments/neurological-rehabilitation/bobath.php
3. https://www.unibo.it/en/study/phd-professional-masters-specialisation-schools-and-other-programmes/course-unit-catalogue/course-unit/2021/424613
4. https://academic.oup.com/ptj/article-abstract/81/3/924/2857641

PROGRAM ELECTIVE

Course Code	Course Title	L	T	P	S	C
22PT101011	**HEALTH PROMOTION AND FITNESS**	2	-	-	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course helps students to understand the theories of health and wellness, screening and assessment of fitness along with training.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Apply health education strategies and identify resources for promoting community wellness.

CO2. Explain the principles of health, wellness, and different health-care approaches.

CO3. Conduct fitness assessments and interpret results using standardized tools.

CO4. Design individualized exercise programs based on assessed fitness and health needs.

CO5. Apply prevention strategies appropriate for individuals across age groups and health conditions.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	3	2	-	1	-	1	-	-	1
CO2	3	3	2	-	1	-	1	-	-	1
CO3	2	2	2	-	1	-.	1	-	-	.1
CO4	3	3	2	-	1	-	1	-	-	1
Course Correlation Mapping	**3**	**3**	**2**	**-**	**1**	**-**	**1**	**-**	**-**	**1**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSECONTENT

Module 1: HEALTH & WELLNESS FOUNDATIONS ***(07 Periods)***

Concept of Health, Predictions of Health Care, Holistic Medicine vs. Conventional Medicine, Types of Prevention Practice, Primary, Secondary & Tertiary Prevention, Healthy People: Characteristics & Determinants

Module 2: HEALTH EDUCATION & COMMUNITY WELLNESS ***(06 Periods)***

Health Education Resources, Designing Health Education for Communities, Physiotherapist's Role in a Healthy Community, Community-Oriented Health Promotion, Resources to Optimize Health & Wellness, Marketing Health & Wellness

Module 3: FITNESS ASSESSMENT & SCREENING ***(07 Periods)***

Measuring Fitness & Fitness Components, BMI Calculations, Stress Assessment Using SurveysVisualizing Fitness (Charts/Graphs/Interpretation), Screening for Mental & Physical Fitness, Physical Activity Readiness Questionnaire (PAR-Q), Physical Activity Pyramid

Module 4: EXERCISE PLANNING & EVIDENCE-BASED PRACTICE ***(05 Periods)***

Exercise Programs: Planning & Implementation, FITT-VP Principles, Evidence-Based Practice for Fitness and Wellness, Health, Fitness & Wellness in Childhood and Adolescence, Health, Fitness & Wellness in Adulthood, Women's Health Issues (Special Focus on Pregnancy)

Module 5: PREVENTION PRACTICES ACROSS HEALTH CONDITIONS ***(05 Periods)***

Prevention Practice for Older Adults, Health Protection Strategies, Prevention Practice for: Musculoskeletal Conditions, Cardiopulmonary Conditions, Neuromuscular Conditions, Integumentary Disorders, Individuals with Developmental Disabilities

Total Periods:30

EXPERIENTIAL LEARNING

1. On field Assessment
2. Evaluation of Physical Fitness: Assessment of strength, power, endurance (muscular & cardiac), VO_2max, flexibility, reaction time and pulmonary function.

RESOURCES

TEXTBOOKS:

1. Philip Maffetone, Big book of health and fitness, Sky horse, 1st edition, 2012.
2. Barbara Richardson, Physiotherapy in occupational health – management, prevention, and health promotion in the workplace, Butterworth – Heinemann, 1994.
3. Jessica Urquhart, Work place health and safety management – D.I.Y guide, 2011.

VIDEOLECTURES:

1. https://youtu.be/onuZa6ilA8I
2. https://www.youtube.com/watch?v=mSLFPl_tvKs
3. https://youtu.be/CWOBuTfp60I
4. https://youtu.be/xUr6tS7QSdM
5. https://youtu.be/xQgYu4p1hvc
6. https://youtu.be/tBCtVoHTMzU

Web Resources:

1. https://healthsciences.humber.ca/programs/fitness-health-promotion.html
2. https://www.fanshawec.ca/programs/fhp1-fitness-and-health-promotion/next
3. https://nzihf.ac.nz/personal-training/exercise-principles/
4. https://www.conestogac.on.ca/fulltime/fitness-and-health-promotion/
5. https://www.physio-pedia.com/Body_Composition

PROGRAM ELECTIVE

Course Code	Course Title	L	T	P	S	C
22PT101017	**HAND REHABILITATION**	2	-	-	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course helps students to analyze different hand disorders and planning appropriate rehabilitation.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Evaluate hand function using standardized functional assessments and outcome measures.

CO2. Apply evidence-based management for burn injuries and post-trauma deformities of the hand.

CO3. Demonstrate physiotherapy interventions for arthritic and deformity-related hand conditions.

CO4. Formulate physiotherapy management plans for peripheral nerve injuries and brachial plexus palsies.

CO5. Perform taping techniques and functional training for different hand and wrist conditions.

CO-PO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	3	2	-	-	-	-	-	-	1
CO2	3	3	2	-	-	-	-	-	-	1
CO3	3	3	2	-	-	-	-	-	-	1
CO4	3	3	2	-	-	-	-	-	-	1
CO5	3	3	2	-	-	-	-	-	-	1
Course Correlation Mapping	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**1**

Correlation Levels: 3: High; 2: Medium; 1: Low

COURSECONTENT

Module 1: GENERAL & FUNCTIONAL EXAMINATION OF THE HAND ***(07 Periods)***

General Examination of Upper Extremity, Surface Anatomy & Clinical Inspection, Sensory Examination of the Hand, Motor Examination of the Hand, Functional Evaluation of the Hand, Outcome Measures for Hand Function, DASH, PRWE, Michigan Hand Questionnaire, Grip & Pinch Strength

Module 2: MANAGEMENT OF SOFT TISSUE INJURIES OF THE HAND ***(05 Periods)***

Physiotherapy Management of: Flexor Tendon Injuries, Extensor Tendon Injuries, Crush Injuries of the Hand, Burnt Hand & Post-burn Deformities, Hand Rehabilitation Protocols, Kleinert, Duran Protocols, Early Mobilization Technique

Module 3: MANAGEMENT OF JOINT & ARTHRITIC CONDITIONS ***(07 Periods)***

Arthritic Hand (RA, OA) – Physiotherapy Management, Deformities & Joint Instability, Post-fracture Rehabilitation, Fractures of Phalanges, Joint Stiffness & Contracture Management, Complex Regional Pain Syndrome (CRPS) – Graded Motor Imagery & Desensitization

Module 4: PERIPHERAL NERVE INJURIES & ENTRAPMENT NEUROPATHIES ***(05 Periods)***

Peripheral Nerve Injuries of: Median Nerve, Radial Nerve, Ulnar Nerve, Nerve, Axillary Nerve, Entrapment Neuropathies: Cubital Tunnel Syndrome, Carpal Tunnel Syndrome, Pronator Teres Syndrome, Supinator Tunnel Syndrome, Brachial Plexus Palsie, Nerve Injury-Based Rehabilitation, Sensory Re-education, Motor Re-learning, Strengthening & Functional Retraining

Module 5: ORTHOSIS, SPLINTING & TAPING FOR HAND CONDITIONS ***(06 Periods)***

Upper Limb Orthosis – Types & Indications Splint Preparation Techniques: POP Splints, Orthoplast Splints, Thermoplastic Splints, Taping Techniques for Wrist & Hand Conditions, Functional Training with Orthosis, Patient Education & Home Programs, Safety & Fabrication Principles

Total Periods:30

EXPERIENTIAL LEARNING

1. Hand Assessment
2. Different outcome measures of hand.
3. Specific rehabilitation protocols of hand injuries.

RESOURCES

1. J.M. Hunter , Rehabilitation of Hand and upper extremity, Mobsy, 5th edition, 2002.
2. Terri M. Skirven, Rehabilitation of hand and upper extremity, Elsevier, 7th edition, 2023.
3. Tubiana, Examination of hand & wrist, Evaluation, Treatment and Fundamentals of hand rehabilitation; Salter Mobsy publications.
4. Barbara G. Stanley, Concepts in hand rehabilitation, FA Davis company, 1992.

VIDEOLECTURES:

1. https://youtu.be/EwsO5gI5X4Y
2. https://youtu.be/T9H_yu0Me8c
3. https://youtu.be/9wWjAvAQlq0
4. https://youtu.be/16Hgmkbl3U8
5. https://youtu.be/OjdLdb7WpF0

WEB RESOURCES:

1. https://www.physio-pedia.com/Brachial_Plexus_Injury
2. https://www.physio-pedia.com/Rehabilitation_of_Hand_Burn_Injuries
3. https://bmjopen.bmj.com/content/11/4/e045260
4. https://www.arthritis.org/health-wellness/healthy-living/physical-activity/other-activities/9-exercises-to-help-hand-arthritis
5. https://www.mayoclinic.org/diseases-conditions/arthritis/in-depth/arthritis/art-20546847

PROGRAM ELECTIVE

Course Code	Course Title	L	T	P	S	C
22PT101016	**GERIATRICS PHYSIOTHERAPY**	2	-	-	-	2

Pre-Requisite -

Anti-Requisite -

Co-Requisite -

COURSE DESCRIPTION: This course gives an overview of different problems faced by old age people, physiological changes of aging, musculoskeletal physiotherapy evaluation, and management.

COURSE OUTCOMES: After successful completion of the course, students will be able to:

CO1. Describe the ageing process and identify common geriatric syndromes.

CO2. Perform basic geriatric assessment and interpret commonly used functional tools.

CO3. Explain and demonstrate essential physiotherapy interventions for major geriatric conditions.

CO4. Apply principles of community-based rehabilitation, fall prevention, and caregiver education in geriatric care.

CO-PO-PSO Mapping Table:

Course Outcomes	Program Outcomes									
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	3	3	2	-	-	-	-	-	-	1
CO2	3	3	2	-	-	-	-	-	-	1
CO3	3	3	2	-	-	-	-	-	-	1
CO4	3	3	2	-	-	-	-	-	-	1
CO5	3	3	2	-	-	-	-	-	-	1
Course Correlation Mapping	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**1**

Correlation Levels: ***3: High;*** ***2: Medium;*** ***1: Low***

COURSE CONTENT

Module 1: INTRODUCTION TO GERIATRICS & AGEING ***(06 Periods)***

Concepts of ageing: biological, physiological, psychological changes, Epidemiology demographic trends, Geriatric syndromes: frailty, falls, delirium, immobility, incontinenc, Scope & role of physiotherapy in geriatric care.

Module 2: GERIATRIC ASSESSMENT IN PHYSIOTHERAPY ***(08 Periods)***

Comprehensive Geriatric Assessment overview, Functional scales: ADL, IADL, FIM, Mobility & balance assessments: TUG, Berg Balance Scale, Pain assessment in elderly, Cognitive screening: MMSE / MoCA,Fall risk evaluation

Module 3: PHYSIOTHERAPY INTERVENTIONS FOR GERIATRIC CONDITIONS ***(10 Periods)***

Exercise prescription for elderly (strength, balance, endurance, flexibility), Training in osteoarthritis, osteoporosis, post-fracture rehab, Neuro-geriatric conditions: Parkinson's, stroke, Basic cardiopulmonary rehab for elderly, Assistive devices: types, indications & gait training, Home-based physiotherapy

Module 4: GERIATRIC REHABILITATION & COMMUNITY-BASED CARE ***(06 Periods)***

Multidisciplinary approach, Fall-prevention strategies & environmental modifications, Community-based rehabilitation (CBR) programs, Caregiver training: transfer techniques, safety, ergonomics, Active ageing, wellness & health promotion, Government policies for senior citizens.

Total Periods: 30

EXPERIENTIAL LEARNING

1. Case Scenario Discussions
2. Hands-on Practice of Geriatric Scales
3. Video-Based Gait Analysis
4. Designing Exercise Programs for Elderly
5. Participation in Community Awareness Program

RESOURCES

BOOKS:

1. Andrew A. Guccione, Rita Wong & Dale Avers -Guccione's Geriatric Physical Therapy-4th Edition (2019)- Elsevier(St. Louis) publishers
2. Susan O'Sullivan & Thomas Schmitz-Physical Rehabilitation- 8th Edition- F.A. Davis Company
3. B.R. Sharma - Essentials of Geriatric Medicine-1stt edition-O.P. Sharma, published by Viva Books Originals.
4. Carolyn Kisner & Lynn Allen Colby -Therapeutic Exercise: Foundations and Techniques- 8th Edition (2022)-F.A. Davis Company

VIDEO LECTURES:

1. https://youtu.be/jvIFA9W836w
2. https://youtu.be/v_Au06q5E18
3. https://youtu.be/Tx_rolpoS2w
4. https://youtu.be/xCB8T1TRguA
5. https://youtu.be/C6SDYeilb6M

WEB RESOURCES:

1. https://www.pdfdrive.com/
2. https://www.physio-pedia.com/
3. https://nzihf.ac.nz/personal-training/exercise-principles/
4. https://www.physio-pedia.com/Maitland%27s_Mobilisations
5. https://en.wikipedia.org/