

FIFTH SEMESTER

1. **PATHOLOGY & MICROBIOLOGY - I**
2. **PHARMACOLOGY - I**
3. **PHYSICAL AGENTS & ELECTROTHERAPY - I**
4. **THERAPEUTIC EXERCISES & TECHNIQUES**
5. **SOCIOLOGY**
6. **HEALTH & WELLNESS**
7. **SUPERVISED CLINICAL PRACTICE - I**

PATHOLOGY & MICROBIOLOGY - I **CREDIT HOURS 2 (2-0)**

COURSE DESCRIPTION:

Students will develop an understanding of pathology underlying clinical disease states and involving the major organ systems. Epidemiological issues will be presented and discussed. Students will learn to recognize pathology signs and symptoms that are considered “red flags” for serious disease. Students will use problem-solving skills and information about pathology to decide when referral to another health care provider or alternative intervention is indicated. Students will be expected to develop the ability to disseminate pertinent information and findings, and ascertain the appropriate steps to follow.

COURSE OUTLINE:

GENERAL PATHOLOGY **CELL INJURY AND DEATH**

- Causes of cell injury
- Necrosis
- Apoptosis
- Subcellular responses.

CELL ADAPTATIONS

- Hyperplasia
- Hypertrophy
- Atrophy
- Metaplasia
- Intracellular accumulation.

INFLAMMATION

- Acute inflammation
 - Vascular events
 - Cellular events
 - Chemical mediators

CHRONIC INFLAMMATION

- General
- Granulomatous
- Morphologic patterns of acute and chronic inflammation.

HEALING AND REPAIR

- Normal controls
- Repair by connective tissue
- Wound healing.

HAEMODYNAMIC DISORDERS

- Edema
- Hyperemia / congestion
- Hemorrhage
- Thrombosis
- Embolism
- Infarction
- Shock.

DISEASES OF IMMUNITY

- General features
- Hypersensitivity reactions
- Immune deficiencies
- Autoimmunity
- Amyloidosis.

NEOPLASIA

- Nomenclature
- Molecular basis
- Carcinogenic agents
- Clinical aspects.

MICROBIOLOGY

THE BACTERIA

- Bacterial cell structure
- Bacterial forms and function
- Bacterial identification and classification
- The gram stain.

METHODS OF STUDYING MICRO-ORGANISM

- Culturing, inoculation and identification
- Types of media
- Physical states of media.

MICROBIAL GROWTH

- Stages in the normal growth curve
- Microbial genetics
- Prokaryotic transcriptions and translations
- Conjugations
- Mutation and its causes
- Mechanism of drug resistances
- Pathogenesis
- Gateway to infection
- Resident flora
- Mechanism of invasions
- Classic stages of clinical infection
- Sterilization and disinfection.

RECOMMENDED TEXT BOOKS:

1. *Pathology: implications for the Physical therapist* by: Catherine cavallaro Goodman, 3rd edition.
2. *Basics & advanced Human Pathology.*
3. *Pathology* by Robbins.
4. *Introduction to Pathology* by Weight.
5. *Lecture notes on Pathology* by Thomas and Cotton.
6. *General Pathology* by Florey *Medical Microbiology and Immunology* By: Levinson and Jawetz, 9th Ed., Mc Graw-Hill.

PHARMACOLOGY - I **CREDIT HOURS: 3 (3-0)**

COURSE DESCRIPTION:

This course covers the basic knowledge of pharmacology including administration, physiologic response and adverse effects of drugs under normal and pathologic conditions. Topics focus on the influence of drugs in rehabilitation patient/client management. Drugs used in iontophoresis and phonophoresis will be discussed in detail.

COURSE OUTLINE:

GENERAL PRINCIPLES OF PHARMACOLOGY

- Basic Principles of Pharmacology
- Pharmacokinematics; Drug Administration, Absorption, and Distribution
- Pharmacokinematics; Drug Elimination
- Drug Receptors.

PHARMACOLOGY OF THE CENTRAL NERVOUS SYSTEM

- Central Nervous System Pharmacology, General Principles
- Sedative-Hypertonic and Anxiety Agents

- Drugs used to treat affective Disorders; Depression and Manic-Depression
- Antipsychotic Drugs
- Antiepileptic Drugs
- Pharmacologic Management of Parkinson Disease
- General Anesthetics
- Local Anesthetics.

DRUGS AFFECTING SKELETAL MUSCLE

- Skeletal Muscle Relaxants.

DRUGS USED TO TREAT PAIN AND INFLAMMATION

- Opioid Analgesics
- Nonsteroidal Anti-Inflammatory Drugs (NASID)
- Pharmacologic Management of Rheumatoid Arthritis and Osteoarthritis
- Patient-Controlled Analgesia.

AUTONOMIC AND CARDIOVASCULAR PHARMACOLOGY

- Introduction to Autonomic Pharmacology
- Cholinergic Drugs
- Adrenergic Drugs
- Antihypertensive Drugs
- Treatment of Angina Pectoris
- Treatment of Cardiac Arrhythmias
- Treatment of Congestive Heart Failure
- Treatment of Coagulation Disorders and Hyperlipidemia.

RECOMMENDED TEXT BOOKS:

1. Pharmacology in Rehabilitation (3rd Edition)By Charles D. Ciccone.
2. Pharmacology, Richard A, Harvey, 2nd Edition, Lippincott's.
3. Mutlianthore text book of Pharmacology and Therapeutics, M. Cheema, A Vol 1 and Vol 2.

PHYSICAL AGENTS & ELECTROTHERAPY - I

CREDIT HOURS: 3 (2-1)

COURSE DESCRIPTION:

This course tends to explore fundamental skills in application of electromodalities and knowledge of indications, contraindications and physiological principles needed for appropriate patient care. It includes topics such as electric stimulation, T.E.N.S. Iontophoresis, ultrasound /Phonophoresis, diathermy and electro diagnostic testing etc.

COURSE OUTLINE:

INTRODUCTION & GENERAL CONSIDERATION OF ELECTROTHERAPY

TYPES OF CURRENT USED

- Low frequency current
- Medium frequency current.

LOW FREQUENCY CURRENT

- Faradic current
- Sinusoidal current
- Galvanic current
 - constant galvanic current
 - modified galvanic current
- Superimposed currents
- Transcutaneous electrical nerve stimulation (TENS)
- Dia-dynamic currents.

MEDIUM FREQUENCY CURRENT

- Interferential Current
- Introduction, physical principles, electro-physiological effects
- Clinical applications, methods of application
- Treatment consideration & contraindications.

FARADIC CURRENT

- Detailed description of faradic current
- Treatment techniques
- Methods of application.

SINUSOIDAL CURRENT

- Detailed description of sinusoidal current
- Treatment
- Methods of application.

GALVANIC CURRENT

- Constant galvanic current
 - Detailed description of galvanic current treatment
 - Methods of application
 - Dangers, precautions, contraindications
- Ionization.

MEDICAL IONIZATION

- Theory & proof of ionization
- Effects of various ions, i.e iodine, salicylate, albucid, copper, zinc, histamine, carbacol, renotinenovocaine, lithium
- Techniques of medical ionization with vasodilator drugs

- Techniques for special areas.

MODIFIED GALVANIC CURRENT

- Definition
- Physical effects
- Therapeutic effects
- Uses
- Treatment techniques & methods of application
- Electrical stimulation of nerve & muscle
 - A nerve impulse
 - Property of accommodation
- Electrical Reactions
- Normal & abnormal reactions of nerve & muscle to faradism & interrupted direct current
- Changes in electrical reaction in
 - Upper motor neurons
 - Lower motor neurons
 - Muscular disease
- Methods of electrical test
 - Faradic & I. D. C test
 - Strength duration curve
 - Accomodity test
 - Electromyography
 - Definition, method, value, uses of E. M. G, Electromyography & temperature , feed back technique.

SUPER IMPOSED CURRENT

- Introduction
- Definition
- Effects & uses
- Technique, Methods, Dangers & Precautions.

TRANSCUTANEOUS ELECTRICAL STIMULATION (TENS)

- Definition
- Theoretical basis of pain
- Equipment selection
- Electrode placement
- Clinical indications.

DIA DYNAMIC CURRENT

- Definition and introduction
- Basic currents (MF,DF)
- Derivative of basic current
- Brief description of Dia dynamic and basic currents
- Characteristics of dia-dynamic current,
- Techniques of application & treatment, frequency of treatment.

- Clinical indication e.g. Sprain ankle, Sciatica. Facial neuralgia. Trigeminal neuralgia & Qtitis media.

PRACTICAL TRAINING/ LAB WORK:

- Location of motor points
- Faradic & I.D.C test
- Strength duration curve, determination of Rheobase and Chronaxie
- Accommodity test
- Electromyography
- Definition, method, value, uses of E.M.G, Electromyography & temperature, feed back technique
- Practical application of TENS in physical therapy treatment ward
- Reflective clinical case studies
- Iontophoresis
- Demonstration of techniques during practical classes, later on techniques practiced by students on patients attending the department under supervision of trained physiotherapists.

Note:

The students are expected to make a record of his/her achievements in the log book. The log book is a collection of evidence that learning has taken place. It is a reflective record of achievements. The log book shall also contain a record of the procedures which student would have performed/observed.

RECOMMENDED TEXT BOOKS:

1. Clayton's *Electrotherapy and Actinotherapy*, 10th edition by PM Scott.
2. *Electrotherapy: Evidence based Practice*, 11th edition by Shelia Kitchen.
3. Michelle H Cameron's *Physical Agent in Rehabilitation: From research to Practice*.
4. *Electrotherapy and Electrodiagnosis* by S. Lient.
5. *Applications of Shortwave Diathermy* by P.M. Scott.
6. *Practical Electrotherapy* by Savage.

THERAPEUTIC EXEDRCISES & TECHNIQUES

CREDIT HOURS: 3 (2-1)

COURSE DESCRIPTION:

This course presents anatomical and physiological principles to allow students to develop integrated therapeutic exercise interventions. Students have the opportunity to develop an acquired understanding of physiological responses to various types of training and develop skills in prescription, implementation, and modeling of exercise programs. Exercise components of strength, aerobic/ anaerobic conditioning, flexibility, balance and stage of healing/rehabilitation are examined. Evidence of appropriate, safe and effective exercise design and proper exercise biomechanics and prescription

parameters are addressed with all interventions. Exercise considerations for special populations and across the age span are covered. Concepts are presented in lecture and practiced in the laboratory.

COURSE OUTLINE:

GENERAL CONCEPTS

THERAPEUTIC EXERCISE: FOUNDATIONAL CONCEPTS

- Therapeutic exercise: impact on physical function
- Process and models of disablement
- Patient management and clinical decision making: an
- Interactive relationship:
- Strategies for effective exercise and task-specific
- Instruction.

PREVENTION, HEALTH, AND WELLNESS

- Role of physical therapy in healthy people.

APPLIED SCIENCE OF EXERCISE AND TECHNIQUES

RANGE OF MOTION

- Types of ROM exercises
- Indications and goals for ROM
- Limitations of ROM exercises
- Precautions and contraindications to ROM exercises
- Principles and procedures for applying ROM Techniques
- ROM techniques
- Self-assisted ROM
- Continuous passive motion
- ROM through functional patterns.

STRETCHING FOR IMPAIRED MOBILITY

- Definitions of terms related to mobility and stretching
- Properties of soft tissue—response to immobilization and stretch
- Determinants, types, and effects of stretching interventions
- Procedural guidelines for application of stretching interventions
- Precautions for stretching
- Adjuncts to stretching interventions
- Manual stretching techniques in anatomical planes of motion.

PERIPHERAL JOINT MOBILIZATION

- Definitions of terms; mobilization/manipulation, self-mobilization (auto-mobilization), mobilization with movement, physiological movements, accessory movements, thrust, manipulation under anesthesia, muscle energy
- Basic concepts of joint motion: arthrokinematics
- Indications for joint mobilization

- Limitations of joint mobilization techniques contraindications and precautions
- Procedures for applying passive joint mobilization techniques
- Mobilization with movement: principles of application
- Peripheral joint mobilization techniques including Shoulder Girdle Complex, Elbow and Forearm Complex, Wrist Complex, Hand and Finger Joints, Hip Joint, Knee and Leg, Ankle and Foot Joints.

RESISTANCE EXERCISE FOR IMPAIRED MUSCLE PERFORMANCE

- Muscle performance and resistance exercise—definitions and guiding principles
- Skeletal muscle function and adaptation to resistance exercise
- Determinants of an exercise programme
- Exercise programme
- Physiological changes that occur with training
- Determinants of resistance exercise
- Types of resistance exercise
- General Principles of Resistance Training
- Precautions For Resistance Exercise
- Contraindications to resistance exercise
- Manual resistance exercise; definition and use, guidelines and special considerations, techniques—general background, upper extremity, lower extremity
- Proprioceptive neuromuscular facilitation—principles and Techniques
- Diagonal patterns, basic procedures with PNF patterns, upper extremity diagonal patterns, lower extremity diagonal patterns, specific techniques with PNF
- Mechanical resistance exercise; use in rehabilitation, use in conditioning programs, special considerations for children and older adults
- Selected resistance training regimens
- Equipment for resistance training.

PRINCIPLES OF AEROBIC EXERCISE

- Application of principles of an aerobic conditioning program for the patient with coronary disease; inpatient phase
 - (phase i) outpatient phase
 - (phase ii) outpatient program
 - (phase iii) special considerations, adaptive changes
- Applications of aerobic training for the de-conditioned individual and the patient with chronic illness
- Age differences; children, young adults, older adults.

AQUATIC EXERCISE

- Background and principles for aquatic exercise
- Definition of aquatic exercise

- Goals and indications for aquatic exercise
- Precautions and contraindications to aquatic exercise
- Properties of water
- Aquatic temperature and therapeutic exercise
- Special equipment for aquatic exercise
- Exercise interventions using an aquatic environment stretching exercises
- Strengthening Exercises
- Aerobic Conditioning.

PRACTICAL TRAINING:

- Practical demonstration of ROM techniques
- Practical demonstration of stretching techniques
- Practical demonstration of resisted exercise techniques
- Practical demonstration of peripheral joint mobilization techniques
- Aerobic exercises
- Balance training
- Hydrotherapy
- Reflective clinical case studies
- Supervised and independent Practical application of therapeutic techniques on patients in outdoor and indoor physiotherapy treatment settings.

Note:

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RECOMMENDED TEXT BOOKS:

1. *Therapeutics Exercises and Technique*, By: Carolyn Kisner & Lynn Allen Colby 4th, 5th edition.
2. *Therapeutics Exercises: Techniques for Intervention* By: Willim D. Bandy.
3. *Clinical decision making in therapeutic exercise* By: Patricia e. Sullivan & prudence d. Markos, Appleton & Lange Norwalk, Connecticut.

SOCIOLOGY

CREDIT HOURS: 2 (2-0)

COURSE DESCRIPTION:

This course covers the basic knowledge and concepts of sociology to with the aim to help them understand the impact of group, culture and environment on the behavior and health of the patients. Make them realize the importance of the relationship of the physical therapist and the patient and the environment around them

COURSE OUTLINE:

INTRODUCTION TO SOCIOLOGY

- Definition
- Subject matter
- Sociology
- The science of society.

SOCIAL ACTION AND INTERACTION

- Social processes
- Co-operation
- Competition
- Conflict and Accommodation.

SOCIAL GROUPS

- Primary-Secondary
- In and Out Group
- Reference group.

CULTURE

- Meanings
- Materials
- Non-material aspects of culture
- Values
- Beliefs
- Sanctions
- Cultural relativism and Ethnocentrism
- Norms
- Folk ways
- Mores and Laws
- Role and Status
- Conflict
- Deviancy
- Social control.

SOCIALIZATION AND PERSONALITY

- Socialization and personality formation

SOCIAL INSTITUTION

- Meanings
- Social stratification
- Meanings and Forms (Classes and Castes).

SOCIAL AND CULTURAL CHANGE

- Factors of promoting and resisting social change.

THE FIELD OF MEDICAL SOCIOLOGY

- Contribution of sociology to medicine
- Social causes of diseases
- Aging and its socio-medical implication
- Environmental pollution and health
- Patient perspective of Illness
- Patient, Physiotherapist relationship
- Role of Physiotherapists and attendants in the managements of patient.

RECOMMENDED TEXT BOOKS:

1. *Text book of Community Medicine* by: Park J E. Latest Edition
2. *David, Tucket (ed), 1976, An Introduction to Medical Sociology, Lahore, Tavistock Publication.*
3. *Horton, Paul B. and Chester L. Hunt, 1984 Sociology, Singapore: McGraw Hill Book Co.*
4. *Moon, Graham, 1995. Society and Health; An introduction to Social Science for Professionals, London: Routledge.*
5. *Smelter Heil J. 1993. Sociology, New Delhi, Prentice Hall of India.*

HEALTH & WELLNESS **CREDIT HOURS 2 (2-0)**

COURSE DESCRIPTION:

This course includes discussion on the theories of health and wellness, including motivational theory, locus of control, public health initiative, and psycho-Social, spiritual and cultural consideration. Health risks, screening, and assessment considering epidemiological principles are emphasized. Risk reduction strategies for primary and secondary prevention, including programs for special populations are covered.

COURSE OUTLINE:

PREVENTION PRACTICE: A HOLISTIC PERSPECTIVE FOR PHYSICAL THERAPY

- Defining Health
- Predictions of Health Care
- Comparing Holistic Medicine and Conventional Medicine
- Distinguishing Three Types of Prevention Practice.

HEALTHY PEOPLE

- Definition of healthy people
- Health education Resources
- Physical Therapist role for a healthy community.

KEY CONCEPTS OF FITNESS

- Defining & Measuring Fitness
- Assessment of Stress with a Survey
- Visualizing Fitness
- Screening for Mental and Physical Fitness
- Body Mass Index calculations.

FITNESS TRAINING

- Physical Activities Readiness Questionnaire
- Physical Activities Pyramid
- Exercise Programs
- Evidence-Based Practice.

SCREENING FOR HEALTH, FITNESS, AND WELLNESS

- Distinguishing Screening, Examination, and Evaluation
- Interviewing for Health, Fitness and Wellness
- Vital Signs, 3-minute Step Test, and Borg perceived Scale of Exertion
- Seven Dimensions of Wellness
- Physical Health Screening.

HEALTH, FITNESS, AND WELLNESS ISSUES DURING CHILDHOOD AND ADOLESCENCE

- Structure and Function
- Recognizing and Reporting Child abuse
- Denver II Developmental Screening
- Special Concerns in Pediatrics
- Programme for Prevention of Obesity.

HEALTH, FITNESS, AND WELLNESS DURING ADULTHOOD

- Tasks of Adulthood
- Adult Health and Wellness Risks
- Screening Tools for Adulthood
- Adult Educational Materials.

WOMEN'S HEALTH ISSUES: FOCUS ON PREGNANCY:

- Screening for Women's Health
- Women's Heart Disease
- Female Athlete Triad
- Educational Material for Women
- Prepartum and Postpartum Exercises.

PREVENTION PRACTICE FOR OLDER ADULTS

- Ageism
- Anatomical and Physiological Changes with Aging
- Common Health Problems of Older Adults
- Screening Older Adult for Health Fitness and Wellness
- Fitness for Older Adults.

RESOURCES TO OPTIMIZE HEALTH AND WELLNESS

- Chronic Illness
- Nutrition
- Progressive Relaxation
- Time management
- Spirituality.

HEALTH PROTECTION

- Infection Control
- Injury Prevention during Childhood
- Injury prevention during Adolescence
- Injury Prevention during Adulthood
- Injury Prevention during Older Adulthood.

PREVENTION PRACTICE FOR MUSCULOSKELETAL CONDITIONS

- Musculoskeletal, Changes in Childhood and Adolescence
- Musculoskeletal Changes with Aging
- Ergonomics
- Workplace Screening for Musculoskeletal Risk.

PREVENTION PRACTICE FOR CARDIOPULMONARY CONDITIONS

- Common Cardiopulmonary Disorders
- Screening for Cardiopulmonary Conditions
- Prevention of Cardiovascular Conditions
- Prevention of pulmonary Conditions
- Recommended Exercises for Chronic Diseases.

PREVENTION PRACTICE FOR NEUROMUSCULAR CONDITIONS

- Prevention Practice for Stroke
- Prevention Practice for spinal Cord Injury
- Prevention Practice for Parkinson's disease
- Prevention practice for Multiple Sclerosis.

PREVENTION PRACTICE FOR INTEGUMENTARY DISORDERS

- Lifespan Changes of the integumentary System
- Skin Care.

PREVENTION PRACTICE FOR INDIVIDUALS WITH DEVELOPMENTAL DISABILITIES

- Defining Developmental Disabilities
- Misconceptions about Disabilities
- Promoting Health for Individuals with Developmental Disabilities
- Quality of life for Individuals with Developmental Disabilities.

MARKETING HEALTH AND WELLNESS

- Definition of Marketing
- Marketing Strategies for health and wellness Centres.

RECOMMENDED TEXT BOOKS:

1. A Physical Therapist's Guide to Health, Fitness, and Wellness, By Catherine R Thompson, PhD, MS, PT.

SUPERVISED CLINICAL PRACTICE - I CREDIT HOURS 3 (0-3)

HISTORY TAKING

SEMESTER	SUPERVISION	FOCUS	WARDS	COMPETENCIES
5	Supervised by trained PT	History Taking	All wards	As listed below

COURSE DESCRIPTION:

During this supervised clinical practice, students are responsible for learning the art of history taking, the first interaction with patient. Students learn the skills under supervision of trained physical therapists. Students become familiar with performance of these skills in all settings (inpatient and outpatient) as well as on all types of patients (surgical, non-surgical, pediatric, geriatric, etc.).

The emphasis is placed on general history taking skills as well as its pertinence to all systems (musculoskeletal, Integumentary, cardiovascular, pulmonary, and neurological.) Student is required to keep a performance record of all listed competencies and successfully perform on real patients during the final evaluation of the course.

CLINICAL COMPETENCIES

Review pertinent medical records and conduct an interview which collects the following data:

- Past and current patient/client history
- Demographics
- General health status
- Chief complaint
- Medications
- Medical/surgical history
- Social history
- Present and pre-morbid functional status/activity
- Social/health habits
- Living environment
- Employment
- Growth and development
- Lab values
- Imaging
- Consultations
- Documentation of the history.