

**CURRICULUM
FOR
5 YEARS DEGREE PROGRAMME
IN
PHYSICAL THERAPY**

DOCTOR OF PHYSICAL THERAPY (DPT)



2020

SHAHEED ZULFIQAR ALI BHUTTO MEDICAL UNIVERSITY,
ISLAMABAD

DOCTOR OF PHYSICAL THERAPY (DPT)

INTRODUCTION

Physical therapy is an essential segment of modern health care system. It is a “science of healing and art of caring”. It pertains to the clinical examination, evaluation, assessment, diagnosis and treatment of musculoskeletal, Neurological, Cardio-Vascular and Respiratory systems’ functional disorders including symptoms of pain, edema, and physiological, structural and psychosomatic ailments. It deals with methods of treatment based on movement, manual therapy, physical agents, and therapeutics modalities to relieve the pain and other complications.

Hence, Physical therapy covers basic parameters of healing sciences i.e. preventive, diagnostic, rehabilitative, and curative.

GOALS OF THE PROGRAM:

THE PURPOSE OF THE DOCTOR OF PHYSICAL THERAPY PROGRAM (DPT) IS TO PREPARE PHYSICAL THERAPISTS WHO WILL:

1. Be primary providers of physical therapy care.
2. Serve as responsible members in the professional community and are willing and able to assume leadership roles in the communities they serve.
3. Identify researchable problems, advocate and participate in research, and incorporate research findings into clinical practice.
4. Understand and place in context the social, economic and cultural issues of practice and effectively advocate for changes in policy
5. Correlate theory with practice and think creatively about, react to, adapt or shape new practice environments.
6. Participate in and provide education for communities, patients, peers, students and others.

OBJECTIVES OF THE PROGRAM:

GRADUATES OF THE DOCTOR OF PHYSICAL THERAPY PROGRAM WILL:

1. Demonstrate in-depth knowledge of the basic and clinical sciences relevant to physical therapy, both in their fundamental context and in their application to the discipline of physical therapy.

2. Understand, correlate and apply theoretical foundations of knowledge to the practice of physical therapy; evaluate and clarify new or evolving theory relevant to physical therapy.
3. Demonstrate the behaviors of the scholarly clinician by developing and utilizing the process of critical thinking and inquiry, particularly focused on the improvement of the practice of physical therapy and the delivery of health care.
4. Engage in reflective practice through sound clinical decision making, critical self-assessment and commitment to lifelong learning.
5. Demonstrate mastery of entry level professional clinical skills. Provision of these services is based on the best available evidence and includes physical therapy examination, evaluation, diagnosis, prognosis, intervention, prevention activities, wellness initiatives and appropriate health care utilization.
6. Prepared to influence the development of human health care regulations and policies that are consistent with the needs of the patient and of the society.
7. Demonstrate leadership, management, and communication skills to effectively participate in physical therapy practice and the health care team.
8. Incorporate and demonstrate positive attitudes and behaviors to all persons.
9. Demonstrate the professional and social skills to adapt to changing health care environments to effectively provide physical therapy care.

***SCHEME OF STUDIES FOR 5 YEARS (10 SEMESTERS)**
DOCTOR OF PHYSICAL THERAPY (DPT) PROGRAM

SEMESTER/YEAR		NAME OF SUBJECT	CREDITS
FIRST	Course Code	FIRST PROFESSIONAL YEAR	
	DAN 511	ANATOMY –I	4(3-1)
	DPH 512	PHYSIOLOGY-I	3(2-1)
	DKI 513	KINESIOLOGY-I	3(2-1)
	DFE 514	ENGLISH-I(FUNCTIONAL ENGLISH)	3(3-0)
	DPS515	PAKISTAN STUDIES	2(2-0)
	DIC 516	INTRODUCTION TO COMPUTERS	3(2-1)
			18
SECOND	DAN 521	ANATOMY –II	4(3-1)
	DPH 522	PHYSIOLOGY-II	3(2-1)
	DKI 523	KINESIOLOGY-II	3(2-1)
	DFE 524	ENGLISH-II(FUNCTIONAL ENGLISH)	3(3-0)
	DIS 525	ISLAMIC STUDIES/ ETHICS	2(2-0)
	DSO 526	SOCIOLOGY	2(2-0)
			17
		SECOND PROFESSIONAL YEAR	
THIRD	DTE 531	ENGLISH-III (Technical Writing & Presentation Skills)	3(3-0)
	DAN 532	ANATOMY –III	3(2-1)
	DPH 533	PHYSIOLOGY-III	3(2-1)
	DBE 534	BIOMECHANICS & ERGONOMICS-I	3(3-0)
	DBI 535	BIOCHEMISTRY I	2(2-0)
	DMP 536	MEDICAL PHYSICS	3(2-1)

			17
FOURTH	DAN 541	ANATOMY-IV (Neuro Anatomy)	3(2-1)
	DBE 542	BIOMECHANICS & ERGONOMICS-II	3(2-1)
	DHW 543	HEALTH & WELLNESS	2(2-0)
	DBC 544	BIOCHEMISTRYII	3(2-1)
	DEP 545	EXERCISE PHYSIOLOGY	3(2-1)
	DMG 546	MOLECULAR BIOLOGY & GENETICS	2(2-0)
			16
		THIRD PROFESSIONAL YEAR	
FIFTH	DPM 551	PATHOLOGY & MICROBIOLOGY I	2(2-0)
	DPT 552	PHARMACOLOGY & THERAPEUTICS I	2(2-0)
	DPE 553	PHYSICAL AGENTS & ELECTROTHERAPY I	3(2-1)
	DTE 554	THERAPEUTIC EXERCISES7 TECHNIQUES	3(2-1)
	DBS 555	BEHAVIORAL SCIENCES	2(2-0)
	DSB 556	BIOSTATISTICS I	3(3-0)
	DSC 557	SUPERVISED CLINICAL PRACTICE I	3(0-3)
			18
SIXTH	DPM 561	PATHOLOGY & MICROBIOLOGY II	3(2-1)
	DPT 562	PHARMACOLOGY & THERAPEUTICS II	2(2-0)
	DPE 563	PHYSICAL AGENTS & ELECTROTHERAPY -II	3(2-1)
	DSB 564	BIOSTATISTICS II	3(2-1)
	DCR 565	COMMUNITY MEDICINE & REHABILITATION	3(3-0)
	DSC 566	SUPERVISED CLINICAL PRACTICE II	3(0-3)
			17

SEVENTH		FOURTH PROFESSIONAL YEAR	
	DME 571	MEDICINE I	3(3-0)
	DSU 572	SURGERY I	3(3-0)
	DRD 573	RADIOLOGY & DIAGNOSTIC IMAGING	3(2-1)
	DMP 574	MUSCULOSKELETAL PHYSICAL THERAPY	3(2-1)
	DEB 575	EVIDENCE BASED PRACTICE	3(2-1)
	DSC 576	SUPERVISED CLINICAL PRACTICE III	3(0-3)
			18
EIGHT	DME 581	MEDICINE II	3(3-0)
	DSU 582	SURGERY II	3(3-0)
	DNP 583	NEUROLOGICAL PHYSICAL THERAPY	3(2-1)
	DEP 584	EMERGENCY PROCEDURE & PRIMATY CARE IN PHYSICAL THERAPY	3(2-1)
	DSR 585	SCIENTIFIC METHODOLOGY & RESEARCH METHODOLOGY	3(2-1)
	DSC 586	SUPERVISED CLINICAL PRACTICE IV	3(0-3)
			18
		FIFTH PROFESSIONAL YEAR	
NINTH	DCD 591	CLINICAL DECISION MAKING & DIFFERENTIAL DIAGNOSIS	3(3-0)
	DCP 592	CARDIOPULMONARY PHYSICAL THERAPY	3(2-1)
	DPO 593	PROSTHETICS & ORTHOTICS	2(2-0)
	DMT 594	MANUAL THERAPY	3(2-1)
	DPP 595	PROFESSIONAL PRACTICE	2(2-0)

		(LAWS , ETHICS &ADMINISTRATION)	
	DIP 596	INTEGUMENTRY PHYSICAL THERAPY	2(2-0)
	DSC 597	SUPERVISED CLINICAL PRACTICE V	3(0-3)
			18
TENTH	DOG 5101	OBSTETRICS & GYNAECOLOGICAL PHYSICAL THERAPY	2(2-0)
	DPP 5102	PAEDIATRIC PHYSICAL THERAPY	2(2-0)
	DGG 5103	GERONTOLOGY &GERIATRIC PHYSICAL THERAPY	2(2-0)
	DSP 5104	SPORTS PHYSICAL THERAPY	2(2-0)
	DSC 5105	SUPERVISED CLINICAL PRACTICE VI	4(0-4)
	DRP 5106	RESEARCH PROJECT	6
			18
		TOTAL CREDITS	175

- This scheme of curriculum is also applicable to annual system; in which two consecutive semesters will be considered as one professional year.
- Credit hours distribution is as following
 - **Theory:** one credit hour shall be equal to one hour of teaching per week throughout the semester
 - **Practical / lab:** one credit hour shall be equal to two hours of lab work per week throughout the semester
 - **Clinical:** one credit hour shall be equal to three hours of clinical work per week throughout the semester
 - **Thesis:** one credit hour shall be equal to three hours of research work per week throughout the semester

HOUSE JOB

One year of house job will be incorporated at the end of five year degree program.

FIRST SEMESTER

- 1. ANATOMY -I**
- 2. PHYSIOLOGY-I**
- 3. KINESIOLOGY-I**
- 4. ENGLISH-I(FUNCTIONAL ENGLISH)**
- 5. PAKISTAN STUDIES**
- 6. INTRODUCTION TO COMPUTERS**

ANATOMY I

CREDIT HOURS 4 (3-1)

COURSE DESCRIPTION:

The focus of this course is an in-depth study and analysis of the regional and systemic organization of the body. Emphasis is placed upon structure and function of human movement. A comprehensive study of human anatomy with emphasis on the nervous, musculoskeletal, and circulatory systems is incorporated. Introduction to general anatomy lays the foundation of the course. Dissection and identification of structures in the cadaver supplemented with the study of charts, models and radiographs are utilized to identify anatomical landmarks and configurations of the upper limb and thoracic region.

DETAILED COURSE OUTLINE

CELL BIOLOGY

GENERAL ANATOMY & FUNCTIONAL ANATOMY

- Terms related to position and movements
- The skin and subcutaneous tissues
- Layers of skin
- Integuments of skin
- Glands associated with hair follicle
- Microscopic picture of skin

BONES AND CARTILAGES

- Osteology
- Functions of Bones
- Classification of bones
- Parts of developing long bones
- Blood supply of bones
- Lymphatic vessels & nerve supply
- Rule of direction of nutrient foramen
- Gross structure of long bone
- Surface marking
- Cartilage
- Development of bone and cartilage
- Microscopic picture of cartilage and bone

THE MUSCLE

- Introduction
- Histological Classification
- Functions of muscles in general
- Type of skeletal muscles
- Parts of skeletal muscle and their action
- Nomenclature.
- Microscopic picture of muscle

STRUCTURES RELATED TO MUSCLES & BONES

- Tendons
- Aponeurosis
- Fasciae
- Synovial bursae
- Tendon Synovial sheaths
- Raphaes
- Ligaments
- Condyle
- Epicondyle
- Ridge
- Tuberosity
- Tubercle
- Foramen
- Canal
- Groove
- Process
- Spur

THE JOINTS

- Introduction
- Functional classifications
- Structural classification

- Structures comprising a Synovial joint
- Movements of joints
- Blood supply of Synovial joints, their nerve supply and lymphatic drainage
- Factors responsible for joint stability.
- Development of joints

CARDIOVASCULAR SYSTEM

- Definition
- Division of circulatory system into pulmonary & systemic
- Classification of blood vessels and their microscopic picture
- Heart and its histology
- Function of the Heart
- Anastomosis

NERVOUS SYSTEM

- Definition
- Outline of cellular architecture
- Classification of nervous system
- Parts of the central nervous system
- Microscopic picture of cerebrum, cerebellum, spinal cord
- Functional components of a nerve
- Typical spinal nerve
- Microscopic picture of nerve
- Introduction of autonomic nervous system
- Anatomy of neuromuscular junction

GENERAL HISTOLOGY:

- Cell
- Epithelium
- Connective tissue
- Muscle tissue
- Bone
- Nervous tissues
- Blood vessels

- Skin and appendages
- Lymphatic organs

GENERAL EMBRYOLOGY

- Male and female reproductive organs
- Cell divisions and gametogenesis
- Fertilization cleavage blastocytes and implementation of the embryo stages of fetal development
- Fetal Membrane
- Developmental Defects

UPPER LIMB

OSTEOLOGY:

- Detailed description of all bones of upper limb and shoulder girdle along their musculature and ligamentous attachments.

MYOLOGY

- Muscles connecting upper limb to the axial skeletal
- Muscles around shoulder joint
- Walls and contents of axilla
- Muscles in brachial region
- Muscles of forearm
- Muscles of hand.
- Retinacula,
- Palmar apouenrosis
- Flexor tendon dorsal digital expansion

NEUROLOGY

- Course, distribution and functions of all nerves of upper limb
- Brachial plexus

ANGIOLOGY (CIRCULATION).

- Course and distribution of all arteries and veins of upper limb.
- Lymphatic drainage of the upper limb
- Axillary lymph node

- Cubital fossa

ARTHROLOGY

- Acromioclavicular and sternoclavicular joints
- Shoulder joint
- Elbow joint
- Wrist joint
- Radioulnar joints
- Inter carpal joints
- Joints MCP and IP
- Surface Anatomy of upper limb
- Surface marking of upper limb

DEMONSTRATIONS:

- Demonstration on Shoulder joint, attached muscles and articulating surfaces.
- Demonstration on Elbow joint.
Demonstration on Wrist joint
- Demonstration on Radioulnar joint.
- Demonstration on MCP and IP joints.
- Demonstration on acromioclavicular joint
- Demonstration on sternoclavicular joint
- Demonstration on Brachial plexus.
- Demonstration of blood supply of brain.
- Demonstration on Structure of bones

PRACTICAL

During study of Gross Anatomy, emphasis should be given on applied aspect, radiological anatomy, surface anatomy and cross-sectional anatomy of the region covered in the respective semester.

RECOMMENDED TEXT BOOKS:

1. *Gray's Anatomy* by Prof. Susan Standring 39th Ed., Elsevier.
2. *Clinical Anatomy for Medical Students* by Richard S.Snell.
3. *Clinically Oriented Anatomy* by Keith Moore.
4. *Clinical Anatomy* by R.J. Last, Latest Ed.
5. *Cunningham's Manual of Practical Anatomy* by G.J. Romanes, 15th Ed., Vol-I, II and III.
6. *The Developing Human. Clinically Oriented Embryology* by Keith L. Moore, 6th Ed.
7. *Wheater's Functional Histology* by Young and Heath, Latest Ed.
8. *Medical Histology* by Prof. LaiqHussain.
9. *Neuroanatomy* by Richard S.Snell.

PHYSIOLOGY I

CREDIT HOURS 3 (2-1)

COURSE DESCRIPTION:

The course is designed to study the function of the human body at the molecular, cellular, tissue and systems levels. The major underlying themes are: the mechanisms for promoting homeostasis; cellular processes of metabolism, membrane function and cellular signaling; the mechanisms that match supply of nutrients to tissue demands at different activity levels; the mechanisms that match the rate of excretion of waste products to their rate of production; the mechanisms that defend the body against injury and promote healing.

These topics are addressed by a consideration of nervous and endocrine regulation of the cardiovascular, hematopoietic, pulmonary, renal, gastrointestinal, and musculoskeletal systems including the control of cellular metabolism. The integrative nature of physiological responses in normal function and disease is stressed throughout the course.

This course will serve as pre requisite for the further courses i.e. exercise physiology, pathology, etc.

DETAIL COURSE OUTLINE

COURSE DESCRIPTION

The course is designed to study the function of the human body at the cellular, tissue and systems levels. The course will help students in understanding the complexities of the cells, tissues, and major organs and systems of the human body, concentrating on basic mechanisms underlying human life processes and important diseases affecting normal human function

LEARNING OBJECTIVES

- Define the terminology related to the structure and function of the human body systems
- Compare and contrast the structural and functional characteristics of the various human body cells
- Describe basic chemical concepts and principles as they apply to the structure and functioning of the blood and neuromuscular system
- Analyze the interrelationships of body organ systems, homeostasis, and the complementarity of structure and functioning of the blood and neuromuscular system
- Demonstrate advanced techniques to investigate the body and interpret data to be used for diagnosis and treatment
- Define the principles behind medical instrumentation and their usage

COURSE CONTENTS

CELL PHYSIOLOGY

- Functional organization of human body
- Homeostasis
- Control systems in the body
- Cell membrane and its functions
- Cell organelles and their functions
- Genes: control and function

NERVE AND MUSCLE

- Structure and function of neuron
- Physiological properties of nerve fibers
- Action potential
- Conduction of nerve impulse
- Nerve degeneration and regeneration
- Synapses
- Physiological structure of muscle
- Skeletal muscle contraction
- Skeletal, smooth and cardiac muscle contraction
- Neuromuscular junction and transmission
- Excitation contraction coupling
- Structure and function of motor unit

BLOOD

- Composition and general functions of blood
- Plasma proteins their production and function
- Erythropoiesis and red blood cell function
- Structure, function, production and different types of hemoglobin
- Iron absorption storage and metabolism
- Blood indices, Function, production and type of white blood cells
- Function and production of platelets
- Clotting mechanism of blood
- Blood groups and their role in blood transfusion
- Complications of blood transfusion with reference to ABO & RH
- incompatibility
- Components of reticuloendothelial systems, gross and

- microscopic structure including tonsil, lymph node and spleen
- Development and function of reticuloendothelial system

LAB WORK

- Use of the microscope
- Determination of hemoglobin
- Determination of erythrocyte sedimentation rate
- Determining packed cell volume
- Measuring bleeding and clotting time
- RBC count
- Red cell indices
- WBC count
- Leukocyte count
- Prothrombin and thrombin time.
- Blood indices in various disorders
- Clotting disorders
- Blood grouping and cross matching

Note

The students are expected to make a practical note book. The book is collection of evidence that learning has taken place. It is a reflective record of their achievements

RECOMMENDED BOOKS

1. *Textbook of Physiology by Guyton and Hall, Latest Ed.*
2. *Review of Medical Physiology by William F. Ganong, Latest Ed.*
3. *Physiology by Berne and Levy, Latest Ed.*
4. *Human Physiology: The Basis of Medicine by Gillian Pocock, Christopher D. Richards*
5. *Physiological Basis of Medical Practice by John B. West and Taylor, 12th Ed.*

KINESIOLOGY I

CREDIT HOURS3 (2-1)

COURSE DESCRIPTION:

This course covers the definition of kinesiology as well as its importance in physical therapy. It identifies the scope of kinesiology and studies its application. It covers the types of human motions as well as plane and relative axis of motion. It also explains the inter-relationship among kinematic variables and utilizes this knowledge to describe and analyze motion.

This course additionally covers the classification of the joints and muscles along their distinguishing characteristics; group action of muscles arthrokinematics and osteokinematics of human movement

DETAIL COURSE OUTLINE

INTRODUCTION TO KINESIOLOGY

- Definition of kinesiology
- Definition of rehabilitation

MECHANICS:

Mechanical Principles and Mechanics of Position

- Force - force system – Description of units.
- Gravity: Center of gravity and line of gravity
- Level of gravity
- Equilibrium
- Fixation and Stabilization

Mechanics of movement

- Axes /Plane
- Speed
- Velocity
- Acceleration
- Momentum
- Inertia

- Friction
- Lever - types - application
- Pulley - types - application
- Anatomical application of lever system and other pulley system application
- Angle of pull

INTRODUCTION TO MOVEMENT

- The body levers
- Forces applied to the body levers
- Types of movement and posture
- Patterns of movement
- Timing in movement
- Rhythm of movement
- The nervous control of movement

STARTING POSITIONS

- Definition
- Fundamental positions
- Standing
- Kneeling
- Sitting
- Lying
- Hanging
- The pelvic tilt

POSTURE

- Inactive postures
- Active postures
- The postural mechanism
- The pattern of posture
- Principles of Re- Education
- Techniques of Re-Education
- Prevention of muscles wasting

- The initiation of muscular contraction
- Strengthening methods
- Abnormal postures

MUSCLE STRENGTH AND MUSCLE ACTION

- Types of Muscles contraction
- Muscles tone
- Physiological application to postural tone
- Group action of muscles
- Overview of muscle structure
- Types of muscle work
- Range of muscle work
- Group action of muscles
- Two joint muscle work
- Active and passive insufficiency
- Group movement of joints
- Muscular weakness and paralysis

PRACTICAL TRAINING/ LAB WORK

- Fundamentals of muscle testing
- Methods of muscle recording
- Basic muscle grading system
- Evaluation of posture
- Regional upper limb muscle testing as the region is covered in Anatomy I
- Practical demonstrations of muscles work and its ranges
- Practical demonstrations of various fundamental positions and posture analysis.

RECOMMENDED TEXT BOOKS:

1. *Practical exercise therapy* by Margaret Hollis
2. *Brunnstrom's Clinical Kinesiology*
3. *Clinical kinesiology and anatomy* by Lynn S Lippert
4. *Joint structure and function: a comprehensive analysis* by: Pamela. K. Levangie and Cynthia. C. Norkin.

5. *Muscle function testing* by: Cunningham and Daniel.
6. *Human movement explain* by kimjonas and karenbaker
7. *The principles of exercise therapy* by: M Dena Gardiner, 4th Edition

ENGLISH I
(FUNCTIONAL ENGLISH)
CREDIT HOURS 3 (3-0)

Objectives: Enhance language skills and develop critical thinking.

Course Contents

- Basics of Grammar
- Parts of speech and use of articles
- Sentence structure, active and passive voice
- Practice in unified sentence
- Analysis of phrase, clause and sentence structure
- Transitive and intransitive verbs
- Punctuation and spelling

Comprehension

- Answers to questions on a given text

Discussion

- General topics and every-day conversation (topics for discussion to be at the discretion of the teacher keeping in view the level of students)

Listening

- To be improved by showing documentaries/films carefully selected by subject teachers

Translation skills

- **Urdu to English**

Paragraph writing

- Topics to be chosen at the discretion of the teacher

Presentation skills

- Introduction

Note: Extensive reading is required for vocabulary building

RECOMMENDED TEXT BOOKS:

Functional English

Grammar

1. *Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 1. Third edition. Oxford University Press. 1997. ISBN 0194313492*
2. *Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press. 1997. ISBN 0194313506*

Writing

- Writing. Intermediate by Marie-Christine Boutin, Suzanne Brinand and Françoise Grellet. Oxford Supplementary Skills. Fourth Impression 1993. ISBN 0 19 435405 7 Pages 20-27 and 35-41.
- Reading/Comprehension
- Reading. Upper Intermediate. Brian Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1992. ISBN 0 19 453402 2.

Speaking

PAKISTAN STUDIES
(COMPULSORY)
CREDIT HOURS 2 (2-0)

Introduction/Objectives

- Develop vision of historical perspective, government, politics, contemporary Pakistan, ideological background of Pakistan.
- Study the process of governance, national development, issues arising in the modern age and posing challenges to Pakistan.

Course Outline

- **Historical Perspective**
 - Ideological rationale with special reference to Sir Syed Ahmed Khan, Allama Muhammad Iqbal and Quaid-i-Azam Muhammad Ali Jinnah.
 - Factors leading to Muslim separatism
 - People and Land
 - ❖ Indus Civilization
 - ❖ Muslim advent
 - ❖ Location and geo-physical features.
- **Government and Politics in Pakistan**

Political and constitutional phases:

- 1947-58
 - 1958-71
 - 1971-77
 - 1977-88
 - 1988-99
 - 1999 onward
- **Contemporary Pakistan**
 - Economic institutions and issues
 - Society and social structure
 - Ethnicity
 - Foreign policy of Pakistan and challenges
 - Futuristic outlook of Pakistan

BOOKS RECOMMENDED

1. Burki, ShahidJaved. *State & Society in Pakistan*, The Macmillan Press Ltd 1980.
2. Akbar, S. Zaidi. *Issue in Pakistan's Economy*. Karachi: OxfordUniversity Press, 2000.
3. S.M. Burke and LawrenceZiring. *Pakistan's Foreign policy: An Historical analysis*. Karachi: OxfordUniversity Press, 1993.
4. Mehmood, Safdar. *Pakistan Political Roots & Development*. Lahore, 1994.
5. Wilcox, Wayne.*The Emergence of Banglades.*, Washington: American Enterprise, Institute of Public Policy Research, 1972.
6. Mehmood, Safdar. *PakistanKayyunToota*, Lahore: Idara-e-Saqafat-e-Islamia, Club Road, nd.
7. Amin, Tahir. *Ethno -National Movement in Pakistan*, Islamabad: Institute of Policy Studies, Islamabad.
8. Ziring, Lawrence. *Enigma of Political Development*. Kent England: WmDawson& sons Ltd, 1980.
9. Zahid, Ansar. *History & Culture of Sindh*. Karachi: Royal Book Company, 1980.
10. Afzal, M. Rafique. *Political Parties in Pakistan*, Vol. I, II & III. Islamabad: National Institute of Historical and cultural Research, 1998.
11. Sayeed, Khalid Bin. *The Political System of Pakistan*. Boston: Houghton Mifflin, 1967.
12. Aziz, K.K. *Party, Politics in Pakistan*, Islamabad: National Commission on Historical and Cultural Research, 1976.
13. Muhammad Waseem, *Pakistan Under Martial Law*, Lahore: Vanguard, 1987.
14. Haq, Noor ul. *Making of Pakistan: The Military Perspective*. Islamabad: National Commission on Historical and Cultural Research, 1993.

INTRODUCTION TO COMPUTERS

CREDIT HOURS: 3(2-1)

COURSE DESCRIPTION

This is an introductory course on Information and Communication Technologies. Topics include ICT terminologies, hardware and software Components, the internet and World Wide Web, and ICT based applications

COURSE CONTENTS

Basic Definitions & Concepts

Hardware: Computer Systems & Components

Storage Devices, Number Systems

Software: Operating Systems, Programming and Application

- Software
- Introduction to Programming, Databases and Information Systems
- Networks
- Data Communication
- The Internet, Browsers and Search Engines
- The Internet: Email, Collaborative Computing and Social
- Networking
- The Internet: E-Commerce
- IT Security and other issues
- Project Week
- Review Week

RECOMMENDED BOOKS

1. Introduction to Computers by Peter Norton, 6th International Edition (McGraw HILL)

2. Using Information Technology: A Practical Introduction to Computer & Communications by Williams Sawyer, 6th Edition (McGraw HILL)

3. Computers, Communications & information: A user's introduction by Sarah E. Hutchinson, Stacey C. Swayer

4. Fundamentals of Information Technology by Alexis Leon, Mathewsleon Leon press.

SECOND SEMESTER

- 1. ANATOMY -II**
- 2. PHYSIOLOGY-II**
- 3. KINESIOLOGY-II**
- 4. ENGLISH-II**
- 5. ISLAMIC STUDIES / ETHICS**
- 6. SOCIOLOGY**

ANATOMY II

CREDIT HOURS4 (3-1)

COURSE DESCRIPTION:

The focus of this course is an in-depth study and analysis of the regional and systemic organization of the body. Emphasis is placed upon structure and function of human movement. A comprehensive study of human anatomy with emphasis on the nervous, musculoskeletal and circulatory systems is incorporated. Introduction to general anatomy lays the foundation of the course. Dissection and identification of structures in the cadaver supplemented with the study of charts, models and radiographs are utilized to identify anatomical landmarks and configurations of the lower limb and abdomen pelvis

DETAIL COURSE OUTLINE

LOWER LIMB

OSTEOLOGY

- Detailed description of all bones of lower limb and pelvis along their musculature and ligamentous attachments.

MYOLOGY

- Muscles of gluteal region
- Muscles around hip joint
- Muscles of thigh (anteriorly, posteriorly, laterally and medially)
- Muscles of lower leg and foot.

NEUROLOGY

- Course, distribution, supply of all nerves of lower limb and gluteal region
- Lumbosacral plexus.

ANGIOLOGY

- Course and distribution of all arteries, veins and lymphatic drainage of lower limb

ARTHROLOGY

- Pelvis
- Hip joint
- Knee joint

- Ankle joint
- Joints of the foot
- Surface Anatomy of lower limb
- Surface marking of lower limb

ABDOMEN

ABDOMINAL WALL:

- Structures of anterior abdominal wall: superficial and deep muscles
- Structure of rectus sheath
- Structures of Posterior abdominal wall
- Lumbar spine (vertebrae)
- Brief description of viscera

PELVIS

- Brief description of anterior, posterior and lateral walls of the pelvis
- Inferior pelvic wall or pelvic floor muscles
- Sacrum
- Brief description of perineum
- Nerves of perineum

EMBRYOLOGY

- Introduction to developing human
- Gametogenesis spermatogenesis oogenesis
- Fertilization and phases
- Germ layers
- Development of limbs Muscular system and Nervous system

PRACTICAL

During study of Gross Anatomy, emphasis should be given on applied aspect, radiological anatomy, surface anatomy and cross-sectional anatomy of the region covered in the respective semester /year

RECOMMENDED TEXT BOOKS:

1. *Gray's Anatomy* by Prof. Susan Standring 39th Ed., Elsevier.
2. *Clinical Anatomy for Medical Students* by Richard S.Snell.
3. *Clinically Oriented Anatomy* by Keith Moore.
4. *Clinical Anatomy* by R.J. Last, Latest Ed.
5. *Cunningham's Manual of Practical Anatomy* by G.J. Romanes, 15th Ed., Vol-I, II and III.
6. *The Developing Human. Clinically Oriented Embryology* by Keith L. Moore, 6th Ed.
7. *Wheater's Functional Histology* by Young and Heath, Latest Ed.
8. *Medical Histology* by Prof. LaiqHussain.
9. *Neuroanatomy* by Richard S.Snell.

PHYSIOLOGY II

CREDIT HOURS 3 (2-1)

COURSE DESCRIPTION:

The course is designed to study the function of the human body at the molecular, cellular, tissue and systems levels. The major underlying themes are: the mechanisms for promoting homeostasis; cellular processes of metabolism, membrane function and cellular signaling; the mechanisms that match supply of nutrients to tissue demands at different activity levels; the mechanisms that match the rate of excretion of waste products to their rate of production; the mechanisms that defend the body against injury and promote healing.

These topics are addressed by a consideration of nervous and endocrine regulation of the cardiovascular, hematopoietic, pulmonary, renal, gastrointestinal, and musculoskeletal systems including the control of cellular metabolism. The integrative nature of physiological responses in normal function and disease is stressed throughout the course.

This course will serve as pre requisite for the further courses i.e. exercise physiology, pathology, etc.

DETAILED COURSE OUTLINE

GASTROINTESTINAL TRACT

- General function of gastrointestinal tract
- Enteric nervous system
- Control of gastrointestinal mobility and secretions
- Mastication
- Swallowing: mechanism and control
- Function, motility and secretions of stomach
- Function, motility and secretions of small intestine
- Function, motility and secretions of large intestine
- Function of GIT hormones
- Mechanism of vomiting and its control pathway
- Defecation and its control pathway
- Functions of liver
- Functions of, gallbladder and bile in digestion
- Endocrine & exocrine pancreas and functions of pancreas in digestion
- Dysphagia
- Physiological basis of acid peptic disease

CARDIOVASCULAR SYSTEM

- Heart and circulation
- Function of cardiac muscle
- Cardiac pacemaker and cardiac muscle contraction
- Cardiac cycle
- ECG: recording and interpretation
- Common arrhythmias
- Types of blood vessels and their function
- Hemodynamics of blood flow (local control systemic circulation its regulation and control).
- Peripheral resistance its regulation and effect on circulation
- Arterial pulse
- Blood pressure and its regulation
- Cardiac output and its control

- Heart sounds and murmurs Importance in circulation and control of venous return.
- Coronary circulation
- Splanchnic, pulmonary and cerebral circulation
- Triple response and cutaneous circulation

ENDOCRINOLOGY

- Classification of endocrine glands
- Mechanism of action
- Feedback and control of hormonal secretion
- Functions of the hypothalamus
- Hormones secreted by the anterior and posterior pituitary and their mechanism of action and function.
- Function of the thyroid gland
- Function of the parathyroid gland
- Calcium metabolism and its regulation
- Secretion and function of calcitonin
- Hormones secreted by the adrenal cortex and medulla, and their function and mechanism of action
- Endocrine functions of the pancreas and control of blood sugar
- The endocrine functions of the kidney and Physiology of growth.

LAB WORK

- Clinical significance of cardiac cycle, correlation of ECG and heart sounds
- Examination of arterial pulses
- Arterial blood pressure
- Effects of exercise and posture on blood pressure
- Cardiopulmonary resuscitation (to be coordinated with the department of medicine)

Note

- The students are expected to make a sketch book. The sketch book is a collection of evidence that learning has taken place. It is a reflective record of achievements

PHYSIOLOGY PRACTICALS

HEMATOLOGY

1. Use of the microscope

2. Determination of hemoglobin
3. Determination of erythrocyte sedimentation rate
4. Determining packed cell volume
5. Measuring bleeding and clotting time
6. RBC count
7. Red cell indices
8. WBC count
9. Leukocyte count
10. 10.Prothrombin and thrombin time

RESPIRATORY SYSTEM

1. Clinical examination of chest
2. Pulmonary volume, their capacities and clinical interpretation
3. Stethography

RECOMMENDED BOOKS

1. *Textbook of Physiology* by Guyton and Hall, Latest Ed.
2. *Review of Medical Physiology* by William F. Ganong, Latest Ed.
3. *Physiology* by Berne and Levy, Latest Ed.
4. *Human Physiology: The Basis of Medicine* by Gillian Pocock, Christopher D. Richards
5. *Physiological Basis of Medical Practice* by John B. West and Taylor, 12th Ed.

KINESIOLOGY II
CREDIT HOURS 3 (2-1)

COURSE DESCRIPTION:

This course covers the definition of kinesiology and its importance to physical therapy and identifies the scope of kinesiology studies and their application. It also covers the types of human motions and their planes of motions and its relative axes explain the inter-relationship among kinematic variables, and utilize the knowledge of this inter-relationship to describe and analyze motion. This course also covers the classification of the joints or muscles and their characteristics distinguishing arthrokinematic movements from osteokinematic movements and explain their relationship and the difference among agonists, antagonists, and synergists integrate the knowledge learned with human motion occurring during daily activities.

DETAIL COURSE OUTLINE

TYPES OF MOVEMENT & EXERCISES

- Voluntary & involuntary movements
- Active and Passive movements
- Classification & techniques of free exercises
- The principles, techniques and effects of assisted exercises
- The principles, techniques and effects of assisted resisted exercises
- The principles, types, techniques and effects of resisted exercises
- Variation of the power of the muscles in different parts of their range
- Progressive Resistance Exercise
- Reflex movement
- The reflex arc
- The stretch reflex
- The righting reflexes
- The postural reflexes
- Effects and uses of reflex movement

PASSIVE MOVEMENT

- The principles, types, techniques and effects of passive exercises

- Definition of Passive manual mobilization and manipulations
- Controlled sustained stretching, Principles and Effects and uses

RELAXATION

- Definition
- Muscle tone
- Postural tone
- Voluntary movement
- Mental attitudes
- Degrees of relaxation
- Pathological tension in the muscles
- Technique
- General relaxation
- Local relaxation

DERIVED POSITIONS

- Purpose of derived positions
- Positions derived from standing by: alteration of arms, legs and trunk.
- Positions derived from kneeling
- Positions derived from sitting by: alteration of the legs& by alteration of trunk
- Positions derived from lying, by alteration of arms and by alteration of the legs
- Positions derived from hanging
- Other positions in which some of the weight is taken on the arms

SUSPENSION THERAPY

- Suspension application
- Suspension concept of inclined planes
- The fixed point suspension
- Supporting rope and its types
- Sling and its types
- Type of suspension: axial & vertical
- Methods, techniques of suspension: upper limb & lower limb
- Suspension effect on muscle work and joint mobility

NEUROMUSCULAR CO-ORDINATION

- Coordinated movement
- Group action of muscles

- Nervous control
- Inco-ordination
- Re-Education
- Frenkel's exercises.

WALKING AIDS

- Crutches
- Sticks
- Tripod or Quadra pod
- Frames

LAB WORK

- Demonstrations of the techniques of active, passive movements
- Demonstrations of relaxation procedures
- Demonstrations of various derived positions
- PRE program
- Manual muscle testing - Regional Lower limb muscle testing

Note: The students are expected to make a practical note book. The book is a collection of evidence that learning has taken place. It is a reflective record of their achievements

RECOMMENDED BOOKS

1. Practical exercise therapy by Margaret Hollis 3rd Ed. illustrated, reprint, Blackwell Scientific
2. Brunnstrom's Clinical Kinesiology 6th Ed. By. Peggy A Houglum, Dolores B Bertoti
3. Clinical kinesiology and anatomy 5th Ed. by Lynn S Lippert
4. Joint structure and function: a comprehensive analysis 5th Ed. by: Pamela. K. Levangie and Cynthia. C. Norkin.
5. Muscle function testing by: Cunningham and Daniel. 2nd, illustrated
6. Human movement explain by kimjonas and karenbaker
7. The principles of exercise therapy by: M. Dena Gardiner, 4th Edition.

PRACTICAL TRAINING/ LAB WORK

- Practical demonstrations of the techniques of active, passive movements
- Manual muscle testing
- Practical demonstrations of relaxation procedures
- Practical demonstrations of various derived positions

GONIOMETRY

- Introduction to Goniometry
- Basic concepts in Goniometry
- Joint motion
- Range of motion
- Factors affecting ROM
- End-feel
- Capsular and non-capsular pattern of ROM limitation
- Procedures
- Positioning
- Stabilization
- Measurements Instruments
- Alignment
- Recording
- Procedures
- Validity and Reliability
- Reliability Studies
- Mathematical methods of evaluation measurement reliability
- Exercise to evaluate reliability
- Measurement of upper extremity
- Measurement of lower extremity
- Measurement of tempomandibular joint
- Measurement of the cervical spine
- Measurement of the thoracic spine
- Measurement of the lumbar joint
- Average range of motion
- Joint measurement by body position

ENGLISH II

(FUNCTIONAL ENGLISH)

CREDIT HOURS 3(3-0)

Objectives: Enable the students to meet their real life communication needs.

Course Contents

Paragraph writing

Practice in writing a good, unified and coherent paragraph

Essay writing

Introduction

CV and job application

Translation skills

Urdu to English

Study skills

Skimming and scanning, intensive and extensive, and speed reading, summary and précis writing and comprehension

Academic skills

Letter/memo writing, minutes of meetings, use of library and internet

Presentation skills

Personality development (emphasis on content, style and pronunciation)

Note: documentaries to be shown for discussion and review

RECOMMENDED BOOKS:

Communication Skills

Grammar

1. *Practical English Grammar* by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press 1986. ISBN 0 19 431350 6.
2. *Writing*
3. *Writing. Intermediate* by Marie-Christine Boutin, Suzanne Brinand and Françoise Grellet. Oxford Supplementary Skills. Fourth Impression 1993. ISBN 019 435405 7
Pages 45-53 (note taking).
4. *Writing. Upper-Intermediate* by Rob Nolasco. Oxford Supplementary Skills. Fourth Impression 1992. ISBN 0 19 435406 5 (particularly good for writing memos, introduction to presentations, descriptive and argumentative writing).
5. *Reading*
6. *Reading. Advanced.* Brian Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1991. ISBN 0 19 453403 0.
7. *Reading and Study Skills* by John Langan

9. ISLAMIC STUDIES

(COMPULSORY)]

CREDIT HOURS 2 (2-0)

Objectives:

This course is aimed at:

- 1 To provide Basic information about Islamic Studies
- 2 To enhance understanding of the students regarding Islamic Civilization
- 3 To improve Students skill to perform prayers and other worships
- 4 To enhance the skill of the students for understanding of issues related to faith and religious life.

Detail of Courses

Introduction to Quranic Studies

- Basic Concepts of Quran
- History of Quran
- Uloom-ul -Quran

Study of Selected Text of Holly Quran

- Verses of Surah Al-Baqra Related to Faith(Verse No-284-286)
- Verses of Surah Al-Hujrat Related to Adab Al-Nabi (Verse No-1-18)
- Verses of Surah Al-Mumanoon Related to Characteristics of faithful (Verse No-1-11)
- Verses of Surah al-Furqan Related to Social Ethics (Verse No.63-77)
- Verses of Surah Al-Inam Related to Ihkam(Verse No-152-154)

Study of Selected Text of Holly Quran

- Verses of Surah Al-Ihزاب Related to Adab al-Nabi (Verse No.6,21,40,56,57,58.)
- Verses of Surah Al-Hashar (18,19,20) Related to thinking, Day of Judgment
- Verses of Surah Al-Saf Related to Tafakar,Tadabar (Verse No-1,14)

Seerat of Holy Prophet (S.A.W) I

- Life of Muhammad Bin Abdullah (Before Prophet Hood)
- Life of Holy Prophet (S.A.W) in Makkah
- Important Lessons Derived from the life of Holy Prophet in Makkah

Seerat of Holy Prophet (S.A.W) II

- Life of Holy Prophet (S.A.W) in Madina
- Important Events of Life Holy Prophet in Madina
- Important Lessons Derived from the life of Holy Prophet in Madina

Introduction To Sunnah

- Basic Concepts of Hadith
- History of Hadith
- Kinds of Hadith
- Uloom –ul-Hadith
- Sunnah& Hadith
- Legal Position of Sunnah

Selected Study from Text of Hadith

Introduction To Islamic Law & Jurisprudence

- Basic Concepts of Islamic Law & Jurisprudence
- History & Importance of Islamic Law & Jurisprudence
- Sources of Islamic Law & Jurisprudence
- Nature of Differences in Islamic Law
- Islam and Sectarianism

Islamic Culture & Civilization

- Basic Concepts of Islamic Culture & Civilization
- Historical Development of Islamic Culture & Civilization
- Characteristics of Islamic Culture & Civilization
- Islamic Culture & Civilization and Contemporary Issues

Islam & Science

- Basic Concepts of Islam & Science
- Contributions of Muslims in the Development of Science
- Quranic& Science

Islamic Economic System

- Basic Concepts of Islamic Economic System
- Means of Distribution of wealth in Islamic Economics
- Islamic Concept of Riba
- Islamic Ways of Trade & Commerce

Political System of Islam

- Basic Concepts of Islamic Political System
- Islamic Concept of Sovereignty
- Basic Institutions of Govt. in Islam

Islamic History

- Period of Khlaft-E-Rashida
- Period of Ummayyads
- Period of Abbasids

Social System of Islam

- Basic Concepts of Social System of Islam
- Elements of Family
- Ethical Values of Islam

RECOMMENDED TEXT BOOK BOOKS:

1. *Hameedullah Muhammad, “Emergence of Islam” , IRI, Islamabad*
2. *Hameedullah Muhammad, “Muslim Conduct of State”*
3. *Hameedullah Muhammad, ‘Introduction to Islam*
4. *Mulana Muhammad YousafIslahi, ”*
5. *Hussain Hamid Hassan, “An Introduction to the Study of Islamic Law” leaf
Publication Islamabad, Pakistan.*
6. *Ahmad Hasan, “Principles of Islamic Jurisprudence” Islamic Research
Institute, International Islamic University, Islamabad (1993)*
7. *Mir Waliullah, “Muslim Jrisprudence and the Quranic Law of Crimes”
Islamic Book Service (1982)*
8. *H.S. Bhatia, “Studies in Islamic Law, Religion and Society” Deep & Deep
Publications New Delhi (1989)*
9. *Dr. Muhammad Zia-ul-Haq, “Introduction to Al Sharia Al
Islamia”AllamaIqbal Open University, Islamabad (2001)*

SOCIOLOGY

CREDIT HOURS: 2(2-0)

COURSE DESCRIPTION

The course focuses at providing basic concepts and models of health Sciences. The psycho-socio and cultural assessment of health seeking behavioral patterns and the role of therapeutic management group will be examined. The indigenous healing system and contemporary medical system will be studied. It makes them realize the importance of the relationship of the physical therapist and the patient.

LEARNING OBJECTIVES

- Comprehend basic knowledge and concepts of sociology
- Describe relationship among impact of group, culture and environment on the behavior and health of patients
- Describe social aspects of health & illness and emphasize importance of the relationship of the physical therapist with patient, along critical perspectives of contemporary issues in health

COURSE CONTENTS

INTRODUCTION

- Medical Sociology, and the field of medical sociology
- Contribution of sociology to medicine.

HEALTH AND DISEASE

- Social definition of illness
- Health and disease as deviant behavior
- Social cultural causes of disease

SOCIOLOGICAL PERSPECTIVES ON HEALTH & ILLNESS

- Functionalist Approach
- Conflict Approach
- Interactionist Approach
- Labeling Approach

ILLNESS BEHAVIOR AND PERCEPTIONS OF ILLNESS

- Illness Behavior

- Cultural Influences on Illness Behavior
- Sociological and Demographic Influences
- Lay Beliefs About Health and Illness
- Self-medication
- Sick Role

SOCIAL DETERMINANTS OF HEALTH

- The Social Gradient
- Stress
- Early Life
- Life Expectancy
- Social support networks
- Education and literacy
- Employment/Working conditions
- Social environments
- Addiction
- Food
- Transport

PATIENT AND PHYSICAL THERAPIST

- Physical Therapist's view of disease and the patient
- Patient's perspective of illness
- Patient Physical Therapist relationship
- Patient-nurses relation

SOCIOLOGY OF MEDICAL CARE

- Hospitals
- Origin and development.
- Hospitals as social organization: problems of Quackery.
- Interpersonal relationship in medical settings.
- Mental illness in sociological perspective.
- Complementary & alternative Medicine (CAM)

RECOMMENDED BOOKS

1. *Sociology for Physiotherapists(2006) by Bid Dibyen dunarayan Jaypee publisher*
2. *A.P Dixit (2005) Global Hiv/Aids Trends, Vista International Publications house New Delhi;*

3. *Diarmuid O Donovan (2008) The State of Health Atlas University of California Press; G.C. Satpalhy (2003) Prevention of Hiv/Aids Drug abuse, isha Books, New Delhi.*
4. *Global Health Challenges for Human Security (ed.) Lincoln Chenet el. Global Equity. UK 2003.*
5. *Jai P Narain (2004) Aids in Asia the challenge a head , Sage Publications New Delhi;*
7. *Julia A Ericksen (2008) Taking charge of Breast Cancer University of California Press;*
8. *Meena Sharma (2006) Aids, Awareness Through Community Participation Kalpaz Publications Delhi;*
9. *P Dixit (2005) Global HIV/AIDS Trends, Vista International Publishing House Delhi 110053;*
10. *Rose Weitz (2004) The Sociology of health, Illness & health care a. a critical approach Thomson wads worth.*
11. *Rubina Sehgal (2004) The Trouble Times; Sustainable Development in the age of extreme. Islamabad.*

THIRD SEMESTER

- **ENGLISH-III (Technical Writing and Presentation Skills)**
- **MEDICAL PHYSICS**
- **ANATOMY -III**
- **PHYSIOLOGY-III**
- **BIOMECHANICS & ERGONOMICS-I**
- **BIOCHEMISTRY I**

ENGLISH III
(Technical Writing and Presentation Skills)
CREDIT HOURS 3(3-0)

Objectives: Enhance language skills and develop critical thinking

Presentation skills

Essay writing

Descriptive, narrative, discursive, argumentative

Academic writing

How to write a proposal for research paper/term paper

How to write a research paper/term paper (emphasis on style, content, language, form, clarity, consistency)

Technical Report writing

Progress report writing

Note: Extensive reading is required for vocabulary building

Recommended books:

Technical Writing and Presentation Skills, Essay Writing and Academic Writing

1. *Writing. Advanced by Ron White. Oxford Supplementary Skills. Third Impression 1992. ISBN 0 19 435407 3 (particularly suitable for discursive, descriptive, argumentative and report writing).*
2. *College Writing Skills by John Langan. McGraw-Hill Higher Education. 2004.*
3. *Patterns of College Writing (4th edition) by Laurie G. Kirszner and Stephen R. Mandell. St. Martin's Press.*
4. *The Mercury Reader. A Custom Publication. Compiled by norther Illinois University. General Editors: Janice Neulib; Kathleen Shine Cain; Stephen Ruffus and Maurice*

Scharton. (A reader which will give students exposure to the best of twentieth century literature, without taxing the taste of engineering students).

MEDICAL PHYSICS

CREDIT HOURS: 3(2-1)

COURSE DESCRIPTION

This course will cover the basic principle of physics which are applicable in medical equipment used in Physical therapy. It also covers the fundamentals of currents, sound waves, electromagnetic radiations and their effects & application in physical therapy

LEARNING OBJECTIVES:

- Describe basic principles of physics used in electro medical equipment
- Define laws of physics various aspect of physical phenomena and their interaction with human body
- Describe basic concepts of electricity, its laws, magnetism, electro mechanics and related theories
- Explain fundamentals of low, medium and high frequency currents, heat, electromagnetic radiations and sound waves.
- Demonstrate safety skills in biomedical instruments and radiation protection.

COURSE CONTENTS

ELECTRICITY AND MAGNETISM

- Structure of an atom
- Electron Theory, Conductors & Insulators
- Conduction & Convection

STATIC ELECTRICITY

- Charging by conduction and Induction
- Electrostatic Fields
- Capacitors, types of capacitors

- Arrangement of Capacitors in series and parallel
- Charging and discharging of capacitors
- Oscillating Discharge of Capacitors

CURRENT ELECTRICITY

- Ohm's Law
- Electrical Components and their units
- Resistance and types
- Chemical effects of a Current
- Types of Current
- Cell and Batteries
- Simple Voltage Cell
- Combination of Cells in series and parallel
- Thermal effects of current
- Electrolysis and Electrolytic burns
- Ionization of gases and Thermionic emission
- Electronic tubes
- Diodes and Triodes

ELECTROMAGNETISM

- Magnetic effect of an electric current
- Moving coil volt meter and Ammeter
- Measurement of high frequency and alternate current with meters
- Electromagnetic induction
- Faradays law
- Mutual and self-Induction
- Eddy currents
- Transformers
- Construction and types
- Static and auto Transformer

ELECTRO MECHANICS

- Current for treatment
- Rectification
- Rectification of A.C

- Half wave and full wave Rectification
- Valve rectification circuits and metal rectifier
- Surging of current
- Vibrations and Multi vibrators circuit

CLASSIFICATION OF CURRENTS (OVERVIEW)

LOW FREQUENCY CURRENT

- Sinusoidal current
- Faradic current
- Galvanic current (constant and interrupted)
- Di dynamic current TENS
- Super imposed current and their graphical representation.

MEDIUM FREQUENCY CURRENT

- Interferential current
- Russian current.

HIGH FREQUENCY CURRENT

- Valves
- Transistors
- Long waves, medium waves short waves micro waves

SOUND WAVES

- Wave motion in sound
- Infrasonic
- Normal hearing band
- Characteristics of the sound waves and their velocities
- Ultrasonic
- Reflection and refraction of sound waves
- Characteristics of tone resonance and beats
- Interference of sound waves

HEAT

- Scales of temperature and its conversion to other scales
- Nature of heat energy
- Specific heat and three modes of heat energy transfer effect of
- impurities on melting and boiling points

ELECTROMAGNETIC RADIATION

- Electromagnetic spectrum
- Relationship between frequency and wave length
- Laws of reflection, refraction and absorptions
- Total internal reflection
- Cosine law and inverse square law
- Concave and convex mirrors
- Lenses and prisms
- Reflectors
- Radio wave (long, medium, short, micro waves)
- Infra-red rays
- Visible rays
- Ultra violet rays
- X-rays
- Nuclear waves (alpha beta and gamma)

SAFETY IN BIOMEDICAL INSTRUMENTS

- Electrical outlets, hot, neutral and ground connections
- Pervasiveness of electricity and of electric shocks
- Causes of electric shocks and precaution
- Effect of electric current on human body
- Techniques to reduce the effect of electric shock
- Earth shocks and precaution against earth shocks

RADIATION PROTECTION

- Ionizing and non-ionizing radiations
- Quantities and associated units of radiations
- Effect of ionizing and non-ionizing radiation
- Internal and external hazards
- Main principle to control external hazard
- Distance and shielding

LAB WORK

- Specify resistance by using the potential divider
- Verify the joules law of electrical methods
- Calibrate a thermo couple and an unknown temperature

- Find the acceleration due to gravity by simple pendulum
- Verify the law of reflection of light
- Verify the law of refraction of light
- Verify the refraction index of glass using rectangular slab

RECOMMENDED BOOKS

1. *Clayton's Electrotherapy and actinotherapy* by: P. M Scott.
2. *Medical physics for physical therapists* by: A. D Moore.
3. *Preliminary Electricity for Physiotherapists* by B. Savage.
4. *Basic Electronics* by Grob.
5. *Principles of Bio-instrumentation* by Richard A. Normann.
6. *Hand book of Biomedical Instrumentation* by R. S. Khanpur
7. *Basic Radiation Protection Technology* by Gollnick

ANATOMY III
CREDIT HOURS 4(3-1)

COURSE DESCRIPTION:

The focus of this course is an in-depth study and analysis of the regional and systemic organization of the body. Emphasis is placed upon structure and function of human movement. A comprehensive study of human anatomy with emphasis on the nervous, skeletal, muscle, and circulatory systems is incorporated. Introduction to general anatomy lays the foundation of the course. Dissection and identification of structures in the cadaver supplemented with the study of charts, models and radiographs are utilized to identify anatomical landmarks and configurations of the head and neck

DETAILED COURSE OUT LINE

THE HEAD AND NECK

THE NECK:

- Muscles around the neck
- Triangles of the neck
- Main arteries of the neck
- Main veins of the neck
- Cervical part of sympathetic trunk
- Cervical plexus
- Cervical spine (Vertebrae)
- Joint of neck

THE FACE:

- Sensory nerves of the face
- Bones of the face
- Muscles of the face
- Facial nerve

- Muscles of mastication
- Mandible
- Hyoid bone
- Temporomandibular joint
- Brief description of orbit and nasal cavity

THE SKULL:

- Bones of skull
- Anterior cranial fossa
- Middle cranial fossa
- Posterior cranial fossa
- Base of skull
- Structures passing through foramina

THORAX

STRUCTURES OF THE THORACIC WALL

- Dorsal spine (vertebrae)
- Sternum
- Costal Cartilages & Ribs
- Intercostal Muscles
- Intercostal Nerves
- Diaphragm
- Blood supply of thoracic wall
- Lymphatic drainage of thoracic wall
- Joints of thorax

THORACIC CAVITY

- Mediastinum
- Pleura
- Trachea
- Lungs
- Bronchopulmonary segments
- Pericardium
- Heart – Its blood supply, venous drainage & nerve supply
- Large veins of thorax, superior and inferior vena cava., pulmonary

- veins brachiocephalic veins
- Large Arteries – Aorta & its branches

PRACTICAL

During study of Gross Anatomy, emphasis should be given on applied aspect, radiological anatomy, surface anatomy and cross-sectional anatomy of the region covered in the respective semester /year

Recommended Text Books:

1. *Gray's Anatomy* by Prof. Susan Standring 39th Ed., Elsevier.
2. *Clinical Anatomy for Medical Students* by Richard S.Snell.
3. *Clinically Oriented Anatomy* by Keith Moore.
4. *Clinical Anatomy* by R.J. Last, Latest Ed.
5. *Cunningham's Manual of Practical Anatomy* by G.J. Romanes, 15th Ed., Vol-I, II and III.
6. *The Developing Human. Clinically Oriented Embryology* by Keith L. Moore, 6th Ed.
7. *Wheater's Functional Histology* by Young and Heath, Latest Ed.
8. *Medical Histology* by Prof. LaiqHussain.
9. *Neuroanatomy* by Richard S.Snell

PHYSIOLOGY III
CREDIT HOURS 3(2-1)

COURSE DESCRIPTION:

The course is designed to study the function of the human body at the molecular, cellular, tissue and systems levels, The major underlying themes are: the mechanisms for promoting homeostasis; cellular processes of metabolism, membrane function and cellular signaling; the mechanisms that match supply of nutrients to tissue demands at different activity levels; the mechanisms that match the rate of excretion of waste products to their rate of production; the mechanisms that defend the body against injury and promote healing.

These topics are addressed by a consideration of nervous and endocrine regulation of the cardiovascular, hematopoietic, pulmonary, renal, gastrointestinal, and musculoskeletal systems, including the control of cellular metabolism. The integrative nature of physiological responses in normal function and disease is stressed throughout

This course provides the foundation for the further course as exercise physiology, pathology, etc

DETAILED COURSE OUT LINE

RESPIRATORY SYSTEM

- Function of respiratory tract
- Respiratory and non-respiratory function of the lungs
- Mechanics of breathing
- Production & function of surfactant and compliance of lungs
- Protective reflexes
- Lung volumes and capacities including dead space
- Diffusion of gases across the alveolar membrane
- Relationship between ventilation and perfusion
- Mechanism of transport of oxygen and carbon dioxide in blood
- Nervous and chemical regulation of respiration

- Abnormal breathing
- Hypoxia, its causes and effects
- Cyanosis, its causes and effects

NERVOUS SYSTEM

- General organization of the nervous system
- Classification of nerve fibers
- Properties of synaptic transmission
- Function of neurotransmitters and neuropeptides
- Type and function of sensory receptors
- Function of the spinal cord and ascending tracts
- Reflex action and reflexes
- Muscle spindle and muscle tone
- Mechanism of touch, temperature and pain
- Functions of the cerebral cortex
- Difference between the sensory and motor cortex and their functions
- Motor pathways including pyramidal and extrapyramidal
- Basal Ganglia and its functions
- Cerebellum and its function
- Control of posture and equilibrium
- Physiology of sleep
- Physiology of memory
- Mechanism and control of speech
- Function of the thalamus
- Function of the hypothalamus and limbic system
- Production of CSF
- Mechanism of temperature regulation
- Function of the autonomic nervous system and the physiological changes of aging

REPRODUCTION

- Function of the male reproductive system, Spermatogenesis
- Mechanism of erection and ejaculation
- Production and function of testosterone and Physiological

- changes during male puberty
- Function of the female reproductive system
- Production and function of estrogen, and progesterone
- Menstrual cycle
- Physiological changes during female puberty and menopause
- Pregnancy and the physiological changes taking place in the mother
- Function of the placenta
- Parturition and lactation
- Neonatal physiology

BODY FLUIDS AND KIDNEY

- Components and quantitative measurements of body fluids
- Fluid compartments, tissue and lymph fluid
- Structure of the kidney and nephron
- General function of the kidney
- GFR and its regulation
- Formation of urine including filtration, re-absorption and secretion
- Plasma clearance, Mechanism of concentration and dilution of urine
- Water and electrolyte balance with reference to the kidney
- Role of the kidney in blood pressure regulation
- Hormonal functions of the kidney
- Acidification of urine and its importance
- Acid base balance with reference to the kidney
- Micturition and its control

PHYSIOLOGY PRACTICALS

Nervous System

1. Examination of superficial and deep reflexes.
2. Brief examination of the motor and sensory system.
3. Examination of the cranial nerves.

Special Senses

1. Measurement of the field of vision.
2. Measurement of light reflex.
3. Ophthalmoscopy.
4. Colour vision.
5. Hearing tests.
6. Testing taste and smell.

Pregnancy tests

RECOMMENDED BOOKS

1. *Textbook of Physiology* by Guyton and Hall, Latest Ed.
2. *Review of Medical Physiology* by William F. Ganong, Latest Ed.
3. *Physiology* by Berne and Levy, Latest Ed.
4. *Human Physiology: The Basis of Medicine* by Gillian Pocock, Christopher D. Richards
5. *Physiological Basis of Medical Practice* by John B. West and Taylor, 12th Ed.

BIOMECHANICS AND ERGONOMICS I

CREDIT HOURS 3(3-0)

COURSE DESCRIPTION:

This course aims to develop appreciation of how mechanical principles can be applied to understand the underlying causes of human movement. It also examines selected anatomical, structural and functional properties of human connective, muscular, and nervous tissues, as well as skeletal structures. Emphasis is placed on the mechanical, neuroregulatory, and muscular events that influence normal and pathological motion

This course will also help to gain an understanding of basic theoretical concepts, principles and techniques of ergonomics as well as an introduction to fundamental ergonomic measurement tools for assessment of physical workload, posture, occupational exposure, and stress

DETAILED COURSE OUT LINE

BASIC TERMINOLOGY

- Biomechanics
- Mechanics

- Dynamics
- Statics
- Kinematics
- Kinetics and anthropometries
- Scope of scientific inquiry addressed by biomechanics
- Difference between quantitative and qualitative approach for analyzing human movements
- Biomechanics of human bone growth and development

KINEMATIC CONCEPTS FOR ANALYZING HUMAN MOTION

- Common units of measurement for mass, force, weight, pressure, volume, density, specific weight, torque and impulse
- Different types of mechanical loads that act on human body.
- Uses of available instrumentation for measuring kinetic quantities

BIOMECHANICS OF TISSUES AND STRUCTURES OF THE MUSCULOSKELETAL SYSTEM

- Biomechanics of Bone
- Biomechanics of Articular Cartilage
- Biomechanics of Tendons and Ligaments
- Biomechanics of Peripheral Nerves and Spinal Nerve Roots
- Biomechanics of Skeletal Muscles

BIOMECHANICS OF THE HUMAN UPPER EXTREMITY

- Biomechanics of the Shoulder
- Biomechanics of the Elbow
- Biomechanics of the Wrist and Hand
- Factors that influence relative mobility and stability of upper extremity articulation
- Muscles that are active during specific upper extremity movements
- Biomechanical contributions to common injuries of the upper extremity

BIOMECHANICS OF HUMAN LOWER EXTREMITY

- Biomechanics of the Hip
- Biomechanics of the Knee

- Biomechanics of the ankle and foot
- Factors influencing relative mobility and stability of lower extremity articulations
- Adaptation of lower extremity to its weight bearing functions
- Muscles that are active in specific lower extremity movements
- Biomechanical contribution to common injuries of the lower extremity

ERGONOMICS

OVERVIEW AND CONCEPTUAL FRAMEWORK.

- Ergonomics and Therapy: An Introduction.
- A Client-Centered Framework for Therapists in Ergonomics.
- Macro ergonomics.s

KNOWLEDGE, TOOLS, AND TECHNIQUES.

- Ergonomic Assessments/Work Assessments.
- Anthropometry
- Cognitive and Behavioral Occupational Demands of Work.
- Psychosocial Factors in Work-Related Musculoskeletal Disorders.
- Physical Environment.
- Human Factors in Medical Rehabilitation Equipment: Product Development and Usability Testing.

Recommended Text Books

1. *Basic biomechanics of musculoskeletal system* By: Nordin& Frankel, 3rd edition.
2. *Basic Biomechanics*, By: Susan J. Hall 4th edition.
3. Additional study material as assigned by the tutor.
4. Ergonomics for the therapist by Karen Jacobs 3rd edition mosby and Elsevier publishers

BIOCHEMISTRY I

CREDIT HOURS 2(2-0)

COURSE DESCRIPTION:

This course provides the knowledge and skills in fundamental organic chemistry and introductory biochemistry that are essential for further studies. It covers basic biochemical, cellular, biological and microbiological processes, basic chemical reactions in the prokaryotic and eukaryotic cells, the structure of biological molecules, introduction to the nutrients i.e. carbohydrates, fats, enzymes, nucleic acids and amino acids. The nutritional biochemistry concludes the course.

DETAILED COURSE OUTLINE:

CELL

- Introduction to Biochemistry
- Cell: (Biochemical Aspects)
- Cell Membrane Structure
- Membrane Proteins
- Receptors & Signal Molecules

BODY FLUIDS

- Structure and properties of Water
- Weak Acids & Bases
- Concept of pH & pK
- Buffers, their mechanism of action
- Body buffers

BIOMOLECULES

AMINO ACIDS, PEPTIDES & PROTEINS

- Amino acids: Classification
- Acid-Base Properties
- Functions & Significance.

- Protein Structure, Primary, Secondary & Super secondary. &, Structural Motifs
- Tertiary & Quaternary Structures of Proteins
- Protein Domains
- Classification of Proteins
- Fibrous proteins (collagens and elastins) & Globular proteins

ENZYMES

- Introduction
- Classification & Properties of Enzymes
- Coenzymes
- Isozymes&Proenzymes
- Regulation & Inhibition of Enzyme activity & enzymes inhibitors
- Clinical Diagnostic Enzymology

CARBOHYDRATES

- Definition
- Classification
- Biochemical Functions & Significance of Carbohydrates
- Structure & Properties of Monosaccharides& Oligosaccharides
- Structure & Properties of Polysaccharides
- Bacterial cell Wall
- Heteropolysaccharides
- GAGS

LIPIDS

- Classification of Lipids
- Fatty Acids: Chemistry
- Classification occurrence & Functions
- Structure & Properties of Triacylglycerols and Complex Lipids
- Classification & Functions of Eicosanoids
- Cholesterol: Chemistry, Functions & Clinical Significance
- Bile acids/salts

NUCLEIC ACIDS

- Structure, Functions & Biochemical Role of Nucleotides
- Structure & Functions of DNA
- Structure & Functions of RNA

NUTRITIONAL BIOCHEMISTRY

MINERALS & TRACE ELEMENTS

- Sources
- RDA
- Biochemical Functions & Clinical Significance of Calcium & Phosphorus
- Sources
- RDA
- Biochemical Functions & Clinical Significance of Sodium Potassium & Chloride
- Metabolism of Iron, Cu, Zn, Mg, Mn, Se, I, F

VITAMINS

- Sources
- RDA
- Biochemical Functions & Clinical Significance of Fat Soluble Vitamins
- Sources
- RDA
- Biochemical Functions & Clinical Significance of Water Soluble
- Vitamins

NUTRITION

- Dietary Importance of Carbohydrates, Lipids & Proteins
- Balanced Diet

Recommended Text Books:

1. *Harper's Biochemistry* by Robert K. Murray, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwell, Latest Ed.
2. *Lippincott's Illustrated Review of Biochemistry* by Pamela C. Champe and Richard A. Harvey, Latest Ed.

3. *Practical Clinical Biochemistry* by Varley.
4. *Textbook of Biochemistry* by Devlin, 5th Ed.
5. *Textbook of Medical Biochemistry* Vol-I and II by M.A. Hashmi. *Biochemistry* by Stryer, Lubert, Latest Ed

FOURTH SEMESTER

- **ANATOMY-IV (Neuro Anatomy)**
- **BIOMECHANICS & ERGONOMICS-II**
- **HEALTH & WELLNESS**
- **BIOCHEMISTRY II**
- **EXERCISE PHYSIOLOGY**
- **MOLECULAR BIOLOGY & GENETICS**

ANATOMY IV
(Neuro Anatomy)

CREDIT HOURS 3(2-1)

COURSE DESCRIPTION:

The focus of this course is an in-depth study and analysis of the regional and systemic organization of the body. Emphasis is placed upon structure and function of human movement. A comprehensive study of human anatomy with emphasis on the nervous, skeletal, muscle, and circulatory systems is incorporated. Introduction to general anatomy lays the foundation of the course. Dissection and identification of structures in the cadaver supplemented with the study of charts, model and radiographs are utilized to identify anatomical landmarks and configurations of the region

DETAILED COURSE OUTLINE:

NEURO ANATOMY

- Central Nervous System: Disposition, Parts and Functions
- Brain stem (Pons, Medulla, and Mid Brain)
- Cerebrum
- Cerebellum
- Thalamus
- Hypothalamus
- Internal Capsule
- Blood Supply of Brain
- Stroke and its types
- Ventricles of Brain
- CSF circulation and Hydrocephalus
- Meninges of Brain
- Neural pathways (Neural Tracts)
- Pyramidal and Extra pyramidal System (Ascending and Descending tracts)
- Functional significance of Spinal cord level
- Cranial Nerves with special emphasis upon IV, V, VII, XI, XII (their course, distribution, and palsies).

- Autonomic nervous system, its components
- Nerve receptors

SPINAL CORD

- Gross appearance
- Structure of spinal cord
- Grey and white matter (brief description)
- Meninges of spinal cord
- Blood supply of spinal cord
- Autonomic Nervous system

PRACTICAL

During study of Gross Anatomy, emphasis should be given on applied aspect, radiological anatomy, surface anatomy and cross-sectional anatomy of the region covered in the respective semester /year

Recommended Text Books:

1. *Gray's Anatomy* by Prof. Susan Standring 39th Ed., Elsevier.
2. *Clinical Anatomy for Medical Students* by Richard S.Snell.
3. *Clinically Oriented Anatomy* by Keith Moore.
4. *Clinical Anatomy* by R.J. Last, Latest Ed.
5. *Cunningham's Manual of Practical Anatomy* by G.J. Romanes, 15th Ed., Vol-I, II and III.
6. *The Developing Human. Clinically Oriented Embryology* by Keith L. Moore, 6th Ed.
7. *Wheater's Functional Histology* by Young and Heath, Latest Ed.
8. *Medical Histology* by Prof. LaiqHussain.

BIOMECHANICS AND ERGONOMICS II

CREDIT HOURS 3(2-1)

COURSE DESCRIPTION:

This course aims to develop appreciation of how mechanical principles can be applied to understand the underlying causes of human movement. It also examines selected anatomical, structural and functional properties of human connective, muscular, and nervous tissues, as well as skeletal structures. Emphasis is placed on the mechanical, neuroregulatory, and muscular events that influence normal and pathological motion

This course will also help to gain an understanding of basic theoretical concepts, principles and techniques of ergonomics as well as an introduction to fundamental ergonomic measurement tools for assessment of physical workload, posture, occupational exposure, and stress

DETAILED COURSE OUTLINE:

BIOMECHANICS OF HUMAN SPINE

- Biomechanics of the Lumbar Spine
- Biomechanics of the Cervical Spine
- Factors influencing relative mobility and stability of different regions of Spine
- Biomechanical adaptations of spine during different functions
- Relationship between muscle location and nature and effectiveness of muscle action in the trunk
- Biomechanical contribution to common injuries of the spine

APPLIED BIOMECHANICS

- Introduction to the Biomechanics of Fracture Fixation
- Biomechanics of Arthroplasty
- Engineering Approaches to Standing, Sitting, and Lying
- Biomechanics of Gait

ANGULAR KINETICS OF HUMAN MOVEMENT

- Angular analogues of mass, force, momentum and impulse
- Angular analogues of Newton's laws of motion
- Centripetal and Centrifugal forces
- Angular acceleration

ANGULAR KINEMATICS OF HUMAN MOVEMENT

- Measuring body angles
- Angular kinematics Relationships
- Relationship between Linear and Angular motion

HUMAN MOVEMENT IN FLUID MEDIUM

- The nature of fluids
- Buoyancy and floatation of human body
- Drag and components of drag
- Lift Force
- Propulsion in a fluid medium

ERGONOMICS II

SPECIAL CONSIDERATIONS

- Lifting Analysis.
- Seating.
- Computers and Assistive Technology.

APPLICATION PROCESS

- Ergonomics of Children and Youth.
- Ergonomics of Aging.
- Ergonomics in Injury Prevention and Disability Management.
- Ergonomics of Play and Leisure.

PRACTICAL TRAINING / LAB WORK

- Biomechanical assessment of Upper extremity
- Biomechanical assessment of Lower Extremity
- Biomechanical assessment of Gait
- Reflective case assignment related to biomechanics of various regions of the body
- Measurement of angles of joints
- Biomechanical study of deformities

Recommended Text Books

1. *Basic biomechanics of musculoskeletal system* By: Nordin& Frankel, 3rd edition.

2. *Basic Biomechanics*, By: Susan J. Hall 4th edition.
3. Additional study material as assigned by the tutor.
4. Ergonomics for the therapist by Karen Jacobs 3rd edition mosby and Elsevier publishers

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.

DETAILED 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
- Program 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 Centers

Recommended Text Book:

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

BIOCHEMISTRY II **CREDIT HOURS 2(2-0)**

COURSE DESCRIPTION:

This course provides the knowledge and skills in fundamental organic chemistry and introductory biochemistry that are essential for further studies. It covers basic biochemical, cellular, biological and microbiological processes, basic chemical reactions in the prokaryotic and eukaryotic cells, the structure of biological molecules, introduction to the nutrients i.e. carbohydrates, fats, enzymes, nucleic acids and amino acids. The nutritional biochemistry concludes the course.

DETAILED COURSE OUTLINE:

TISSUE BIOCHEMISTRY

- Extracellular Matrix
- Collagen
- Elastin and Extracellular Matrix Components
- Biochemistry of Proteoglycans
- Bone & Teeth
- Muscle & Cytoskeleton

METABOLISM

BIOENERGETICS

- Introduction to Bioenergetics,
- Biological Oxidations
- Electron Transport Chain and Oxidative Phosphorylation

METABOLISM OF CARBOHYDRATES

- Digestion & Absorption of Carbohydrates
- Glycolysis & its Regulation
- Citric Acid Cycle
- Metabolism of Glycogen
- Gluconeogenesis and regulation of blood glucose
- Pentose Phosphate Pathway & its Significance

METABOLISM OF LIPIDS

- Digestion & Absorption of Lipids
- Metabolism & Clinical Significance of Lipoproteins
- Fatty acid oxidation biosynthesis and metabolism of Triacylglycerols

- Metabolism & clinical Significance of Cholesterol
- Metabolism of Eicosanoids

METABOLISM OF PROTEINS & AMINO ACIDS

- Digestion of Proteins & Absorption of Amino Acids
- Transamination & Deamination of Amino Acids and urea cycle
- Specialized products formed from Amino Acids

LAB WORK

Section 1

Techniques of Instruments in Clinical Biochemistry with examples.

1. Visible Spectrophotometry
2. Flame photometry
3. UV & IR spectrophotometry
4. Atomic Absorption spectrophotometry
5. pH Metry
6. Chromatography and determination of Amino Acids in Urine by pape chromatography

Section 2

Clinical quantatives analysis in Biochemistry

1. Sample Collection Blood, Faces and body fluids
2. Serum Glucose Estimation
3. Glucose tolerance Test (GTT)
4. Serum Cholesterol estimation (Total, HDL and HDL cholesterol)
5. Serum Bilirubin Estimation (Total, Direct and Indirect bilirubins)
6. Serum Amylase Estimation
7. Serum AST Estimation
8. Serum ALT Estimation
9. Serum ALP Estimation
10. Serum Creatine Kinase(CK) Estimation
11. Serum Ascorbic acid Estimation
12. Serum LDH Estimation

13. Serum Proteins Estimation (Total, Albumin & Globulin)
14. Serum Total lipids Estimation
15. Serum calcium Estimation (total, ionized & unionized)
16. Serum Uric acid Estimation
17. Serum Magnesium Estimation
18. Serum Urea Estimation
19. Serum Creatinine Estimation

Recommended Text Books:

1. *Harper's Biochemistry* by Robbert K. Murray, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwell, Latest Ed.
2. *Lippincott's Illustrated Review of Biochemistry* by Pamela C. Champe and Richard A. Harvey, Latest Ed.
3. *Practical Clinical Biochemistry* by Varley.
4. *Textbook of Biochemistry* by Devlin, 5th Ed.
5. *Textbook of Medical Biochemistry* Vol-I and II by M.A. Hashmi.
Biochemistry by Stryer, Lubert, Latest Ed

EXERCISE PHYSIOLOGY

CREDIT HOURS 3 (3-0)

COURSE DESCRIPTION:

This course aims to develop a critical appreciation of exercise and applied physiology, enabling design of specialist injury prevention, rehabilitation and performance enhancement programmes and strategies

DETAILED COURSE OUTLINE:

PHYSIOLOGY OF EXERCISE

CONTROL OF INTERNAL ENVIRONMENT

- Homeostasis
- Control systems of the body
- Nature of the control system
- Examples of homeostatic control
- Exercise : A test of homeostatic control

HORMONAL RESPONSES TO EXERCISE (BRIEF REVISION)

- Neuroendocrinology
- Hormones: Regulation and action
- Hormonal control of substrate mobilization during exercise

MEASUREMENT OF WORK, POWER & ENERGY EXPENDITURE

- Units of measure
- Work and power defined
- Measurement of work and power
- Measurement of energy expenditure
- Estimation of energy expenditure
- Calculation of exercise efficiency

CIRCULATORY RESPONSES TO EXERCISE (BRIEF REVISION):

- Organization of the circulatory system
- Heart: myocardium and cardiac cycle
- Cardiac output
- Hemodynamics

- Changes in oxygen delivery to muscle during exercise
- Circulatory responses to exercise
- Regulation of cardiovascular adjustments to exercise

RESPIRATION DURING EXERCISE (BRIEF REVISION)

- Function of the lung
- Structure of respiratory system
- Mechanics of breathing
- Pulmonary ventilation
- Pulmonary volumes and capacities
- Diffusion of gases
- Blood flow to the lungs
- Ventilation-perfusion relationships
- O₂ and CO₂ transport in blood
- Ventilation and acid base balance
- Ventilatory and blood-gas responses to exercise
- Control of ventilation
-

TEMPERATURE REGULATION

- Overview of heat balance during exercise
- Overview of heat production/heat loss
- Body's thermostat-hypothalamus
- Thermal events during exercise
- Exercise in the heat
- Exercise in cold environment

THE PHYSIOLOGY OF TRAINING: EFFECT ON VO₂ MAX, PERFORMANCE, HOMEOSTASIS AND STRENGTH

- Principles of training
- Research designs to study training
- Endurance training and VO₂ max
- VO₂ max: cardiac output and arterio-venous oxygen difference
- Detraining and VO₂ max
- Endurance training: effects on performance and homeostasis

- Endurance training: links between muscle and system physiology
- Physiological effects of strength training
- Physiological mechanisms causing increased strength

PHYSIOLOGY OF HEALTH AND FITNESS

WORK TESTS TO EVALUATE CARDIO RESPIRATORY FITNESS

- Cardio respiratory fitness
- Testing procedures
- FIELD Tests for estimating CRF
- Graded exercise tests: measurements
- VO2 max
- Graded exercise tests : protocols

EXERCISE PRESCRIPTION FOR HEALTH AND FITNESS

- Prescription of exercise
- General guidelines for improving
- Exercise prescription for CRF
- Sequence of physical activity
- Strength and flexibility training

EXERCISE FOR SPECIAL POPULATIONS

- Diabetes
- Asthma
- Chronic obstructive pulmonary disease
- Hypertension
- Cardiac rehabilitation
- Exercise for older adults
- Exercise during pregnancy

PHYSIOLOGY OF PERFORMANCE

FACTORS AFFECTING PERFORMANCE:

- Sites of fatigue
- Factors limiting All-out anaerobic performances

- Factors limiting All-out aerobic performances

LABORATORY ASSESSMENT OF HUMAN PERFORMANCE:

- Laboratory assessment of physical performance
- Direct testing of maximal aerobic power
- Laboratory tests to predict endurance performance
- Determination of anaerobic power
- Evaluation of muscular strength

TRAINING OF PERFORMANCE

- Training principles
- Components of a training session: warm-up, workout and cool down
- Training to improve aerobic power
- Injuries and endurance training
- Training for improved anaerobic power
- Training to improve muscular strength
- Training for improved flexibility
- Year-round conditioning for athletes
- Common training mistakes

TRAINING FOR THE FEMALE ATHLETE, CHILDREN AND SPECIAL POPULATION

- Factors important to women involved in vigorous training
- Sports conditioning for children
- Competitive training for diabetics
- Training for asthmatics
- Epilepsy and physical training

Recommended Textbooks:

1. *Exercise Physiology- Theory and Application to Fitness and Performance* by: Scott K. Powers, Edward T. Howley.
2. *Exercise physiology, A thematic Approach* By: Tudor Hale, University College Chic ester, UK
3. *Additional study material as assigned by the tutor*

MOLECULAR BIOLOGY & GENETICS

CREDIT HOURS 2(2-0)

COURSE DISCRIPTION

This course covers the brief overview of the cellular & molecular biology membrane physiology, introduction to molecular medicine and gene therapy, nuclear transplantation, gene therapy for neurological disorders, gene therapy for musculoskeletal disorders and the concept of molecular medicine in physical therapy.

This course has been designed to address a more in depth study of biology of inheritance and inheritance patterns. This course focuses on classical Mendelian genetics, the DNA molecule and molecular genetics, and population genetics. The course also covers Human genome and Molecular Pathology.

COURSE CONTENTS

BRIEF REVIEW OF CELLULAR & MOLECULAR BIOLOGY

Structure and Functions of Cell, Nucliec Acid, Chromosomes & Proteins

INTRODUCTION TO MOLECULAR MEDICINE AND GENE THERAPY

Introduction

Genetic Manifestations of Molecular Medicine

Gene Therapy and Patterns of Gene Expression

Gene Therapy and Molecular Medicine

Gene Therapy: Current Basic Science Issues

Human Gene Therapy: Current Status and Basic Science

GENE THERAPY FOR NEUROLOGICAL DISORDERS:

- Introduction
- Sorting Out the Complexity of the Nervous System
- What Goes Wrong in Neurological Disorders
- Neurotrophic Factors and Gene Therapy
- Neural Transplants and Stem Cells
- Clinical Neurodegenerative Conditions

- Clinical Trials Testing Genetically Modified Cells and
- Neurotrophic Factors for Neurodegeneration:
- Stem Cell Therapy in Spinal Cord Injuries
- Future Considerations and Issues

GENE THERAPY FOR MUSCULOSKELETAL DISORDERS

- **Bone**

- Introduction:
- Regulatory Factors in Bone Development and
- Regeneration:
- Cells for Gene Therapy Strategies Directed Towards Bone
- Regeneration
- In Vivo & Ex Vivo Gene Therapy Strategies for Bone
- Clinical Trials for Bone Replacement

- **Ligament and Tendon:**

- Introduction
- Ligament and Tendon Growth Factors
- Cells for Gene Therapy Strategies Directed Towards Ligament Regeneration
- In Vivo & Ex Vivo Gene Therapy Strategies to Intact Ligament and Tendon
- Gene Therapy Strategies for Lacerated Tendon Repair, promote Osseo-Integration of Tendon Grafts
- Clinical Trials for Ligament and Tendon Replacement:

- **Cartilage:**

- Introduction
- Growth Factors and Cytokines for Cartilage Repair and Regeneration
- Cells for Gene Therapy Strategies Directed Towards Cartilage Regeneration
- Gene Delivery Strategies for Cartilage Repair and Regeneration
- Dose Dependency Detected with Cartilage Gene Therapies
- Therapeutic Effects by Transfected Cells on Distal Joints
- Transfected Xenogeneic Cells for Cartilage Repair
- Cartilage Tissue Engineering and Gene Therapy

- **Intervertebral Disc**

- Introduction
- The Biology of Intervertebral Disc Degeneration

- Application of Gene Therapy in Intervertebral Disc
- In Vivo& Ex Vivo Gene Therapy Strategies to Intervertebral Disc
- Clinical Trials for Intervertebral Disc
- **Muscles**
- Introduction
- The Molecular Basis of Myopathies
- In Vivo& Ex Vivo Gene Therapy Strategies in Myopathies
- Clinical Trials in Myopathies
- Gene Therapy: Ethical Issues at the Policy Level

A brief introduction to following topics

- The chemistry of DNA
- DNA replication and recombination
- Transcription, translation and protein synthesis
- Cell-based DNA cloning
- Nucleic acid hybridization assays:
- PCR, DNA sequencing and in vitro mutagenesis:
- Organization of the human genome:
- Human gene expression:
- Instability of the human genome:
- Mutation and DNA repair:
- Physical and transcript mapping:

RECOMMENDED BOOKS

1. *Molecular Medicine: Genomics to Personalized Healthcare, 3rd Edition* by R. Trent. (Published in 2005 by Academic Press).
2. *Principles of Molecular Medicine, 2nd Edition* by Marschall S. Runge and Cam Patterson. (Published in 2006 by Humana Press).
3. *Molecular Neuropharmacology: A Foundation for Clinical Neuroscience, 2nd Edition* by Eric J. Nestler, Steven E. Hyman and Robert C. Malenka. (Published in 2008 by McGraw-Hill Professional).
4. *Molecular Medicine: An Introductory Text, 3rd Edition* by R. J. Trent. (Published in 2005 by Academic Press).

5. *Molecular Biology of the Cell, 5th Edition* by Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts and Peter Walter. (Published in 2007 by Garland Science).
6. *Human Molecular Genetics, 3rd Edition* by Tom Strachan and Andrew Read. (Published in 2003 by Garland Science/Taylor & Francis Group).
7. *Molecular Medicine for Clinicians, 1st Edition* by Barry Mendelow, Michele Ramsay, Nanthakumar Chettyan and Wendy Stevens. (Published in 2008 by University Press).
8. *Molecular Markers, Natural History and Evolution, 2nd Edition* by John C. Avise. (Published in 2004 by Sinauer Associates).
9. "Molecular Pathology: The Molecular Basis of Human Disease, 1st Edition" by William B. Coleman, and Gregory J. Tsongalis. (Published in 2009 by Academic Press).
10. Additional Study Material as assigned By the tutor.
11. *Genetics: A Conceptual Approach, 3rd Edition* by Benjamin Pierce (Published in 2007 by W. H. Freeman).
12. *Human Molecular Genetics, 3rd Edition* by Tom Strachan and Andrew P Read (Published in 2003 by Garland Science/Taylor & Francis Group).
13. *Genetics-From Genes to Genomes, 3rd Edition* by Hartwell, Hood, Goldberg, Reynolds, Silver and Veres (Published in 2006 by McGraw-Hill).
14. Additional Study Material, as assigned By the tutor.

FIFTH SEMESTER

- **PATHOLOGY & MICROBIOLOGY I**
- **PHARMACOLOGY & THERAPEUTICS I**
- **PHYSICAL AGENTS & ELECTROTHERAPY -I**
- **THERAPEUTIC EXERCISES & TECHNIQUES**
- **BIO STATISTIC 1**
- **BEHAVIORAL SCIENCES**
- **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.

DETAILED 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., McGraw-Hill.

PHARMACOLOGY & THERAPEUTICS 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.

DETAILED COURSE OUTLINE:

GENERAL PRINCIPLES OF PHARMACOLOGY;

- Basic Principles of Pharmacology
- Pharmacokinetics; Drug Administration, Absorption and Distribution
- Pharmacokinetics; 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 Book

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

DETAILED COURSE OUTLINE:

INTRODUCTION & GENERAL CONSIDERATION OF ELECTROTHERAPY

- Electrotherapy.
- Types of currents and its parameters.
- Identification of the safety rules for using electrical currents.
- Background with respect to RMP, nerve impulse, electrical charges of nerve and tissues.
- Healing process.
- Application of the energy to the body for therapy.
- List of the risks, preventions and knowledge of indications and contraindications.

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)

- Di-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, renotin enovocaine, 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

DI DYNAMIC CURRENT

- Definition and introduction
- Basic currents (MF,DF)
- Derivative of basic current
- Brief description of Di dynamic and basic currents
- Characteristics of di-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
- Accomodity 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 EXERCISES & 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.

DETAILED 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 program
- Exercise program
- 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:

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. *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

BIostatISTICS-I

CREDIT HOURS 3(3-0)

COURSE DESCRIPTION

It involves selection of appropriate statistical techniques to address questions of medical relevance; select and apply appropriate statistical techniques for managing common types of medical data; use various software packages for statistical analysis and data management; interpret the results of statistical analyses and critically evaluate the use of statistics in the medical literature; communicate effectively with statisticians and the wider medical community, in writing and orally through presentation of results of statistical analyses; explore current and anticipated developments in medical statistics.

LEARNING OBJECTIVES

- Discuss necessary concepts of statistics to enable them to realize
- a research project in the field of Physiotherapy
- Explain Fundamentals of reading and understanding research methods, design, and statistics.

- **COURSE CONTENTS**

STATISTICS

- Define Statistics, Population, sample Descriptive and inferential
- Statistics, Observations, Data, Discrete and continuous variables,
- Errors of measurement, Significant digits, Rounding of a Number,
- Collection of primary and secondary data, Sources, Editing of Data.
- Exercises.

- **PRESENTATION OF DATA**

- Introduction, basic principles of classification and Tabulation,
- Constructing of a frequency distribution, Relative and Cumulative frequency distribution, Diagrams, Graphs and their Construction,
- Bar charts, Pie chart, Histogram, Frequency polygon and Frequency curve, Cumulative Frequency Polygon or Ogive, Histogram, Ogive for Discrete Variable. Types of frequency curves.

- Exercises.
- **MEASURES OF CENTRAL TENDENCY**
- Explain Different types of Averages, Quantiles, The Mode,
- Empirical Relation between Mean, Median and mode,
- Relative Merits and Demerits of various Averages. Properties of Good Average, Box and Whisker Plot, Stem and Leaf Display, definition of outliers and their detection.
- Exercises.

- **MEASURES OF DISPERSION**
- Describe Absolute and relative measures, Range, The semi-Interquartile Range, The Mean Deviation, The Variance and standard deviation, Change of origin and scale, Interpretation of the standard Deviation, Coefficient of variation, Properties of variance and standard Deviation, Standardized variables, Moments and Moments ratios.
- Exercises.
- **PROBABILITY AND PROBABILITY DISTRIBUTIONS**
- Define Discrete And Continuous Distributions: Binomial, Poisson And Normal Distribution.
- Exercises.
- **SAMPLING AND SAMPLING DISTRIBUTIONS**
- Describe sample design and sampling frame, bias, sampling and non-sampling errors, sampling with and without replacement,
- Probability and non-probability sampling, Sampling distributions for single mean and proportion, Difference of means and proportions.
- Exercises.

RECOMMENDED BOOKS

1. *Walpole RE. Students study guide: introduction to statistics. 3rd ed. 1982.*
2. *Muhammad F. Statistical methods and data analysis. Faisalabad: KitabMarkaz; 2000*
3. *R. L Ott, Micheal T longnecker. An introduction to statistical*

*methods and data analysis, 7th ed. Brooks/Cole, Cengage
Learning 2015*

BEHAVIORAL SCIENCES

(Psychiatry & Psychology)

CREDIT HOURS 3(3-0)

COURSE DESCRIPTION

This course is designed to increase awareness of psychosocial issues faced by individuals and their significant reference groups at various points on the continuum of health and disability, including factors that influence values about health promotion, wellness, illness and disability. Personal and professional attitudes and values are discussed as they relate to developing therapeutic relationships. Communication skills are emphasized for effective interaction with clients, health-care professionals and others

DETAILED COURSE OUTLINE:

INTRODUCTION

- Behavioral Sciences and their importance in health
- Bio-Psycho-Social Model of Healthcare
- Desirable attitudes
- Correlation of brain, mind and Behavioral Sciences
- Roles of a doctor

UNDERSTANDING BEHAVIOUR

- Sensation, sense organs / special organs
- Perception and factors affecting it
- Attention and concentration
- Memory and its stages, types and methods to improve it
- Types and theories of thinking
- Cognition and levels of cognition

- Problem solving and decision making strategies
- Communication Its types, modes and factors affecting it Non-verbal cues
- Characteristics of a good communicator

PERSONALITY AND INTELLIGENCE

- Stages and characteristics of psychological growth and development
- Personality and development theories of personality Factors affecting personality development
- Assessment of personality Influence of personality in determining reactions during health, disease, hospitalization, stress, etc
- Intelligence and its types Relevance of IQ and EQ Methods of enhancing EQ and effectively using IQ Factors affecting intelligence and their assessment

STRESS MANAGEMENT

- Definition and classification of stress and stressors
- Relationship of stress and stressors with illness
- Stress and health
- Anxiety
- Coping skills
- Psychological defense mechanisms
- Conflict and frustration
- Adjustment and maladjustment
- Patient anxiety / stress
- Psychological theories of pain perception and patients' experience of pain Treatment adherence and compliance
- Psychological techniques including hypnosis

DOCTOR – PATIENT RELATIONSHIP

- Concept of boundaries and psychological reactions in doctor – patient relationship (such as transference and counter transference)

PAIN, SLEEP AND CONSCIOUSNESS

- Concept of pain
- Physiology of pain, psychosocial assessment and management of chronic /intractable atypical facial pain
- Stages of sleep
- Physiology of consciousness
- Attend states of consciousness
- Psychological influence on sleep and consciousness
- Non-pharmacological methods of inducing sleep
- Changes in consciousness

COMMUNICATION SKILLS

- Principles of effective communication
- Active listening
- Art of questioning
- Good and bad listener
- Counseling: steps, scope, indication and contraindications
- Dealing with real life crisis and conflict situations in health settings
- A practical method of communication between the doctor and patient about disease, drugs, prognosis etc

INTERVIEWING

- Collecting data on psychosocial factors in Medicine / Surgery / Reproductive Health / Paediatrics and other general health conditions
- Types of interview
- Skills of interviewing

HEALTH PSYCHOLOGY

- Importance of psychological consideration in clinical management of patients

- Psychological therapies
- Key concepts in child's social and cognitive development
- Psychological changes during adolescence and old age and their clinical management
- Impact of illness on a patient's psychological wellbeing including the ability to cope and understand the association between psychological stress and physical well being
- Role of doctor in patient reassurance and allaying anxiety and fear

SOCIAL AND COMMUNITY PERSPECTIVE

- Inequalities of healthcare and the relationship of social class
- Ethnicity, culture and racism, How disease pattern and medical care vary by culture and ethnicity?
- Gender and Healthcare
- Influence of health and illness on behavior

APPLICATION OF BEHAVIOURAL PRINCIPLES IN HEALTH AND DISEASE

- Mentally / emotionally handicapped
- Physically handicapped
- Chronically ill
- Homebound
- Medically compromised

Recommended Text Books:

1. *A Handbook of Behavioural Sciences for Medical and Dental Students* By: Mowadat H Rana, Sohail Ali and Mansoor Mustafa, , University of Health Sciences Lahore
2. *Medicine in Society ; Behavioural Sciences for Medical Students*, By: Christopher Dowrick, , Arnold Publisher
3. *Behavioural Sciences in Clinical Medicine* By: Wolf & Stewert
4. *Developmental Psychology for Healthcare Professions* By: Katherine A Billingham

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

SIXTH SEMESTER

- **PATHOLOGY & MICROBIOLOGY II**
- **PHARMACOLOGY & THERAPEUTICS II**
- **PHYSICAL AGENTS & ELECTROTHERAPY –II**
- **BIOSTATISTIC II**
- **COMMUNITY MEDICINE & REHABILITATION**
- **SUPERVISED CLINICAL PRACTICE II**

PATHOLOGY & MICROBIOLOGY II

CREDIT 3(2-1)

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.

DETAILED COURSE OUTLINE:

THE INTEGUMENTARY SYSTEM

- Skin Lesions
- Signs and Symptoms of Skin Disease
- Aging and the Integumentary System
- Common Skin Disorders
- Skin Infections
- Skin Cancer
- Skin Disorders Associated With Immune
- Dysfunction
- Thermal Injuries
- Miscellaneous Integumentary Disorders

THE CARDIOVASCULAR SYSTEM

- Signs and Symptoms of Cardiovascular Disease
- Aging and the Cardiovascular System
- Gender Differences and the Cardiovascular System
- Diseases Affecting the Heart Muscle
- Disease Affecting the Cardiac Nervous System

- Diseases Affecting the Heart Valves
- Diseases Affecting the Pericardium
- Diseases Affecting the Blood Vessels
- Other Cardiac Considerations

THE LYMPHATIC SYSTEM

- Anatomy and Physiology
- Inflammation and Infection in the Lymphatic System

THE RESPIRATORY SYSTEM

- Aging and the Pulmonary System
- Infectious and Inflammatory Diseases
- Obstructive Diseases
- Environmental and Occupational Diseases
- Near Drowning
- Congenital Disorders
- Parenchymal Disorders
- Disorders of the Pulmonary Vasculature
- Disorders of the Pleural Space

PATHOLOGY OF THE MUSCULOSKELETAL SYSTEM

INTRODUCTION TO PATHOLOGY OF THE MUSCULOSKELETAL SYSTEM

- Advances in Musculoskeletal Biotechnology
- Biologic Response to Trauma
- Aging and the Musculoskeletal System
- The Musculoskeletal System and Exercise
- Musculoskeletal System Disease

GENETIC AND DEVELOPMENTAL DISORDERS

- Down syndrome

- Scoliosis
- Kyphoscoliosis
- Spina Bifida Occulta, Meningocele, Myelomeningocele
- Developmental Dysplasia of the Hip
- Neuromuscular Disorders
- Torticollis
- Erb's Palsy
- Osteogenesis Imperfecta
- Arthrogyrosis Multiplex Congenita

METABOLIC DISORDERS

- Osteoporosis
- Osteomalacia
- Paget's Disease

INFECTIOUS DISEASES OF THE MUSCULOSKELETAL SYSTEM

- Osteomyelitis
- Infections of Prostheses and Implants
- Diskitis
- Infectious (Septic) Arthritis
- Infectious (Inflammatory) Muscle Disease
- Extra pulmonary tuberculosis
- Summary of Special Implications for the Therapist

MUSCULOSKELETAL NEOPLASMS

- Primary Tumors
- Primary Benign Bone tumors
- Primary Malignant Bone tumors
- Multiple Myeloma
- Primary Soft Tissue Tumors
- Metastatic Tumors

SOFT TISSUE, JOINT AND BONE DISORDERS

- Soft Tissue
- Joint
- Bone

PATHOLOGY OF THE NERVOUS SYSTEM

INTRODUCTION TO CENTRAL NERVOUS SYSTEM DISORDERS

- Overview
- Pathogenesis
- Clinical Manifestations
- Diagnosis
- Treatment
- Prognosis

INFECTIOUS DISORDERS OF THE CENTRAL NERVOUS SYSTEM

- Overview
- Meningitis
- Encephalitis
- Brain Abscess
- Prion Disease

CENTRAL NERVOUS SYSTEM NEOPLASMS

- Primary Brain Tumors
- Specific Primary Brain Tumors
- Primary Intraspinial Tumors
- Metastatic Tumors
- Paraneoplastic Syndromes
- Leptomeningeal Carcinomatosis
- Pediatric Tumors

DEGENERATIVE DISEASES OF THE CENTRAL NERVOUS SYSTEM

- Amyotrophic Lateral Sclerosis,
- Alzheimer's Disease, Alzheimer's Dementia, and Variants
- Dystonia,
- Huntington's Disease
- Multiple Sclerosis
- Parkinsonism and Parkinson's Disease

STROKE

- Stroke
- Vascular Disorders of the Spinal Cord

MEDICAL MICROBIOLOGY

G +VE COCCI

- Staphylococci
- Streptococci

G -VE COCCI

- Neisseria

G +VE SPORE FORMING RODS

- Bacillies
- Clostridia
- G –ve rods (introduction to Enterics)

ACID FAST BACILLI

- Mycobacteria

SPIROCHETES

- Introduction

- Treponemes

BASIC VIROLOGY

- General characteristics
- Viral structure
- Nomenclature and classification

MYCOLOGY

- Introduction to mycology

PARASITOLOGY

- Introduction to protozoan

Practical Training/ Lab Work

- To study the microscope
- To study the calcification
- To study the osteogenic sarcoma
- To study the granulation tissue
- To study the chronic inflammation (cholecystitis)
- To study the acute inflammation (appendicitis)
- To Fibroedenoma
- To study the carcinoma of breast
- To study the actinomycosis
- To study the culture media
- To study the gram staining
- To study the Z-N staining
- To study the giant cell tumor
- Examination of urine

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., McGraw-Hill.

PHARMACOLOGY & THERAPEUTICS II

CREDIT HOURS 2(2-0)

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.

DETAILED COURSE OUTLINE:

RESPIRATORY AND GASTROINTESTINAL PHARMACOLOGY;

- Respiratory drugs
- Gastrointestinal Drugs

ENDOCRINE PHARMACOLOGY;

- Introduction to Endocrine Pharmacology
- Adrenocorticosteroids
- Male and Female hormones
- Thyroid and Parathyroid Drugs; Agents affecting bone mineralization
- Pancreatic Hormones and the Treatment of Diabetes Mellitus

CHEMOTHERAPY OF INFECTIOUS AND NEOPLASTIC DISEASES;

- Treatment of Infections; Antibacterial Drugs
- Treatment of Infections; Antiviral Drugs
- Treatment of Infections; Antifungal and Ant parasitic drugs
- Cancer Chemotherapy
- Immunomodulating Agents

DRUGS USED IN CURRENT PHYSICAL THERAPY PRACTICE:

- Drugs administered by Iontophoresis and Phonophoresis
- Potential Interactions Between Physical Agents and Therapeutic drugs

Recommended Text Book:

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

PHYSICAL AGENTS & ELECTROTHERAPY II

CREDIT HOURS 3(2-1)

COURSE DESCRIPTION:

This course tends to explore further fundamental skills in application of electro modalities and knowledge of indications, contraindications and physiological principles needed for appropriate patient care. It includes topics such as infra-red, ultra violet, cryotherapy, hydrotherapy, Iontophoresis, ultrasound /Phonophoresis, electro diagnostic testing, traction, compression laser therapy etc.

DETAILED COURSE OUTLINE:

MEDIUM FREQUENCY CURRENT:

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

PHYSICS OF HEAT AND RADIATION

- Definition of heat and temperature
- Physical effects
- Transmission of heat
- Radiant energy electromagnetic spectrum its production & properties
- Laws governing radiation

INFRA-RED RAYS

- Definition
- Production, luminous & non-luminous generators
- Physiological effects
- Therapeutic effects
- Uses
- Techniques of application

- Dangers and contraindications

ULTRA VIOLET RAYS

- Production, U.V. rays
- Mercury Vapor Lamp: Air cooled mercury vapor lamp & Kromayer lamp
- Fluorescent Tubes
- Penetration of rays into the skin
- Physiological effects (local & general)
- Therapeutic effects
- Sensitizers
- Assessment of doses
- Test dose
- Techniques of local and general radiation with special techniques of treatment of wounds
- Techniques with compression
- Dangers & precautions
- Contraindications

HELIO THERAPY

- Introduction
- Effects
- Uses
- dangers and contraindications

ULTRASONIC THERAPY

- Introduction
- Production
- Physiological & therapeutic effects
- Uses, dangers, precautions & contraindications
- Techniques and application of treatment

CRYOTHERAPY

- Definition
- Methods
- Physiological & therapeutic effects
- Dangers, indications and precautions

HYDROTHERAPY

- Physiological principles of hydrotherapy
- Application of heat & cold
- Outline of methods of applying moist heat
- Medium used, contrast bath, paraffin baths, whirlpool baths, techniques, effects, uses, dangers, contraindications of each
- The use of water as medium of each, the use of water as a medium of movement pool therapy
- Immersion baths, full, plain and medicated, partial baths, packs, general local methods of application
- Hot air, vapors, the care of patients in hydrological department
- Detailed description of indication of hydrotherapy

TRACTION

- Effects of spinal traction
- Clinical indications for the use of spinal traction
- Contraindications and precautions for spinal traction
- Adverse effects of spinal traction
- Application technique

COMPRESSION

- Effects of External Compressions
- Clinical indications for the Use of External Compression
- Contraindications and Precautions of External Compression

- Contraindications for the Use of Intermittent or Sequential Compression Pumps
- Precautions for the Use of Intermittent or Sequential Compression Pumps
- Adverse Effects of External Compression
- Application Techniques

LASER THERAPY:

- Definition
- Properties of laser
- Production of Lasers
- Types of Lasers
- Techniques of application
- Dosage parameters
- Interaction of laser with body tissues
- Physiological and therapeutic effects of lasers
- Dangers and contraindications
- Methods of Treatment
- **BIOFEED BACK**
- Introduction
- Indications
- Contra-Indications
- Types of Biofeedback
- Advantages
- Disadvantages
- **SHOCKWAVE THERAPY**
- Physiology
- Indications
- Method of Application
- Contra-Indications
- **WAX THERAPY**
- Characteristics of Paraffin Wax

- Care of Apparatus
- Physiological Effects
- Indications
- Contra-Indications
- Advantages
- Disadvantages
- Method of Application
- **MEGNATIC THERAPY**
- Indications
- Contra-Indications
- Method of Application

Practical Training/ Lab Work

The practical training will be practiced in physiotherapy treatment ward under the supervision of qualified physiotherapists

- Practical application of Infra-red rays
- Practical application of ultrasound including Phonophoresis
- Supervised application of Ultraviolet rays including determination of test dosage
- Practical application of cold packs
- Practical application of traction
- Paraffin Wax bath application
- 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

BIostatistics-II

CREDIT HOURS 3(3-0)

COURSE DESCRIPTION

The course is designed to provide the students with the necessary concepts of statistics to enable them to realize a research project in the field of Physiotherapy. It involves selection of appropriate statistical techniques to address questions of medical relevance; select and apply appropriate statistical techniques for managing common types of medical data; use various software packages for statistical analysis and data management; interpret the results of statistical analyses and critically evaluate the use of statistics in the medical literature; communicate effectively with statisticians and the wider medical community, in writing and orally through presentation of results of statistical analyses; explore current and anticipated developments in medical statistics. It is designed to teach entry-level physical therapy students the fundamentals of reading and understanding research methods, design, and statistics.

LEARNING OBJECTIVES

The course aims to shape the attitudes of learners regarding the field of Statistics.

- Specifically, the course aims to Motivate in students an intrinsic interest in statistical thinking.
- Instill the belief that Statistics is important for scientific research.
- Provide a foundation and motivation for exposure to statistical ideas subsequent to the course.
- Demonstrate the ability to apply fundamental concepts in exploratory data analysis.
- Design studies for obtaining data whilst avoiding common design flaws that incur bias, inefficiency and confounding.
- Demonstrate an understanding of the basic concepts of probability and random variables.
- Understand the concept of the sampling distribution of a statistic, and in particular describe the behavior of the sample mean.
- Apply inferential methods relating to the means of Normal distributions.
- Apply and interpret basic summary and techniques for data and use inferential methods.

COURSE CONTENTS

HYPOTHESIS TESTING

- Introduction, Statistical problem, null and alternative hypothesis, Type-I and Type-II errors, level of significance, Test statistics, acceptance and rejection regions, general procedure for testing of hypothesis.
- Exercises.

TESTING OF HYPOTHESIS- SINGLE POPULATION:

Introduction, testing of hypothesis and confidence interval about the population mean and proportion for small and large samples,

Exercises.

TESTING OF HYPOTHESES-TWO OR MORE POPULATIONS:

Introduction, Testing of hypothesis and confidence intervals about the difference of population means and proportions for small and large samples, Analysis of Variance and ANOVA Table.

Exercises.

TESTING OF HYPOTHESIS-INDEPENDENCE OF ATTRIBUTES

Introduction, Contingency Tables, Testing of hypothesis about the Independence of attributes. Exercises.

REGRESSION AND CORRELATION:

Introduction, cause and effect relationships, examples, simple linear regression, estimation of parameters and their interpretation. r and R^2 . Correlation. Coefficient of linear correlation, its estimation and interpretation. Multiple regression and interpretation of its parameters.

RECOMMENDED TEXT BOOKS

1. *Walpole, R. E. 1982. —Introduction to Statistics", 3rd Ed., Macmillan Publishing Co., Inc. New York. Muhammad, F. 2005.*
2. *Statistical Methods and Data Analysis", KitabMarkaz, Bhawana Bazar Faisalabad.*

COMMUNITY MEDICINE & REHABILITATION

COURSE DESCRIPTION

This course is designed for the Physical Therapy students in order to develop strong background knowledge regarding the community health, wellbeing and community based rehabilitation. It also gives knowledge about the issues of community health, policies and procedures for their effective rehabilitation management. It provide awareness about the problems faced by people in community at all levels and effective strategies to solve these issues.

LEARNING OBJECTIVES

- Describe impact of environmental, biological, social and behavioral risk factors on health and disease through the epidemiologic methods.
- Discuss agent, host and environmental factors determining health and disease.
- Describe complete nutritional assessment of individual using clinical, Anthropometric and diet survey tools
- Discuss the community health, diagnosis and to take remedial measure for improving community health
- Discuss various types of disabilities existing in special children

COURSE CONTENTS

COMMUNITY BASED MEDICINE

INTRODUCTION

- History of Community medicine & rehabilitation
- Definition, concept of Health & illness of diseases
- Natural History of diseases, levels & prevention.

ENVIRONMENTAL SANITATION & MEDICAL ENTOMOLOGY

- water
- waste disposal
- Environmental problems & pollution.

GENETICS

- Prevention of genetic diseases
- Genetic counseling.

GENERAL EPIDEMIOLOGY

DESCRIPTIVE EPIDEMIOLOGY

- Time
- Place
- Person.

ANALYTICAL EPIDEMIOLOGY

- Case control
- Cohort studies.

EXPERIMENTAL EPIDEMIOLOGY RANDOMIZED CONTROL TRIAL

SYSTEMIC EPIDEMIOLOGY

- Vector borne diseases
- Water borne diseases
- Air borne diseases
- Contact diseases
- Diseases of major public health and its importance along with national health programs wherever Applicable

NON-COMMUNICABLE DISEASES

- Diabetes
- Hypertension
- Heart diseases
- Blindness
- Accidents
- Geriatric problems.

OCCUPATIONAL HEALTH PROBLEMS

- M.C.H. and family welfare Programmes
- Health care delivery in the community
- National Health Policy
- National Health programmes including
- Rehabilitation, Evaluation of Health
- Programmes, Health Planning Organization.

STRUCTURE OF HEALTH CARE SYSTEM IN THE COUNTRY

- P. H. C. district level

- State level and central level.
- P. H. C. Organization and Function
- Role of Non-Governmental Organization.

HEALTH EDUCATION

- Principles of Health Promotion
- Methods, approaches and media for
- I. E. C (Information, Education & Communication)
- Medical and Health/Information system
- Mental Health
- Nutrition.

COMMUNITY BASED REHABILITATION HEALTH IN THE COMMUNITY

- Handicap and the community
- Nutrition and mal nutrition
- Breast feeding
- Immunization
- Oral rehydration.

NORMAL BODY FUNCTION

- Normal development
- Growth and weight of children.

CONDITIONS AND TREATMENTS

- Cerebral palsy in children
- Down syndrome
- Mental handicap
- Hydrocephalus
- Spin bifida
- Poliomyelitis
- Blindness
- Deafness
- Strokes
- Spinal cord injuries

- Amputation.

MANAGEMENT OF PATIENTS

- Assessment and recoding
- Fits
- Contractures
- Pressure sores
- Urine and bowel management
- Chest infection
- Feeding children with cerebral palsy
- Toy making workshop
- Welfare assistance.

RECOMMENDED BOOKS

1. *Textbooks of Community Medicine, by Prof. H. A. Siddique (2nd Edition).*
2. *Parks text book of preventive & social medicine –K Park.*
3. *Community based rehabilitation worker manual, marion loveday, global health publication*
4. *Introduction to Special Education By: Allen and Beacon,(1992), A Simon &SuperterComp.Needham Heights*
5. *Exceptional Children and Adults, Patton, J.R. (1991); Boston Scott Foresmen and Co.*
6. *Exceptional Children in Focus by: Patton J.R. (1991); New York, Macmillan pub. Co*

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

SYSTEM REVIEW

SEMESTER	SUPERVISION	FOCUS	WARDS	COMPETENCIES
6	SUPERVISED BY TRAINED PHYSIOTHERAPIST	SYSTEMS REVIEW	All wards	AS LISTED BELOW

COURSE DESCRIPTION:

During this supervised clinical practice, students are responsible for learning the skills of systems review and validate the need for physical therapy services. Students learn to objectively review each system under the 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.) 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:

- Perform review of systems to determine the need for referral or for physical therapy services.
- Systems review screening includes the following:

GENERAL HEALTH CONDITION (GHC)

- Fatigue
- Malaise
- Fever/chills/sweats
- Nausea/vomiting
- Dizziness/lightheadedness
- Unexplained weight change
- Numbness/Paresthesia

- Weakness
- Mentation/cognition

CARDIOVASCULAR SYSTEM (CVS)

- Dyspnea
- Orthopnea
- Palpitations
- Pain/sweats
- Syncope
- Peripheral edema
- Cough

PULMONARY SYSTEM (PS)

- Dyspnea
- Onset of cough
- Change in cough
- Sputum
- Hemoptysis
- Clubbing of nails
- Stridor
- Wheezing

GASTROINTESTINAL SYSTEM (GIS)

- Difficulty with swallowing
- Heartburn, indigestion
- Change in appetite
- Change in bowel function

URINARY SYSTEM (US)

- Frequency

- Urgency
- Incontinence

GENITAL REPRODUCTIVE SYSTEM (GRS)

MALE

- Describe any sexual dysfunction, difficulties, or concerns

FEMALE

- Describe any sexual or menstrual dysfunction, difficulties, or problems

RECOGNITION OF RED AND YELLOW FLAGS

- Initiate referral when positive signs and symptoms identified in the review of systems are beyond the specific skills or expertise of the physical therapist or beyond the scope of physical therapist practice.
- Consult additional resources, as needed, including other physical therapists, evidence-based literature, other health care professionals, and community resources.
- Screen for physical, sexual, and psychological abuse.

CARDIOVASCULAR AND PULMONARY SYSTEMS

- Conduct a systems review for screening of the cardiovascular and pulmonary system (heart rate and rhythm, respiratory rate, blood pressure, edema).
- Read a single lead EKG.

INTEGUMENTARY SYSTEM

- Conduct a systems review for screening of the integumentary system, the assessment of pliability (texture), presence of scar formation, skin color, and skin integrity.

MUSCULOSKELETAL SYSTEM

- Conduct a systems review for screening of musculoskeletal system, the assessment of gross symmetry, gross range of motion, gross strength, height and weight.

NEUROLOGICAL SYSTEM

- Conduct a systems review for screening of the neuromuscular system, a general assessment of gross coordinated movement (eg, balance, gait, locomotion, transfers, and transitions) and motor function (motor control and motor learning).
- Documentation of all listed competencies in SOAP notes format

SEVENTH SEMESTER

- **MEDICINE I**
- **SURGERY I**
- **RADIOLOGY & DIAGNOSTIC IMAGING**
- **MUSCULOSKELETAL PHYSICAL THERAPY**
- **EVIDENCE BASED PRACTICE**
- **SUPERVISED CLINICAL PRACTICE III**

MEDICINE I

CREDIT HOURS 3(3-0)

COURSE DESCRIPTION:

This course intends to familiarize students with medical terminology and abbreviations for efficient and effective chart reviewing and documentation. It also explores select systemic diseases, focusing on epidemiology, pathology, histology, etiology, as well as primary and secondary clinical characteristics and their management. Discusses and integrates subsequent medical and surgical management to formulate appropriate intervention indications, precautions and contraindications.

DETAILED COURSE OUTLINE

CARDIOVASCULAR DISEASES

CARDIAC DISEASES:

- Chest pain
- Dyspnoea
- Palpitation
- Peripheral edema
- Syncope
- Cardiac failure
- Acute pulmonary edema
- Cardiogenic shock
- Systemic hypertension
- Ischemic heart disease
- Angina pectoris
- Unstable angina
- Myocardial infarction

- Rheumatic fever
- Valvular heart diseases
- Congenital heart diseases
- Ventricular septic defect
- Atrial septal defect
- pulmonary heart disease
- Pericardial disease
- Pulmonary hypertension
- Cardiac arrhythmias and heart in pregnancy

VASCULAR DISEASES:

- Arteriosclerosis
- Acute & Chronic ischemia of leg
- Aortic aneurysm
- Buerger's disease
- Raynaud's disease
- Varicose veins
- Venous thrombosis

RHEUMATOLOGY AND BONE DISEASES

ARTHRITIS

- Osteoarthritis
- Rheumatoid arthritis
- Connective tissue diseases
- Arthritis in elderly
- Arthritis in children,
- Seronegative spondyloarthropathies
- Crystals deposition disease
- Arthritis associated with other diseases

BACK PAIN

- Back Pain due to serious disease
- Inflammatory Back Pain
- Disc disease
- Mechanical problems
- Soft tissues problems
- Psychogenic Back Pain
- Nonspecific Back Pain
- Neck pain

SOFT TISSUE RHEUMATISM

BONE DISEASES

- Paget's disease
- Infections of bones
- Neoplastic disease
- Skeletal dysplasia
- Other hereditary diseases

RESPIRATORY DISEASES

DISEASES OF UPPER RESPIRATORY TRACT

- Common cold
- Sinusitis
- Rhinitis
- Pharyngitis
- Acute laryngo-tracheobronchitis
- Influenza
- Inhalation of the foreign bodies

DISEASE OF LOWER RESPIRATORY TRACT

- Acute & chronic Bronchitis

- Bronchiectasis
- Cystic fibrosis
- Asthma
- Emphysema
- Pneumonias
- Tuberculosis
- Pulmonary fibrosis
- Radiation damage
- Common tumors of the lungs
- Respiratory failure
- Adult distress respiratory syndrome
- Disorders of chest wall and pleura
- Chest trauma
- Deformities of rib cage
- Dry pleurisy
- Pleural effusion
- Empyema
- Pneumothorax

Recommended Text Books:

- *Practice of medicine* by: Davidson
- *Clinical medicine* by: Parveen j Kumar & Michael Clark
- *Short text book by medicine* by: M. Inam Danish
- *Hutchison's clinical methods* by: Michael swash. 21st edition
- *Bed side techniques*

SURGERY I

CREDIT HOURS 3(3-0)

COURSE DESCRIPTION:

This course intends to familiarize students with principles orthopedic surgery along with familiarization with terminology and abbreviations for efficient and effective chart reviewing and documentation. It also explores various orthopedic conditions needing surgical attention, focusing on epidemiology, pathology, as well as primary and secondary clinical characteristics and their surgical management. The purpose of this course is to make physiotherapy students aware of various surgical conditions so these can be physically managed effectively both pre as well as postoperatively.

DETAILED COURSE OUTLINE

ORTHOPEDIC SURGERY

FRACTURES

- Definition
- Classification
- Causes
- Clinical features
- Healing of fractures
- Complications
- Principles of general management of
 - Fracture of the Upper Extremity
 - Fracture of the Lower Extremity
 - Fracture of the vertebral column, thorax and pelvis
- Basic and advanced trauma life support

DISLOCATIONS & SUBLUXATIONS

- Definition
- Traumatic dislocation
- General description
- Principles of general description and management of traumatic dislocation and subluxation of
 - Shoulder joint
 - Acromioclavicular joint
 - Elbow joint
 - Hip joint
 - Knee joint

SOFT TISSUE INJURIES

- Introduction
- Anatomy & physiology general description and management of injuries of:
 - Ligaments
 - Tendons
 - Muscles
 - Fascia
 - Bursae
- Detailed description of physiotherapy management of individual tissue injuries around:
 - Shoulder region
 - Elbow region
 - Wrist and hand region
 - Knee region
 - Ankle region
- Muscles and tendons injuries of upper and lower limb
- Cervical & lumbar injuries
- Whiplash of the cervical spine
- Crush injuries
- Spinal pain

- Degenerative and Inflammatory Conditions:
 - Osteo-arthrosis/Arthritis
 - Spondylosis
 - Spondylolysis
 - Pyogenic arthritis
 - Rheumatoid arthritis
 - Juvenile arthritis
 - Tuberculosis arthritis
 - Gouty arthritis
 - Haemophilic arthritis
 - Neuropathic arthritis
 - Ankylosing spondylitis
 - psoriatic arthritis

GENERAL ORTHOPEDIC DISORDERS

- Carpel tunnel syndrome
- Compartment syndromes
- Muscular dystrophies
- Neuropathies
- Avascular necrosis of bone in adult and children
- Ischemic contracture
- Gangrene
- Rickets
- Osteoporosis and osteomalacia
- Shoulder pain
- Neck pain
- Knee pain
- Backache
- Painful conditions around elbow
- Detailed description of :

- Orthotics
- Prosthetics
- Splintage
- Traction
- POP

TUMORS:

- Classification
- Principles of general management
- General description of benign and malignant tumors of musculoskeletal system

DEFORMITIES AND ANOMALIES

- Definition
- Causes
- Classification
- Congenital and acquired deformities
- Physical and clinical and radiological features
- Complications
- Principles of medical and surgical management of the deformities
- General description of following deformities:

DEFORMITIES OF THE SPINE:

- Torticollis
- Scoliosis
- Kyphosis
- Lordosis
- flat back

DEFORMITIES OF THE LOWER LIMB:

- CDH
- coxavera

- coxavalga
- anteversion
- Retroversion
- Genu valgum
- Genu varum
- Genu recurvatum
- CDK
- Talipes calcaneus equinus, varus & valgus
- Talipes calcaneovarus
- Talipes calcaneovalgus
- Talipes equinovarus
- Pes cavus
- Pes planus
- Hallux valgus & varum,
- Hallux rigidus and hammer toe

DEFORMITIES OF SHOULDER AND UPPER LIMB:

- Sprengel's shoulder
- Cubitus varus
- Cubitus valgus
- Dupuytren's contracture

Recommended Text Books:

- *Short practice of surgery* by Bailey and Love's
- *Text Book of Surgery* by Ijaz Ahsan
- *Out line of Fractures*

RADIOLOGY & DIAGNOSTIC IMAGING

CREDIT HOURS 3(2-1)

COURSE DESCRIPTION:

This course covers the study of common diagnostic and therapeutic imaging tests. At the end of the course students will be aware of the indications and implications of commonly used diagnostic imaging tests as they pertain to patient's management. The course will cover that how X-Ray, CT, MRI, Ultrasound and Other Medical Images are created and how they help the health professionals to save lives.

FROM THE WATCHING OF SHADOWS:

- History
- A New Kind of Ray
- How a Medical Image Helps
- What Imaging Studies Reveal
- Radiography(x-rays)
- Fluoroscopy
- Computed Tomography (CT)
- Magnetic Resonance Imaging (MRI)
- Ultrasound
- Endoscopy

RADIOGRAPHY AND MAMMOGRAPHY:

- Equipment components
- Procedures for Radiography & Mammography
- Benefits versus Risks and Costs
- Indications and contraindications

FLUOROSCOPY:

- What is Fluoroscopy?
- Equipment used for fluoroscopy
- Indications and Contra indications
- How it helps in diagnosis
- The Findings in Fluoroscopy
- Benefits versus Risks and Costs

COMPUTED TOMOGRAPHY (CT):

- What is Computed Tomography?
- Equipment used for Computed Tomography
- Indications and Contra indications
- How it helps in diagnosis
- The Findings in Computed Tomography
- Benefits versus Risks and Costs

MAGNETIC RESONANCE IMAGING (MRI)

- What is MRI?
- Equipment used for MRI
- Indications and Contra indications
- How it helps in diagnosis
- The Findings in MRI
- Benefits versus Risks and Costs
- Functional MRI

ULTRASOUND:

- What is Ultrasound?
- Equipment used for Ultrasound
- Indications and Contra indications
- How it helps in diagnosis

- The Findings in Ultrasound
- Benefits versus Risks and Costs

ENDOSCOPY:

- What is Endoscopy?
- Equipment used for Endoscopy
- Indications and Contra indications
- How it helps in diagnosis
- The Findings in Endoscopy
- Benefits versus Risks and Costs

NUCLEAR MEDICINE:

- What is Nuclear Medicine?
- Equipment used for Nuclear Medicine
- Indications and Contra indications
- How it helps in diagnosis.
- Benefits versus Risks and Costs

INTERVENTIONAL RADIOLOGY

Recommended Text Book:

- Looking Within (How X-ray, CT, MRI, Ultrasound and Other Medical Images Created and How They Help Physicians Save Lives) By Anthony Brinton Wolbarst
- *A–Z of Musculoskeletal and Trauma Radiology* By: James R. D. Murray
- *Essentials of Radiology* by Fred. A. Mettler, 2nd edition.
- *Imaging in rehabilitation*, By: Terry. R. Malone, Charles Hazle& Michael L. Grey. McGraw Hill Publishers.

MUSCULOSKELETAL PHYSICAL THERAPY

CREDIT HOURS 3 (2-1)

COURSE DESCRIPTION:

This course includes a study of anatomy and physiology of the musculoskeletal system and pathological changes of the system and function, including diagnostic tests and measurements. Relevant tests and measures for determining impairment and differentiating the diagnosis based on the specificity and sensitivity of the assessment instruments as related to patients with musculoskeletal conditions are discussed. The use of evidence-based physical therapy intervention for musculoskeletal conditions is emphasized. Topics will focus on medical terminology, clinical examination, evaluation, comparing contemporary, traditional interventions and the impact of evolving technology in this area.

DETAILED COURSE OUTLINE

MEDICAL TERMINOLOGY REGARDING MUSCULOSKELETAL SYSTEM

PRINCIPLES AND CONCEPTS OF MUSCULOSKELETAL EVALUATION&ASSESSMENT

- Patient history
- Observation
- Examination

Principles, vital signs, examination of specific joints, functional assessment, specific diagnostic test, reflexes and cutaneous distribution, joint play movements, palpation

Evaluation /Assessment of spine and peripheral joints

- Causes
- Effects of range limitation on functional activities

Principles of assessment and outcome measures

Documentation in SOAP notes format

Evidence based musculoskeletal Physical Therapy Treatment protocols

PRINCIPLES OF INTERVENTION

SOFT TISSUE INJURY, REPAIR, AND MANAGEMENT

- Soft tissue lesions
- Management during the acute stage
- Management during the sub acute stage
- Management during the chronic stage
- Cumulative trauma–chronic recurring pain

JOINT, CONNECTIVE TISSUE, AND BONE DISORDERS AND MANAGEMENT

- Arthritis–arthrosis
- Fibromyalgia and myofascial pain syndrome
- Osteoporosis
- Fractures–post-traumatic immobilization

SURGICAL INTERVENTIONS AND POSTOPERATIVE MANAGEMENT

- Indications for surgical intervention
- Guidelines for preoperative and Postoperative management; considerations for preoperative management, considerations for postoperative management, potential postoperative complications
- Overview of common orthopedic surgeries and postoperative management; surgical approaches–open, arthroscopic, and arthroscopically assisted procedures, use of tissue grafts, repair, reattachment, reconstruction, stabilization, or transfer of soft tissues, release, lengthening, or decompression of Soft tissues

PERIPHERAL NERVE DISORDERS AND MANAGEMENT

- Review of peripheral nerve structure; nerve structure, nervous system mobility characteristics, common sites of injury to peripheral nerves
- Impaired nerve function

- Nerve injury and recovery
- Neural tension disorders and their managements
- Musculoskeletal diagnoses involving impaired
- Nerve function thoracic outlet syndrome
- Carpal tunnel syndrome
- Compression in tunnel of Guyon
- Complex regional pain syndrome: reflex sympathetic Dystrophy and causalgia

EXERCISE INTERVENTIONS BY BODY REGION

THE SPINE AND POSTURE: STRUCTURE, FUNCTION, POSTURAL IMPAIRMENTS& MANAGEMENT GUIDELINES

Posture and Biomechanical Influences

- Alignment
- Stability

Impaired posture

- Etiology of pain
- Common faulty postures: characteristics and Impairments

Management of impaired posture

- General management guidelines
- Tension headache/cervical headache

THE SPINE: IMPAIRMENTS, DIAGNOSES, & MANAGEMENT GUIDELINES

- Review of the structure and function of the spine

SPINAL PATHOLOGIES AND IMPAIRED SPINAL FUNCTION

- Pathology of the intervertebral disk
- Pathomechanical relationships of the intervertebral disk and facet joints
- Pathology of the zygapophyseal (facet)

- Pathology of muscle and soft tissue injuries: strains, tears, and contusions
- Pathomechanics of spinal instability

MANAGEMENT GUIDELINES BASED ON IMPAIRMENTS

- Principles of management for the Spine
- Management guidelines–non-weight-bearing bias
- Management guidelines–extension bias
- Management guidelines–flexion bias
- Management guidelines–stabilization
- Management guidelines–mobilization
- Management guidelines–soft tissue injuries
- Management Guidelines–Temporomandibular Joint Dysfunction

THE SPINE: EXERCISE INTERVENTIONS

- Basic concepts of spinal management with exercise
- Fundamental interventions
- Patient education
- General exercise guidelines
- Kinesthetic awareness
- Elements of kinesthetic training–fundamental techniques
- Progression to active and habitual control of Posture
- Mobility/flexibility
- Cervical and upper thoracic
- Region–stretching techniques
- Mid and lower thoracic and lumbar
- Regions–stretching techniques
- Muscle performance: stabilization, muscle endurance, and strength training
- Stabilization training–fundamental techniques and Progressions
- Isometric and dynamic exercises
- Cardiopulmonary endurance
- Common aerobic exercises and effects on the spine

- Functional activities
- Early functional training–fundamental techniques
- Preparation for functional activities–basic exercise Techniques
- Body mechanics and environmental adaptations
- Intermediate to advanced exercise techniques for Functional training
- Education for prevention

THE SHOULDER AND SHOULDER GIRDLE

- Examination, evaluation and assessment of shoulder joint
- Referred pain and nerve injury
- Management of shoulder disorders and surgeries
- Joint Hypo mobility: non-operative management
- Glenohumeral joint surgery and postoperative management
- Painful shoulder syndromes (rotator cuff disease, impingement syndromes, shoulder instabilities):
- Non-operative management
- Painful shoulder syndromes: surgery and postoperative management
- Shoulder dislocations: non- operative management
- Shoulder instabilities: surgery and postoperative management
- Exercise interventions for the shoulder
- Girdle Exercise Techniques During Acute And Early Subacute Stages of tissue healing
- Exercise techniques to increase flexibility and range of motion
- Exercises to develop and improve muscle performance and functional control

THE ELBOW & FOREARM COMPLEX

- Examination, evaluation and assessment of elbow and forearm complex
- Referred pain and nerve injury in the elbow region
- Management of elbow and forearm disorders and surgeries
- Joint Hypomobility: nonoperative management
- Joint surgery and postoperative management

- Myositis ossificans
- Overuse syndromes: repetitive trauma syndromes
- Exercise interventions for the elbow and Forearm
- Exercise techniques to increase flexibility and range of Motion
- Exercises to develop and improve muscle performance And functional

THE WRIST & HAND

- Examination, evaluation and assessment of wrist and hand
- Major nerves subject to pressure and trauma at the Wrist and hand
- Management of wrist and hand disorders And surgeries
- Joint Hypomobility: nonoperative management
- Joint surgery and postoperative management
- Repetitive trauma syndromes/overuse
- Traumatic lesions in the wrist and hand
- Exercise interventions for the wrist and Hand
- Techniques for musculotendinous mobility
- Exercise techniques to increase flexibility and range Of motion
- Exercises to develop and improve muscle Performance, neuromuscular control, and coordination.

THE HIP

- Examination, evaluation and assessment of hip joint
- The hip and gait
- Referred pain and nerve injury
- Management of hip disorders and surgeries
- Joint Hypomobility: nonoperative management
- Joint surgery and postoperative management
- Fractures of the hip–surgical and postoperative management
- Painful hip syndromes/overuse syndromes: nonoperative management
- Exercise interventions for the hip region

- Exercise techniques to increase flexibility and range of motion
- Exercises to develop and improve muscle performance and functional control

THE KNEE

- Examination, evaluation and assessment of knee joint
- Referred pain and nerve injuries
- Management of knee disorders and surgeries
- Joint Hypomobility: nonoperative management
- Joint surgery and postoperative management
- Patellofemoral dysfunction: nonoperative management
- Patellofemoral and extensor mechanism dysfunction: Surgical and postoperative management
- Ligament injuries: nonoperative management
- Ligament injuries: surgical and postoperative Management
- Meniscal tears: nonoperative management
- Meniscal tears: surgical and postoperative management
- Exercise interventions for the knee
- Exercise techniques to increase flexibility and range of motion
- Exercises to develop and improve muscle performance and functional control

THE ANKLE & FOOT

- Examination, evaluation and assessment of ankle and foot joint
- Referred pain and nerve injury
- Management of foot and ankle disorders and surgeries
- Joint Hypomobility: nonoperative management
- Joint surgery and postoperative management
- Overuse (repetitive trauma) syndromes: nonoperative management
- Ligamentous injuries: nonoperative management
- Traumatic soft tissue injuries: surgical and postoperative management
- Exercise interventions for the ankle and foot
- Exercise techniques to increase flexibility and range of motion

- Exercises to develop and improve muscle performance and functional control

Practical Training:

- The practical training will be sought in physiotherapy treatment based settings. Keeping in view therapeutic principles, management of various pre and post-operative conditions will be practiced under supervision and later independently by the students, the practical work might include:
 - Therapeutic Management of conditions of spine
 - Therapeutic Management of conditions of extremities
 - Therapeutic Management of vascular disorders
 - Therapeutic Management of pulmonary conditions
 - Therapeutic Management of gynecological conditions
 - Reflective clinical case studies
 - Supervised and independent Practical application of therapeutic techniques on patients in outdoor and indoor physiotherapy treatment settings.

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:

- *Therapeutics Exercises and Technique*, By: Carolyn Kisner & Lynn Allen Colby 4th 5th edition.
- *Therapeutics Exercises: Techniques for Intervention* By: Willim D. Bandy
- *Clinical decision making in therapeutic exercise* By: Patricia e. Sullivan & prudence d. Markos, Appleton & Lange Norwalk, Connecticut
- Hertling, D, and Kessler RM. Management of Common Musculoskeletal Disorders: Physical Therapy Principles and Methods. 3rd ed. Philadelphia, PA: WB Saunders 1995

- *Orthopaedic Physical Therapy* By: Donatelli & Michael J. Wooden 4th Edition.
- *Physiotherapy in Orthopaedics, A problem-solving approach* By: Atkinson, Coutts & Hassenkamp 2nd Edition
- *Clinical orthopaedic rehabilitation* By S. Brent. Brotzman & Kevin. E. Wilk, 2nd edition, Mosby publishers.
- *Management of Common Musculoskeletal Disorder* by: Hertling, D, and Kessler RM *Physical Therapy Principles and Methods*. 3rd ed. Philadelphia, PA: WB Saunders
- *Orthopedic Physical Assessment*. Magee, D. 4th ed. Philadelphia PA: WB Saunders 1995
- *Physical Rehabilitations Assessments and Treatment*”. By Susan B, O’Sullivan & Thomas J. Schmitz , 4th edition
- *Tidy’s Physiotherapy* by Thomas A Skinner & Piercy

EVIDENCE BASED PRACTICE

CREDIT HOURS 3(2-1)

COURSE DESCRIPTION:

This course introduces the concept of evidence-based practice in physical therapy including the formulation of answerable clinical questions, methods of obtaining peer-reviewed evidence to those clinical questions, and how to critically appraise evidence once located. This course is a lecture and seminar course that will focus on developing the skills need for evaluating, critiquing, and consuming the literature germane to physical therapy practice. Current journal articles, texts, and online resources will be used in the course to develop critical reading and writing skills.

DETAILED COURSE OUTLINE

EVIDENCE-BASED PHYSIOTHERAPY

- An introduction about evidence-based Physiotherapy:
 - What do we mean by ‘high quality clinical research’?
 - What do we mean by ‘patient preferences’?
 - What do we mean by ‘practice knowledge’?
 - Additional factors
 - The process of clinical decision-making
- Importance of evidence-based Physiotherapy:
 - For patients
 - For physiotherapists and the profession
 - For funders of physiotherapy services
 - History of Evidence-Based Health Care
 - Steps for practicing evidence-based Physiotherapy

WHAT DO WE NEED TO KNOW?

- Relevant clinical questions

- Refining your question
- Effects of intervention
- Experiences
- Prognosis
- Diagnosis

WHAT CONSTITUTES EVIDENCE?

- Evidence about effects of interventions
- Different forms of evidence
- Different sources of evidence
- Hierarchy of evidence
- Research study design

FINDING THE EVIDENCE

- Search Strategies
 - The World Wide Web
 - Selecting search terms AND and OR
- Finding Evidence of Effects of Interventions
 - PEDro
 - The Cochrane Library
- Finding Evidence of Prognosis and Diagnostic Tests
- Finding Evidence of Experiences
 - CINAHL
 - Pub Med
- Getting full text
- Finding evidence of advances in clinical
- Practice (Browsing)

TRUST UPON EVIDENCE

- A process for critical appraisal of evidence

- Critical appraisal of evidence about the Effects of intervention
 - Randomized trials
 - Systematic reviews of randomized trials
- Critical appraisal of evidence about experiences
- Critical appraisal of evidence about prognosis
 - Individual studies of prognosis
 - Systematic reviews of prognosis
- Critical Appraisal of Evidence about Diagnostic Tests
 - Individual studies of diagnostic tests
 - Systematic reviews of diagnostic tests

CLINICAL GUIDELINES AS A RESOURCE FOR EVIDENCE-BASED PHYSIOTHERAPY

- What are clinical guidelines?
- History of clinical guidelines and why they are important
- Where can I find clinical guidelines?
- How do I know if I can trust the recommendations in a clinical Guideline?
 - Scope and purpose
 - Stakeholder involvement
 - Rigor of development
 - Clarity and presentation
 - Applicability
 - Editorial independence
 - What do the results of the critical appraisal mean for my practice?
- Legal Implications of Clinical Guidelines
 - Clinical guidelines or ‘reasonable care’: which do the courts consider more important?
 - Documenting the use of a clinical guideline in practice: legal implications
- Reflections on the Future of Guideline Development
 - Who should develop clinical guidelines?
 - Collaboration in guideline development

- Uniprofessional or multiprofessional guideline development?

CRITICAL THINKING

- The Benefit of Asking the Right Questions
- What Are the Issue and the Conclusion?
- What Are the Reasons?
- What Words or Phrases Are Ambiguous?
- What Are the Value Conflicts and Assumptions?
- What Are the Descriptive Assumptions?
- Are There Any Fallacies in the Reasoning?
- How Good Is the Evidence: Intuition, Personal Experience?
- Testimonials, and Appeals to Authority?
- How Good Is the Evidence: Personal Observation, Research?
- Studies, Case Examples, and Analogies
- Are There Rival Causes?
- Are the Statistics Deceptive?
- What Significant Information Is Omitted?
- What Reasonable Conclusions Are Possible?
- Practice and Review
- The Tone of Your Critical Thinking
- Strategies for Effective Critical Thinking

PRACTICAL

- Identify the different sources of evidence
- Critically appraised topics (CAT)
- How to evaluate web page
- Ways of searching strategies for different databases
- Selection of search terminology
- Retrieving of articles from data bases

Recommended Text Books:

- *Practical Evidence based physiotherapy* By, Rob Herbert, GroJamtdvedt, Judy Mead&KareBirger Hagen.
- *Asking the right question-A guide to critical thinking*, 8th Edition By, M.Neil.Browne& Stuart M Keeley
- *Additional reading material as assigned.*

SUPERVISED CLINICAL PRACTICE III

CREDITS 3(0-3)

MUSCULOSKELETAL

SEMESTER	SUPERVISION	FOCUS	WARDS	COMPETENCIES
7	Supervised by trained PT	Evaluation, Examination, and Intervention	MSK (IPD/OPD; surgical & non-surgical)	Listed below

COURSE DESCRIPTION:

During this supervised clinical practice, students are responsible for successful execution of examination, evaluation, and interventions relating to musculoskeletal disorders. Students become familiar with performance of these skills in all settings (inpatient and outpatient) as well as on all types of conditions (surgical, non-surgical, pediatric and geriatric)

Students learn to objectively perform these skills under the supervision of trained physical therapists. 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.

COMPETENCIES:

EXAMINATION:

- Based on best available evidence select examination tests and measures that are appropriate for the patient/client.
- Perform posture tests and measures of postural alignment and positioning.*
- Perform gait, locomotion and balance tests including quantitative and qualitative measures such as:
 - Balance during functional activities with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment
 - Balance (dynamic and static) with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment
 - Gait and locomotion during functional activities with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment to include:
 - ❖ Bed mobility
 - ❖ Transfers (level surfaces and floor)*
 - ❖ Wheelchair management
 - ❖ Uneven surfaces
 - ❖ Safety during gait, locomotion, and balance
 - Perform gait assessment including step length, speed, characteristics of gait, and abnormal gait patterns.
- Characterize or quantify body mechanics during self-care, home management, work, community, tasks, or leisure activities.
- Characterize or quantify ergonomic performance during work (job/school/play)*:
 - Dexterity and coordination during work
 - Safety in work environment
 - Specific work conditions or activities
 - Tools, devices, equipment, and workstations related to work actions, tasks, or activities
- Characterize or quantify environmental home and work (job/school/play) barriers:
 - Current and potential barriers
 - Physical space and environment
 - Community access
- Observe self-care and home management (including ADL and IADL)*
- Measure and characterize pain* to include:

- Pain, soreness, and nociception
 - Specific body parts
- Recognize and characterize signs and symptoms of inflammation.

PERFORM MUSCULOSKELETAL SYSTEM TESTS AND MEASURES INCLUDING:

- Accessory movement tests
- Anthropometrics
 - Limb length
 - Limb girth
 - Body composition
- Functional strength testing
- Joint integrity
- Joint mobility
- Ligament laxity tests
- Muscle length
- Muscle strength including manual muscle testing, dynamometry, one repetition max
- Palpation
- Range of motion including goniometric measurements

PERFORM ORTHOTIC TESTS AND MEASURES INCLUDING

- Components, alignment, fit, and ability to care for orthotic, protective, and supportive devices and equipment.
- Evaluate the need for orthotic, protective, and supportive devices used during functional activities.
- Remediation of impairments in body function and structure, activity limitations, and participation restrictions with use of orthotic, protective, and supportive device.
- Residual limb or adjacent segment, including edema, range of motion, skin integrity and strength.
- Safety during use of orthotic, protective, and supportive device.
- Perform prosthetic tests and measures including*:

- ❖ Alignment, fit, and ability to care for prosthetic device.
 - ❖ Prosthetic device use during functional activities.
 - ❖ Remediation of impairments in body function and structure, activity limitations, and participation restrictions, with use of prosthetic device.
 - ❖ Evaluation of residual limb or adjacent segment, including edema, range of motion, skin integrity, and strength.
- Safety during use of the prosthetic device.
 - Perform tests and measures for assistive and adaptive devices including*:
 - ❖ Assistive or adaptive devices and equipment use during functional activities.
 - ❖ Components, alignment, fit, and ability to care for the assistive or adaptive devices and equipment.
 - ❖ Remediation of impairments in body function and structure, activity limitations, and participation restrictions with use of assistive or adaptive devices and equipment.
 - ❖ Safety during use of assistive or adaptive equipment.

EVALUATION:

- Clinical reasoning
- Clinical decision making
- Synthesize available data on a patient/client expressed in terms of the International Classification of Function, Disability and Health (ICF) model to include body functions and structures, activities, and participation.
- Use available evidence in interpreting the examination findings.
- Verbalize possible alternatives when interpreting the examination findings.
- Cite the evidence (patient/client history, lab diagnostics, tests and measures and scientific literature) to support a clinical decision.

DIAGNOSIS:

- Integrate the examination findings to classify the patient/client problem in terms of body functions and structures, and activities and participation (ie, practice patterns in the Guide)

- Identify and prioritize impairments in body functions and structures, and activity limitations and participation restrictions to determine specific body function and structure, and activities and participation towards which the intervention will be directed.

PROGNOSIS:

- Determine the predicted level of optimal functioning and the amount of time required to achieve that level.
- Recognize barriers that may impact the achievement of optimal functioning within a predicted time frame including:
 - Age
 - Medication(s)
 - Socioeconomic status
 - Co-morbidities
 - Cognitive status
 - Nutrition
 - Social Support
 - Environment

PLAN OF CARE:

- Goal setting
- Coordination of Care
- Progression of care
- Discharge
- Design a Plan of Care
- Write measurable functional goals (short-term and long-term) that are time referenced with expected outcomes.
- Consult patient/client and/or caregivers to develop a mutually agreed to plan of care.
- Identify patient/client goals and expectations.
- Identify indications for consultation with other professionals.
- Make referral to resources needed by the patient/client (assumes knowledge of referral sources).

- Select and prioritize the essential interventions that are safe and meet the specified functional goals and outcomes in the plan of care
 - identify precautions and contraindications
 - provide evidence for patient-centered interventions that are identified and selected
 - define the specificity of the intervention (time, intensity, duration, and frequency)
 - Set realistic priorities that consider relative time duration in conjunction with family, caregivers, and other health care professionals.
- Establish criteria for discharge based on patient goals and current functioning and disability.
- Coordination of Care
 - Identify who needs to collaborate in the plan of care.
 - Identify additional patient/client needs that are beyond the scope of physical therapist practice, level of experience and expertise, and warrant referral.
 - Refer and discuss coordination of care with other health care professionals.
 - Articulate a specific rationale for a referral.
 - Advocate for patient/client access to services.
- Progression of Care
 - Identify outcome measures of progress relative to when to progress the patient further.
 - Measure patient/client response to intervention.
 - Monitor patient/client response to intervention.
 - Modify elements of the plan of care and goals in response to changing patient/client status, as needed.
 - Make on-going adjustments to interventions according to outcomes including environmental factors and personal factors and, medical therapeutic interventions.
 - Make accurate decisions regarding intensity and frequency when adjusting interventions in the plan of care.
- Discharge Plan
 - Re-examine patient/client if not meeting established criteria for discharge based on the plan of care.

- Differentiate between discharge of the patient/client, discontinuation of service, and transfer of care with re-evaluation.
- Prepare needed resources for patient/client to ensure timely discharge, including follow-up care.
- Include patient/client and family/caregiver as a partner in discharge.
- Discontinue care when services are no longer indicated.
- When services are still needed, seek resources and/or consult with others to identify alternative resources that may be available.
- Determine the need for equipment and initiate requests to obtain.

INTERVENTIONS:

- Safety, Emergency Care, CPR and First Aid
- Standard Precautions
- Body Mechanics and
- Positioning
- Categories of Interventions
 - Safety, Cardiopulmonary Resuscitation Emergency Care, First Aid
 - ❖ Ensure patient safety and safe application of patient/client care.
 - ❖ Perform first aid.
 - ❖ Perform emergency procedures.
 - ❖ Perform Cardiopulmonary Resuscitation (CPR).
 - ❖ Precautions
- Demonstrate appropriate sequencing of events related to universal precautions.
- Use Universal Precautions.
- Determine equipment to be used and assemble all sterile and non-sterile materials.
- Use transmission-based precautions.
- Demonstrate aseptic techniques.
- Apply sterile procedures.
- Properly discard soiled items.

BODY MECHANICS AND POSITIONING

- Apply proper body mechanics (utilize, teach, reinforce, and observe).
- Properly position, drape, and stabilize a patient/client when providing physical therapy.

INTERVENTIONS

- Coordination, communication, and documentation may include:
 - Addressing required functions:
 - ❖ Establish and maintain an ongoing collaborative process of decision-making with patients/clients, families, or caregivers prior to initiating care and throughout the provision of services.
 - ❖ Discern the need to perform mandatory communication and reporting (eg, incident reports, patient advocacy and abuse reporting).
 - ❖ Follow advance directives.
 - Admission and discharge planning.
 - Case management.
 - Collaboration and coordination with agencies, including:
 - ❖ Home care agencies
 - ❖ Equipment suppliers
 - ❖ Schools
 - ❖ Transportation agencies
 - ❖ Payer groups
 - Communication across settings, including:
 - ❖ Case conferences
 - ❖ Documentation
 - ❖ Education plans
 - Cost-effective resource utilization.
 - Data collection, analysis, and reporting of:
 - ❖ Outcome data
 - ❖ Peer review findings
 - ❖ Record reviews
- Documentation across settings, following APTA's Guidelines for Physical Therapy Documentation, including:
 - Elements of examination, evaluation, diagnosis, prognosis, and Intervention

- Changes in body structure and function, activities and participation.
- Changes in interventions
- Outcomes of intervention
- Interdisciplinary teamwork:
 - Patient/client family meetings
 - Patient care rounds
 - Case conferences
 - Referrals to other professionals or resources.
- Patient/client-related instruction may include:
 - Instruction, education, and training of patients/clients and caregivers regarding:
 - Current condition, health condition, impairments in body structure and function, and activity limitations, and participation restrictions)
 - Enhancement of performance
 - Plan of care:
 - Risk factors for health condition, impairments in body structure and function, and activity limitations, and participation restrictions.
 - Preferred interventions, alternative interventions, and alternative modes of delivery
 - Expected outcomes
 - Health, wellness, and fitness programs (management of risk factors)
 - Transitions across settings

THERAPEUTIC EXERCISE MAY INCLUDE PERFORMING:

- Body mechanics and postural stabilization:
 - Body mechanics training
 - Postural control training
 - Postural stabilization activities
 - Posture awareness training
- Flexibility exercises:
 - Muscle lengthening
 - Range of motion
 - Stretching

- Gait and locomotion training:
 - Developmental activities training
 - Gait training
 - Device training
 - Perceptual training
 - Basic wheelchair training
- Strength, power, and endurance training for head, neck, limb, and trunk:
 - Active assistive, active, and resistive exercises (including concentric, dynamic/isotonic, eccentric, isokinetic, isometric, and plyometric exercises)
 - Aquatic programs*
 - Task-specific performance training
- Strength, power, and endurance training for pelvic floor:
 - Active (Kegel)
- Strength, power, and endurance training for ventilatory muscles:
 - Active and resistive
- Manual therapy techniques may include:
 - Passive range of motion
 - Massage:
 - ❖ Connective tissue massage
 - ❖ Therapeutic massage
 - Manual traction
 - Mobilization/manipulation:
 - ❖ Soft tissue (thrust and nonthrust)
 - ❖ Spinal and peripheral joints (thrust and nonthrust)
- Functional training in self-care and home management may include:
- Functional training in work (job/school/play), community, and leisure integration or reintegration may include:
 - Activities of daily living (ADL) training:
 - Bed mobility and transfer training
 - Age appropriate functional skills
 - Barrier accommodations or modifications

- Device and equipment use and training:
- Assistive and adaptive device or equipment training during ADL (specifically for bed mobility and transfer training, gait and locomotion, and dressing)
- Orthotic, protective, or supportive device or equipment training during self-care and home management
- Prosthetic device or equipment training during ADL (specifically for bed mobility and transfer training, gait and locomotion, and dressing)*
 - Functional training programs
 - Simulated environments and tasks
 - Task adaptation
 - Injury prevention or reduction:
 - ❖ Safety awareness training during self-care and home management*
 - ❖ Injury prevention education during self-care and home management
 - ❖ Injury prevention or reduction with use of devices and equipment
- Prescription, application, and, as appropriate, fabrication of devices and equipment may include:
 - Adaptive devices
 - ❖ Hospital beds
 - ❖ Raised toilet seats
 - ❖ Seating systems – prefabricated
 - Assistive devices
 - ❖ Canes
 - ❖ Crutches
 - ❖ Long-handled reachers
 - ❖ Static and dynamic splints – prefabricated
 - ❖ Walkers
 - ❖ Wheelchairs
 - Orthotic devices:
 - ❖ Prefabricated braces
 - ❖ Prefabricated shoe inserts
 - ❖ Prefabricated splints

- Prosthetic devices (lower-extremity)
- Protective devices:
 - ❖ Braces
 - ❖ Cushions
 - ❖ Helmets
 - ❖ Protective taping
- Supportive devices:
 - ❖ Prefabricated compression garments
 - ❖ Corsets
 - ❖ Elastic wraps
 - ❖ Neck collars
 - ❖ Slings
 - ❖ Supplemental oxygen - apply and adjust
 - ❖ Supportive taping
- Electrotherapeutic modalities may include:
 - ❖ Biofeedback
 - ❖ Electrotherapeutic delivery of medications (eg, iontophoresis)
- Electrical stimulation:
 - ❖ Electrical muscle stimulation (EMS)
 - ❖ Functional electrical stimulation (FES)
 - ❖ High voltage pulsed current (HVPC)
 - ❖ Neuromuscular electrical stimulation (NMES)
 - ❖ Transcutaneous electrical nerve stimulation (TENS)
- Physical agents and mechanical modalities may include: *Physical agents:*
 - Cryotherapy:
 - ❖ Cold packs
 - ❖ Ice massage
 - ❖ Vapocoolant spray
 - Hydrotherapy:
 - ❖ Contrast bath
 - ❖ Pools

- ❖ Whirlpool tanks
- Sound agents:
 - ❖ Phonophoresis
 - ❖ Ultrasound
- Thermotherapy
 - ❖ Dry heat
 - ❖ Hot packs*
 - ❖ Paraffin baths
- Mechanical modalities: Compression therapies (prefabricated)
 - ❖ Compression garments: Skill Category Description of Minimum Skills
 - ❖ Vasopneumatic compression devices
 - ❖ Taping
 - ❖ Compression bandaging (excluding lymphedema)
- Gravity-assisted compression devices:
 - ❖ Standing frame
 - ❖ Tilt table
- Mechanical motion devices:
 - ❖ Continuous passive motion (CPM)
- Traction devices
 - ❖ Intermittent
 - ❖ Positional
 - ❖ Sustained
- Documentation of all listed competencies in SOAP notes format

EIGHT SEMESTER

- **MEDICINE II**
- **SURGERY II**
- **NEUROLOGICAL PHYSICAL THERAPY**
- **EMERGENCY PROCEDURE & PRIMARY CARE IN PHYSICAL THERAPY**
- **RESEARCH METHODOLOGY & SCIENTIFIC INQUIRY**
- **SUPERVISED CLINICAL PRACTICE IV**

MEDICINE II

CREDIT HOURS 3(3-0)

COURSE DESCRIPTION:

This course intends to familiarize students with medical terminology and abbreviations for efficient and effective chart reviewing and documentation. It also explores select systemic diseases, focusing on epidemiology, pathology, histology, etiology, as well as primary and secondary clinical characteristics and their management. Discusses and integrates subsequent medical and surgical management to formulate appropriate intervention indications, precautions and contraindications

DETAILED COURSE OUTLINE:

DERMATOLOGY

- Introduction to disorders and diseases
- Acne vulgaris
- Psoriasis
- Boils
- Carbuncles
- Alopecia
- Mycosis fungoides
- Polymorphic light eruptions
- Vitiligo
- Pityriasis
- Hyperhidrosis

DISEASES OF BRAIN AND SPINAL CORD:

- Common neurological symptoms
- Neurological examination
- The brain death
- Stroke, types of stroke
- Parkinson's disease

- Epilepsy
- Multiple Sclerosis
- Infective and Inflammatory diseases
- Intracranial tumors
- Hydrocephalus
- Headache
- Migraine
- Facial pain
- Head injury
- Motor neuron disease
- Diseases of spinal cord
- Diseases of Cranial nerves
- Peripheral nerve lesions
- Diseases of voluntary muscles and of neuromuscular junction
- Sleep
- Unconsciousness and Comma

RENAL DISEASES

- Glomerulonephritis
- Acute nephritic syndrome
- Nephrotic syndrome
- Urinary tract infection
- Renal hypertension
- Renal failure
- Benign enlargement of prostate gland
- Prostatic carcinoma

DISEASES OF THE BLOOD:

- Anaemia
- Brief description of types of Anaemia

- Brief description of Bleeding and Coagulation, only Haemophilia and Thrombosis is described in detail

MISCELLANEOUS DISEASES:

- Brief description of Diabetes Mellitus and its complications
- Detailed description of Diabetic Neuropathy and Diabetic foot
- Steroid induced Myopathy

Recommended Text Books:

- *Practice of medicine* by: Davidson
- *Clinical medicine* by: Parveen j Kumar & Michael Clark
- *Short text book by medicine* by: M. Inam Danish
- *Hutchison's clinical methods* by: Michael swash. 21st edition
- *Bed side techniques*

SURGERY II
CREDIT HOURS3(3-0)

COURSE DESCRIPTION:

This course intends to familiarize students with principles orthopaedic surgery along with familiarization with terminology and abbreviations for efficient and effective chart reviewing and documentation. It also explores various orthopaedic conditions needing surgical attention, focusing on epidemiology, pathology, as well as primary and secondary clinical characteristics and their surgical management. The purpose of this course is to make physiotherapy students aware of various surgical conditions so these can be physically managed effectively both pre as well as postoperatively

DETAILED COURSE OUTLINE:

GENERAL SURGERY

- Introduction
- Indications for surgery
- Types of incisions
- Wounds, types of wounds, factors affecting wounds healing, care of wounds
- Bandages and dressing
- Trauma and metabolic response to trauma
- Detailed description of chest and abdominal trauma
- Hemorrhage, hemostasis and blood transfusion
- Classification and brief description of shock
- Fluid and electrolyte balance
- Classification of body fluid changes
- Pre, intra and post operative fluid therapy
- Surgery and diabetes
- Burns and grafts
- Neoplasia
- Preoperative assessment & preparation

- Post operative treatment, complications and their management
- Types of anaesthesia
 - Local anaesthetic agents
 - Regional anaesthesia (spinal and epidural)
- Intravenous anaesthetic agents
- Muscle relaxants
- Inhalational anaesthetic agents
- Anaesthesia and associated diseases.
- Complications of anaesthesia.
- Perioperative management.
- Cardiopulmonary Resuscitation. CPR.
- Recovery from anaesthesia.
- Pain management and postoperative care.
- Ulcers, sinuses and fistulas
- Transplantation
- Brief description of operation performed on: oesophagus, stomach, intestine gall bladder, bile duct, spleen, pancreas, liver, abdominal wall, hernias, breast, kidneys, ureters, prostate, peritoneum, mesentery and retroperitoneal space

THORACIC SURGERY

PULMONARY SURGERY

- Introduction
- types of incision
- types of operation
- complications of pulmonary surgery
- drains , tubes
- pneumonectomy, lobectomy , thoracoplasty
- Operations on pleura
- Chest injuries
- Brief description of indication for pulmonary surgery:

- Diseases of chest wall and pleura
- Diseases of bronchi
- Tumors of lung
- Lung abscess
- Hydatid disease of lung
- Pulmonary embolism
- Mediastinal masses
- Problems related to diaphragm

CARDIAC SURGERY

- Introduction
- Cardiorespiratory resuscitation
- Special investigation procedures in cardiac surgery
- Basic techniques in cardiac surgery
- Types of incision
- Types of operation
- Complications of cardiac surgery
- Lines, drains and tubes
- Brief description of indications for cardiac surgery
- Congenital heart disease
- Acquired heart diseases
- Diseases of the pericardium
- Cardiac transplantation

VASCULAR SURGERY

- Introduction
- Investigation in vascular disease types of operation
- Indication for vascular surgery
- Complication of vascular surgery
- Brief description of arterial occlusion

- Gangrene
- Detailed description of amputation
- Aneurysm
- Burgers disease
- Raynaud's disease and syndrome
- Varicose veins
- Superficial and deep venous thrombosis
- Venous hemorrhage
- Lymph edema
- Lymph adenitis and lymphomas

NEUROSURGERY

CRANIAL SURGERY

- Introduction
- Special investigation in brain diseases and traumas
- Types of operations, indications and complications of cranial surgery
- Head injuries to the brain
- Acute intracranial hematomas
- Fractures of the skull
- Intra cranial abscess
- Intracranial tumors
- Intra cranial aneurysm and hydrocephalus

SURGERY OF VERTEBRAL COLUMN SPINAL CORD AND PERIPHERAL NERVES

- Dislocation and management of dislocation of vertebral column
- Tumors of vertebral column
- Prolapse intervertebral disc
- Disc protrusion
- Spondylosis and spondylolisthesis
- Spinal cord injuries and their management

- Tumors of spinal cord types of operations performed on nerves
- Nerve injuries and their surgical management
- Brief description of lesions of cranial and spinal nerves and their management

Recommended Text Books:

- Short practice of surgery by Baily and Love's
- Text Book of Surgery by IjazAhsan
- Outline of Fractures by davidhamblen, Hamish Simpsons
- Outline of orthopedics. by davidhamblen, Hamish Simpsons
- Apley's systems of orthopedics and fractures by Louis Solomon 9thed , publisher holder Arnold

NEUROLOGICAL PHYSICAL THERAPY

CREDIT HOPURS 3(2-1)

COURSE DESCRIPTION:

This course provides an in-depth exploration of the assessment and intervention procedures used with persons with various neurological pathologies. The focus of this course will be on neurological problems acquired in adulthood. Theories of motor control and motor learning will be studied and applied to assessment and treatment. Laboratories will be used to strengthen evaluation and intervention skills, especially the analysis of movement as well as planning, practicing, and modifying treatment. The format of this course includes lectures, discussions, laboratory experiences, problem-based learning activities, community based experiences, and patient-centred case study learning activities. There will also be contact with persons with neurological dysfunction as part of this course. Clinical competence in the evaluation and treatment of persons with neurological impairments is to be developed. Topics will focus on medical terminology, clinical examination, evaluation, comparing contemporary, traditional interventions and the impact of evolving technology in this area.

DETAILED COURSE OUT LINE

MEDICAL TERMINOLOGY REGARDING NEUROLOGICAL SYSTEM

ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM (BRIEF REVISION)

- Brain
- Spinal cord
- CNS Support Structures
- Neurons
- PNS
- Spinal Level Reflexes

NEUROLOGICAL EXAMINATION:

- History
- System review
- Test and measures

INTERVENTIONS:

Introduction to Theories of Neurological Rehabilitation

- Remediation & facilitation approaches
 - Bobath-NDT
 - Motor relearning program(MRP)
 - Kabat, Knott, Voss (PNF)
 - Constraint induced movement therapy (CIMT)
- Motor Control / Motor Learning Approach
- Neural plasticity/ adoptability
- Balance
- Role of sensory system
- Skill acquisition
- Postural Control
- Mobility Function
- Task-Related Training Approach
- Compensatory Training Approach
- Normal Reach, Grasp and Manipulation

NEUROLOGICAL DYSFUNCTIONS

- CVA (Stroke)
- Traumatic Brain Injury (TBI)
- Spinal Cord Injury (SCI)
- Degenerative Diseases (Progressive CNS disorders)
- Multiple Sclerosis (MS)
- Parkinson's Disease (PD)
- Post Polio Syndrome (PPS)
- Cerebellar Disorders
- Vestibular Disorders
- Cranial Nerves Disorders

- Poly Neuropathies

NEUROMUSCULAR DISORDERS

CASE HISTORIES

- Principles of assessment and outcome measures
- Documentation in SOAP notes format
- Evidence based neurological Physical Therapy Treatment protocols

Practical/ Clinical Training:

In the laboratory sessions, neurological physiotherapy skills will be demonstrated and practiced. Various reflective case studies related to neurological rehabilitation will be assigned to the students.

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. This log book will be an integral part of the Physiotherapy in Practice I and Physiotherapy in Practice II.

Recommended Text Books:

- Neurological Physiotherapy Bases of evidence for practice *Treatment and management of patients described by specialist clinicians* by Cecily Partridge
- *Neurological Physiotherapy A problem-solving approach* By Susan Edwards, second edition.
- *Neurologic examination* By Robert j. Schwartzman , first edition

EMERGENCY PROCEDURES & PRIMARY CARE IN PHYSICAL THERAPY

CREDIT HOURS 2(2-0)

COURSE DESCRIPTION:

This course provides the student with all of the skills necessary to take appropriate action in an emergency in any practice setting. Basic life support, advanced cardiac life support, and first aid and emergency preparedness are the content areas of this course. The course is designed to provide knowledge and skill in emergency techniques and in the application of appropriate action necessary to take care of the patient/client.

DETAILED COURSE OUT LINE

ORGANIZATION AND ADMINISTRATION OF EMERGENCY CARE

- Develop and implement emergency action plan
- Emergency team
- Initial patient assessment and care
- Emergency communication
- Emergency equipment and supplies
- Venue location
- Emergency transportation
- Emergency care facilities
- Legal need and documentation

PHYSICAL EXAMINATION OF THE CRITICALLY INJURED PATIENT/ATHLETE

- Scene assessment and safety
- Body substance isolation precautions
- Primary survey
- Secondary survey
- Vital signs

AIRWAY MANAGEMENT

- Air way anatomy
- Air way compromise
- Oxygen therapy
- Advanced airway devices

SUDDEN CARDIAC DEATH

- Incidence and etiology of sudden death in general population
- Sudden cardiac arrest in athletes
- Screening and recognition of cardiac warning signs
- Preparation for cardiac emergencies
- Management of sudden cardiac arrest

HEAD INJURIES

- Pathomechanics of brain injuries
- Types of pathology
- Classification of cerebral concussion
- Cerebral contusion
- Cerebral hematoma
- Second impact syndrome
- Initial on site assessment
- Sideline assessment
- Special tests for assessment of coordination
- Special tests for assessment of cognition
- Other tests
- Medications
- Wake ups and rest

EMERGENCY CARE OF CERVICAL SPINE INJURIES

- Anatomy
- Mechanism of injuries

- Injuries to the spinal cord
- Assessment
- Management

EMERGENT GENERAL MEDICAL CONDITIONS

- Sudden death
- Exercise induced anaphylaxis
- Acute asthma
- Diabetes mellitus
- Mononucleosis
- Sick cell traits
- Hypertension

ENVIRONMENT-RELATED CONDITIONS

- Heat related emergencies and their prevention
- Cold related injuries
- Lightning
- Altitude related emergencies

ORTHOPEDIC INJURIES

- Basic emergency medical care
- Fundamentals of skeletal fractures
- Splinting techniques
- Fractures and dislocations of upper extremity
- Fractures and dislocations of lower extremity
- Fractures and dislocations of spine

ABDOMINAL INJURIES

- Initial evaluation

- Specific injuries: abdominal wall contusions, splenic injuries, liver injuries, renal injuries, intestinal injuries, pancreatic injuries
- Non-traumatic abdominal injuries: Appendicitis, ectopic pregnancy

THORACIC INJURIES

- Assessment
- Management of different Types of injuries: fractures, Pneumothorax, hemothorax, pulmonary embolism

SPINE BOARDING IN CHALLENGING ENVIRONMENTS

- The soft foam pit in gymnastics
- The pole vault pit
- The swimming pole and diving well
- The ice hockey rink

THE PSYCHOLOGICAL AND EMOTIONAL IMPACT OF EMERGENCY SITUATIONS

- Defining psychological trauma
- Psychological interventions in crisis situations
- Psychological trauma in athletic environment
- The psychological emergency response team
- Internal team members
- External team members
- The psychological interventions recommendations.

PRIMARY CARE

FOUNDATION

- Primary care: physical therapy modles1
- Evidence - Based examination of diagnostic information
- Cultural competence: An essential of primary health care

- Pharmacologic considerations for the physical therapist
- The patient interview: the science behind the art

EXAMINATION/EVALUATION

- Prologue
- Symptoms investigation, Part I: Chief complaint by body region
- Symptoms investigation, Part II: Chief complaint by symptom
- Patient health history including identifying health risk factor
- Review of systems
- Patient interview: the physical examination begins
- Review of cardiovascular and pulmonary systems and vital signs
- Upper quadrant screening examination
- Lower quadrant screening examination\
- Diagnostic imaging
- Laboratory tests and values

DISORDERS AND MANAGEMENT

- Acute Care Physical Therapy Examination and Discharge Planning.
- Clinical Laboratory Values and Diagnostic Testing.
- Physiologic Monitors and Patient Support Equipment.
- Bed Rest, Deconditioning, and Hospital-Acquired Neuromuscular Disorders.
- The Immune System and Infectious Diseases and Disorders.
- Cardiovascular Diseases and Disorders.
- Pulmonary Diseases and Disorders.
- Musculoskeletal/Orthopedic Diseases and Disorders
- Neurologic and Neurosurgical Diseases and Disorders.
- Endocrine Diseases and Disorders.
- Gastrointestinal Diseases and Disorders.
- Genitourinary Diseases and Disorders.
- Oncological Diseases and Disorders.

- Transplantation.
- Integumentary Diseases and Disorders
- Wound Management.

SPECIAL POPULATIONS

- The Pediatric and adolescent population
- The obstetric client
- The geriatric population
- Health and wellness perspective in primary care

Recommended Text Books:

- *Emergency Care in Athletic Training* by: Keith M.Gorse, Robert O. Blanc, Francis Feld, Matthew Radelet, 1st edition, 2010, FA Davis Company
- *Acute care hand book for Physical Therapists* by: Jaime C paz, Michelle P West, 2nd edition, 2002, Butterworth Heinemann

RESEARCH METHODOLOGY & SCIENTIFIC INQUIRY

CREDIT HOURS 3(2-1)

COURSE DESCRIPTION:

This course includes discussion on basic quantitative methods and designs, including concepts of reliability and validity, interpretation of inferential statistics related to research designs, correlational statistic & designs, interclass correlation coefficients, and critical appraisal of the literature.

DETAILED COURSE OUTLINE

RESEARCH FUNDAMENTALS:

- Rehabilitation Research
- Theory in Rehabilitation Research
- Research Ethics

RESEARCH DESIGN:

- Research Problems, Questions, and Hypotheses
- Research Paradigms
- Design Overview
- Research Validity

EXPERIMENTAL DESIGNS:

- Group Designs
- Single-System Design

NON EXPERIMENTAL RESEARCH:

- Overview of Nonexperimental Research
- Clinical Case Reports
- Qualitative Research
- Epidemiology
- Outcomes Research
- Survey Research

MEASUREMENT:

- Measurement Theory
- Methodological Research

DATA ANALYSIS:

- Statistical Reasoning
- Statistical Analysis of Differences; The basics
- Statistical Analysis of Differences; Advanced and special Techniques
- Statistical Analysis of Relationships; The basics
- Statistical Analysis of Relationships; Advanced and special Techniques

BEING A CONSUMER

- Locating the Literature
- Evaluating Evidence One Article at a time
- Synthesizing Bodies of Evidence

IMPLEMENTING RESEARCH:

- Implementing a Research Project
- Publishing and Presenting Research

PRACTICAL

- Literature review
- Preparation, presentation and defence of research proposal
- Poster presentation

Recommended Text Book:

- *Essentials of clinical research* By Stephan P. Glasser

- Rehabilitation Research (Principles and Applications) 3rd Edition By Elizabeth Domholdt.

SUPERVISED CLINICAL PRACTICE IV

CREDIT HOURSS 3(0-3)

NEUROLOGICAL

SEMESTER	SUPERVISION	FOCUS	WARDS	COMPETENCIES
8	Supervised by trained PT	Evaluation, Examination, and Intervention	Neurological (IPD/OPD; surgical & non- surgical)	Listed below

COURSE DESCRIPTION:

During this supervised clinical practice, students are responsible for successful execution of examination, evaluation, and interventions relating to neurological disorders. Students become familiar with performance of these skills in all settings (inpatient and outpatient) as well as on all types of conditions (surgical, non-surgical, pediatric and geriatric.) Students learn to objectively perform these skills under the supervision of trained physical therapists. 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.

COMPETENCIES:

EXAMINATION:

- Based on best available evidence select examination tests and measures that are appropriate for the patient/client.
- Perform posture tests and measures of postural alignment and positioning.

- Perform gait, locomotion and balance tests including quantitative and qualitative measures such as:
 - Balance during functional activities with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment
 - Balance (dynamic and static) with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment
 - Gait and locomotion during functional activities with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment to include:
 - ❖ Bed mobility
 - ❖ Transfers (level surfaces and floor)
 - ❖ Wheelchair management
 - ❖ Uneven surfaces
 - ❖ Safety during gait, locomotion, and balance
 - Perform gait assessment including step length, speed, characteristics of gait, and abnormal gait patterns.
- Characterize or quantify body mechanics during self-care, home management, work, community, tasks, or leisure activities.
- Characterize or quantify ergonomic performance during work (job/school/play)
 - Dexterity and coordination during work
 - Safety in work environment
 - Specific work conditions or activities
 - Tools, devices, equipment, and workstations related to work actions, tasks, or activities
- Characterize or quantify environmental home and work (job/school/play) barriers:
 - Current and potential barriers
 - Physical space and environment
 - Community access
- Observe self-care and home management (including ADL and IADL)
- Measure and characterize pain* to include:
 - Pain, soreness, and nociception

- Specific body parts
- Recognize and characterize signs and symptoms of inflammation.
- Perform neurological tests and measures including:
- Perform arousal, attention and cognition tests and measures to characterize or quantify (including standardized tests and measures)
- Perform cranial and peripheral nerve integrity tests and measures
 - Motor distribution of the cranial nerves (eg, muscle tests, observations)
 - Motor distribution of the peripheral nerves (eg, dynamometry, muscle tests, observations, thoracic outlet tests)
 - Response to neural provocation (e.g. tension test, vertebral artery compression tests)
 - Response to stimuli, including auditory, gustatory, olfactory, pharyngeal, vestibular, and visual (eg, observations, provocation tests)
- Perform motor function tests and measures to include:
 - Dexterity, coordination, and agility
 - Initiation, execution, modulation and termination of movement patterns and voluntary postures
- Perform neuromotor development and sensory integration tests and measures to characterize or quantify:
 - Acquisition and evolution of motor skills, including age-appropriate development
 - Sensorimotor integration, including postural responses, equilibrium, and righting reactions
- Perform tests and measures for reflex integrity including:
 - Deep reflexes (eg, myotatic reflex scale, observations, reflex tests)
 - Postural reflexes and reactions, including righting, equilibrium and protective reactions
 - Primitive reflexes and reactions, including developmental
 - Resistance to passive stretch
 - Superficial reflexes and reactions
 - Resistance to velocity dependent movement
- Perform sensory integrity tests and measures that characterize or quantify including*:
 - Light touch

- Sharp/dull
- Temperature
- Deep pressure
- Localization
- Vibration
- Deep sensation
- Stereognosis
- Graphesthesia

EVALUATION:

- Clinical reasoning
- Clinical decision making
- Synthesize available data on a patient/client expressed in terms of the International
- Classification of Function, Disability and Health (ICF) model to include body functions and structures, activities, and participation.
- Use available evidence in interpreting the examination findings.
- Verbalize possible alternatives when interpreting the examination findings.
- Cite the evidence (patient/client history, lab diagnostics, tests and measures and scientific literature) to support a clinical decision.

DIAGNOSIS:

- Integrate the examination findings to classify the patient/client problem in terms of body functions and structures, and activities and participation (ie, practice patterns in the Guide)
- Identify and prioritize impairments in body functions and structures, and activity limitations and participation restrictions to determine specific body function and structure, and activities and participation towards which the intervention will be directed.

PROGNOSIS:

- Determine the predicted level of optimal functioning and the amount of time required to achieve that level.

- Recognize barriers that may impact the achievement of optimal functioning within a predicted time frame including
 - Age
 - Medication(s)
 - Socioeconomic status
 - Co-morbidities
 - Cognitive status
 - Nutrition
 - Social Support
 - Environment

PLAN OF CARE:

- Goal setting
- Coordination of Care
- Progression of care
- Discharge
- Design a Plan of Care
 - Write measurable functional goals (short-term and long-term) that are time referenced with expected outcomes.
 - Consult patient/client and/or caregivers to develop a mutually agreed to plan of care.
 - Identify patient/client goals and expectations.
 - Identify indications for consultation with other professionals.
 - Make referral to resources needed by the patient/client (assumes knowledge of referral sources).
 - Select and prioritize the essential interventions that are safe and meet the specified functional goals and outcomes in the plan of care
 - ❖ identify precautions and contraindications,
 - ❖ provide evidence for patient-centered interventions that are identified and selected,
 - ❖ define the specificity of the intervention (time, intensity, duration, and frequency),

- ❖ set realistic priorities that consider relative time duration in conjunction with family, caregivers, and other health care professionals).
- Establish criteria for discharge based on patient goals and current functioning and disability.
- Coordination of Care
 - Identify who needs to collaborate in the plan of care.
 - Identify additional patient/client needs that are beyond the scope of physical therapist practice, level of experience and expertise, and warrant referral
 - Refer and discuss coordination of care with other health care professionals
 - Articulate a specific rationale for a referral.
 - Advocate for patient/client access to services.
- Progression of Care
 - Identify outcome measures of progress relative to when to progress the patient further.
 - Measure patient/client response to intervention.
 - Monitor patient/client response to intervention.
 - Modify elements of the plan of care and goals in response to changing patient/client status, as needed.
 - Make on-going adjustments to interventions according to outcomes including environmental factors and personal factors and, medical therapeutic interventions.
 - Make accurate decisions regarding intensity and frequency when adjusting interventions in the plan of care.
- Discharge Plan
 - Re-examine patient/client if not meeting established criteria for discharge based on the plan of care.
 - Differentiate between discharge of the patient/client, discontinuation of service, and transfer of care with re-evaluation.*
 - Prepare needed resources for patient/client to ensure timely discharge, including follow-up care.
 - Include patient/client and family/caregiver as a partner in discharge.*
 - Discontinue care when services are no longer indicated.

- When services are still needed, seek resources and/or consult with others to identify alternative resources that may be available.
- Determine the need for equipment and initiate requests to obtain.

INTERVENTIONS:

- Safety, Emergency Care, CPR and First Aid
- Standard Precautions
- Body Mechanics and
- Positioning
- Categories of Interventions
 - Safety, Cardiopulmonary Resuscitation Emergency Care, First Aid
 - ❖ Ensure patient safety and safe application of patient/client care.
 - ❖ Perform first aid.
 - ❖ Perform emergency procedures.
 - ❖ Perform Cardiopulmonary Resuscitation (CPR).
 - ❖ Precautions
 - Demonstrate appropriate sequencing of events related to universal precautions.
 - Use Universal Precautions.
 - Determine equipment to be used and assemble all sterile and non-sterile materials.
 - Use transmission-based precautions.
 - Demonstrate aseptic techniques.
 - Apply sterile procedures.
 - Properly discard soiled items.
- Body Mechanics and Positioning
 - Apply proper body mechanics (utilize, teach, reinforce, and observe)
 - Properly position, drape, and stabilize a patient/client when providing physical therapy.
- Interventions
 - Coordination, communication, and documentation may include:
 - Addressing required functions:

- ❖ Establish and maintain an ongoing collaborative process of decision-making with patients/clients, families, or caregivers prior to initiating care and throughout the provision of services.
- ❖ Discern the need to perform mandatory communication and reporting (eg, incident reports, patient advocacy and abuse reporting).
- ❖ Follow advance directives.
- Admission and discharge planning.
- Case management.
- Collaboration and coordination with agencies, including:
 - ❖ Home care agencies
 - ❖ Equipment suppliers
 - ❖ Schools
 - ❖ Transportation agencies
 - ❖ Payer groups
- Communication across settings, including:
 - ❖ Case conferences
 - ❖ Documentation
 - ❖ Education plans
- Cost-effective resource utilization.
- Data collection, analysis, and reporting of:
 - ❖ Outcome data
 - ❖ Peer review findings
 - ❖ Record reviews
- Documentation across settings, following APTA's Guidelines for Physical Therapy Documentation, including:
 - ❖ Elements of examination, evaluation, diagnosis, prognosis, and Intervention
 - ❖ Changes in body structure and function, activities and participation.
 - ❖ Changes in interventions
 - ❖ Outcomes of intervention
- Interdisciplinary teamwork:
 - ❖ Patient/client family meetings

- ❖ Patient care rounds
- ❖ Case conferences
- Referrals to other professionals or resources.
- Patient/client-related instruction may include:
 - Instruction, education, and training of patients/clients and caregivers regarding:
 - Current condition, health condition, impairments in body structure and function, and activity limitations, and participation restrictions)
 - Enhancement of performance
 - Plan of care:
 - Risk factors for health condition, impairments in body structure and function, and activity limitations, and participation restrictions.
 - Preferred interventions, alternative interventions, and alternative modes of delivery
 - Expected outcome
 - Health, wellness, and fitness programs (management of risk factors)
 - Transitions across settings

THERAPEUTIC EXERCISE MAY INCLUDE PERFORMING:

Balance coordination and agility training:

- Developmental activities training*
- Motor function (motor control and motor learning) training or retraining
- Neuromuscular education or reeducation*
- Perceptual training
- Posture awareness training*
- Sensory training or retraining
- Standardized, programmatic approaches
- Task-specific performance training

Neuromotor development training:

- Developmental activities training*
- Motor training
- Movement pattern training
- Neuromuscular education or reeducation

- Functional training in self-care and home management may include
- Functional training in work (job/school/play), community, and leisure integration or reintegration may include
- Activities of daily living (ADL) training: Bed mobility and transfer training, Age appropriate functional skills
- Barrier accommodations or modifications
- Device and equipment use and training:
 - Assistive and adaptive device or equipment training during ADL (specifically for bed mobility and transfer training, gait and locomotion, and dressing)*
 - Orthotic, protective, or supportive device or equipment training during self-care and home management*
 - Prosthetic device or equipment training during ADL (specifically for bed mobility and transfer training, gait and locomotion, and dressing)*
 - Functional training programs:
 - Simulated environments and tasks*
 - Task adaptation
 - Injury prevention or reduction:
 - Safety awareness training during self-care and home management*
 - Injury prevention education during self-care and home management
 - Injury prevention or reduction with use of devices and equipment
 - Prescription, application, and, as appropriate, fabrication of devices and equipment may include:
 - Adaptive devices:
 - Hospital beds
 - Raised toilet seats
 - Seating systems – prefabricated
 - Assistive devices:
 - Canes
 - Crutches
 - Long-handled reachers
 - Static and dynamic splints – prefabricated

- Walkers
- Wheelchairs
- Orthotic devices:
 - Prefabricated braces
 - Prefabricated shoe inserts
 - Prefabricated splints
- Prosthetic devices (lower-extremity)
- Protective devices:
 - Braces
 - Cushions
 - Helmets
 - Protective taping
- Supportive devices
 - Prefabricated compression garments
 - Corsets
 - Elastic wraps
 - Neck collars
 - Slings
 - Supplemental oxygen - apply and adjust
 - Supportive taping
- Electrotherapeutic modalities may include:
 - Biofeedback
 - Electrotherapeutic delivery of medications (eg, iontophoresis)*
 - Electrical stimulation:Electrical muscle stimulation (EMS), Functional electrical stimulation (FES)High voltage pulsed current (HVPC)Neuromuscular electrical stimulation (NMES)Transcutaneous electrical nerve stimulation (TENS)
- Physical agents and mechanical modalities may include: *Physical agents:*
- Cryotherapy:
 - Cold packs
 - Ice massage
 - Vapocoolant spray

- Hydrotherapy*:
 - Contrast bath
 - Pools
 - Whirlpool tanks
- Sound agents:
 - Phonophoresis
 - Ultrasound
- Thermotherapy:
 - Dry heat
 - Hot packs*
 - Paraffin baths*
- Mechanical modalities:
 - Compression therapies (prefabricated)*
 - ❖ Compression garments: Skill Category Description of Minimum Skills
 - ❖ Vasopneumatic compression devices*
 - ❖ Taping
 - ❖ Compression bandaging (excluding lymphedema)
 - Gravity-assisted compression devices:
 - ❖ Standing frame*
 - ❖ Tilt table*
 - Mechanical motion devices*:
 - ❖ Continuous passive motion (CPM)*
- Traction devices*:
 - ❖ Intermittent
 - ❖ Positional
 - ❖ Sustained
- Documentation of all listed competencies in SOAP notes format

NINTH SEMESTER

- **CARDIOPULMONARY PHYSICAL THERAPY**
- **PROSTHETICS & ORTHOTIST**
- **CLINICAL DECISION MAKING & DIFFERENTIAL DIAGNOSIS**
- **MANUAL THERAPY**
- **PROFESSIONAL PRACTICE**
(LAWS, ETHICS & ADMINISTRATION)
- **INTEGUMENTARY PHYSICAL THERAPY**
- **SUPERVISED CLINICAL PRACTICE V**

CARDIOPULMONARY PHYSICAL THERAPY

CREDIT HOURS3(2-1)

COURSE DESCRIPTION:

This course includes a study of anatomy and physiology of the cardiovascular, pulmonary, and lymphatic systems and pathological changes of the systems and function, including diagnostic tests and measurements. This course discuss relevant testes and measures for determining impairment and differentiating the diagnosis based on the specificity and sensitivity of the assessment instruments as related to patients with cardiovascular, pulmonary, and lymphatic systems disorders. The use of evidence-based physical therapy intervention for cardiovascular, pulmonary, and lymphatic systems disorders is emphasized. Topics will focus on medical terminology, clinical examination, evaluation, comparing contemporary, traditional interventions and the impact of evolving technology in this area.

DETAILED COURSE OUTLINE

MEDICAL TERMINOLOGY REGARDING CARDIOPULMONARY SYSTEM

INTRODUCTION

ANATOMY AND PHYSIOLOGY

- Anatomy of the Cardiovascular and Respiratory Systems
- Physiology of the Cardiovascular and Respiratory Systems

PATHO-PHYSIOLOGY

- Ischemic Cardiac Condition
- Cardiac Muscle Dysfunction
- Restrictive Lung Dysfunction
- Chronic Obstructive Pulmonary Diseases
- Cardiopulmonary Implications of Specific Diseases

DIAGNOSTIC TESTS AND PROCEDURES

- Cardiovascular Diagnostic Tests and procedures
- Electro cardio-graphy
- Pulmonary Diagnostic Tests and Procedures

SURGICAL INTERVENTIONS, MONITORING AND SUPPORT

- Cardiovascular and Thoracic interventions
- Thoracic Organ Transplantation; Heart, Lung, and heart-Lung
- Monitoring and Life-Support Equipment

PHARMACOLOGY

- Cardiovascular Medications
- Pulmonary Medications

CARDIOPULMONARY ASSESSMENT AND INTERVENTION

- Assessment Procedures
- Treatment of Acute Cardiopulmonary Conditions
- Therapeutic Interventions in Cardiac Rehabilitation and Prevention
- Pulmonary Rehabilitation
- Outcome Measures

THE NEEDS OF SPECIFIC PATIENTS

INTENSIVE CARE FOR THE CRITICALLY ILL ADULT

- Assessment of the critically ill patient in the intensive care unit (ICU)
- Mechanical ventilation - implications for physiotherapy
- Musculoskeletal problems
- Patient groups with specific needs
- Systemic inflammatory response syndrome (SIRS) and sepsis
- Acute respiratory distress syndrome (ARDS)
- Disseminated intravascular coagulation (DIC)
- Inhalation burns

- Trauma
- Neurological conditions requiring intensive care
- Physiotherapy techniques
- Emergency situations

PULMONARY REHABILITATION

- Definition and aims of pulmonary rehabilitation
- Benefits of pulmonary rehabilitation
- Setting up pulmonary rehabilitation
- Resources
- Selection of patients
- Patient assessment for pulmonary rehabilitation
- Structure of pulmonary rehabilitation
- Pulmonary rehabilitation team
- Exercise component
- Outcome measures

CARDIAC REHABILITATION

- Introduction
- Goals of cardiac rehabilitation
- Cardiac rehabilitation team
- Role of the physiotherapist
- Rationale for cardiac rehabilitation
 - Early ambulation
 - Exercise training
 - Secondary prevention
 - Education
- Manifestations of ischemic heart disease
 - Cardiac arrest
 - Angina pectoris

- Myocardial infarction
- Cardiac surgery
- Drugs to control the cardiovascular system
- Physiotherapy
 - Assessment
 - Recording
 - Treatment
 - Outcome evaluation
 - Complications of exercise
- Other considerations
 - The older patient
 - Cardiac failure
 - Valvular heart disease
 - Congenital heart disease
 - Compliance
 - Cost-effectiveness
 - Legal aspects

CARDIOPULMONARY TRANSPLANTATION

- Introduction
- Assessment
- The transplantation process
- Donors
- Operative procedures
- Postoperative care
- Rejection of the transplanted organs
- Immunosuppression
- Infections
- Special considerations for the physiotherapist
- Denervation of the heart/lungs

- Immunosuppression
- Infection/rejection
- Physiotherapy management

HYPERVENTILATION

- Introduction
- Signs and symptoms
- Causes of hyperventilation
- Personality
- Diagnostic tests
- Breathing patterns
- Treatment
- The assessment
- Treatment plan
- Breathing education
- Breathing pattern re-education
- Compensatory procedures in the short term
- Planned rebreathing
- Speech
- Home program
- Exercise and fitness programs
- Group therapy

BRONCHIECTASIS, PRIMARY CILIARY DYSKINESIA AND CYSTIC FIBROSIS

- Bronchiectasis
 - Medical management
 - Physiotherapy
 - Evaluation of physiotherapy
- Primary ciliary dyskinesia
 - Medical management

- Physiotherapy
- Evaluation of physiotherapy
- Cystic fibrosis
 - Medical management
 - Physiotherapy
 - Evaluation of physiotherapy
 - Continuity of care

CASE HISTORIES

- Principles of assessment and outcome measures
- Documentation in SOAP notes format
- Evidence based cardiopulmonary Physical Therapy Treatment protocols

Recommended Text Book:

- Essentials of Cardiopulmonary Physical Therapy (2nd Edition)By Hillegass and Sadowsky
- *Physiotherapy for respiratory and cardiac problems*, By: Jennifer A. Pryor & Barbara A. Webber, 2nd edition, Churchill Livingstone.
- *Tidy's Physiotherapy* by Thomas A Skinner & Piercy
- *Therapeutics Exercises and Technique* by Carolyn Kisner&Laynn Allen Colby 4th 5th edition
- *Cash's Text book of General Medical & Surgical Condition for Physiotherapists* by Patrica A. Downie
- *Cash's Textbook of chest , heart and vascular condition for physiotherapist* by Patrica A. Downie

PROSTHETICS& ORTHOTICS

CREDIT HOURS 2(2-0)

COURSE DESCRIPTION:

This course intends to study prosthetic and orthotic management as applied to a variety of patient populations across a life span. It also addresses the considerations of various pathologies and medical, surgical management to formulate appropriate patient examinations, evaluation,

diagnosis, prognosis and intervention that are consistent with physical therapy practice guidelines. Principles of normal biomechanics, pathomechanics, physiology and Pathophysiology will be a major focus for evaluation, intervention and education of the vascular, neuromuscular, and / or musculoskeletal compromised patient who may utilize prosthetic or orthotic devices. Basic principles of mechanical physics and material characteristics will be applied.

DETAILED COURSE OUTLINE:

ORTHOTICS

INTRODUCTION TO ORTHOTICS

- Basic Terminology
- Historical Background
- Factors In Prescription Orthotics
- Nomenclature of Orthotics
- Biomechanical Principles
- Materials Used in Orthotics Manufacturing
- Methods of Construction

FOOT ORTHOSES

- Shoe Style
- Parts of Shoes
- Special Purpose Shoes
- Foot Examination
- Orthotics Interventions
- Fabrication Options
- Pediatric Foot Orthoses
- Guideline for Prescription Foot Orthoses

ANKLE FOOT ORTHOSES

- Plastic Ankle Foot Orthoses

- Lather Metal Ankle Foot Orthoses
- Composite Materials
- Weight Relieving Ankle Foot Orthoses
- Support (Fabric , Leather, Gel And Air)
- Contracture Reducing Ankle Foot Orthoses
- Guidelines for Prescription Ankle Foot Orthoses

KNEE ANKLE FOOT ORTHOSES AND KNEE ORTHOSES

- Plastic Metal Knee Ankle Foot Orthoses
- Knee Immobilizer
- Supra- Condylar Knee Ankle Foot Orthoses
- Weight Relieving Orthoses, Fracture Orthoses
- Lather Metal Knee Ankle Foot Orthoses
- Knee Orthoses
- Guidelines For Prescription Knee Ankle Foot Orthoses

ORTHOSES FOR PARAPLEGIA AND HIP DISORDERS

- Paraplegia
- Standing Frames
- Orthoses Designed For Ambulation
- Functional Electrical Stimulation
- Specific Devices for Paraplegia
- Hip Orthoses
- Guidelines for Prescription

EVALUATION PROCEDURES FOR LOWER LIMB ORTHOSES

- Need of Evaluation
- Static Evaluation
- Dynamic Evaluation
- Gait Disorders with Orthoses Usage

TRUNK AND CERVICAL ORTHOSES

- Trunk Orthoses
- Trunk Orthoses Evaluation
- Scoliosis and Kyphosis Orthoses
- Scoliosis And Kyphosis Orthoses Evaluation
- Cervical Orthoses
- Cervical Orthoses Evaluation
- Guideline For Prescription

UPPER LIMB ORTHOSES

- Hand And Wrist Hand Orthoses
- Forearm And Elbow Orthoses
- Shoulder Orthoses, Fabrication Option
- Upper limb Orthoses Evaluation (Hand, Wrist, Fingers, Shoulder and Elbow)
- Guideline For Prescription

ORTHOSES FOR BURNS AND OTHER SOFT TISSUE DISORDERS

- Importance of Orthoses for Burns and Other Soft Tissue Disorders
- Orthoses for Burn Management
- Orthoses for Patients with Soft Tissues Problem Associated With Neuromuscular Disorders

GOAL SETTING AND TREATMENT PLAN

- Long Term Goals
- Short Term Goals
- Treatment Planning
- Criteria for Discharge
- Care of Orthoses

PROSTHETICS

EARLY MANAGEMENT

- Clinic Team Approach to Rehabilitation
- Amputation Surgery: Osteomyoplastic Reconstructive Technique
- Postoperative Management
- Pain Management
- Skin Disorders and Their Management
- Psychological Consequences of Amputation

REHABILITATION OF ADULTS WITH LOWER-LIMB AMPUTATIONS

- Partial Foot and Syme's Amputations and Prosthetic Designs
- Transtibial Prosthetic Designs
- Transfemoral Prosthetic Designs
- Hip Disarticulations and Transpelvic Prosthetic Designs
- Basic Lower-Limb Prosthetic Training

REHABILITATION OF ADULTS WITH UPPER-LIMB AMPUTATIONS

- Body-Powered Upper-Limb Prosthetic Designs
- Upper-Limb Externally Powered Prosthetic Designs
- Training Patients with Upper-Limb Amputations

BEYOND THE BASICS

- Special Considerations with Children
- Rehabilitation Outcomes
- Adaptive Protheses for Recreation
- Future Prosthetic Advances and Challenges
- Future Surgical and Educational Advances and Challenges

Recommended Text Books

- Prosthetics and Patient Management: A Comprehensive Clinical Approach By: Kevin Carroll
; Joan Edelstein

- Orthotics a comprehensive clinical approach By: Joan E Eldestein& Jan Bruckner

CLINICAL DECISION MAKING &DIFFERENTIAL DIAGNOSIS

CREDIT HOURS 3(3-0)

COURSE DESCRIPTION:

The course will cover the principles and methods of clinical screening in physical therapy practice. A basic format for musculoskeletal, neuromuscular, Integumentary, and cardiopulmonary screening in physical therapy will be presented, with a focus on differential diagnosis within the scope of physical therapy practice, and incorporation of the role of the physical therapist as it interfaces with the role of the physician. A clarification of red-flags that differentiate a systemic condition from a neuro-musculoskeletal condition will be a continuing theme throughout the course. Decision-making skills related to physical therapy will be emphasized through the use of patient case scenarios with a focus on when to treat, and when to refer. Strategies to effectively and appropriately communicate with health care colleagues and patients regarding medical diagnostic information and medical status will be introduced.

DETAILED COURSE OUTLINE

SCREENING AND INTERVIEWING, THE PT SCOPE OF PRACTICE: TO REFER OR TREAT?

INTRODUCTION TO SCREENING FOR REFERRAL IN PHYSICAL THERAPY,

- Reasons to Screen
- Screenings and Surveillance
- Diagnosis by the Physical Therapist
- Differential Diagnosis Versus Screening
- Direct Access
- Decision-Making Process
- Case Examples and Case Studies

INTRODUCTION TO THE INTERVIEWING PROCESS

- Concepts in Communication
- Cultural Competence
- The Screening Interview
- Subjective Examination
- Core Interview
- Hospital Inpatient Information
- Physician Referral

OVERVIEW OF THE PHYSIOLOGY OF PAIN AND SYSTEMIC CAUSES OF PAIN

- Mechanisms of Referred Visceral Pain
- Multisegmental Innervations
- Assessment of Pain and Symptoms
- Sources of Pain
- Types of Pain
- Comparison of Systemic Versus Musculoskeletal Pain
- Patterns
- Characteristics of Viscerogenic Pain,
- Screening for Emotional and Psychologic Overlay
- Screening for Systemic Versus Psychogenic
- Symptoms
- Physician Referral

PHYSICAL ASSESSMENT AS A SCREENING TOOL

- General Survey
- Techniques of Physical Examination
- Integumentary Screening Examination
- Nail Bed Assessment
- Lymph Node Palpation

- Musculoskeletal Screening Examination
- Neurologic Screening Examination
- Regional Screening Examination
- Systems Review
- Physician Referral

SCREENING FOR HEMATOLOGIC DISEASE

- Signs and Symptoms of Hematologic Disorders
- Classification of Blood Disorders
- Physician Referral

SCREENING FOR CARDIOVASCULAR DISEASE

- Signs and Symptoms of Cardiovascular Disease
- Cardiac Pathophysiology
- Cardiovascular Disorders
- Laboratory Values

SCREENING FOR THE EFFECTS OF CARDIOVASCULAR MEDICATIONS

- Physician Referral

SCREENING FOR PULMONARY DISEASE

- Signs and Symptoms of Pulmonary Disorders
- Inflammatory/Infectious Disease
- Genetic Disease of the Lung
- Occupational Lung Diseases
- Pleuropulmonary Disorders
- Physician Referral

SCREENING FOR GASTROINTESTINAL DISEASE

- Signs and Symptoms of Gastrointestinal Disorders

- Gastrointestinal Disorders
- Physician Referral

SCREENING FOR HEPATIC AND BILIARY DISEASE

- Hepatic and Biliary Signs and Symptoms
- Hepatic and Biliary Pathophysiology
- Gallbladder and Duct Diseases
- Physician Referral

SCREENING FOR UROGENITAL DISEASE

- Signs and Symptoms of Renal and Urological Disorders,
- The Urinary Tract
- Renal and Urological Pain
- Renal and Urinary Tract Problems
- Physician Referral

SCREENING FOR ENDOCRINE AND METABOLIC DISEASE

- Associated Neuromuscular and Musculoskeletal Signs and Symptoms
- Endocrine Pathophysiology
- Introduction to Metabolism
- Physician Referral

SCREENING FOR IMMUNOLOGIC DISEASE

- Using the Screening Model
- Immune System Pathophysiology
- Physician Referral
- Screening for Cancer
- Cancer Statistics
- Risk Factor Assessment
- Cancer Prevention

- Major Types of Cancer
- Metastases
- Clinical Manifestations of Malignancy
- Oncologic Pain
- Side Effects of Cancer Treatment
- Cancers of the Musculoskeletal System
- Primary Central Nervous System Tumors
- Cancers of the Blood and Lymph System
- Physician Referral

SCREENING THE HEAD, NECK, AND BACK

- Using the Screening Model to Evaluate the Head, Neck, or Back,
- Location of Pain and Symptoms
- Sources of Pain and Symptoms
- Screening for Oncologic Causes of Back Pain
- Screening for Cardiac Causes of Neck and Back Pain
- Screening for Peripheral Vascular Causes of Back Pain
- Screening for Pulmonary Causes of Neck and Back Pain
- Screening for Renal and Urologic Causes of Back Pain,
- Screening for Gastrointestinal Causes of Back Pain
- Screening for Liver and Biliary Causes of Back Pain
- Screening for Gynecologic Causes of Back Pain
- Screening for Male Reproductive Causes of Back Pain
- Screening for Infectious Causes of Back Pain
- Physician Referral

SCREENING THE SACRUM, SACROILIAC, AND PELVIS

- The Sacrum and Sacroiliac Joint
- The Coccyx
- The Pelvis

- Physician Referral

SCREENING THE LOWER QUADRANT: BUTTOCK, HIP, GROIN, THIGH, AND LEG

- Using the Screening Model to Evaluate the Lower Quadrant
- Trauma as a Cause of Hip, Groin, or Lower Quadrant Pain
- Screening for Systemic Causes of Sciatica
- Screening for Oncologic Causes of Lower Quadrant Pain
- Screening for Urologic Causes of Buttock, Hip, Groin, or Thigh Pain
- Screening for Male Reproductive Causes of Groin Pain
- Screening for Infectious and Inflammatory Causes of Lower Quadrant Pain
- Screening for Gastrointestinal Causes of Lower Quadrant Pain
- Screening for Vascular Causes of Lower Quadrant Pain
- Screening for Other Causes of Lower Quadrant Pain
- Physician Referral

SCREENING THE CHEST, BREASTS, AND RIBS

- Using the Screening Model to Evaluate the Chest, Breasts, or Ribs
- Screening for Oncologic Causes of Chest or Rib Pain
- Screening for Cardiovascular Causes of Chest, Breast, or Rib Pain
- Screening for Pleuropulmonary Causes of Chest, Breast, or Rib Pain
- Screening for Gastrointestinal Causes of Chest, Breast, or Rib Pain
- Screening for Breast Conditions that Cause Chest or Breast Pain
- Screening for Other Conditions as a Cause of Chest, Breast, or Rib Pain
- Screening for Musculoskeletal Causes of Chest, Breast, or Rib Pain
- Screening for Neuromuscular or Neurologic Causes of Chest, Breast, or Rib Pain
- Physician Referral

SCREENING THE SHOULDER AND UPPER EXTREMITY

- Using the Screening Model to Evaluate Shoulder and Upper Extremity

- Screening for Pulmonary Causes of Shoulder Pain
- Screening for Cardiac Causes of Shoulder Pain
- Screening for Gastrointestinal Causes of Shoulder Pain
- Screening for Liver and Biliary Causes of Shoulder Pain
- Screening for Rheumatic Causes of Shoulder Pain
- Screening for Infectious Causes of Shoulder Pain
- Screening for Oncologic Causes of Shoulder Pain
- Screening for Gynecologic Causes of Shoulder Pain
- Physician Referral

Recommended Text Books

- Goodman CC, Snyder TEK. *Differential Diagnostics for Physical Therapists: Screening for Referral*. Saint Louis, MO: Saunders: Elsevier; 2006. ISBN: 978-0-7216-0619-4
- APTA. *Guide to Physical Therapy Practice: Revised second edition*. Alexandria, VA: American Physical Therapy Association; 2003. ISBN: 978-1-887759-85-
- Additional readings as assigned by the instructors

MANUAL THERAPY

CREDIT HOURS 3(2-1)

COURSE DESCRIPTION:

Through the utilization of instruction, demonstration, practical exercises, research article critical review and case study discussions and presentations this course will provide the best evidence in state of the art advanced manual therapy A detailed overall review of all Manual Therapy techniques, along with manual therapy techniques covering spine and Temporo-Mandibular joint, will take place Techniques covered are: advanced myofascial trigger point therapy, Proprioceptive training, muscle energy combination techniques, strain counter strain, neuromobilization combination techniques and mobilization, manipulation techniques with emphasis on thrust manipulation Thorough evaluation, assessment and technique selection training will take place utilizing evidence based models such as APTAs “Open Door” and “Hooked in Evidence”

programs All skills will be introduced through on-site demonstration and hands-on practice Students will also get significant exposure in critical review of research articles pertaining to application of manual therapy techniques Case review, discussion and case presentations are an important component of this course

DETAILED COURSE OUTLINE

INTRODUCTION TO MANUAL THERAPY

OMT (ORTHOPEDIC MANUAL THERAPY) KALTENBORN-EVJENTH CONCEPT

- History
- Special features
- Overview

PRINCIPLES

SPINAL MOVEMENT

- The mobile segment
- Spinal range of movement
- Joint positioning for evaluation and treatment
- Three-dimensional joint positioning
 - Resting position
 - Actual resting position
 - Nonresting positions
- Joint locking
- Bone and joint movement
- Rotations of a vertebral bone
 - Standard bone movements
 - Combined bone movements
 - Coupled movements
 - Noncoupled movements
- Joint roll-gliding associated with bone rotations
 - Joint roll-gliding
 - Abnormal roll-gliding

- Translation of vertebral bone
- Joint play associated with bone translation

TRANSLATORIC JOINT PLAY

- The Kaltenbom Treatment Plane
- Translatoric Joint Play Movements
- Determining the direction of restricted gliding
- Glide test
- Kaltenbom Convex-Concave Rule
- Grades of translatoric movement
- Normal grades of translatoric movement (Grades I - III)
 - Palpating resistance to normal movement
- Pathological grades of translatoric movement
- Using translatoric grades of movement

TESTS OF FUNCTION

- Principles of function testing
- Assessing quantity of movement
 - Measuring rotatoric movement with a device
 - Manual grading of rotatoric movement (- scale)
- Assessing quality of movement
 - Quality of movement to the first stop
 - End-feel: Quality of movement after the first stop
- Elements of function testing
- Active and passive rotatoric movements
 - Testing rotatoric movement
 - Localization tests
 - Differentiating articular from extra-articular dysfunction
 - Differentiating muscle shortening from muscle spasm
- Translatoric joint play tests

- Resisted movements
- Passive soft tissue movements
- Additional tests

OMT EVALUATION

- Goals of the OMT evaluation
- Physical diagnosis
- Indications and contraindications
- Measuring progress
- Elements of the OMT evaluation
- Screening exam
- Detailed exam
 - History
 - inspection
 - Tests of function
 - Palpation
 - Neurologic and vascular tests
- Medical diagnostic studies
- Diagnosis and trial treatment

SPINAL JOINT MOBILIZATION

- Goals of joint mobilization
- Mobilization techniques
- Pain relief mobilization
 - Pain-relief traction mobilization (Grade I -IISZ)
 - Vibrations and oscillations
- Relaxation mobilization
 - Relaxation-traction mobilization (Grade I -II)
- Stretch mobilization
 - Stretch-traction mobilization (Grade III)

- Stretch-glide mobilization (Grade /)
- Manipulation
- If traction exacerbates symptoms
- A voiding high-risk manual treatment
 - Rotation mobilization
 - Joint compression

OMT TREATMENT

- Elements of OMT
- Treatment to relieve symptoms
 - Immobilization
 - Thermo-Hydro-Electric (T-H-E) therapy
 - Pain-relief mobilization
 - Special procedures for pain relief
- Treatment to increase mobility
 - Soft tissue mobilization
 - Passive soft tissue mobilization
 - Active-facilitated soft tissue mobilization
 - Muscle stretching principles
 - Joint mobilization to increase mobility
 - Neural tissue mobilization
- Specialized exercise to increase mobility
- Treatment to limit movement
- To inform, instruct and train
- Research

SPINAL SYNDROMES

- Notes on spinal syndromes
- Cervical syndromes
- Thoracic syndromes
- Lumbar syndromes

- Neurologic evaluation of nerve root syndromes
- Sensory innervation of the skin
- Sensory innervation of deep structures
- Motor innervation
- Common nerve root syndromes

MANUAL THERAPY ASSESSMENT

- The Maitland's and Mulligan concept
- Subjective examination
- Physical examination
- Examination of the temporomandibular joint
- Examination of the upper cervical spine
- Examination of the cervicothoracic spine
- Examination of the thoracic spine
- Examination of the lumbar spine

THE SUBJECTIVE EXAMINATION STEP BY STEP

- Introduction
- Body chart
- Behavior of symptoms
- Special questions
- History of the present condition (HPC)
- Past medical history (PM H)
- Social and family history (SH, FH)
- Plan of the physical examination
- Case scenarios
- Counterfeit clinical presentations

PHYSICAL EXAMINATION STEP BY STEP

- Introduction

- Observation
- Joint tests
- Muscle tests
- Neurological tests
- Special tests
- Functional ability
- Palpation
- Accessory movements
- Completion of the physical examination

TECHNIQUES

TECHNIQUE PRINCIPLES

- Learning manual techniques
- Applying manual techniques
- Objective
- Starting position
 - Patient's position
 - Therapist's position
- Hand placement and fixation/stabilization
 - Grip
 - Therapist 's stable hand
 - Therapist's moving hand
- Procedure
 - Joint pre-positioning
 - Mobilization technique
 - Symbols
- Recording
- Identifying an intervertebral segment
- The Star Diagram

PELVIS

- Functional anatomy and movement
- Notes on evaluation and treatment
- Pelvis tests and mobilizations

LUMBAR SPINE

- Functional anatomy and movement
- Notes on evaluation and treatment
- Lumbar tests and mobilizations

THORACIC SPINE AND RIBS

- Functional anatomy and movement
- Notes on evaluation and treatment
- Thoracic tests and mobilizations

CERVICAL SPINE

- Functional anatomy and movement
- Notes on evaluation and treatment
- Cervical tests and mobilizations

UPPER CERVICAL SPINE

- Functional anatomy and movement
- Notes on evaluation and treatment
- Upper cervical tests and mobilizations

JAW

- Functional anatomy and movement
- Jaw examination scheme
- Jaw tests and mobilizations

SPINAL MOBILIZATIONS

THE CERVICAL AND UPPER THORACIC SPINES

- NAGS
- REVERSE NAGS
- SNAGS
- SELF SNAGS
- Spinal Mobilization with arm Movement
- Other mobilization with movement techniques (MWMS) for the Cervical and Upper Thoracic Spines

THE UPPER CERVICAL SPINE SPECIAL TECHNIQUES

- The acute Wry Neck
- Headaches
- Vertigo, Nausea and other vertebral artery Signs

THE LUMBAR SPINE

- SNAGS
- SELF SNAGS

THE SACROILIAC JOINTS (S/I) JOINTS

THE THORACIC SPINE

THE RIB CAGE

CONCLUSION

INTEGRATIVE MANUAL THERAPY

- Postural Compensations of the spine
- Muscle Energy and 'Beyond' Technique for the spine
- Treatment of spine Hypertonicity for Synergic Pattern
- Release with Strain and Counter strain Technique
- Myofascial Release

- Tendon Release Therapy for Treatment of Tendon Tissue Tension with Advanced Strain and Counter strain Technique
- Ligaments: a Tensile Force Guidance System: Treatment with Ligament Fiber Therapy
- Procedures and Protocols to correct spinal Dysfunction with Integrative Manual Therapy

PRACTICAL/ CLINICAL TRAINING:

In the laboratory sessions, Supervised evaluation and manual therapy treatment techniques will be demonstrated and practiced, including joint and soft-tissue mobilization, manipulations, and posture and movement retraining in the physiotherapy clinic/Ward and Orthopaedic clinic/Ward, Indoor as well as outdoor. Various reflective case studies related to manual therapy of the spine and TM joint will be assigned to the students.

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:

- *Manual Mobilization of the Joints The Kaltenborn Method of Joint Examination and Treatment Volume I The Extremities* By: Freddy M. Kaltenbomin collaboration with Olaf Evjenth, Traudi Baldauf Kaltenbom, Dennis Morgan, and Eileen Vollowitz, OPTP Minneapolis, Minnesota, USA.
- *Manual Therapy* By: Ola Grimsby, the Ola Grimsby institute San Diego.
- *Integrative Manual therapy for the upper and lower extremities* By: Sharon weiselfish, North Atlantic books Berkeley, California.
- *Orthopedic manual therapy an evidence-based approach* by: Chad Cook
- *Orthopaedic Manual Therapy Diagnosis Spine and Temporomandibular Joints* By: Aad van der

- *Translatory Spinal Manipulation* By: John R. Krauss, Olaf Evjenth, and Doug Creighton John R. Krauss A Lakeview Media L. L.C. Publication
- *Neuromusculoskeletal Examination and Assessment A Handbook for Therapists*
- By: Nicola J Petty, Ann P Moore & G D Maitland, Second Edition Churchill Livingstone
- *Myofascial Manipulation Theory and Clinical Application*, Second Edition By: Robert I. Cantu, Alan J. Grodin an Aspen Publication Aspen Publishers, Inc. Gaithersburg, Maryland 2001
- *Maitland's Vertebral Manipulation* Seventh Edition By: Geoffrey D. Maitland
- *Musculoskeletal manual medicine, diagnosis and treatment* by Jiri Dovark, Vaclav Dovark, Werner Schneider etc
- *Manual therapy, NAGS, SNAGS, MWMS etc* by Brian R Mulligan fifth edition

PROFESSIONAL PRACTICE IN PHYSICAL THERAPY

(Law , Ethics & Administration)

CREDIT HOURS 2(2-0)

COURSE DESCRIPTION:

The course will discuss the role, responsibility, ethics administration issues and accountability of the physical therapists. The course will also cover the change in the profession to the doctoral level and responsibilities of the professional to the profession, the public and to the health care team. The topic of health care system in Pakistan with comparison with current health system abroad will be discussed too.

DETAILED COURSE OUTLINE

THE PHYSICAL THERAPIST AS PROFESSIONAL

- What does professional mean?
- Preliminary definitions of profession and professional
- Sociological perspective
- Structural approach
- Processual approach
- Characteristics of professions cited in the literature
- Power approach
- Dimensions of occupation & profession
- Autonomy, self-regulation of ethical standards, and accountability
- Privileges of autonomous practice in 2020
- Self-regulation of ethical standards
- Accountability of professionals
- Individual professionalism—professionalism without professions?
- The history of a profession
- Professional recognition

CONTEMPORARY PRACTICE ISSUES

- A vision for the future
- The doctorate in physical therapy
- Perspective of the profession
- Perspective of the practitioner
- Direct access issue
- Selected curriculum requirements from evaluative criteria for physical therapist
- Plan of care
- Social responsibility
- Career development
- Physical therapy practice patterns
- Components of a practice pattern
- Important factors that affect health

THE FIVE ROLES OF THE PHYSICAL THERAPIST

THE PHYSICAL THERAPIST AS PATIENT/CLIENT MANAGER

- evaluation and diagnosis
- Diagnosis as clinical decision making
- Prognosis
- Discharge planning and discontinuance of care
- Discontinuance of care
- Outcomes
- Clinical decision making
- Referral relationships
- Interpersonal relationships
- Ethical and legal issues
- Informed consent
- Managed care and fidelity

THE PHYSICAL THERAPIST AS CONSULTANT

- Physical therapy consultation
- Building a consulting business
- The consulting process
- The skills of a good consultant
- Trust in the consultant/client relationship
- Ethical and legal issues in consultation
- Components of a consulting agreement

THE PHYSICAL THERAPIST AS CRITICAL INQUIRER

- History of critical inquiry
- Evidence-based medicine
- Outcomes research
- Whose responsibility is research?

- Roles of the staff physical therapist in critical inquiry
- Collaboration in clinical research
- Ethical and legal issues in critical inquiry

THE PHYSICAL THERAPIST AS EDUCATOR

- History of physical therapy education
- Contemporary educational roles of the physical therapist
- Teaching opportunities in continuing education
- Academic teaching opportunities
- Theories of teaching and learning in professional education
- Ethical and legal issues in physical therapy education

THE PHYSICAL THERAPIST AS ADMINISTRATOR

- History of physical therapy administration
- Contemporary physical therapy administration
- Patient/client management
- First-line management
- Midlevel managers and chief executive officers
- Leadership
- Ethical and legal issues

PROFESSIONAL DEVELOPMENT, COMPETENCE, AND EXPERTISE

- Lifelong process of skill enhancement
- The professional development continuum: from competence to expertise
- Activities that promote professional development
- Evaluation of competence and professional development
- Professional development planning
- Possible evaluators of professional achievement
- Career advancement
- Organizational impact on professional development

FUTURE CHALLENGES IN PHYSICAL THERAPY

- Physical therapy's moral mission
- The future in three realms, individual, institutional& societal.
- Professionalism and the physical therapist
- **CONSULTATION IN PHYSICAL THERAPY**
- Introduction to Consultation in Physical Therapy:
- The Way the Consultation is Carried out:
- Patient-Related Consultation:
- Client-Related Consultation:
- Consultation Activities of Physical Therapist:
- Responding to a request for a second opinion:
- Advising a referring practitioner about the indications for intervention:
- Advising employers about the requirements of the Patients/Clients with Disabilities:
- Instructing employers about pre-placement in accordance with provisions of the Patients/Clients with Disabilities:
- Educating other health practitioners (eg, in injury prevention):
- Performing environmental assessments to minimize the risk of falls:
Conducting a program to determine the suitability of employees for specific job assignments:
- Examining school environments and recommending changes to improve accessibility for students with disabilities:
- Developing programs that evaluate the effectiveness of an intervention plan in reducing work-related injuries:
- Working with employees, labor unions, and government agencies
- to develop injury reduction and safety programs:
- Participating at the local, state, and federal levels in policymaking for physical therapy services:
- Providing expert legal opinion:
- **SCREENING IN PHYSICAL THERAPY**

- Introduction to Screening in Physical Therapy
- The Way the Screening is Carried Out
- The Basis of Screening
- Problem-focused, systematic collection and analysis of data to
- Identify individuals at risk in order to provide primary Prevention:
- Identify those in need of physical therapy intervention or other rehabilitative services
- Ascertain the presence of positive findings that require attention by another health care practitioner in order to provide secondary or tertiary prevention
- Candidates for Screening
- Screening Activities of Physical Therapist
- Identifying children who may need an examination for idiopathic scoliosis
- Identifying risk factors in the workplace
 - o Pre-performance testing of individuals active in sports
 - o Identifying an individual's lifestyle factors (eg, exercise, stress, weight) that may lead to increased risk for serious health problems
 - o Identifying elderly individuals in a community center or nursing home who are at high risk for slipping, tripping, or falling
- **DELEGATION IN PHYSICAL THERAPY**
- Introduction to Delegation in Physical Therapy:
- Delegation Pertinent Responsibilities of Physical Therapist:
- Interpretation of record of patient referred by health care provider:
- Initial evaluation and problem identification of patient:
- Development of plan of care and goals of treatment:
- Determination of appropriate portion of treatment program to be delegated to a physical therapist's assistant:
- Delegation of treatment to be administered by physical therapist's assistant:
- Instruction to the physical therapist's assistant regarding:

- The specific program of treatment of a patient:
- Any precaution to be taken to protect a patient:
- Any special problem of a patient:
- Any procedure which should not be administered to a patient:
- The proper methods for documenting the treatment that is administered to the patient:
- Any other information required to treat a patient:
- Treatment review in a timely manner:
- Documentation of goal of treatment:
- Revision of plan of care when indicated:
- Revision of Documentation done by PTA during periodic
- Reviews of the patient and make note of those reviews in the evaluation or reassessment of the patient:
- Case management and dissemination of any written and oral reports:
- Performance of final evaluation upon the discharge:
- When and When Not to Delegate:
- National Perspectives:
- International Perspectives:
- To Whom and to Whom Not to Delegate:
- National Perspectives:
- International Perspectives:
- Supervision of Treatment Program Delegated to a Physical Therapist's Assistant by Physical Therapist:

CULTURAL COMPETENCY IN PHYSICAL THERAPY

- General Consideration of Cultural Competence in Physical Therapy
- Cultural Competence
- Key Concepts
- Culture
- Principles and Assumptions
- Power and Privilege
- Exploring Differences

- Equitable Access
- Racism & Oppression
- Elements of Cultural Competence
- National Diverse Communities
- International Diverse Communities
- Providing Health Care in a Multicultural Society
- Patient and Client Encounter Questions
- LIAASE: A General Cultural Competence Tool
- Health Professional Self-Assessment Tool
- Steps to Cultural Study and Cultural Competence
- Therapist's vs Patient's Culture
- Physical Therapist's Culture
- Understanding Patient's Culture
- Addressing Conflict
- LIAASE (Learn, Inquire, Avoid Polarization, Avoid Arguing and Defending, Show Empathy): A General Cultural Competence Tool
- Health Professional Self-Assessment Tool

STANDARDS OF COMPETENCE IN PHYSICAL THERAPY

- Need for developing standards of competence
- Assumptions behind the standards
- Why have standards not been developed for the physical therapist assistant
- Continuing competence
- How were these standards developed
- How are the standards presented
- To whom do these standards apply
- Domain 1-Professional Practice
- Professional Accountability
- Professional Behavior
- Professional Development
- Domain 2-Patient/Client Management

- Examination, Evaluation And Diagnosis Plan Of Care
- Implementation
- Education
- Discharge
- Cultural Heritage
- Communication in Cultural Context
- Family Roles and Organization Within Culture
- Cultural Workforce Issues
- High Risk Health Behaviors, Biocultural Ecology, and Nutrition in
- Light of Culture:
- Spirituality and Cultural Death Rituals
- Cultural Healthcare Practices and Roles of Healthcare Practitioners
- Selected Ethnic Cultures
- Cultural Considerations for
- Pakistani Cultures:
- American / Black Cultures
- Chinese Culture
- Latino/Hispanic Client
- American Indian Cultures
- Middle Eastern Cultures
- Jewish Clients
- Culture of Various Physical Therapy Populations
- Disability across Cultures
- Veteran and Military Culture and Physical Therapy
- The Challenge and Culture of Poverty and Homelessness
- Physical Therapy Cultural Encounters in Pediatrics
- Physical Therapy Cultural Encounters in Geriatrics
- Professional Development, Competence, and Expertise
- Lifelong process of skill enhancement
- The professional development continuum: from competence to expertise

- Activities that promote professional development
- Evaluation of competence and professional development:
- Professional development planning
- Possible evaluators of professional achievement
- Career advancement
- Organizational impact on professional development
- Future Challenges in Physical Therapy
- Physical therapy's moral mission
- The future in three realms, individual, institutional & societal
- Professionalism and the physical therapist
- **LAWS, REGULATIONS, AND POLICIES FOR PHYSICAL THERAPY**
- National Laws, Regulations, and Policies for Physical Therapy:
- International Laws, Regulations, and Policies for Physical Therapy:
- Arab Countries' Laws, Regulations, and Policies for Physical Therapy (e.g., UAE and KSA etc):
- European Laws, Regulations, and Policies for Physical Therapy:
- Australian & New Zealand Laws, Regulations, and Policies for Physical Therapy:
- American Laws, Regulations, and Policies for Physical Therapy:
- Statutes and Regulations:
- Statutes:
- Regulations
- Creating Statutes and regulation:
- The Court System:
- Criminal versus Civil Law
- Criminal Law:
- Civil Law:
- Policies:
- The American Physical Therapy Association:
- Payer Reimbursement Policies:
- Employer Policies:

- An Overview of Laws, Regulations, and Policies of different
- States for Physical Therapy:
- The roles of World Confederation for Physical Therapy (WCPT)

EDUCATION TECHNIQUES

- **THE TEACHING-LEARNING PROCESS**

- Teaching Responsibilities:
- Components of the Teaching Process:
- Analysis of the learner / assessment:
- Analysis of data, formulation of objectives of instruction:
- Analysis of instruction / planning:
- Implantation:
- Evaluation:
- Documentation:

- **EDUCATIONAL THEORY**

- Learning Theories:
- Behaviorist:
- Cognitive:
- Humanist:
- Adult learning:
- Behavioral Objectives from the Educational Domains:
- Cognitive:
- Affective:
- Psychomotor:

- **EDUCATION IN THE ACADEMIC ENVIRONMENT**

- Curriculum Design for Physical Therapy Educational Programs:
- From Curricular Goals to Instruction: Preparing to Teach:
- Teaching and Learning in Academic Settings:
- Physical Therapy Education in the Digital Age: Leveraging:
- Technologies to Promote Learning:
- Assessing and Improving the Teaching and Learning Process in

- Academic Settings:
- Authentic Assessment: Simulation-Based Education:
- Strategies for Planning and Implementing Inter-professional Education
- **EDUCATION IN PRACTICE ENVIRONMENTS**
- Preparation for Teaching in Clinical Settings:
- Techniques for Teaching in Clinical Settings:
- Qualities of a Good Clinical Teacher:
- Facilitating the Teaching and Learning of Clinical Reasoning:
- Patient Education and Health Literacy:
- Applied Behavioral Theory and Adherence: Models for Practice:
- Teaching and Learning Psychomotor Skills:

Recommended Text Books:

- *Professionalism in Physical Therapy: History, Practice, & Development*, Lisa L. Dutton, PT, PhD
- APTA. *Guide to Physical Therapy Practice: Revised second edition*. Alexandria, VA: American Physical Therapy Association; 2003. ISBN: 978-1-887759-85-

INTEGUMENTARY PHYSICAL THERAPY

CREDIT HOURS 2(2-0)

COURSE DESCRIPTION:

This course includes a study of anatomy and physiology of the Integumentary system and pathological changes of the system and function, including diagnostic tests and measurements. The use of evidence-based physical therapy intervention for Integumentary conditions is emphasized. Topics will focus on comparing contemporary and traditional interventions and the impact of evolving technology in this area. Topics will focus on medical terminology, clinical

examination, evaluation, comparing contemporary, traditional interventions and the impact of evolving technology in this area.

MEDICAL TERMINOLOGY REGARDING INTEGUMENTARY SYSTEM

- Quality of Life and Ethical Issues
- Regulation and wound Care
- Skin, an Essential Organ
- Acute and Chronic Wound Healing
- Wound assessment
- Wound Bioburden
- Wound Debridement
- Wound Treatment Options
- Nutrition and wound care
- Seating, Positioning and support surfaces
- Pain Management and wounds

WOUND CLASSIFICATIONS AND MANAGEMENT STRATEGIES

- Pressure Ulcers
- Vascular Ulcers
- Diabetic Foot Ulcers
- Sickle Cell Ulcers
- Wounds in special Populations
- Complex wounds
- Atypical Wounds
- Wound Care; where we were, where we are, and where we are going
- **BURNS**
- Skin and appendage
- Classification of burns
- Types of burns

- Criteria of care in burn center
- Physical therapy in different phases of burns

CASE HISTORIES

- Principles of assessment and outcome measures
- Documentation in SOAP notes format
- Evidence based integumentary Physical Therapy Treatment protocols

Recommended Text Book:

- Wound Care Essentials, practice principles, By Sharon Baranoski & Elizabeth A. Ayello
- APTA. *Guide to Physical Therapy Practice: Revised second edition.* Alexandria, VA: American Physical Therapy Association; 2003. ISBN: 978-1-887759-85-

SUPERVISED CLINICAL PRACTICE V

CREDIT HOURS 3(0-3)

CARDIOVASCULAR AND PULMONARY

SEMESTER	SUPERVISION	FOCUS	WARDS	COMPETENCIES
9	Supervised by trained PT	Evaluation, Examination, and Intervention	Cardiovascular and pulmonary (IPD/OPD; surgical & non-surgical)	Listed below

COURSE DESCRIPTION:

During this supervised clinical practice, students are responsible for successful execution of examination, evaluation, and interventions relating to cardiovascular and pulmonary disorders. Students become familiar with performance of these skills in all settings (inpatient and outpatient) as well as on all types of conditions (surgical, non-surgical, pediatric and geriatric,.) Students learn to objectively perform these skills under the supervision of trained physical therapists. 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.

COMPETENCIES:

EXAMINATION:

- Based on best available evidence select examination tests and measures that are appropriate for the patient/client.
- Perform posture tests and measures of postural alignment and positioning.
- Perform gait, locomotion and balance tests including quantitative and qualitative measures such as:
 - Balance during functional activities with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment
 - Balance (dynamic and static) with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment
 - Gait and locomotion during functional activities with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment to include:
 - ❖ Bed mobility
 - ❖ Transfers (level surfaces and floor)
 - ❖ Wheelchair management
 - ❖ Uneven surfaces
 - ❖ Safety during gait, locomotion, and balance
 - Perform gait assessment including step length, speed, characteristics of gait, and abnormal gait patterns.
- Characterize or quantify body mechanics during self-care, home management, work, community, tasks, or leisure activities.

- Characterize or quantify ergonomic performance during work (job/school/play):
 - Dexterity and coordination during work
 - Safety in work environment
 - Specific work conditions or activities
 - Tools, devices, equipment, and workstations related to work actions, tasks, or activities
- Characterize or quantify environmental home and work (job/school/play) barriers:
 - Current and potential barriers
 - Physical space and environment
 - Community access
- Observe self-care and home management (including ADL and IADL)
- Measure and characterize pain to include:
 - Pain, soreness, and nociception
 - Specific body parts
- Recognize and characterize signs and symptoms of inflammation.
- Perform cardiovascular/pulmonary tests and measures including:
 - Heart rate
 - Respiratory rate, pattern and quality*
 - Blood pressure
 - Aerobic capacity test* (functional or standardized) such as the 6-minute walk test
 - Pulse Oximetry
 - Breath sounds – normal/abnormal
 - Response to exercise (RPE)
 - Signs and symptoms of hypoxia
 - Peripheral circulation (deep vein thrombosis, pulse, venous stasis, lymphedema)

EVALUATION:

- Clinical reasoning
- Clinical decision making
- Synthesize available data on a patient/client expressed in terms of the International Classification of Function, Disability and Health (ICF) model to include body functions and structures, activities, and participation.

- Use available evidence in interpreting the examination findings.
- Verbalize possible alternatives when interpreting the examination findings.
- Cite the evidence (patient/client history, lab diagnostics, tests and measures and scientific literature) to support a clinical decision.

DIAGNOSIS:

- Integrate the examination findings to classify the patient/client problem in terms of body functions and structures, and activities and participation (ie, practice patterns in the Guide)
- Identify and prioritize impairments in body functions and structures, and activity limitations and participation restrictions to determine specific body function and structure, and activities and participation towards which the intervention will be directed.

PROGNOSIS:

- Determine the predicted level of optimal functioning and the amount of time required to achieve that level.
- Recognize barriers that may impact the achievement of optimal functioning within a predicted time frame including
 - Age
 - Medication(s)
 - Socioeconomic status
 - Co-morbidities
 - Cognitive status
 - Nutrition
 - Social Support
 - Environment

PLAN OF CARE:

- Goal setting
- Coordination of Care
- Progression of care
- Discharge

- Design a Plan of Care
 - Write measurable functional goals (short-term and long-term) that are time referenced with expected outcomes.
 - Consult patient/client and/or caregivers to develop a mutually agreed to plan of care.
 - Identify patient/client goals and expectations.
 - Identify indications for consultation with other professionals.
 - Make referral to resources needed by the patient/client (assumes knowledge of referral sources).
 - Select and prioritize the essential interventions that are safe and meet the specified functional goals and outcomes in the plan of care (ie, (a) identify precautions and contraindications, (b) provide evidence for patient-centered interventions that are identified and selected, (c) define the specificity of the intervention (time, intensity, duration, and frequency), and (d) set realistic priorities that consider relative time duration in conjunction with family, caregivers, and other health care professionals).
 - Establish criteria for discharge based on patient goals and current functioning and disability.
- Coordination of Care
- Identify who needs to collaborate in the plan of care.
- Identify additional patient/client needs that are beyond the scope of physical therapist practice, level of experience and expertise, and warrant referral.
- Refer and discuss coordination of care with other health care professionals.
- Articulate a specific rationale for a referral.
- Advocate for patient/client access to services.
- Progression of Care
- Identify outcome measures of progress relative to when to progress the patient further.
- Measure patient/client response to intervention.
- Monitor patient/client response to intervention.
- Modify elements of the plan of care and goals in response to changing patient/client status, as needed.*
- Make on-going adjustments to interventions according to outcomes including environmental factors and personal factors and, medical therapeutic interventions.

- Make accurate decisions regarding intensity and frequency when adjusting interventions in the plan of care.
- Discharge Plan
- Re-examine patient/client if not meeting established criteria for discharge based on the plan of care.
- Differentiate between discharge of the patient/client, discontinuation of service, and transfer of care with re-evaluation.*
- Prepare needed resources for patient/client to ensure timely discharge, including follow-up care.
- Include patient/client and family/caregiver as a partner in discharge.*
- Discontinue care when services are no longer indicated.
- When services are still needed, seek resources and/or consult with others to identify alternative resources that may be available.
- Determine the need for equipment and initiate requests to obtain.

INTERVENTIONS:

- Safety, Emergency Care, CPR and First Aid
- Standard Precautions
- Body Mechanics and
- Positioning
- Categories of Interventions
 - Safety, Cardiopulmonary Resuscitation Emergency Care, First Aid
 - ❖ Ensure patient safety and safe application of patient/client care.
 - ❖ Perform first aid.
 - ❖ Perform emergency procedures.
 - ❖ Perform Cardiopulmonary Resuscitation (CPR).
- Precautions
 - Demonstrate appropriate sequencing of events related to universal precautions.
 - Use Universal Precautions.
 - Determine equipment to be used and assemble all sterile and non-sterile materials.
 - Use transmission-based precautions.

- Demonstrate aseptic techniques.*
- Apply sterile procedures.*
- Properly discard soiled items.*
- Body Mechanics and Positioning
 - Apply proper body mechanics (utilize, teach, reinforce, and observe).*
 - Properly position, drape, and stabilize a patient/client when providing physical therapy.*
- Interventions
 - Coordination, communication, and documentation may include: Addressing required functions:
 - Establish and maintain an ongoing collaborative process of decision-making with patients/clients, families, or caregivers prior to initiating care and throughout the provision of services.
 - Discern the need to perform mandatory communication and reporting (eg, incident reports, patient advocacy and abuse reporting).
 - Follow advance directives.
 - Admission and discharge planning.

C. Case management.

D. Collaboration and coordination with agencies, including:

- (1) Home care agencies
- (2) Equipment suppliers
- (3) Schools
- (4) Transportation agencies
- (5) Payer groups

E. Communication across settings, including:

- (1) Case conferences
- (2) Documentation
- (3) Education plans

F. Cost-effective resource utilization.

G. Data collection, analysis, and reporting of:

- (1) Outcome data

- (2) Peer review findings
- (3) Record reviews

H. Documentation across settings, following APTA's Guidelines for Physical Therapy Documentation, including:

- (1) Elements of examination, evaluation, diagnosis, prognosis, and Intervention
- (2) Changes in body structure and function, activities and participation.
- (3) Changes in interventions
- (4) Outcomes of intervention
 - Interdisciplinary teamwork:
 - (1) Patient/client family meetings
 - (2) Patient care rounds
 - (3) Case conferences
- J. Referrals to other professionals or resources.*
- K. Patient/client-related instruction may include:
 - A. Instruction, education, and training of patients/clients and caregivers regarding:
 - (1) Current condition, health condition, impairments in body structure and function, and activity limitations, and participation restrictions)*
 - (2) Enhancement of performance
 - (3) Plan of care:
 - a. Risk factors for health condition, impairments in body structure and function, and activity limitations, and participation restrictions.
 - b. Preferred interventions, alternative interventions, and alternative modes of delivery
 - c. Expected outcomes
 - (4) Health, wellness, and fitness programs (management of risk factors)
 - (5) Transitions across settings

Therapeutic exercise may include performing:

Aerobic capacity/endurance conditioning or reconditioning*:

- (1) Gait and locomotor training*
- (2) Increased workload over time (modify workload progression)

- (3) Movement efficiency and energy conservation training
- (4) Walking and wheelchair propulsion programs
- (5) Cardiovascular conditioning programs
- B. Relaxation:
 - (1) Breathing strategies*
 - (2) Movement strategies
 - (3) Relaxation techniques
- C. Airway clearance techniques may include*:
 - A. Breathing strategies*:
 - (1) Active cycle of breathing or forced expiratory techniques*
 - (2) Assisted cough/huff techniques*
 - (3) Paced breathing*
 - (4) Pursed lip breathing
 - (5) Techniques to maximize ventilation (eg, maximum inspiratory hold, breath stacking, manual hyperinflation)
 - B. Manual/mechanical techniques*:
 - (1) Assistive devices
 - C. Positioning*:
 - (1) Positioning to alter work of breathing
 - (2) Positioning to maximize ventilation and perfusion
- Functional training in self-care and home management may include*:
- Functional training in work (job/school/play), community, and leisure integration or reintegration may include*:
 - Activities of daily living (ADL) training:
 - (1) Bed mobility and transfer training*
 - (2) Age appropriate functional skills
 - Barrier accommodations or modifications*
 - Device and equipment use and training:
 - (1) Assistive and adaptive device or equipment training during ADL (specifically for bed mobility and transfer training, gait and locomotion, and dressing)*

- (2) Orthotic, protective, or supportive device or equipment training during self-care and home management*
 - (3) Prosthetic device or equipment training during ADL (specifically for bed mobility and transfer training, gait and locomotion, and dressing)*
- Functional training programs*:
 - (1) Simulated environments and tasks*
 - (2) Task adaptation
- Injury prevention or reduction:
 - (1) Safety awareness training during self-care and home management*
 - (2) Injury prevention education during self-care and home management
 - (3) Injury prevention or reduction with use of devices and equipment
- Prescription, application, and, as appropriate, fabrication of devices and equipment may include*:
 - Adaptive devices*:
 - (1) Hospital beds
 - (2) Raised toilet seats
 - (3) Seating systems – prefabricated
 - Assistive devices*:
 - (1) Canes
 - (2) Crutches
 - (3) Long-handled reacher
 - (4) Static and dynamic splints – prefabricated
 - (5) Walkers
 - (6) Wheelchairs
 - Orthotic devices*:
 - (1) Prefabricated braces
 - (2) Prefabricated shoe inserts
 - (3) Prefabricated splints
 - Prosthetic devices (lower-extremity)*
 - Protective devices*:
 - (1) Braces

- (2) Cushions
- (3) Helmets
- (4) Protective taping
- Supportive devices*:
 - (1) Prefabricated compression garments
 - (2) Corsets
 - (3) Elastic wraps
 - (4) Neck collars
 - (5) Slings
 - (6) Supplemental oxygen - apply and adjust
 - (7) Supportive taping
- Electrotherapeutic modalities may include:
 - A. Biofeedback*
 - B. Electrotherapeutic delivery of medications (eg, iontophoresis)*
 - C. Electrical stimulation*:
 - (1) Electrical muscle stimulation (EMS)*
 - (2) Functional electrical stimulation (FES)
 - (3) High voltage pulsed current (HVPC)
 - (4) Neuromuscular electrical stimulation (NMES)
 - (5) Transcutaneous electrical nerve stimulation (TENS)
- Physical agents and mechanical modalities may include: *Physical agents*:
 - A. Cryotherapy*:
 - (1) Cold packs
 - (2) Ice massage
 - (3) Vapocoolant spray
 - B. Hydrotherapy*:
 - (1) Contrast bath
 - (2) Pools
 - (3) Whirlpool tanks*
 - C. Sound agents*:
 - (1) Phonophoresis*

(2) Ultrasound*

D. Thermotherapy*:

(1) Dry heat

(2) Hot packs*

(3) Paraffin baths*

Mechanical modalities:

A. Compression therapies (prefabricated)*

(1) Compression garments

- Skill Category Description of Minimum Skills

(2) Vasopneumatic compression devices*

(3) Taping

(4) Compression bandaging (excluding lymphedema)

B. Gravity-assisted compression devices:

(1) Standing frame*

(2) Tilt table*

C. Mechanical motion devices*:

(1) Continuous passive motion (CPM)*

D. Traction devices*:

(1) Intermittent

(2) Positional

(3) Sustained

- Documentation of all listed competencies in SOAP notes format

TENTH SEMESTER

- **OBSTETRICS & GYNECOLOGICAL PHYSICAL THERAPY**
- **PAEDIATRIC PHYSICAL THERAPY**
- **GERONTOLOGY & GERIATRIC PHYSICAL THERAPY**
- **SPORTS PHYSICAL THERAPY**
- **SUPERVISED CLINICAL PRACTICE VI**
- **RESEARCH PROJECT**

OBSTETRICS& GYNECOLOGICAL PHYSICAL THERAPY

CREDIT HOURS 2(2-0)

COURSE DESCRIPTION:

This course intends to provide Introduction to physical therapy practice for evaluation and treatment of pelvic floor dysfunction and an Introduction to physical therapy practice for evaluation and treatment of problems related to pregnancy, osteoporosis, and other disorders specific to women. Topics will focus on medical terminology, clinical examination, evaluation, comparing contemporary, traditional interventions and the impact of evolving technology in this area.

DETAILED COURSE OUT LINE

MEDICAL TERMINOLOGY REGARDING GYNECOLOGY, OBSTETRICS AND WOMEN'S HEALTH

- Anatomy
- Physiology of pregnancy
- Physical and physiological changes of labor and the puerperium
- The antenatal period
- Relieving the discomforts of pregnancy
- Preparation of labor
- Postnatal period
- The climacteric
- Common gynecological conditions

- Gynecological surgery
- Urinary function and dysfunction
- Bowel and anorectal function and dysfunction

ONCOLOGICAL ISSUE WITH WOMEN'S HEALTH

- Management of breast cancer
- Management of lymph odema

SPECIAL TOPIC IN WOMEN'S HEALTH

- Female athletes
- Exercise issues and aging
- Aquatic therapy services in women health
- Physical therapy management for women with long term physical disabilities

CASE HISTORIES

- Principles of assessment and outcome measures
- Documentation in SOAP notes format
- Evidence based obstetrics and gynecological Physical Therapy Treatment protocols

Recommended Text Books

- Physiotherapy in Obstetrics and Gynecology By: Jill Mantle, Jeanette Haslam, Sue Barton, 2nd edition.
- Textbook of Physiotherapy for Obstetric and Gynecological Conditions (Paperback) By (author) G.B. Madhur

PEDIATRIC PHYSICAL THERAPY

CREDIT HOURS 2(2-0)

COURSE DESCRIPTION:

This course addresses both the medical and rehabilitation management of the pediatric patient. Foundation lectures on normal development and psychological issues provide the students with a model to use when learning about pediatric pathologies, assessments and interventions. This course also involves the examination and treatment of the pediatric population using an interdisciplinary approach. The etiology and clinical features of common diseases/ disorders observed in the pediatric population will be emphasized. Lab: Methods for examination, goal setting, and intervention are emphasized. Students will participate in interdisciplinary case studies and an interdisciplinary evaluation project. Topics will focus on medical terminology, clinical examination, evaluation, comparing contemporary, traditional interventions and the impact of evolving technology in this area.

DETAILED COURSE OUT LINE

MEDICAL TERMINOLOGY REGARDING PEDIATRICS

DETAILED COURSE OUTLINE:

- History and Examination / Pediatric Examination
- Assessment and outcome measurement
- Theories of Development

- Medical Care of Children with Disabilities
- Psychological Assessment in Pediatric Rehabilitation
- Approaches to working with children
- Normal Developmental Milestones
- Language Development in Disorders of Communication and Oral Motor Function
- Adaptive Sports and Recreation
- Orthotic and Assistive Devices
- Electrodiagnosis in Pediatrics
- Motor Learning & Principles of Motor Learning
- The Child Parents and Physiotherapist
- Aging With Pediatric Onset Disability and Diseases
- The Assessment of Human Gait, Motion, and Motor Function
- Psychosocial Aspects of Pediatric Rehabilitation
- Pediatric and Neonatal Intensive Therapy
- Disorders of Respiratory System
- Cystic Fibrosis Duchene Muscular
- Hemophilia
- Lower Limb Deformities
- Orthopedics and Musculoskeletal Conditions
- Talipes Equino Varus
- Torticollis
- Pediatric Limb Deficiencies
- Neuromuscular Diseases
- Myopathies
- Traumatic Brain Injury
- Cerebral Palsy
- Spinal Cord Injuries
- Spina Bifida
- Oncology and palliative care

CASE HISTORIES

- Principles of assessment and outcome measures
- Documentation in SOAP notes format
- Evidence based pediatric Physical Therapy Treatment protocols

Recommended Text Books:

- *Physical Therapy for Children* By, Suzann K. Campbell, Robert J. Palisano&Darl W. Vander Linden.
- *Paediatric Rehabilitation Principles and practice* (Fourth Edition) By, Michael A Alexander & Dennis j. Matthews.
- *Additional reading material as assigned.*

GERONTOLOGY & GERIATRIC PHYSICAL THERAPY

CREDIT HOURS 2(2-0)

COURSE DESCRIPTION:

The course covers normal aging process, physiological and psychological changes and their effects on daily living activities (ADL) and instrumental daily living activities (IADL). Relevant tests and measures for determining impairment and differentiating the diagnosis based on the specificity and sensitivity of the assessment instruments as related to patients with geriatric conditions are discussed. The use of evidence-based physical therapy intervention for geriatric conditions is emphasized. Topics will focus on comparing contemporary and traditional interventions and the impact of evolving technology in this area. Topics will focus on medical terminology, clinical examination, evaluation, comparing contemporary, traditional interventions and the impact of evolving technology in this area.

DETAILED COURSE OUT LINE

GERONTOLOGY

- Introduction to Gerontology
- Demographic Trends of an Aging Society
- Social Gerontology
- The Physiology and Pathology of Aging
- The Cognitive and Psychological Changes Associated with Aging
- Functional Performance in Later Life: Basic Sensory, Perceptual, and Physical Changes Associated with Aging

- Geriatric Pharmacotherapy
- Sexuality and Aging
- Living Options and the Continuum of Care
- Legal and Financial Issues Related to Health Care for Older People
- Health Care Providers Working With Older Adults
- Future Concerns in an Aging Society
- Health Literacy and Clear Health Communication

GERIATRIC PHYSICAL THERAPY
DETAILED COURSE OUTLINE

MEDICAL TERMINOLOGY REGARDING GERIATRICS

ATTITUDES AND AGEISM

- Ageism
- Myths and Facts about Older Adults
- Age Bias in Healthcare
- Geriatric Training and Role of Physical Therapist

NORMAL PHYSICAL CHANGES IN OLDER ADULTS

- Breathing — the Respiratory System
- Beating — the Cardiovascular System
- Thinking and Reacting — the Nervous System
- Moving — the Musculoskeletal System
- Eating & Eliminating — the Gastrointestinal and Urinary Systems
- Metabolizing — the Endocrine System
- Responding — the Sensory System
- Sleeping and Other Physical Changes

PSYCHOLOGICAL CHANGES:

- The 3 Ds and Suicide in Older Adults
- Delirium
- Dementia
- Depression

OLDER ADULT ABUSE AND NEGLECT:

- Scope of Older Adult Abuse and Neglect
- Clues to Abuse and Interventions

TRIAGE AND ASSESSMENT:

- ABCs of Geriatric Assessment
- Assessment Techniques and Atypical Presentations

PAIN

- Pain in Older Adults
- Pain Assessment and Challenges
- Impact of Physiological Changes
- Medication and Pain Management
- Medication Interactions
- Medication and Food

EFFECTS OF AGE:

- Task Complexity,
- Exercise
- Ambulation.

PHYSICAL THERAPY FOR GERIATRICS IN VARIOUS NEUROMUSCULAR DISORDERS:

- Alzheimer's disease
- Parkinsonism

- Cerebrovascular accident (C.V.A)
- Poly neuropathies etc.

PRE-OPERATIVE AND POST OPERATIVE PHYSICAL THERAPY FOR GERIATRICS IN VARIOUS MUSCULOSKELETAL DISORDERS:

- Hip & Knee Joint replacements
- Soft tissue injuries.

BALANCE AND FALL IN ELDERLY: ISSUES IN EVALUATION AND TREATMENT

- Introduction
- Defining the problem of falls, risk factors, aging theory concept pertinent to falls in the elderly
- Multi faceted approach to the falls problem
- Postural control theory, physiology of balance ,
- Summary influence of age on postural control, relationship between postural control and falls, A model, examination and evaluation, history, biological assessment, sensory effectors, strength, ROM, endurance, central processing, functional assessment, environmental assessment, psychosocial assessment, intervention

MEDICATIONS

NUTRITIONAL DEFICIENCIES:

- Primary nutritional problems, limited fixed incomes, severely limited food choices and availability.

CASE HISTORIES

- Principles of assessment and outcome measures
- Documentation in SOAP notes format
- Evidence based geriatric Physical Therapy Treatment protocols

Recommended Text Books:

1. *Geriatric Physical Therapy* by Andrew A. Guccione

2. *Fundamentals of Geriatric Medicine*
3. *Gerontology for health care professional by regula H robbnet/ walter*
4. *Handbook of gerontology by James A Blackburn and Catherine N Dulmus*

SPORTS PHYSICAL THERAPY

CREDIT HOURS 2(2-0)

COURSE DESCRIPTION

The main focus of this course is related to the understanding of the role that physical therapists play in both the industrial continuum and sports physical therapy. Emphasis is placed on acute management of traumatic injuries and/or sudden illness. In addition, injury prevention with an emphasis on the advanced clinical competencies related to the practice of sports physical therapy will also be covered.

DETAILED COURSE OUT LINE

MEDICAL TERMINOLOGY RELATED TO SPORTS PHYSICAL THERAPY

INTRODUCTION TO SPORTS REHABILITATION

- Introduction to sport injury management

INJURY SCREENING AND ASSESSMENT OF PERFORMANCE

- Injury prevention and screening
- Assessment and needs analysis

PATHOPHYSIOLOGY OF MUSCULOSKELETAL INJURIES

- Pathophysiology of skeletal muscle injuries
- Pathophysiology of tendon injuries
- Pathophysiology of ligament injuries

- Pathophysiology of skeletal injuries
- Peripheral nerve injuries

EFFECTIVE CLINICAL DECISION MAKING

- An introduction to periodisation
- Management of acute sport injury
- Musculoskeletal assessment
- Progressive systematic functional rehabilitation
- Strength and conditioning
- Nutritional considerations for performance and rehabilitation
- Psychology and sports rehabilitation
- Clinical reasoning

JOINT SPECIFIC SPORT INJURIES AND PATHOLOGIES

- Shoulder injuries in sport
- The elbow
- Wrist and hand injuries in sport
- The groin in sport
- The knee
- Ankle complex injuries in sport
- The foot in sport

TRAVELING WITH A TEAM

DRUGS AND THE ATHLETE

ETHICS AND SPORTS MEDICINE

CASE HISTORIES

- Principles of assessment and outcome measures

- Documentation in SOAP notes format
- Evidence based sports Physical Therapy Treatment protocols

Recommended Text Books:

- *Sports Rehabilitation and Injury Prevention* by: Paul Comfort & Earle Abrahamson, 1st Edition, 2010, Wiley Blackwell Publishers
- *Clinical Sports Medicine* by: Brukner & Khan, 4ed, McGraw-Hill Publishers
- *A guide to sports and injury management* by: Mike Bundy & Andy Leaver, 1st edition, 2010, Churchill Livingstone.

SUPERVISED CLINICAL PRACTICE VI

CREDIT HOURS 4(0-4)

INTEGUMENTARY

SEMESTER	SUPERVISION	FOCUS	WARDS	COMPETENCIES
10	Supervised by trained PT	Evaluation, Examination, and Intervention	Integumentary, gynecology & obstetrics, sports and metabolic disorders (IPD/OPD; surgical & non- surgical)	Listed below

COURSE DESCRIPTION:

During this supervised clinical practice, students are responsible for successful execution of examination, evaluation, and interventions relating to Integumentary, gynecology and obstetrics, sports and metabolic disorders. Students become familiar with performance of these skills in all settings (inpatient and outpatient) as well as on all types of conditions (surgical, non-surgical, pediatric, geriatric, obstetrics & gynecology, sports etc.) Students learn to objectively perform these skills under the supervision of trained physical therapists. 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.

COMPETENCIES:

EXAMINATION:

- Based on best available evidence select examination tests and measures that are appropriate for the patient/client.
- Perform posture tests and measures of postural alignment and positioning.*
- Perform gait, locomotion and balance tests including quantitative and qualitative measures such as*:
 - Balance during functional activities with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment
 - Balance (dynamic and static) with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment
 - Gait and locomotion during functional activities with or without the use of assistive, adaptive, orthotic, protective, supportive, or prosthetic devices or equipment to include:
 - ❖ Bed mobility
 - ❖ Transfers (level surfaces and floor)*
 - ❖ Wheelchair management
 - ❖ Uneven surfaces
 - ❖ Safety during gait, locomotion, and balance
 - Perform gait assessment including step length, speed, characteristics of gait, and abnormal gait patterns.
- Characterize or quantify body mechanics during self-care, home management, work, community, tasks, or leisure activities.
- Characterize or quantify ergonomic performance during work (job/school/play)*:
 - Dexterity and coordination during work
 - Safety in work environment
 - Specific work conditions or activities
 - Tools, devices, equipment, and workstations related to work actions, tasks, or activities
- Characterize or quantify environmental home and work (job/school/play) barriers:

- Current and potential barriers
- Physical space and environment
- Community access
- Observe self-care and home management (including ADL and IADL)*
- Measure and characterize pain* to include:
 - Pain, soreness, and nociception
 - Specific body parts
- Recognize and characterize signs and symptoms of inflammation.
- Perform integumentary integrity tests and measures including*:
 - A. Activities, positioning, and postures that produce or relieve trauma to the skin.
 - B. Assistive, adaptive, orthotic, protective, supportive, or prosthetic devices and equipment that may produce or relieve trauma to the skin.
 - C. Skin characteristics, including blistering, continuity of skin color, dermatitis, hair growth, mobility, nail growth, sensation, temperature, texture and turgor.
 - D. Activities, positioning, and postures that aggravate the wound or scar or that produce or relieve trauma.
 - E. Signs of infection.
 - F. Wound characteristics: bleeding, depth, drainage, location, odor, size, and color.
 - G. Wound scar tissue characteristics including banding, pliability, sensation, and texture.

Evaluation:

- Clinical reasoning
 - Clinical decision making
1. Synthesize available data on a patient/client expressed in terms of the International Classification of Function, Disability and Health (ICF) model to include body functions and structures, activities, and participation.
 2. Use available evidence in interpreting the examination findings.
 3. Verbalize possible alternatives when interpreting the examination findings.
 4. Cite the evidence (patient/client history, lab diagnostics, tests and measures and scientific literature) to support a clinical decision.

Diagnosis:

1. Integrate the examination findings to classify the patient/client problem in terms of body functions and structures, and activities and participation (ie, practice patterns in the Guide)
2. Identify and prioritize impairments in body functions and structures, and activity limitations and participation restrictions to determine specific body function and structure, and activities and participation towards which the intervention will be directed.*

Prognosis:

1. Determine the predicted level of optimal functioning and the amount of time required to achieve that level.*
2. Recognize barriers that may impact the achievement of optimal functioning within a predicted time frame including*:
 - A. Age
 - B. Medication(s)
 - C. Socioeconomic status
 - D. Co-morbidities
 - E. Cognitive status
 - F. Nutrition
 - G. Social Support
 - H. Environment

Plan of Care:

- Goal setting
- Coordination of Care
- Progression of care
- Discharge
 - Design a Plan of Care
 1. Write measurable functional goals (short-term and long-term) that are time referenced with expected outcomes.
 2. Consult patient/client and/or caregivers to develop a mutually agreed to plan of care.*
 3. Identify patient/client goals and expectations.*
 4. Identify indications for consultation with other professionals.*

5. Make referral to resources needed by the patient/client (assumes knowledge of referral sources).*

6. Select and prioritize the essential interventions that are safe and meet the specified functional goals and outcomes in the plan of care* (ie, (a) identify precautions and contraindications, (b) provide evidence for patient-centered interventions that are identified and selected, (c) define the specificity of the intervention (time, intensity, duration, and frequency), and (d) set realistic priorities that consider relative time duration in conjunction with family, caregivers, and other health care professionals).

7. Establish criteria for discharge based on patient goals and current functioning and disability.*

- Coordination of Care

1. Identify who needs to collaborate in the plan of care.

2. Identify additional patient/client needs that are beyond the scope of physical therapist practice, level of experience and expertise, and warrant referral.*

3. Refer and discuss coordination of care with other health care professionals.*

4. Articulate a specific rationale for a referral.

5. Advocate for patient/client access to services.

- Progression of Care

1. Identify outcome measures of progress relative to when to progress the patient further.*

2. Measure patient/client response to intervention.*

3. Monitor patient/client response to intervention.

4. Modify elements of the plan of care and goals in response to changing patient/client status, as needed.*

5. Make on-going adjustments to interventions according to outcomes including environmental factors and personal factors and, medical therapeutic interventions.

6. Make accurate decisions regarding intensity and frequency when adjusting interventions in the plan of care.

- Discharge Plan

1. Re-examine patient/client if not meeting established criteria for discharge based on the plan of care.

2. Differentiate between discharge of the patient/client, discontinuation of service, and transfer of care with re-evaluation.*
3. Prepare needed resources for patient/client to ensure timely discharge, including follow-up care.
4. Include patient/client and family/caregiver as a partner in discharge.*
5. Discontinue care when services are no longer indicated.
6. When services are still needed, seek resources and/or consult with others to identify alternative resources that may be available.
7. Determine the need for equipment and initiate requests to obtain.

Interventions:

- Safety, Emergency Care, CPR and First Aid
 - Standard Precautions
 - Body Mechanics and
 - Positioning
 - Categories of Interventions
 - Safety, Cardiopulmonary Resuscitation Emergency Care, First Aid
 - ❖ Ensure patient safety and safe application of patient/client care.*
 - ❖ Perform first aid.*
 - ❖ Perform emergency procedures.*
 - ❖ Perform Cardiopulmonary Resuscitation (CPR).*
 - ❖ Precautions
1. Demonstrate appropriate sequencing of events related to universal precautions.*
 2. Use Universal Precautions.
 3. Determine equipment to be used and assemble all sterile and non-sterile materials.*
 4. Use transmission-based precautions.
 5. Demonstrate aseptic techniques.*
 6. Apply sterile procedures.*
 7. Properly discard soiled items.*
- Body Mechanics and Positioning
 1. Apply proper body mechanics (utilize, teach, reinforce, and observe).*

2. Properly position, drape, and stabilize a patient/client when providing physical therapy.*

- Interventions

1. Coordination, communication, and documentation may include:

A. Addressing required functions:

(1) Establish and maintain an ongoing collaborative process of decision-making with patients/clients, families, or caregivers prior to initiating care and throughout the provision of services.*

(2) Discern the need to perform mandatory communication and reporting (eg, incident reports, patient advocacy and abuse reporting).

(3) Follow advance directives.

B. Admission and discharge planning.

C. Case management.

D. Collaboration and coordination with agencies, including:

(1) Home care agencies

(2) Equipment suppliers

(3) Schools

(4) Transportation agencies

(5) Payer groups

E. Communication across settings, including:

(1) Case conferences

(2) Documentation

(3) Education plans

F. Cost-effective resource utilization.

G. Data collection, analysis, and reporting of:

(1) Outcome data

(2) Peer review findings

(3) Record reviews

H. Documentation across settings, following APTA's Guidelines for Physical Therapy Documentation, including:

(1) Elements of examination, evaluation, diagnosis, prognosis, and

Intervention

(2) Changes in body structure and function, activities and participation.

(3) Changes in interventions

(4) Outcomes of intervention

I. Interdisciplinary teamwork:

(1) Patient/client family meetings

(2) Patient care rounds

(3) Case conferences

J. Referrals to other professionals or resources.*

K. Patient/client-related instruction may include:

A. Instruction, education, and training of patients/clients and caregivers regarding:

(1) Current condition, health condition, impairments in body structure and function, and activity limitations, and participation restrictions)*

(2) Enhancement of performance

(3) Plan of care:

a. Risk factors for health condition, impairments in body structure and function, and activity limitations, and participation restrictions.

b. Preferred interventions, alternative interventions, and alternative modes of delivery

c. Expected outcomes

(4) Health, wellness, and fitness programs (management of risk factors)

(5) Transitions across settings

Therapeutic exercise may include performing:

- Integumentary repair and protection techniques may include*:

A. Debridement*—nonselective:

(1) Enzymatic debridement

(2) Wet dressings

- (3) Wet-to-dry dressings
- (4) Wet-to-moist dressings

B. Dressings*:

- (1) Hydrogels
- (2) Wound coverings

C. Topical agents*:

- (1) Cleansers
- (2) Creams
- (3) Moisturizers
- (4) Ointments
- (5) Sealants

- Functional training in self-care and home management may include*:
- Functional training in work (job/school/play), community, and leisure integration or reintegration may include*:
 - Activities of daily living (ADL) training:
 - (1) Bed mobility and transfer training*
 - (2) Age appropriate functional skills
 - Barrier accommodations or modifications*
 - Device and equipment use and training:
 - (1) Assistive and adaptive device or equipment training during ADL (specifically for bed mobility and transfer training, gait and locomotion, and dressing)*
 - (2) Orthotic, protective, or supportive device or equipment training during self-care and home management*
 - (3) Prosthetic device or equipment training during ADL (specifically for bed mobility and transfer training, gait and locomotion, and dressing)*
- Functional training programs*:
 - (1) Simulated environments and tasks*
 - (2) Task adaptation
- Injury prevention or reduction:
 - (1) Safety awareness training during self-care and home management*

- (2) Injury prevention education during self-care and home management
- (3) Injury prevention or reduction with use of devices and equipment
- Prescription, application, and, as appropriate, fabrication of devices and equipment may include*:
 - Adaptive devices*:
 - (1) Hospital beds
 - (2) Raised toilet seats
 - (3) Seating systems – prefabricated
 - Assistive devices*:
 - (1) Canes
 - (2) Crutches
 - (3) Long-handled reachers
 - (4) Static and dynamic splints – prefabricated
 - (5) Walkers
 - (6) Wheelchairs
 - Orthotic devices*:
 - (1) Prefabricated braces
 - (2) Prefabricated shoe inserts
 - (3) Prefabricated splints
 - Prosthetic devices (lower-extremity)*
 - Protective devices*:
 - (1) Braces
 - (2) Cushions
 - (3) Helmets
 - (4) Protective taping
 - Supportive devices*:
 - (1) Prefabricated compression garments
 - (2) Corsets
 - (3) Elastic wraps
 - (4) Neck collars
 - (5) Slings

(6) Supplemental oxygen - apply and adjust

(7) Supportive taping

- Electrotherapeutic modalities may include:

A. Biofeedback*

B. Electrotherapeutic delivery of medications (eg, iontophoresis)*

C. Electrical stimulation*:

(1) Electrical muscle stimulation (EMS)*

(2) Functional electrical stimulation (FES)

(3) High voltage pulsed current (HVPC)

(4) Neuromuscular electrical stimulation (NMES)

(5) Transcutaneous electrical nerve stimulation (TENS)

- Physical agents and mechanical modalities may include: *Physical agents:*

A. Cryotherapy*:

(1) Cold packs

(2) Ice massage

(3) Vapocoolant spray

B. Hydrotherapy*:

(1) Contrast bath

(2) Pools

(3) Whirlpool tanks*

C. Sound agents*:

(1) Phonophoresis*

(2) Ultrasound*

D. Thermotherapy*:

(1) Dry heat

(2) Hot packs*

(3) Paraffin baths*

Mechanical modalities:

A. Compression therapies (prefabricated)*

(1) Compression garments

- Skill Category Description of Minimum Skills

- (2) Vasopneumatic compression devices*
- (3) Taping
- (4) Compression bandaging (excluding lymphedema)

B. Gravity-assisted compression devices:

- (1) Standing frame*
- (2) Tilt table*

C. Mechanical motion devices*:

- (1) Continuous passive motion (CPM)*

D. Traction devices*:

- (1) Intermittent
- (2) Positional
- (3) Sustained

- Documentation of all listed competencies in SOAP notes format