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OFFICE OF THE REGISTRAR
(ACAD BRANCH)

NOTIFICATION

On the recommendations of Academic Council made in its 21st (2/2024) meeting held on 07.06.2024, the Syndicate in its 67th (3/2024) meeting held on 12.07.2024 approved the following for implementation w.e.f Fall 2024.

i.	Revised curriculum of Doctor of Physical Therapy (DPT) under Semester System for main campus and affiliated Colleges	(Annex-'A')
ii.	Curriculum of BS in Medical Laboratory Technology (BS-MLT)	(Annex-'B')
iii.	Curriculum of BS in Radiography and Imaging Technology (BS-RIT)	(Annex-'C')
iv.	Curriculum of BS in Nursing (BSN)	(Annex-'D')

(WAQAR AHMAD)
Additional Registrar (General)

No. SU/Acad/24/745

Dated: 25.09.2024

Distribution:

- Incharge, Department of Allied Health Sciences
- Controller of Examinations
- Director Academics

C.C:

- Director, QEC
- Deputy Registrar (Affiliation)
- Deputy Registrar (Registration)
- Secretary to the Vice-Chancellor
- PA to Registrar
- Notification File

Annexure-I

CURRICULUM

OF

DOCTOR OF PHYSICAL THERAPY

(DPT)

(W.e.f, Fall 2024)

DEPARTMENT OF ALLIED HEALTH SCIENCES

UNIVERSITY OF SARGODHA

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RATIONALE

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, 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, promotive, diagnostic, rehabilitative, and curative.

GOALS OF THE PROGRAMME:

THE PURPOSE OF THE DOCTOR OF PHYSICAL THERAPY PROGRAMME (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 PROGRAMME:

GRADUATES OF THE DOCTOR OF PHYSICAL THERAPY PROGRAMME 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. 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.
2. 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.

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3. Engage in reflective practice through sound clinical decision making, critical self-assessment and commitment to lifelong learning.
4. 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.
5. 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.
6. Demonstrate leadership, management, and communication skills to effectively participate in physical therapy practice and the health care team.
7. Incorporate and demonstrate positive attitudes and behaviors to all persons.
8. Demonstrate the professional and social skills to adapt to changing health care environments to effectively provide physical therapy care.

Eligibility Criteria:

HSSC/A levels/Equivalent (12 years of schooling) in Pre-Medical Group with minimum of 60% marks.

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SCHEME OF STUDIES
DOCTOR OF PHYSICAL THERAPY (DPT)

FIRST PROFESSIONAL YEAR			
FIRST SEMESTER			
COURSE CODE	**Course**	**Category**	**Credit Hours**
DPTH -5101	ANATOMY –I	Major	4(3-1)
DPTH -5102	PHYSIOLOGY-I	Major	3(2-1)
DPTH -5103	KINESIOLOGY-I	Major	3(2-1)
URCG-5118	ENGLISH-I (FUNCTIONAL ENGLISH)	General Education	3(3-0)
URCG-5122	IDEOLOGY AND CONSTITUTION OF PAKISTAN	General Education	2(2-0)
URCG-5123	APPLICATIONS OF INFORMATION COMMUNICATION TECHNOLOGIES (ICT)	General Education	3(2-1)
URCG-5111	TRANSLATION OF THE HOLY QURAN – I	Compulsory Course	Non -Credit
	Credit Hours		18
SECOND SEMESTER			
COURSE CODE	**Course**	**Category**	**Credit Hours**
DPTH -5104	ANATOMY –II	Major	4(3-1)
DPTH -5105	PHYSIOLOGY-II	Major	3 (2-1)
DPTH -5106	KINESIOLOGY-II	Major	3(2-1)
URCG- 5119	ENGLISH-II (EXPOSITORY WRITING)	General Education	3 (3-0)
URCG-5105	ISLAMIC STUDIES ** (OR) RELIGIOUS EDUCATION / ETHICS IN LIEU OF ISLAMIC STUDIES ONLY FOR NON-MUSLIM STUDENTS	General Education	2(2-0)
URCG-5125	CIVICS AND COMMUNITY ENGAGEMENT	General Education	2(2-0)
URCG-5127	SEERAT OF HOLY PROPHET (SAW)	General Education	1(1-0)
	Credit Hours		18
SECOND PROFESSIONAL YEAR			
THIRD SEMESTER			
COURSE CODE	**Course**	**Category**	**Credit Hours**
DPTH -5107	ANATOMY –III	Major	3(2-1)
DPTH -5108	PHYSIOLOGY-III	Major	3(2-1)
DPTH -5109	BIOMECHANICS & ERGONOMICS-I	Major	3 (2-1)
DPTH -5110	MOLECULAR BIOLOGY & GENETICS	General Education	3(3-0)

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DPTH -5111	HEALTH AND WELLNESS	General Education	2(2-0)
URCG-5120	QUANTITATIVE REASONING	General Education	3(3-0)
URCG-5111	TRANSLATION OF THE HOLY QURAN – II -	Compulsory Course	Non -Credit
	Credit Hours		17
	FOURTH SEMESTER		
COURSE CODE	**Course**	**Category**	**Credit Hours**
DPTH -5112	ANATOMY-IV (Neuro Anatomy)	Major	3(2-1)
DPTH -5113	BIOMECHANICS & ERGONOMICS-II	Major	3(2-1)
URCG-5116	SCIENCE OF SOCIETY-I	General Education	2(2-0)
DPTH -5115	BIOCHEMISTRY-I	Inter Disciplinary	2(2-0)
URCG-5124	ENTREPRENEURSHIP	General Education	2(2-0)
URCG-5121	TOOLS FOR QUANTITATIVE REASONING	General Education	3(3-0)
DPTH-5116	PROFESSIONAL PRACTICE (LAWS, ETHICS AND ADMINISTRATION)	General Education	2 (2-0)
	Credit Hours		17
	THIRD PROFESSIONAL YEAR		
	FIFTH SEMESTER		
COURSE CODE	**Course**	**Category**	**Credit Hours**
DPTH -6117	PATHOLOGY & MICROBIOLOGY- I	Inter Disciplinary	2(2-0)
DPTH -6118	PHARMACOLOGY & THERAPEUTICS I	Inter Disciplinary	2(2-0)
DPTH -6119	PHYSICAL AGENTS & ELECTROTHERAPY-I	Major	3(2-1)
DPTH -6120	THERAPEUTIC EXERCISES & TECHNIQUES	Major	3(2-1)
DPTH -6121	BIOCHEMISTRY- II	Inter Disciplinary	3(2-1)
DPTH -6122	MEDICAL PHYSICS	Major	2(2-0)
DPTH -6123	SUPERVISED CLINICAL PRACTICE-I	Major	3(0-3)
URCG-5111	TRANSLATION OF THE HOLY QURAN – III	Compulsory Course	Non -Credit
	Credit Hours		18
	SIXTH SEMESTER		
COURSE CODE	**Course**	**Category**	**Credit Hours**
DPTH -6124	PATHOLOGY & MICROBIOLOGY-II	Inter Disciplinary	3(2-1)
DPTH -6125	PHARMACOLOGY &	Inter Disciplinary	2(2-0)

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	THERAPEUTICS- II		
DPTH -6126	PHYSICAL AGENTS & ELECTROTHERAPY –II	Major	3(2-1)
DPTH -6127	MANUAL THERAPY	Major	3(2-1)
DPTH -6128	COMMUNITY MEDICINE & BEHAVIORAL SCIENCES	Major	3(3-0)
DPTH -6129	SUPERVISED CLINICAL PRACTICE-II	Major	3(0-3)
	Credit Hours		17 ✓
FOURTH PROFESSIONAL YEAR			
SEVENTH SEMESTER			
COURSE CODE	**Course**	**Category**	**Credit Hours**
DPTH -6130	MEDICINE- I	Inter Disciplinary	3(3-0)
DPTH -6131	SURGERY-I	Inter Disciplinary	3(3-0)
DPTH -6132	RADIOLOGY & DIAGNOSTIC IMAGING	Inter Disciplinary	3(2-1)
DPTH -6133	MUSCULOSKELETAL PHYSICAL THERAPY	Major	3(2-1)
DPTH -6134	CLINICAL DECISION MAKING & DIFFERENTIAL DIAGNOSIS	Major	3(3-0)
DPTH -6135	SUPERVISED CLINICAL PRACTICE-III	Major	3(0-3)
URCG-5111	TRANSLATION OF THE HOLY QURAN – IV	Compulsory Course	Non Credit
	Credit Hours		18 ✓
EIGHTH SEMESTER			
COURSE CODE	**Course**	**Category**	**Credit Hours**
DPTH -6136	MEDICINE- II	Inter Disciplinary	3(3-0)
DPTH -6137	SURGERY- II	Inter Disciplinary	3(3-0)
DPTH -6138	PROSTHETICS & ORTHOTICS	Major	2(2-0)
DPTH -6139	NEUROLOGICAL PHYSICAL THERAPY	Major	3(2-1)
DPTH -6140	SPORTS PHYSICAL THERAPY	Major	2(2-0)
DPTH -6141	AI APPLICATIONS IN HEALTH CARE	Inter Disciplinary	2(2-0)
DPTH -6142	SUPERVISED CLINICAL PRACTICE-IV	Major	3(0-3)
	Credit Hours		18 ✓
FIFTH PROFESSIONAL YEAR			
NINTH SEMESTER			
COURSE CODE	**Course**	**Category**	**Credit Hours**
DPTH -6143	OBSTETRICS & GYNAECOLOGICAL PHYSICAL THERAPY	Major	2(2-0)
DPTH -6144	SCIENTIFIC INQUIRY & RESEARCH	General	2(2-0)

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	METHODOLOGY	Education	
DPTH -6145	EXERCISE PHYSIOLOGY	Major	3(2-1)
DPTH -6146	EVIDENCE BASED PRACTICE IN PHYSICAL THERAPY	Major	2(2-0)
DPTH -6147	PAEDIATRIC PHYSICAL THERAPY	Major	3(2-1)
DPTH -6148	INTEGUMENTRY PHYSICAL THERAPY	Major	2(2-0)
DPTH -6149	SUPERVISED CLINICAL PRACTICE -V	Major	3(0-3)
	Credit Hours		17 ✓

TENTH SEMESTER

COURSE CODE	Course	Category	Credit Hours
DPTH -6150	CARDIOPULMONARY PHYSICAL THERAPY	Major	3(2-1)
DPTH -6151	GERONTOLOGY & GERIATRIC PHYSICAL THERAPY	Major	2(2-0)
DPTH -6152	EMERGENCY PROCEDURES & PRIMARY CARE IN PHYSICAL THERAPY	Major	3(2-1)
DPTH -6153	SUPERVISED CLINICAL PRACTICE - VI	Major	4(0-4)
DPTH -6154	CAPSTONE / RESEARCH PROJECT	Major	6 (1)
	Credit Hours		18 ✓
	TOTAL CREDIT HOURS		176

Total theory/Lectures for ten Semesters	126
Total Practical Hours for ten Semesters	25
Total Clinical Hours for ten Semesters	19
Total Research Hours for ten Semesters	06

Note *

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.
Research: One credit hour shall be equal to three hours of research work per week throughout the semester.

FIRST SEMESTER

1. ANATOMY -I
2. PHYSIOLOGY-I
3. KINESIOLOGY-I
4. ENGLISH-I (FUNCTIONAL ENGLISH)
5. IDEOLOGY AND CONSTITUTION OF PAKISTAN
6. APPLICATIONS OF INFORMATION COMMUNICATION TECHNOLOGIES (ICT)

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7. TRANSLATION OF THE HOLY QURAN – I (Non-Credit)

DETAILS OF COURSES

1. ANATOMY- I

CREDIT HOURS 4(3-1)

COURSE DESCRIPTION

The focus of this course is an in-depth study and analysis of the general and regional organization of the human body. Emphasis is placed upon structure and function of human movement. A comprehensive study of human anatomy histology, embryology, 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, prosected materials and radiographs are utilized to identify anatomical landmarks and configurations of the upper limb

LEARNING OBJECTIVES

- Define basic technical terminology and language associated with anatomy.
- Describe the structure, composition and functions of the organs in the human body.
- Comprehend the concepts (& associated principles) for each general type of anatomical structures.
- Demonstrate skills in the surface markings of clinically important structures, on normal living bodies and the correlation of structure with function.
- Describe concepts of embryology and histology
- Identify histological slides of the human body.
- Describe the interdependency and interactions of the structural and functional components of upper limb.

COURSE CONTENTS

GENERAL ANATOMY AND 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

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- 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
- Classification
- 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 classification
- 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

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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 nerve
- Typical spinal nerve
- Microscopic picture of nerve
- Introduction of autonomic nervous system
- Anatomy of neuromuscular junction

GENERAL HISTOLOGY

- Cell
- Epithelium
- Connective tissue
- Bone
- Muscle tissue
- Nerve tissues
- Blood vessels
- Skin and appendages
- Lymphatic organs

GENERAL EMBRYOLOGY

- Male and female reproductive organs
- Cell division and Gametogenesis
- Fertilization, cleavage, blastocyte formation and implantation of the embryo. Stages of early embryonic development in second and third week of intrauterine life
- Foetal membrane (amniotic cavity, yolk sac, allantois, umbilical cord and Placenta)
- 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

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- 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

DEMONSTRATION

- Shoulder joint, attached muscles and articulating surfaces
- Elbow joint
- Wrist joint
- Radioulnar joint
- MCP and IP joints
- Acromioclavicular joint
- Sternoclavicular joint
- Brachial plexus
- Blood supply of brain
- Structure of bones

LAB WORK

During study of this course, emphasis should be given on applied aspects, practical histology, radiological anatomy, surface anatomy and cross-sectional anatomy of the region covered in the respective semester /year

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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. The practical note book shall contain a record of the surface landmarks and cross-sectional views of parts which student would have observed

RECOMMENDED BOOKS

1. Gray's Anatomy by Prof. Susan Standing 41st Ed., Elsevier.
2. Clinical Anatomy for Medical Students by Richard S. Snell.
3. Clinically Oriented Anatomy by Keith Moore.
4. General Anatomy by Prof.
5. Ghulam Ahmad, latest Ed.
6. Clinical Anatomy by R. J. Last, Latest Ed.
7. Cunningham's Manual of Practical Anatomy by G. J. Romanes, 15th Ed., Vol-I, II and III.
8. The Developing Human. Clinically Oriented Embryology by Keith L. Moore, 6th Ed.
9. Wheater's Functional Histology by Young and Heath, Latest Ed.
10. Medical Histology by Prof. Laiq Hussain.
11. NeuroaSnatomy by Richard S. Snell 7th edition.
12. Jancquera textbook of histology
13. Colourd atlas of histology by defiero
14. Langman`s embryology
15. Clinicaly oriented developmental anatomy by k.l.moore

2. PHYSIOLOGY- I

CREDIT HOUR 3(2-1)

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

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- Demonstrate advance 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 haemoglobin
- 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 haemoglobin
- Determination of erythrocyte sedimentation rate

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- 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 a 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, 12th Ed.
2. Review of Medical Physiology by William F. Ganong, 23rd Ed.
3. Physiology by Berne and Levy, 6th Ed.
4. Human Physiology: The Basis of Medicine by Gillian Pocock, Christopher D.Richards 4th Ed.
5. Physiological Basis of Medical Practice by John B. West and Taylor, 12th Ed.

3. KINESIOLOGY- I
CREDIT HOURS 3(2-1)

COURSE DESCRIPTION
Course covers the principles of mechanics and anatomy in relation to human movement facilitating students to apply kinesiological evaluation and treatment of muscular imbalance or derangement in their clinical practice. It consists of evaluation of muscular function and group movements of muscle in relation to force of gravity and manual resistance. By becoming familiar with the knowledge of basic mechanical and physiological mechanisms, students will be more confident and competent in using them in use of exercises to promote physical rehabilitation

LEARNING OBJECTIVES
- Define the mechanical principles and their application on the human body
- Describe concept of movement and how it occurs in body
- Demonstrate fundament position, their effects and uses
- Explore fundamental skills to differentiate between a good and bad posture and to use technique for re-education
- Develop critical thinking ability in students on how and why to select which technique in a specific case, suitable for its rehabilitation

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- Describe muscular anatomy, its function against gravity and manual resistance

COURSE CONTENTS

INTRODUCTION TO KINESIOLOGY

- Definition of Physical Therapy and Rehabilitation
- Definition of kinesiology

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 / Planes
- Speed
- Velocity
- Acceleration
- Momentum
- Inertia
- Friction
- Lever - types – application in human body
- Pulley - types – application in human body
- Angle of pull

INTRODUCTION TO MOVEMENT

- 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

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- The postural mechanism
- The pattern of posture
- Principles of Re- Education
- Techniques of Re-Education
- Prevention of muscles wasting
- The initiation of muscular contraction
- 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
- Two joint muscle work
- Active and passive insufficiency
- Group movement of joints
- Muscular weakness and paralysis

LAB WORK

- Fundamentals of muscle testing
- Methods of muscle recording
- Basic muscle grading system
- Evaluation of posture
- Regional upper limb muscle testing
- Practical demonstrations of muscles work and its ranges
- Practical demonstrations of various fundamental positions and posture analysis.

Note

The students are expected to make a practical note book. The practical note book is a collection of evidence that learning has taken place and also a reflective record of student's 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.

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

The course aims at providing understanding of a writer's goal of writing (i.e. clear, organized and effectivecontent and to use that understanding and awareness for academic reading and writing. The objectives ofthe course are to make the students acquire and master the grammatical academic writing skills. The coursewould enable the students to develop argumentative writing techniques. The students would be able tologically add specific details on the topics such as facts, examples and statistical or numerical values. Thecourse will also provide insight to convey the knowledge and ideas in an objective and persuasive manner.Furthermore, the course will also enhance the students' understanding of ethical considerations in writing academic assignments and topics including citation, plagiarism, formatting and referencing the sources aswell as the technical aspects involved in referencing.

Contents

1. Developing Analytical Skills
2. Transitional devices (word, phrase and expressions)
3. Development of ideas in writing
4. Reading Comprehension
5. Precis Writing
6. Developing argument
7. Sentence structure: Accuracy, variation, appropriateness, and conciseness
8. Appropriate use of active and passive voice
9. Organization and Structure of a Paragraph
10. Organization and structure of Essay
11. Types of Essays

Recommended Texts

1. Bailey, S. (2011). Academic writing: A handbook for international students (3rd ed.). New York:Routledge.
2. Eastwood, J. (2011). A Basic English grammar. Oxford: Oxford University Press.
3. Swales, J. M., & Feak, C. B. (2012). *Academic writing for graduate students: Essential tasks and skills* (3rd ed.). Ann Arbor: The University of Michigan Press.
4. Swan, M. (2018). *Practical English usage* (8th ed.). Oxford: Oxford University Press.

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Suggested Readings

1. Biber, D., Johansson, S., Leech, G., Conrad, S., Finegan, E., & Quirk, R. (1999). *Longman grammarof spoken and written English*. Harlow Essex: MIT Press.
2. Cresswell, G. (2004). *Writing for academic success*. London: SAGE.
3. Johnson-Sheehan, R. (2019). *Writing today*. Don Mills: Pearson.
4. Silvia, P. J. (2019). *How to write a lot: A practical guide to productive academic writing*. Washington:American Psychological Association
5. Thomson, A. J., & Martinet, A. V. (1986). *A Practical English Grammar*. Oxford: Oxford UniversityPress

5. IDEOLOGY AND CONSTITUTION OF PAKISTAN
CREDIT HOURS 2(2-0)

This course focuses on ideological background of Pakistan. The course is designed to give a comprehensive insight about the constitutional developments of Pakistan. Starting from the Government of India Act, 1935 till to date, all important events leading to constitutional developments in Pakistan will be the focus of course. Failure of the constitutional machinery and leading constitutional cases on the subject. Moreover, students will study the process of governance, national development, issues arising in the modern age and posing challenges to Pakistan. It will also cover the entire Constitution of Pakistan 1973. However, emphasis would be on the fundamental rights, the nature of federalism under the constitution, distribution of powers, the rights and various remedies, the supremacy of parliament and the independence of judiciary

Outline:

- **Ideology of Pakistan**

  Ideological rationale with special reference to Sir Syed Ahmed Khan, Allama Muhammadlqbal and Quaid-e-Azam Muhammad Ali Jinnah.

  Two Nation Theory and Factors leading to Muslim separatism.

- Constitutional Developments

  Salient Feature of the Government of

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India Act 1935
Salient Feature
of Indian
Independence
Act 1947
Objectives
Resolution

Salient Feature of the 1956 Constitution

Developments leading to the abrogation of Constitution of 1956Salient features of the 1962 Constitution

Causes of failure of the Constitution of 1962

Comparative study of significant features of the Constitution of 1956, 1962 and 1973

- Fundamental rights
- Principles of policy

Federation of Pakistan President Parliament

The Federal Government

- Provinces

Governors

Provincial Assemblies

The Provincial Government

- The Judicature
- Supreme Court High Courts
- Federal Shariat Courts Supreme Judicial Council

Administrative Courts and tribunals

- Islamic Provisions in Constitution
- Significant Amendments of Constitution of Pakistan 1973

Recommended Books:

1. Constitutional and Political History of Pakistan by Hamid Khan
2. Mahmood, Shaukat and Shaukat, Nadeem. Constitution of the Islamic Republic of Pakistan, 3rd re edn. Lahore: Legal Research Centre, 1996.
3. Munir, Muhammad. Constitution of the Islamic Republic of Pakistan: Being a

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Commentary on the Constitution of Pakistan, 1973. Lahore, Law Pub., 1975.
4. Rizvi, Syed Shabbar Raza. Constitutional Law of Pakistan: Text, Case Law and Analytical Commentary. 2nd re edn. Lahore: Vanguard, 2005.
5. The Text of the Constitution of the Islamic Republic of Pakistan, 1973 (as amended).

6.APPLICATIONS OF INFORMATION COMMUNICATION TECHNOLOGIES (ICT) CREDIT HOURS: 3(2-1)

COURSE DESCRIPTION

The course introduces students to information and communication technologies and their application in the workplace. Objectives include basic understanding of computer software, hardware, and associated technologies. How computers can be used in the workplace, how communications systems can help boost productivity, and how the Internet technologies can influence the workplace. Students will get basic understanding of computer software, hardware, and associated technologies. They will also learn how computers are used in the workplace, how communications systems can help to boost productivity, and how the Internet technologies can influence the workplace.

Contents

1. Introduction, Overview of Information Technology.
2. Hardware: Computer Systems & Components, Storage Devices.
3. Software: Operating Systems, Programming and Application Software.
4. Databases and Information Systems Networks.
5. File Processing Versus Database Management Systems.
6. Data Communication and Networks.
7. Physical Transmission Media & Wireless Transmission Media.
8. Applications of smart phone and usage.
9. The Internet, Browsers and Search Engines.
10. Websites and their types.
11. Email Collaborative Computing and Social Networking.
12. E-Commerce.
13. IT Security and other Issues.
14. Cyber Laws and Ethics of using social media.

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15. Use of Microsoft Office tools (Word, Power Point, Excel) or other similar tools depending on theoperating system.
16. Other IT tools/software specific to field of study of the students if any.

Recommended Texts

1. Discovering Computers 2022: Digital Technology, Data and Devices by Misty E. Vermaat, Susan L. sebok; 17th edition.

Suggested Readings

1. Computing Essentials 2021 by Timothy J. O'Leary and Linda I. O'Leary, McGraw Hill HigherEducation; 26th edition.
2. Computers: Understanding Technology by Fuller, Floyd; Larson, Brian: edition 2018.

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Topic	Details
Semester/Level	In some discipline 1st semester and in some discipline 2nd Semester/ ADP Program 1st Year
Course Code	URCG-5111
Course Title	Translation of the Holy Quran – I
Credit Hours	1(0-1)
Objectives	• To familiarize the students to keys and fundamentals of recitation of the holy Quran. • To develop the skill of the students of recitation the last revelation. • Students will learn the basic Arabic grammar in a practical way. • To develop an eagerness among the students to explore the last divine Book.
Course Contents:	• تیسواں پارہ-ناظرہ مع تجوید • بنیادی عربی گرامر اسم اور اسکے متعلقات: اسم فاعل، مفعول، تفضیل، مبالغہ فعل اور اسکی اقسام: ماضی، مضارع، امر، نہی حرف اور اسکی اقسام: حروف علت، حروف جارہ، مشبہ بالفعل
Memorization:	تیسویں پارے کی آخری بیس سورتیں (حفظ مع ترجمہ)

SECOND SEMESTER

1. ANATOMY-II
2. PHYSIOLOGY-II
3. KINESIOLOGY-II
4. ENGLISH-II (EXPOSITORY WRITING)
5. ISLAMIC STUDIES/ETHICS
6. CIVICS AND COMMUNITY ENGAGEMENT
7. Seerat of the Holy Prophet (SAW)

1. ANATOMY- II

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 manikins/smart board systems supplemented with the study of charts, models, prosected materials and radiographs are utilized to identify anatomical landmarks and configurations of the lower limb, abdomen and pelvis

LEARNING OBJECTIVES

- Describe gross anatomy of neuro-musculoskeletal and circulatory system of lower limb, abdominal wall and pelvis.
- Demonstrate anatomical landmarks and configuration of the lower limb, abdominal wall and pelvis through dissection/identification of structures in the manicans / smart board systems supplemented with the study of charts, models, prosected materials, and radiographs.
- Describe major stages of embryological development of the lower limb with development of the neurological and vascular supplies to the lower limb.

COURSE CONTENTS

LOWER LIMB OSTEOLOGY

- Detailed description of all bones of lower limb and pelvis along with their markings

MYOLOGY

- Muscles of gluteal region
- Muscles around hip joint
- Muscles of thigh
- Muscles of lower leg and foot

NEUROLOGY

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- 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 of fertilization
- Germ layers
- Development of limbs, Muscular system and Nervous system

LAB WORK

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.

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. Gray's Anatomy by Prof. Susan Standing 41st Ed., Elsevier.
2. Clinical Anatomy for Medical Students by Richard S. Snell.
3. Clinically Oriented Anatomy by Keith Moore.
4. General Anatomy by Prof. Ghulam Ahmad, latest Ed.
5. Clinical Anatomy by R. J. Last, Latest Ed.
6. Cunningham's Manual of Practical Anatomy by G. J. Romanes, 15th Ed., Vol-I, II and III.
7. The Developing Human. Clinically Oriented Embryology by Keith L. Moore, 6th Ed.
8. Wheater's Functional Histology by Young and Heath, Latest Ed.
9. Medical Histology by Prof. Laiq Hussain.
10. Neuroanatomy by Richard S. Snell 7th edition.
11. Jancquera textbook of histology
12. Colourd atlas of histology by defiero
13. Langman`s embryology
14. Clinicaly oriented *developmental anatomy by k.l.moore*

2. 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. These topics are addressed by a consideration of the cardiovascular, gastrointestinal, and endocrinological systems. The integrative nature of physiological responses in normal function and disease is stressed throughout the course

LEARNING OBJECTIVES

- Describe functions of gastrointestinal tract, endocrinology and cardiovascular system
- Describe physiology at the molecular, metabolic/cellular, tissue and systems levels
- Differentiate the physiological responses in normal function and disease stages

COURSE CONTENTS

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

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- 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
- Haemodynamics 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

RECOMMENDED BOOKS
1. Textbook of Physiology by Guyton and Hall, 12th Ed.
2. Review of Medical Physiology by William F. Ganong, 23rd Ed.
3. Physiology by Berne and Levy, 6th Ed.
4. Human Physiology: The Basis of Medicine by Gillian Pocock, Christopher D.Richards 4th Ed.
5. Physiological Basis of Medical Practice by John B. West and Taylor, 12th Ed.

3. KINESIOLOGY-II
CREDIT HOURS 3(2-1)

COURSE DESCRIPTION
The course covers the types of human motions in relation to axes and planes. It further explores the inter-relationship among kinematic variables and motion analysis

LEARNING OBJECTIVES

- Describe the ROM and types of movements & exercises.
- Differentiate among agonists, antagonists, and synergists integrating the knowledge learned with human motion occurring during daily activities.
- Demonstrate relaxation techniques, derived positions and effective use of walking aids.
- Demonstrate coordinated and incoordinated movements

COURSE CONTENTS

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

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- 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

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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.*

4. ENGLISH-II (EXPOSITORY WRITING)
CREDIT HOURS 3(3-0)

This course prepares undergraduates to become successful writers and readers of English. The course helps students develop their fundamental language skills with a focus on writing so that they can gain the confidence to communicate in oral and

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written English outside the classroom. The course is divided into five units and takes a Project-based Learning approach. Unit themes target the development of 21st centuryskills and focus on self-reflection and active community engagement. The course completion will enable the students to develop communication skills as reflective and self-directed learners. They will be able to intellectually engage with different stages of writing process, and develop analytical and problem-solving skills to address various community-specific challenges.

Contents

1. Self-Reflection
    - Introduction to the basics of the writing process
    - Introduction to the steps of essay writing
    - Prewriting activities: Brainstorming, listing, clustering and freewriting
    - Practicing Outlining of the essay
2. Personalized Learning
    - Learning Process, Learning Styles, Goal Setting and Learning Plan
3. Oral Presentation
    - Structure and Significance, Content Selection and Slide Presentation, Peer Review
4. Critical Reading Skills
    - Introducing Authentic Reading (Dawn and non-specialist academic books/texts)
    - Reading Strategies and Practice: Skimming, scanning, SQW3R, Annotating, Detailed reading and note-taking, Standard Test Practice: TOEFL and IELTS, Model Review Reports and Annotated Bibliographies
5. Community Engagement
    - Student-led brainstorming on local versus global issues, Identifying research problems
    - Drafting research questions, Drafting Interview/survey questions for community research (inEnglish or L1)
    - Engaging students in Critical reading, Presenting interview/ survey information, Field work
    - Writing Community Engagement Project
6. Letter to the Editor
    - Types of letters, Format and purpose of letter to the editor, Steps in writing letter-to-editor

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Recommended Texts

1. Bailey, S. (2011). Academic writing: A handbook for international students (3rd ed.). New York:Routledge.
2. Swales, J. M., & Feak, C. B. (2012). *Academic writing for graduate students: Essential tasks and skills* (3rd ed.). Ann Arbor: The University of Michigan Press.

Suggested Readings

1. Cresswell, G. (2004). *Writing for academic success.* London: SAGE.
2. Johnson-Sheehan, R. (2019). *Writing today.* Don Mills: Pearson.

Silvia, P. J. (2019). *How to write a lot: A practical guide to productive academic writing.* Washington: American Psychological Association.

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URCG-5105 **Islamic Studies (Compulsory)** **2(2-0)**

Course Description

Islamic Studies engages in the study of Islam as a textual tradition inscribed in the fundamental sources ofIslam; Qur'an and Hadith, history and particular cultural contexts. The area seeks to provide an introductionto and a specialization in Islam through a large variety of expressions (literary, poetic, social, and political)and through a variety of methods (literary criticism, hermeneutics, history, sociology, and anthropology). It offers opportunities to get fully introductory foundational bases of Islam in fields that include Qur'anic studies, Hadith and Seerah of Prophet Muhammad (PBUH), Islamic philosophy, and Islamic law, culture and theology through the textual study of Qir'an and Sunnah..

Course Objectives

At the completion of this course students will be able to:

1. To make students understand the relevance and pragmatic significance of Islam in their lives.
2. To make learners comprehend the true spirit of Islam with reference to modern world.
3. To generate a sense of Islamic principles as a code of living that guarantee the effective solutions tothe current challenges of being.
4. To provide Basic information about Islamic Studies
5. To enhance understanding of the students regarding Islamic Civilization
6. To improve Students skill to perform prayers and other worships
7. To enhance the skill of the students for understanding of issues related to faith and religious life.

Course Outline

Introduction to Qur'anic Studies

1) Basic Concepts of Qur'an
2) History of Quran
3) Uloom-ul-Quran

مطالعہ قرآن (تعارف قرآن، منتخب آیات کا ترجمہ و تفسیر: سورۃ البقرہ آیات 1-5، 284-286؛ سورۃ الحجرات آیات 1-18؛ سورۃ الفرقان آیات 63-77؛ سورۃ المومنون آیات 1-11؛ سورۃ الاحزاب آیات 6، 21، 32-33؛ 40، 56-59؛ سورۃ الانعام آیات 151-153؛ سورۃ الصف آیات 1-14؛ الحشر آیات 18-20؛ آل عمران آیات 190-192؛ النحل آیات 12-14؛ لقمن آیت 20، حم السجدہ آیت 53)

Introduction to Sunnah

1) Introduction of Hadith
2) Legal Status of Hadith
3) History of the compilation of Hadith
4) Kinds of Hadith

حدیث کا تعارف، حدیث کی دینی حیثیت، حفاظت و تدوین حدیث، حدیث کی اقسام

متن حدیث: 1 درج ذیل موضوعات پر احادیث کا مطالعہ

1۔ اعمال کا اجر نیت پر منحصر ہے۔ 2۔ بہترین انسان قرآن کا طالب علم اور اس کا معلم ہے۔ 3۔ کتاب و سنت گمراہی سے بچنے کا ذریعہ ہیں 4۔ ارکان اسلام 5۔ اسلام، ایمان، احسان اور قیامت کی نشانیاں، 6۔ بچوں کی نماز کی تلقین 7۔ دین کا گہرا فہم اللہ کی خاص عنایت ہے 8۔ حصول علم، تلاوتِ قرآن اور عمل کی اہمیت و فضیلت، 9۔ روز محشر کا محاسبہ، 10۔ حقوق اللہ

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کے ساتھ ساتھ حقوق العباد کا لحاظ رکھنا بھی لازم ہے 11۔ حسن خلق کی عظمت اور فحش و بد گوئی کی مذمت 12۔ دنیا و آخرت کی بھلائی کی ضامن چار چیزیں، 13۔ ہلاک کر دینے والی سات چیزیں، 14۔ بے عمل مبلغ کا عبرت ناک انجام 15۔ ہر شخص نگران ہے اور ہر شخص مسئول

1) Sirah of the Prohet
2) Importance of the Study of Sirah
3) Character building method of the Prophet

(سیرت النبی ﷺ(مطالعہ سیرت کی ضرورت و اہمیت، تعمیر، سیرت و شخصیت کا نبوی منہاج اور عملی نمونے، اقامت دین کا نبوی طریق کار، اقامت دین بعد خلافت راشدہ، میثاق مدینہ، خطبہ حجۃ الوداع، اخلاقی تعلیمات، تشکیل اجتماعیت اور اسوہ حسنہ، قرآن مجید میں سیرت سرور عالم کا بیان، غزواتِ نبوی ﷺ کے مقاصد و حکمتیں)

Islamic Culture & Civilization
1) Basic Concepts of Islamic Culture & Civilization
2) Historical Development of Islamic Culture & Civilization
3) Characteristics of Islamic Culture & Civilization
4) Islamic Culture & Civilization and Contemporary Issues

4. اسلامی تہذیب و تمدن (اسلامی تہذیب کا مفہوم، اسلامی کے عوامل و عناصر، اسلامی تہذیب کی خصوصیات،، اسلامی تہذیب، علمی، معاشرتی اور سماجی اثرات، تہذیبوں کے تصادم کے نظریے کا تنقیدی جائزہ، تہذیبی تصادم کے اثرات و نتائج، طبعی، حیاتیاتی اور معاشرتی علوم میں مسلمانوں کا کردار، نام ور مسلمان سائنسدان)

Pre-Requisite: Nil

Recommended Books

1) Hameed ullah Muhammad, —Emergence of Islam‖ , IRI, Islamabad
2) Hameed ullah Muhammad, —Muslim Conduct of State
3) Hameed ullah Muhammad, _Introduction to Islam
4) Ahmad Hasan, —Principles of Islamic Jurisprudence‖ Islamic Research, Institute, International Islamic University, Islamabad (1993)
5) Dr. Muhammad Zia-ul-Haq, —Introduction to Al Sharia Al Islamia‖ Allama Iqbal Open University, Islamabad (2001)
6) Dr. MuhammadShahbaz Manj, Teleeemat-e- Islam

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ETHICS **2(2+0)**

1. Meaning and Scope of Ethics.
2. Relation of Ethics with:
   (a) Religion
   (b) Science
   (c) Law

Historical Development of Morality: (a). Instinctive Moral Life.
(b). Customary Morality. (c). Reflective Morality.
Moral Theories:
(a). Hedonism (Mill)
(b). Intuitionism (Butler)
(c). Kant's Moral Theory.
Moral Ethics and Society.
(a). Freedom and Responsibility. (b). Tolerance
Justice
Punishment (Theories of Punishment)
Moral Teachings of Major Religions: a). Judaism
b). Christianity c). Islam
Professional Ethics:
a). Medical Ethics
b). Ethics of Students
c). Ethics of Teachers d). Business Ethics

Recommended Texts

2. William Lille. An Introduction to Ethics., London Methuen & Co. latest edition.
3. Titus, H.H. Ethics for Today. New York: American Book, latest edition.
4. Hill, Thomas. Ethics in Theory and Practice. N.Y. Thomas Y. Crowel, latest edition
5. Ameer Ali, S. The Ethics of Islam. Culcutta: Noor Library Publishers, latest edition
6. Donaldson, D.M. Studies in Muslim Ethics. London: latest edition.
7. . Sayeed, S.M.A.(Tr.) Ta'aruf-e-Akhlaqiat. Karachi: BCC&T, Karachi University.

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5. CIVICS AND COMMUNITY ENGAGEMENT
Credit Hours 2(2-0)

The Civics and Community Engagement course is designed to provide students with an understanding of the importance of civic participation, culture and cultural diversity, basic foundations of citizenship, group identities and the role of individuals in creating positive change within their communities. The course aims at developing students' knowledge, skills and attitudes necessary for active and responsible citizenship.

Learning outcomes

After completing this course, students will be able to

- Understand the concepts of civic engagement, community development, and social responsibility.
- Understand rights and responsibilities of citizenship
- Understand cultural diversity in local and global context
- Analyze the significance of civic participation in promoting social justice, equity, and
- democracy.
- Examine the historical and contemporary examples of successful civic and community engagement initiatives.
- Identify and assess community needs, assets, and challenges to develop effective strategies for community improvement.
- Explore the ethical implications and dilemmas associated with civic and community engagement.
- Develop practical skills for effective community organizing, advocacy, and leadership.
- Foster intercultural competence and respect for diversity in community engagement efforts.
- Collaborate with community organizations, stakeholders, and fellow students to design and implement community-based projects.
- Reflect on personal growth and learning through self-assessment and critical analysis of community engagement experiences.

Course Content:

Introduction to Civics & Community Engagement

- Overview of the course: Civics & Community Engagement
- Definition and importance of civics

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- Key concepts in civics: citizenship, democracy, governance, and the rule of law
- Rights and responsibilities of citizens

Citizenship and Community Engagement

- Introduction to Active Citizenship: Overview of the Ideas, Concepts, Philosophy and Skills
- Approaches and Methodology for Active Citizenship

Identity, Culture, and Social Harmony

- Concept and Development of Identity, Group identities
- Components of Culture, Cultural pluralism, Multiculturalism, Cultural Ethnocentrism, Cultural relativism, Understanding cultural diversity, Globalization and Culture, Social Harmony,
- Religious Diversity (Understanding and affirmation of similarities & differences)
- Understanding Socio-Political Polarization
- Minorities, Social Inclusion, Affirmative actions

Multi-cultural society and inter-cultural dialogue

- Inter-cultural dialogue (bridging the differences, promoting harmony)
- Promoting intergroup contact/ Dialogue
- Significance of diversity and its impact
- Importance and domains of Inter-cultural dialogue

Active Citizen: Locally Active, Globally Connected

- Importance of active citizenship at national and global level
- Understanding community
- Identification of resources (human, natural and others)
- Utilization of resources for development (community participation)
- Strategic planning, for development (community linkages and mobilization)

Human rights, constitutionalism and citizens' responsibilities

- Introduction to Human Rights
- Human rights in constitution of Pakistan
- Public duties and responsibilities
- Constitutionalism and democratic process

Social Institutions, Social Groups, Formal Organizations and Bureaucracy

- Types of Groups, Group identities, Organizations
- Bureaucracy, Weber's model of Bureaucracy
- Role of political parties, interest groups, and non-governmental organizations

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Civic Engagement Strategies

- Grassroots organizing and community mobilization
- Advocacy and lobbying for policy change
- Volunteerism and service-learning opportunities

Social Issues/Problems of Pakistan

- Overview of major social issues of Pakistani society

Social Action Project

Recommended Texts

1. Kennedy. J. K., & Brunold, A. (2016). Regional context and Citizenship education in Asia andEurope. New Yourk: Routledge, Falmer.
2. Henslin, James M. (2018). Essentials of Sociology: A Down to Earth Approach (13th ed.). New York:Pearson Education
3. Macionis, J. J., & Gerber, M.L. (2020). Sociology. New York: Pearson Education

Suggested Readings

1. Glencoe McGraw-Hill. (n.d.). Civics Today: Citizenship, Economics, and Youth.
2. Magleby, D. B., Light, P. C., & Nemacheck, C. L. (2020). Government by the People (16th ed.).Pearson.
3. Sirianni, C., & Friedland, L. (2005). The Civic Renewal Movement: Community-Building and Democracy in the United States. Kettering Foundation Press.
4. Bloemraad, I. (2006). Becoming a Citizen: Incorporating Immigrants and Refugees in the UnitedStates and Canada. University of California Press.
5. Kuyek, J. (2007). Community Organizing: Theory and Practice. Fernwood Publishing.
6. DeKieffer, D. E. (2010). The Citizen's Guide to Lobbying Congress. TheCapitol.Net.
7. Rybacki, K. C., & Rybacki, D. J. (2021). Advocacy and Opposition: An Introduction to Argumentation (8th ed.). Routledge.
8. Kretzmann, J. P., & McKnight, J. L. (1993). Building Communities from the Inside Out: A PathTowards Finding and Mobilizing a Community's Assets. ACTA Publications.
9. Patterson, T. E. (2005). Engaging the Public: How

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Government and the Media Can ReinvigorateAmerican Democracy. Oxford University Press.
10. Love, N. S., & Mattern, M. (2005). Doing Democracy: Activist Art and Cultural Politics. SUNYPress.

Seerat of the Holy Prophet مطالعہ سیرت النبی صلی اللہ علیہ وسلم

Course Code : URCG-5127

Title	Description
Semester	
Nature of Course	
No. of C.Hrs.	1(1-0)
Total Teaching weeks	18
Objectives of the Course	۱۔ طلباء کو مطالعہ سیرت طیبہ کی ضرورت و اہمیت سے آگاہ کرنا ۲۔ تعمیر شخصیت میں مطالعہ سیرت طیبہ کے کردار کو واضح کرنا ۳۔ بعثت نبوی کے موقع پر اقوام عالم کی عمومی صورت حال سے آگاہ کرنا ۴۔ رسول اکرم صلی اللہ علیہ وسلم کی مکی اور مدنی زندگی کا اس طرح مطالعہ کروانا کہ طلباء ان واقعات سے نتائج کا استنباط کر سکیں ۵۔ طلباء کو عہد نبوی کی معاشرت، سیاست، معیشت سے آگاہ کرنا

Course Description

S.No.	Title	Description
1	حضور صلی اللہ علیہ وسلم کے ابتدائی حالات زندگی	۱۔ حضور صلی اللہ علیہ وسلم کا خاندانی حسب و نسب ۲۔ پیدائش اور ابتدائی تربیت ۳۔ لڑکپن اور جوانی کے حالات زندگی
2	بعثت نبوی کے وقت دنیا کے حالات (۱)	۱۔ بعثت نبوی کے وقت اہم تہذیبیں ۲۔ عرب، مصر، حبشہ، بیزنطینی ساسانی
3	بعثت نبوی	۱۔ مکی عہد میں دعوت اسلام
4	بعثت نبوی	۱۔ مدنی عہد میں دعوت اسلام
5	خصائص النبیؐ	آپ کا طور پیغامبرانہ
6	خصائص النبیؐ	بحیثیت استاد و معلم
7	خصائص النبیؐ	بحیثیت جج
8	خصائص النبیؐ	بحیثیت سربراہ ریاست
9	خصائص النبیؐ	ذاتی محاسن اور عالمگیر اثرات

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ناموسِ رسالت	خصائص النبیؐ	10
غیر مسلموں سے تعلقات	اسوۂ حسنہ اور عصر حاضر	11
اسوۂ حسنہ کی روشنی میں گھریلو زندگی	اسوۂ حسنہ اور عصر حاضر	12
مستشرقین اور مطالعہ سیرت	اسوۂ حسنہ اور عصر حاضر	13
وطن سے محبت اور سیرت	اسوۂ حسنہ اور عصر حاضر	15
مستشرقین کے اعتراضات اور ان کے جوابات	اسوۂ حسنہ اور عصر حاضر	16

نصابی کتب

نمبر شمار	نام مؤلف	نام کتاب
1	ابن ہشام	السیرۃ النبویۃ
2	مولانا شبلی نعمانی، سید سلیمان ندوی	سیرۃ النبی صلی اللہ علیہ وسلم
3	قاضی محمد سلیمان سلمان منصور پوری	رحمۃ للعالمین
4	مولانا سید ابو الحسن علی ندوی	نبی رحمت صلی اللہ علیہ وسلم
5	ڈاکٹر یٰسین مظہر صدیقی	عہد نبوی کا نظام حکومت
6	ڈاکٹر خالد علوی	انسان کاملؐ

حوالہ جاتی کتب

نمبر شمار	نام مؤلف	نام کتاب
1	سید ابو الاعلیٰ مودودی	سیرت سرور عالم صلی اللہ علیہ وسلم
2	مولانا صفی الرحمن مبارکپوری	الرحیق المختوم
3	پیر محمد کرم شاہ الازہری	ضیاء النبی صلی اللہ علیہ وسلم
4	ڈاکٹر اکرم ضیاء العمری	السيرة النبوية الصحيحة
5	مولانا عبد الرؤف دانا پوری	اصح السیر

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THIRD SEMESTER

1. ANATOMY-III
2. PHYSIOLOGY-III
3. BIOMECHANICS & ERGONOMICS-I
4. MOLECULAR BIOLOGY & GENETICS
5. HEALTH AND WELLNESS
6. QUANTITATIVE REASONING
7. Translation of the Holy Quran-II

1. ANATOMY-III

CREDIT HOURS: 4(3-1)

COURSE DESCRIPTION

The focus of this course is an in-depth and comprehensive study of human anatomy with emphasis on the head and neck, face and skull. Identify anatomical structures within the thorax with emphasis on structures of thoracic wall and thoracic cavity. Dissection and identification of structures in the manikins/smart board system supplemented with the study of charts, models, prosected materials and radiographs are utilized to identify anatomical landmarks and configurations of the head and neck, face, skull and thorax.

LEARNING OBJECTIVES

- Describe and illustrate human anatomy related to head and neck, face, skull and thoracic cavity
- Identify joints, muscles, nerves, veins, arteries and other anatomical structures of head and neck, face and skull
- Identify anatomical structures of the thoracic wall and thoracic cavity

COURSE CONTENTS

THE HEAD AND 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)
- Joints 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

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- Temporomandibular joint
- Brief description of orbit and nasal cavity
- Muscles of eye

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

LAB WORK

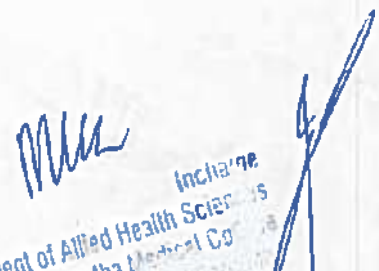
During study of Gross Anatomy, emphasis should be given on applied aspect, radiological anatomy, surface anatomy and cross-sectional anatomy of the region covered in the respective semester/year

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. 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. Neuroanatomyby Richard S. Snell.

2. PHYSIOLOGY-III

CREDIT HOURS: 3(2-1)

COURSE DESCRIPTION

The course is designed to study the function of the human body with emphasis on function of human respiratory system, nervous system, reproductive system, body fluids and renal system. These topics are addressed by a consideration of clinical and applied physiology in relation to clinical modules and practice

LEARNING OBJECTIVES

- Describe major functions of the respiratory system
- Explain major functions of central and peripheral nervous
- Discuss major functions of male and female reproductive
- Describe major functions body fluids and renal system and relate this to clinical practice

COURSE CONTENTS

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

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- 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

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- 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

LAB WORK

RESPIRATORY SYSTEM

- Stethography
- Breath sounds
- Respiratory rate
- Lung function tests

NERVOUS SYSTEM

- Examination of superficial and deep reflexes
- Brief examination of the motor and sensory system
- Examination of the cranial nerves

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. 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, 12thEd.

3. 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

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LEARNING OBJECTIVES

- Define concepts and terminology within the area of biomechanics
- Describe statics, kinematics and kinetics in human movement
- Analyze and describe the motion of a body or system using qualitative and quantitative approaches
- Demonstrate an understanding of how changes of movement patterns and techniques will influence the load on human tissues of the musculoskeletal system during movement
- Apply knowledge of the underlying musculoskeletal principles and concepts of biomechanics including the core areas of human movements in upper and lower extremity
- Understand and apply knowledge, tools and techniques used in Ergonomics

COURSE CONTENTS

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

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

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- 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
- Macroergonomics

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 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

4. MOLECULAR BIOLOGY & GENETICS

CREDIT HOURS: 3(3-0)

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

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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
- Neurotophic 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 VivoGene Therapy Strategies to Intact Ligament and Tendon
  - Gene Therapy Strategies for Lacerated Tendon Repair,

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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 Xenogenic 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

RECOMMENDED BOOKS

1. Molecular Medicine: Genomics to Personalized Healthcare, 3rdEdition by R. Trent. (Published in 2005 by Academic Press).
2. Principles of Molecular Medicine, 2ndEdition by Marschall S. Runge and Cam Patterson. (Published in 2006 by Humana Press).

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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, 3rdEdition by R. J. Trent.(Published in 2005 by Academic Press).
5. Molecular Biology of the Cell, 5thEdition by Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts and Peter Walter.(Published in 2007 by Garland Science).
6. Human Molecular Genetics, 3rdEdition by Tom Strachan and Andrew Read. (Published in 2003 by Garland Science/Taylor & Francis Group).
7. Molecular Medicine for Clinicians, 1stEdition by Barry Mendelow, Michele Ramsay, NanthakumarChettyan and Wendy Stevens.(Published in 2008 by University Press).
8. Molecular Markers, Natural History and Evolution, 2ndEdition by John C. Avise. (Published in 2004 by Sinauer Associates).
9. "Molecular Pathology: The Molecular Basis of Human Disease, 1stEdition 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, 3rdEdition by Benjamin Pierce (Published in 2007 by W. H. Freeman).
12. Human Molecular Genetics, 3rdEdition by Tom Strachan and Andrew P Read(Published in 2003 by Garland Science/Taylor & Francis Group).
13. Genetics-From Genes to Genomes, 3rdEdition by Hartwell, Hood, Goldberg, Reynolds, Silver andVeres(Published in 2006 by McGraw-Hill).
14. Additional Study Material, as assigned By the tutor

5. HEALTH AND WELLNESS

CREDIT HOURS: 2(2-0)

COURSE DESCRIPTION

This course will facilitate discussion on cultural or historical significance of health practices, the role of art therapy in wellness, the theories of health and wellness, including motivational theory, locus of control, public health initiative, psycho-social, spiritual, and cultural. The course will cover health history, risks, screening, and assessment considering epidemiological principles. This will also cover risk reduction strategies for primary and secondary prevention, including programs for special populations

LEARNING OBJECTIVES

Define Health, wellness, and fitness.

Cultural or historical significance of health practices

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The role of art therapy in wellness

Philosophical and ethical dimensions of health care

Describe healthy people and role of Allied Health professionals in Health and wellness.

Explain the key concepts of physical and mental fitness.

Explain health and wellness issues in child, adolescence and old age

Discuss Women health issues.

COURSE CONTENTS

PREVENTION PRACTICE

A HOLISTIC PERSPECTIVE FOR HEALTH

Defining Health

Predictions of Health Care

Comparing Holistic Medicine and Conventional Medicine

Distinguishing Three Types of Prevention Practice.

Cultural or historical significance of health practices

Traditional Medicine Systems

Medical Beliefs and Rituals

Folk Medicine and Remedies

Influence of Religion and Spirituality

Medical Traditions in Different Cultures

The role of art therapy in wellness

History of Art Therapy

Benefits of Art Therapy

Applications of Art Therapy

Cultural Considerations in Art Therapy

Philosophical and ethical dimensions of health care

Ethical Theories in Healthcare

Patient Autonomy and Informed Consent

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Healthcare Professional-Patient Relationships

Ethical Issues in Research and Clinical Trials

Technological Advances in Healthcare

HEALTHY PEOPLE

Definition of healthy people

Health education Resources

Allied Health professional role for a healthy community.

SCREENING FOR HEALTH, FITNESS, AND WELLNESS

Distinguishing Screening, Evaluation &Examination

Interviewing for Health, Fitness and Wellness

Vital Signs, 3-minute Step Test, and Borg perceived Scale of Exertion

HEALTH, FITNESS, AND WELLNESS ISSUES DURING CHILDHOOD AND ADOLESCENCE

Structure and Function

Recognizing and Reporting Child abuse

Special Concerns in Pediatrics

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

Pre-partum 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

RESOURCES TO OPTIMIZE HEALTH AND WELLNESS

Chronic Illness

Nutrition

Progressive Relaxation

Time management

HEALTH PROTECTION

Infection Control

Injury Prevention during Childhood

Injury prevention during Adolescence

Injury Prevention during Adulthood

Injury Prevention during Older Adulthood

MARKETING HEALTH AND WELLNESS

Definition of Marketing

Marketing Strategies for health and wellness Centers

RECOMMENDED BOOKS

Principles of Biomedical Ethics" by Tom L. Beauchamp and James F. Childress

Art as Therapy" by Alain de Botton and John Armstrong

Doing Right: A Practical Guide to Ethics for Medical Trainees and Physicians" by Philip C. Hebert

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

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6. QUANTITATIVE REASONING

CREDIT HOURS 3(3-0)

Since ancient times, numbers, quantification, statistics and mathematics has played a central role in scientific and technological development. In the 21st century, Quantitative Reasoning (QR) skills are essential for life as they help to better understand socio-economic, political, health, education, and many other issues, an individual now faces in daily life. The skills acquired by taking this course will help the students to apply QR methods in their daily life and professional activities. This course will also change student's attitude about statistics and mathematics. It will not only polish their QR skills, but also enhance their abilities to apply these skills.

Contents

1. Introduction to quantitative reasoning
2. Overview of contributions of Mathematicians and Statisticians especially Muslim scholars.
3. Types of standard numbers
4. Proportions, rates, ratio and percentages
5. Odds and odds ratio
6. Scale of measurements
7. Number sequence and series
8. Unit analysis as a problem-solving tool
9. Data handling (small and large)
10. Data errors, absolute and relative and their applications
11. Descriptive statistics
12. Rules of counting: multiplication rule, factorial, permutation and combination
13. Probability and its application in real life
14. A graphical perspective through Venn Diagram
15. Financial indicator analysis, and money management (profit, loss, simple and compound interest)
16. Practical scenarios involving algebraic expressions: linear and quadratic

Recommended Texts

1. Akar, G. K., Zembat, İ. Ö., Arslan, S., & Thompson, P. W. (2023). Quantitative Reasoning In Mathematics and Science Education. 1st Ed., Springer, USA.

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2. Peck, R., Olsen, C., & Devore, J. L. (2015). Introduction to statistics and data analysis. 5th Ed., Brooks Cole, USA.
3. Devlin, K. J. (2012). Introduction to mathematical thinking. Palo Alto, CA: Keith Devlin.

Suggested Readings

1. Triola, M. F., Goodman, W. M., Law, R., & Labute, G. (2006). Elementary statistics. Reading, MA: Pearson/Addison-Wesley.
2. Blitzer, R., & White, J. (2005). Thinking mathematically. Pearson Prentice Hall.

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Translation of the Holy Quran- II

Topic	Details
Semester/Level	In some discipline 3rd semester and in some discipline 4th Semester/ ADP Program 2nd Year
Course Code	URCG-5111
Course Title	Translation of the Holy Quran – II
Credit Hours	1(0-1)
Objectives	▪ Students will come to know about the real nature, significance and relevance of the Islamic beliefs in light of the text of the Holy Quran. ▪ Students will seek knowledge of translation and transliteration of the Holy Book Quran. ▪ To familiarize the students with the concept of Ibādah (Its significance, scope and relevance) and its types in Islam. ▪ Students will learn literal and idiomatic way of translation of the Holy Book. ▪ Students will learn about the polytheism and its incompatibility in Islam highlighted by the Holy Quran. ▪ To highlight the significance of learning through using all human faculties provided by the almighty Allah and familiarize the students about condemnation of ignorance mentioned in the Quranic text. ▪ To develop Awareness among the students about rights and duties of different circles of society in the light of Holy Quran. ▪ To introduce the students to Quranic Arabic grammar in practical manner.
Course Contents:	○ ایمانیات اور عبادات اللہ پر ایمان، فرشتوں پر ایمان، رسولوں پر ایمان، آسمانی کتابوں پر ایمان یوم آخرت پر ایمان، تقدیر پر ایمان نماز، روزہ، زکوۃ، حج، جہاد ○ معاشرے کے حقوق • خاندان کی تکوین • حق مہر • رضاعت و حمل • اولاد کو قتل کرنے کی ممانعت • شوہر کی نافرمانی • طلاق • بیوہ کی عدت کے احکام • نکاح کا پیغام بھیجنا • عورت کی وراثت (اس کے شوہر کی طرف سے) • والدین کے حقوق • بیویوں اور اولاد کے مابین عدالت ○ خاندان کے حقوق • مہمان کی عزت

	• اجازت طلب کرنے کے اصول • مجلس کے آداب • تعاون اور بھائی چارہ • گروہ بندی • محبت • لوگوں کے درمیان صلح • عفو ودرگزر، غصہ پر قابو اور معاف کرنا • شعوب وقبائل • لوگوں کے بیچ اختلافات • حمایت ونگہبانی
Grammar:	• قرآنی عربی گرامر کے اصول اور فعل کے اطلاقات (متن قرآنی پر اطلاق سے توضیحات)
Details of Chapters and verse Numbers:	• منتخب آیات مع ترجمہ وتجوید • البقرہ((۱۷۷،۱۳۶،۱۲۷،۲۵۶،۲۸۵،۹۲،۸۴،۲۵۳،۱۲۹،۱۵،۲۸۵،۳۳،۲۸۵،۲۰۱،۲۴۷،۱۵۳،۲۵،۱۱۰،۲۱۹،۲۷۷،۴۵،۲۳۸،۱۷۷،
۱۸۹،۲۰۰،۱۸۴،۱۸۳،۲۱۸،۱۵۸،۲۴۱،۱۹۹،۲۲۷،۲۲۶،۲۲۷،۲۳۷،۲۲۹،۲۲۹،۲۲۸،۲۳۷،۲۳۵،۲۳۰،۸۴،۱۸۴،۲۳۳،۱۸۴،۱۶۰،۸۳) • النساء(۶،۹۱،۳۵،۲۰،۳۵،۱۹۱،۱۲۸،۱۱،۱۱،۴۵،۲۳،۱۷۶،۳،۱۱،۳۴،۱۲۸،۳۵،۱۲،۱۷۶،۳۶،۸۰،۸۶،۶۹،۱۳،۸۰،۶۹،۱۳۶،۵۹،۹۲،۹۵،
۸۱،۱۳۸،۵۴،۱۴۹،۱۶،۱،۲۰،۱) • الانعام(۵۴،۳۸،۱۵۱،۹۲،۱۴،۱۳۷،۲۲) • آل عمران(۱۰۹،۱۴۳،۸۴،۱۲۵،۸۵،۳۹،۹۷) • المائدہ(۵،۲،۸۲،۱۹،۳۹،۹۲،۲،۵۴) • الاعراف(۱۸۹،۱۸۹،۳۵) • التوبہ(۱۶،۷۱،۲۰) • ہود(۱۲) • الزمر(۶) • النور(۲۹،۶۰،۲۷،۵۲،۲۸،۵۴) • محمد(۳۳) • انفال(۲۰،۸۲) • الرعد(۳) • الطلاق(۴) • الحج(۵) • ابراہیم((۳۴،۲۳) • الاسراء(۲۴،۲۳) • الاحقاف(۱۵) • المومنون(۲۷) • العنکبوت(۸،۴۸،۲۵) • النحل(۲۲) • لقمان(۱۴،۳،۱۵) • الاحزاب((۳۹،۳۸،۵۰،۳۵) • الشعراء(۷) • الروم(۲۱) • مریم(۲۶،۱۴)

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	▪ الجدول (١٠،١٢)

FOURTH SEMESTER

1. ANATOMY-IV (Neuro Anatomy)
2. BIOMECHANICS & ERGONOMICS-II
3. SCIENCE OF SOCIETY-1
4. BIOCHEMISTRY I
5. ENTREPRENEURSHIP
6. TOOLS FOR QUANTITATIVE REASONING
7. PROFESSIONAL PRACTICE (LAWS, ETHICS AND ADMINISTRATION)

1. ANATOMY - IV (Neuro Anatomy)

CREDIT HOURS 3 (2-1)

COURSE DESCRIPTION

The purpose of the course is to provide the students an in-depth study and analysis of the regional and systemic organization of the body. Course will emphasis on structure and function of human movement. Course will cover human anatomy with emphasis on the nervous, skeletal, muscle, and circulatory systems. Course will lay down the foundation of General Anatomy, the understanding of Neuroanatomy (regional Anatomy) to be supplemented through dissection and identification of structures in the manikins/smart boards, charts, models, prosected materials and radiographs

LEARNING OBJECTIVES

- Describe regional organization of human brain & neural pathways
- Classify the nervous system
- Explain structure and function of spinal cord

COURSE CONTENTS

NEURO ANATOMY

- Central Nervous System: Disposition, Parts and Functions
- Brain stem (Pons, Medulla, and Mid Brain)
- Cerebrum
- Cerebellum
- Thalamus
- Basal ganglia
- Lymbic system
- Hypothalamus
- Internal Capsule
- Blood Supply of Brain
- Stroke and its types
- Ventricles of Brain

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- 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

LAB WORK

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

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

- Gray's Anatomy by Prof. Susan Standring 41th Ed., Elsevier.
- Clinical Neuroanatomy Anatomy for Medical Students by Richard S. Snell,
- Clinically Oriented Anatomy by Keith Moore.
- Clinical Anatomy by R.J. Last, Latest Ed.
- Cunningham's Manual of Practical Anatomy by G.J. Romanes, 15th Ed., Vol-I, II and III.

2. 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. 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

LEARNING OBJECTIVES

- Describe biomechanical structure and function of human connective, muscular, nervous and skeletal tissues
- Explain mechanical, neural and muscular events in normal and pathological motion
- Explain mechanical and ergonomic principles are applied in understanding the human movement
- Discuss basic concepts, principles and theories of ergonomics

COURSE CONTENTS

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, 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

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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

LAB WORK

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
- Measurement of upper extremity & lower extremity
- Measurement of temporomandibular, cervical , thoracic & lumber spine
- Joint measurement by body position
- 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 BOOKS

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

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URCG-5116 **Science of Society-I** **2 (2-0)**

Course Description:

This course will introduce students with the subject matter of social science, its scope, nature and ways of looking at social phenomenon. It will make the participants acquaintance with the foundations of modern society, state, law, knowledge and selfhood. While retaining a focus on Pakistani state and society, students will encounter theoretical concepts and methods from numerous social science disciplines, including sociology, politics, economics anthropology and psychology and make them learn to think theoretically by drawing on examples and case studies from our own social context. Students will be introduced to the works of prominent social theorists from both western and non-western contexts. Instruction will include the use of written texts, audio-visual aids and field visits.

Learning Outcomes:

The course has following outcomes:

It will

- Introduce student with the nature of human social behavior and foundations of human group life
- Analyze the reciprocal relationship between individuals and society.
- Make student aware with the nature of societies existing in modern world
- Make students familiar with the philosophy of knowledge of social sciences
- Introduce students with the works of prominent theories explain human group behavior
- Help students to understand the foundations of society including culture, socialization, politics and economy
- Introduce students with various dimensions of social inequalities with reference to gender, race, ethnicity and religion
- Make them aware about the understanding of various themes pertains to social science in local context
- Help them recognize the difference between objective identification of empirical facts, and subjective formulation of opinionated arguments

Course Outlines:

1. **Introduction to Social Sciences**
   - Social world, Human Social behavior, Foundations of society
   - Evolution of Social sciences
   - Philosophy of Science
   - Scope and nature of social sciences
   - Modernity and social sciences
   - Branches of social science: Sociology, Anthropology, Political Science, Economics

   Society and Community, Historical evolution of Society
   - Types of Societies
   - Foraging society, Horticultural society, Pastoralist society
   - Agrarian societies, Industrial society, Postindustrial society

2. **Philosophy of Knowledge in social Science and social inquiry**
   - Understanding social phenomenon
   - Alternative ways of knowing
   - Science as a source to explore social reality
   - Objectivity, Value-Free research
   - Positivism vs Interpretivism
   - Qualitative vs Quantitative

3. **Culture and Society**
   - Idea of Culture, Assumptions of Culture

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- Types, Components, Civilization and culture
- Individual and culture. Cultural Ethnocentrism, Cultural Relativism
- Outlook of Pakistani culture
- Global Flows of culture, Homogeneity, Heterogeneity

4. **Social Stratification and Social inequality**
   - Dimensions of inequality, Social class
   - Gender, Race, Religion, Ethnicity, Caste
   - Patterns of social stratification in Pakistan
   - Class, caste system in agrarian society
   - Ascription vs Achievement, Meritocracy
   - Global stratification in modern world, Global patterns of inequality
5. **Personality, Self and Socialization**
   - Concept of self, Personality
   - Nature vs Nurture, Biological vs Social
   - Development of Personality
   - Socialization as a process, Agents of socialization
   - Socialization and self/group identity
6. **Gender and Power**
   - Understanding Gender
   - Social construction of Patriarchy
   - Feminism in Historical context, Gender Debates
   - Gender and Development
   - Gender issues in Pakistani society, Women Participation in politics, economy and education
   - Toward a gender sensitive society, Gender mainstreaming

Pakistan: State, Society, Economy and Polity

- Colonialism, colonial legacy, National identity
- Transformation in Pakistani society: Traditionalism vs Modernism
- Economy, Informality of Economy, Modern economy and Pakistan
- Political Economy, Sociology of Economy

Recommended Textbooks and Reading Materials:

1. Giddens, A. (2018). Sociology (11th ed.). UK: Polity Press.
2. Henslin, J. M. (2018). Essentials of Sociology: A Down-to-Earth Approach.(18th Edition) Pearson Publisher.
3. Macionis, J. J. (2016). Sociology (16th ed.). New Jersey: Prentice-Hall.
4. Qadeer, M. (2006) Pakistan - Social and Cultural Transformation in a Muslim Nation.
5. Smelser, N.J. and Swedburg, R., The Handbook of Economic Sociology, Chapter 1 'Introducing Economic Sociology', Princeton University Press, Princeton.
6. Systems of Stratification | Boundless Sociology (no date). Available at: https://courses.lumenlearning.com/boundless-sociology/chapter/systems-of-stratification/

Jalal, A. (ed.) (1995) 'The colonial legacy in India and Pakistan', in Democracy and

4.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 introduction to the biomolecules i.e. amino acid,

proteins carbohydrates, fats, enzymes and nucleic acids. The nutritional biochemistry concludes the course

LEARNING OBJECTIVES

- Describe cell and body fluids in the context of chemistry and human biochemistry
- Discuss the properties, classification and functions of biomolecules with emphasis on amino acid, peptides, proteins, enzymes, carbohydrates, lipids and nucleic acid
- Explain importance of nutritional biochemistry with emphasis on minerals, trace elements, vitamins and balance diet

COURSE CONTENTS

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

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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 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.

5.ENTREPRENEURSHIP

CREDIT HOURS 2(2-0)

This course addresses the unique entrepreneurial experience of conceiving, evaluating, creating, managing, and potentially selling a business idea. The goal is to provide a solid background with practical application of important concepts applicable to the entrepreneurial environment. Entrepreneurial discussions regarding the key business areas of finance, accounting, marketing and management include the creative aspects of entrepreneurship. The course relies on classroom discussion, participation, the creation of a feasibility plan, and building a business plan to develop a comprehensive strategy for launching and managing a new venture. The core learning objectives of course are: to enhance the 'entrepreneurial intentions' of the students by improving their natural willingness to start a business; to understand the process of entrepreneurship and learn the ways to manage it by working individually in the class and in the form of groups outside the class to conduct field assignments; to educate the students about the practical underpinnings of the entrepreneurship with the aid ofpractical assignments and idea pitching.

Contents

1. **Background:** What is an Organization, Organizational Resources, Management Functions, Kindsof Managers, Mintzberg's Managerial Roles.
2. **Forms of Business Ownership:** The Sole proprietorship, Partnership, Joint Stock Company
3. **Entrepreneurship:** The World of the Entrepreneur, what is an entrepreneur? The Benefits of Entrepreneurship, The Potential Drawbacks of Entrepreneurship, Behind the Boom: Feeding the Entrepreneurial Fire.
4. **The Challenges of Entrepreneurship:** The Cultural Diversity in Entrepreneurship, The Power of"Small" Business, Putting Failure into Perspective, The Ten Deadly Mistakes of Entrepreneurship,How to Avoid the Pitfalls, Idea Discussions

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& Selection of student Projects, Islamic Ethics of Entrepreneurship.

5. **Inside the Entrepreneurial Mind:** From Ideas to Reality: Creativity, Innovation, and Entrepreneurship, Creativity – Essential to Survival, Creative Thinking, Barriers to Creativity, How to Enhance Creativity, The Creative Process, Techniques for Improving the Creative Process, Protecting Your Ideas, Idea Discussions & Selection of student Projects.
6. Products and technology, identification opportunities
7. **Designing a Competitive Business Model and Building a Solid Strategic Plan:** Building a strategic plan, Building a Competitive Advantage, The Strategic Management Process, Formulate strategic options and select the appropriate strategies, Discussion about execution of Students' Project.
8. **Conducting a Feasibility Analysis and Crafting a Winning Business Plan:** Conducting a Feasibility Analysis, Industry and market feasibility, Porter's five forces model, Financial feasibility analysis. Why Develop a Business Plan, The Elements of a Business Plan, What Lenders and Investors Look for in a Business Plan, Making the Business Plan Presentation.
9. **Building a Powerful Marketing Plan:** Building a Guerrilla Marketing Plan, Pinpointing the Target Market, Determining Customer Needs and Wants Through Market Research.Plotting a Guerrilla Marketing Strategy: How to Build a Competitive Edge, Feed Back & Suggestions on Student Project, Islamic Ethics for Entrepreneurial Marketing
10. **E-Commerce and the Entrepreneur:** Factors to Consider before Launching into E-Commerce, Ten Myths of E-Commerce, Strategies for E-Success, Designing a Killer Web Site, Tracking Web Results, Ensuring Web Privacy and Security, Feed Back & Suggestions on Student Project.
11. **Pricing 'Strategies:** Three Potent Forces: Image, Competition, and Value, Pricing Strategies and Tactics, Pricing Strategies and Methods for Retailers, The Impact of Credit on Pricing
12. **Attracting Venture Capitalist:** Projected Financial Statements, Basic Financial Statements, Ratio Analysis, Interpreting Business Ratios, Breakeven Analysis, Feed Back &Suggestions on Student Project,
13. **Idea Pitching:** Formal presentation, 5-minutes pitch, funding negotiation and launching.

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Recommended Texts

1. Scarborough, N. M. (2011). *Essentials of entrepreneurship and small business management*. Publishing as Prentice Hall, One Lake Street, Upper Saddle River, New Jersey 07458..

Suggested Readings

1. Burstiner, I. (1989). *Small business handbook*. Prentice Hall Press.

6. TOOLS FOR QUANTITATIVE REASONING

CREDIT HOURS 3(3-0)

This course is based on quantitative reasoning 1 course. It will enhance the quantitative reasoning skills learned in quantitative reasoning 1 course. Students will be introduced to more tools necessary for quantitative reasoning skills to live in the fast paced 21st century. Students will be introduced to importance of mathematical skills in different professional settings, social and natural sciences. These quantitative reasoning skills will help students to better participate in national and international issues like political and health issues. This course will prepare the students to apply quantitative reasoning tools more efficiently in their professional and daily life activities. This course will help them to better understand the information in form of numeric, graphs, tables, and functions. Students will be introduced to the above listed concepts, and they will be prepared to apply these concepts to practical life scenarios. This course will enhance their ability to deal with scenarios involving quantitative reasoning skills in a logical manner which they can face in their practical lives. It will prepare students to deal with different forms of data occurring in professional, social and natural sciences. Students will be introduced to scenarios involving functions and probability in different disciplines. This course will prepare the students to apply the quantitative reasoning skills in other disciplines. This course will provide solid foundation for students to use the quantitative reasoning skills in solving practical life problems.

Contents

1. Investigating relationships between variables. Exploring tools to find relationship between variables Resources and population growth. Dealing with Economical, environmental and social issues.
2. Graphical and analytical approaches to solve a problem.

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Applications of graphical & analytical approaches in social & economic problems.

3. Understanding inequalities around us. Dealing with practical problems involving inequalities in different disciplines.
4. Golden ratio in sculptures. Comparison of statements and their use in social and economic problems. Number patterns and their applications.
5. Survival in the modern World. Propositions and truth values. Applications of logic.
6. Exploring and summarizing data, misleading graphs. Finding a representative value in a data. Measure and spread of a data, measuring degree of relationship among variables. Counting the odds.

Recommended Texts

1. Bennett, J. & Briggs, W. (2015). Using and understanding mathematics (6th Edition). Pearson Education, Limited.
2. Blitzer, R. (2014). Precalculus. (5th Edition). Pearson Education, Limited.
3. Stewart, J., Redlin, L. & Watson, S. (2011). Pre-calculus: Mathematics for Calculus (7th edition). Cengage Learning.

Suggested Readings

1. Aufmann, R., Lockwood, J., Nation, R. & Clegg, D. (2007). Mathematical thinking and reasoning. Brooks Cole.
2. Montgomery, D. C., & Runger, G. C. (2010). Applied statistics and probability for engineers. John wiley & sons.

DasGupta, A. (2008). Asymptotic theory of statistics and probability (Vol. 180). New York: Springer.

7.PROFESSIONAL PRACTICE (LAWS, ETHICS AND ADMINISTRATION)

CREDIT HOURS 2(2-0)

PROFESSIONAL PRACTICE IN PHYSICAL THERAPY (Laws, Ethics & Administration)

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

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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 and 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 and 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 and 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

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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 and 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 and 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

RECOMMENDED BOOKS

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

FIFTH SEMESTER

1. **PATHOLOGY & MICROBIOLOGY-I**
2. **PHARMACOLOGY & THERAPEUTIC-I**
3. **PHYSICAL AGENTS & ELECTROTHERAPY-I**
4. **THERAPEUTIC EXERCISES & TECHNIQUES**
5. **BIOCHEMISTRY II**
6. **MEDICAL PHYSICS**
7. **SUPERVISED CLINICAL PRACTICE-I**
8. **Translation of the Holy Quran-III**

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1.PATHOLOGY & MICROBIOLOGY-I

CREDIT HOURS 2(2-0)

COURSE DESCRIPTION

The course will develop an understanding among students about the pathology of underlying clinical disease states and involving the major organ systems. Epidemiological issues will be presented and discussed. Students will use problem-solving skills and information about pathology and Microbiology to decide when referred to another health care provider or alternative intervention is indicated

COURSE OBJECTIVES

- Discuss concepts of general pathology
- Discuss recognize signs and symptoms that are considered red flag for serious disease
- Discuss and disseminate pertinent information and findings, and ascertain the appropriate steps to follow during physical therapy management

COURSE CONTENTS

GENERAL PATHOLOGY WHICH INCLUDES

CELL INJURY AND DEATH

- Causes of cell injury
- Pathogenesis of necrosis and apoptosis
- Sub cellular responses

CELL ADAPTATIONS

- Relevant examples: Hyperplasia, Hypertrophy, Atrophy, Metaplasia and intracellular accumulation

INFLAMMATION

- Acute inflammation
- Vascular events and cellular events
- Chemical mediators

CHRONIC INFLAMMATION

- General and granulomatous inflammation
- Morphologic patterns of acute and chronic inflammation

HEALING & REPAIR

- Normal controls of healing and repair.
- Repair by connective tissue
- Wound healing

HAEMODYNAMIC DISORDERS

- Edema and its types
- Hyperemia /congestion, Hemorrhage, Thrombosis, Embolism, Infarction, Shock.

DISEASES OF IMMUNITY

- General features of Immunity

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- Hypersensitivity reactions
- Immune deficiencies
- Autoimmunity
- Amyloidosis

NEOPLASIA

- Nomenclature of neoplasia
- Molecular basis of neoplasia
- Carcinogenic agents of neoplasia
- Clinical aspects of neoplsia

MICROBIOLOGY

THE BACTERIA

- Bacterial cell structure, its forms and function
- Identification and classification of bacteria
- Gram stain

METHODS OF STUDYING MICRO-ORGANISM

- Culturing, inoculation and identification
- Types of medicine
- 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 and its pathogenesis.
- Gateway to infection.
- Resident flora and its mechanism of invasions
- Classic stages of clinical infection
- Sterilization and disinfection.

RECOMMENDED BOOKS

1. Goodman CC & Fuller KS. Pathology: implication for the Physical Therapist. 4th ed. Elsevier:USA;2015
2. Kumar V, Abbas AK, &Aster JC. Robbins basic pathology. 9th ed. Elsevier: Philadelphia; 2013.
3. Levinson W. review of medical microbiology & immunology. 14th ed. McGraw-Hill: Canada; 2016
4. Thomson AD & Cotton RE. Lecture notes on pathology. 3rd ed. FA Davis; 1983

2.PHARMACOLOGY & THERAPEUTICS- I

CREDIT HOURS 2(2-0)

COURSE DESCRIPTION

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This course deals with pharmacodynamics, pharmacokinetics, clinical/therapeutic uses and toxicology of drugs. Emphasis is given on how a drug works to anticipate when giving a drug to a patient are of paramount importance include administering drugs, calculating medication dosages based on given setting, assessing drug effects, intervening to make a drug more tolerable, and providing teaching about drugs and the drug regimen.

LEARNING OBJECTIVES

- Discuss prescription and/or over-the-counter medications used in the management of a variety of patient conditions encountered during physical therapy management.

COURSE CONTENTS

GENERAL PRINCIPLES OF PHARMACOLOGY

- Various principal of pharmacology
- Introduction to pharmacokinematics
- Various drug dosage forms and pharmacological doses
- Various routes of drug administration and their advantages/ disadvantages
- Factors modifying drug absorption and distribution
- Major mechanisms responsible for drug metabolism
- Factors modifying drug metabolism
- Basic principles of drug excretion
- Factors modifying drug excretion
- Various mechanisms by which drugs exert their effects
- Various types of pharmacological graphs
- Identification of the therapeutic index and therapeutic window on a given dose response curve

DRUG USED TO TREAT PAIN AND INFLAMMATION

- Therapeutic uses of opioid analgesics.
- Classification of non-steroidal anti-inflammatory drugs on the basis of mechanism of action.
- Pharmacological management of rheumatoid and osteoarthritis.
- Patient control analgesia

PHARMACOLOGY OF CENTRAL NERVOUS SYSTEM

- Classification of the drugs, which modulate the central Nervous System according to their general principles, selectivity, specificity and mode of action.
- Pharmacokinetics, clinical uses, contraindications, adverse effects and toxicity of drugs acting on above receptor system
- Sedative, hypertonic and anxiety agents
- Drugs used to treat effective disorders depression and manic depression
- Antipsychotic and antiepileptic drugs
- Pharmacologic management of Parkinson disease

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- General and local anesthetics

DRUGS AFFECTING SKELETAL MUSCLE

- Skeletal Muscle Relaxants

AUTONOMIC AND CARDIOVASCULAR PHARMACOLOGY

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

RECOMMENDED BOOKS

1. Ciccone CD. Pharmacology in rehabilitation. 5th ed. United states: Cardiopulmonary Perspectives in Rehabilitation; 2015.
2. Whalen K, Finkel R &Panavelil TA, editors. Lippincott Illustrated reviews: pharmacology. 6th ed. Philadelphia: Wolters Kluwer; 2015
3. Cheema M. multi author textbook of pharmacology and therapeutics. Lahore. National Medical Publication; 2015: 1.
4. Cheema M. multi author textbook of pharmacology and therapeutics. Lahore: National Medical Publication; 2015: 2

• 3.PHYSICAL AGENTS & ELECTROTHERAPY-I

CREDIT HOURS 3(2-1)

COURSE DESCRIPTION

This course deals with the Physical principle associated with Electrotherapy and methods used in the field of Physical Therapy.

LEARNING OBJECTIVES

- Discuss in detail the information about the physiological and therapeutic uses, risks, preventions and knowledge of indications and contraindications on the type of electric current to be used in different disorders
- Demonstrate fundamental skills that will be used to train in electrotherapy modalities according to the need of patient

COURSE CONTENTS

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.

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- 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)
- Dia-Dynamic currents

TRANSCUTANEOUS ELECTRICAL NERVE STIMULATOR (TENS)

- TENS
- Characteristics of TENS
- Modes, pain theories, pain modulation and technique of application of TENS
- Therapeutic uses, contraindications and dangers of TENS
- Clinical method of application and dosage

FARADIC AND FARADIC TYPE CURRENT

- Faradic and Faradic type current.
- Explain true Faradic current
- Therapeutic effects, mode of applications, contraindications and dangers of Faradic current?
- Clinical method of application and dosages of Faradic current

SINUSOIDAL CURRENT

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

GALVANIC DIRECT CURRENT AND INTERRUPTED DIRECT CURRENT (DC &IDC)

- Galvanic Current & IDC.
- Production and transmission of galvanic & IDC.
- Effects, uses, contraindications and dangers of DC & IDC.
- Dosages and clinical methods of application of DC & IDC

MODIFIED GALVANIC CURRENT

- Modified galvanic currents
- Physical and Therapeutic effects
- Uses

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- Treatment techniques & methods of application
- Electrical stimulation of nerve & muscle
- 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 and Lower motor neurons and Muscular disease

DIDYNAMIC CURRENT

- Didynamic current
- Explain characteristics, derivatives and effects of Didynamic current
- Explain the technique of application, therapeutic uses, contraindications and dangers
  - Example: Sprain ankle, Sciatica. Facial neuralgia. Trigeminal neuralgia & Otitis media
- Clinical method of application and dosage

MEDICAL IONIZATION

- Describe Theory& proof of ionization
- Discuss Effects of various ions; iodine, salycylate, albucid, copper, zinc histamine, carbacol, renotinenovocaine, lithium
- Describe Techniques of medical ionization with vasodilator drugs
- Discuss Techniques for special areas.

ELECTRO-DIAGNOSTICS

- What are the use of electrical changes in evaluation and diagnosis?
- What are Faradic & I. D. C test
- What is Accomodity test
- Explain the physiological changes in Peripheral nerve.
- Give an assessment of nerve and muscle potential.
- What do you about Electromyography? Explain briefly.
- Give an assessment by observing the results of stimulating nerve and muscle.
- Explain muscle contraction.
- Give SDCT (Strength Duration Curve Test).
- Explain Evoked potentials.

MEDIUM FREQUENCY CURRENT

- Define Russian current,
- Explain the technique of application, contraindications and dangers of Russian current.
- Explain clinical method of application and dosage
- Define IFC,
- What are the characteristics, effects, technique of application and therapeutic uses

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- Explain the contraindications, dangers and clinical method of application of IFC.

SUPER IMPOSED CURRENT

- Give Introduction
- Definition
- Describe Effects & uses, Technique, Methods, Dangers and Precautions

HIGH VOLTAGE CURRENT (HVC)

- Define HVC, Explain the characteristics, effects and uses of HVC.
- Explain the technique of application of HVC.
- What are the contraindications and dangers of HVC
- What is the clinical method of application and dosage of HVC

HIGH FREQUENCY CURRENTS

- Introductions of high frequency currents
- Describe Productions of high frequency currents
- Describe Uses, indication, contraindications & methods of applications of high frequency currents

LAB WORK

- Location of motor points
- Faradic & I.D.C test
- Strength duration curve, determination of Rheobase and Chronaxie
- Accommodity test
- Electromyography
- Definition, method, value, uses of E.M.G, Electromyography & temperature, feedback techniques
- Practical application of TENS in physical therapy treatment
- 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 BOOKS

1. Savage B. Practical electrotherapy for physiotherapists. UK: Faber; 1960.

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2. Scott PM. Clayton's electrotherapy and actinotherapy. 7th ed. USA: Williams & Wilkins: 1980.
3. Watson T. Electrotherapy: evidence-based practice. 12th ed. Edinburgh: Churchill Livingstone; 2008
4. Cameron MH. Physical agents in rehabilitation: from research to practice. 4th ed. St. Louis: Elsevier; 2013.
5. Singh J. Textbook of electrotherapy. 2nd ed. India: Jaypee; 2012

4. THERAPEUTIC EXEDRCISES &TECHNIQUES

CREDIT HOURS 3(2-1)

COURSE DESCRIPTION

This course presents anatomical and physiological principles to allow students to develop integrated therapeutic exercise interventions. Students have the opportunity to develop an acquired understanding of physiological responses to various types of training and develop skills in prescription, implementation, and modeling of exercise programs. Exercise components of strength, aerobic/ anaerobic conditioning, flexibility, balance and stage of healing/rehabilitation are examined. Evidence of appropriate, safe and effective exercise design and proper exercise biomechanics and prescription parameters are addressed with all interventions. Exercise considerations for special populations and across the age span are covered. Concepts are presented in lecture and practiced in the laboratory

LEARNING OBJECTIVES

- Defines & Explain types of physical therapy techniques and exercises
- Demonstrate best practices associated with injury and its rehabilitation
- Discuss strategies to improve movement and function, relieve pain and extend mobility potential.

COURSE CONTENTS

THERAPEUTIC EXERCISE: FOUNDATIONAL CONCEPTS

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

APPLIED SCIENCE OF EXERCISE AND TECHNIQUES

- Define Range of motion, Types of ROM exercises, its indications and goals.

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- Discuss Limitations of ROM exercises with Precautions and contraindications.
- Describe Principles and procedures for applying ROM Techniques: Self-assisted ROM, continuous passive motion and ROM through functional patterns.

STRETCHING FOR IMPAIRED MOBILITY

- Define terms related to mobility and stretching
- Discuss Properties of soft tissue–response to immobilization and stretch
- Discuss determinants, types, and effects of stretching interventions
- Describe Procedural guidelines for application of stretching interventions
- Explain Precautions during stretching
- Discuss Adjuncts to stretching interventions
- Explain Manual stretching techniques in anatomical planes of motion.

PERIPHERAL JOINT MOBILIZATION

- Define terms: mobilization/manipulation, self-mobilization (auto-mobilization), mobilization with movement, physiological movements, accessory movements, thrust, manipulation under anesthesia, muscle energy
- Discuss Basic concepts of joint motion: arthro kinematics
- Discuss Indications and Limitations of joint mobilization techniques with its contraindications and precautions
- Discuss Procedures for applying passive joint mobilization techniques
- Discuss Mobilization with movement: principles of application
- Discuss 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

- Define Muscle performance
- Discuss types of resistance exercise with its guiding principles
- What are Determinants of an resistance exercise program
- Discuss General Principles of Resistance Training with Precautions For and Contraindications to resistance exercise
- Define Manual resistance exercise with its guidelines
- What are Physiological changes that occur with training
- Discuss Skeletal muscle function and its adaptation to resistance exercise
- Discuss special considerations, techniques with general background for upper extremity and lower extremity

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- Describe Proprioceptive neuromuscular facilitation, its principles, procedures and basic and specific Techniques
- Discuss Diagonal patterns of PNF with reference to upper and lower extremity.
- Discuss Mechanical resistance exercise and its use in rehabilitation, conditioning programs with special considerations for children and older adults
- Discuss Selected resistance training regimens
- Discuss Equipment for resistance training

PRINCIPLES OF AEROBIC EXERCISE

- Discuss Application of principles of an aerobic conditioning program for the patient with coronary disease for both inpatients and multiple phases of outpatient
- Discuss special considerations and adaptive changes
- Discuss Applications of aerobic training for the de-conditioned individual and the patient with chronic illness in different Age group.

AQUATIC EXERCISE

- Define aquatic exercises with its Background and principles,
- Identify Goals, indications, Precautions and contraindications to aquatic exercise
- Discuss Properties of water, Aquatic temperature and therapeutic exercise
- What are the Special equipment for aquatic exercise
- Discuss Exercise interventions using an aquatic environment such as stretching exercises, Strengthening Exercises and Aerobic Conditioning.

LAB WORK

- Range of Motion of all joints of upper limb, lower limb & spine
- Stretching of all muscle groups of upper & lower limbs
- Resisted exercises of all muscle groups of upper & lower limbs
- Peripheral joint mobilization of all joints of upper & lower limbs
- Aerobic exercises for children, adults, old age, coronary artery disease, deconditioned & chronic illness individuals
- Balance training for static & dynamic postures with different activities of upper and lower limbs
- Hydrotherapy stretching & strengthening exercises of all muscle groups of upper limb, lower limb, spine including PNF patterns.

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

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also contain a record of the procedures which student performs/observes during course of study

RECOMMENDED BOOKS

7. Kisner C & Colby LA. Therapeutic exercise: foundations & techniques. 6th ed. Philadelphia: FA Davis; 2012.
8. Bandy WD & Sanders B. Therapeutic Exercise for physical therapist assistants: techniques for intervention. 3rd ed. Wolters Kluwer; 2012.
9. Sullivan PE and Markos PD. Clinical decision making in therapeutic exercise. Appleton & Lange; 1994.
10. Connolly BH & Montgomery P. Therapeutic exercise in developmental disabilities. 3rd ed. Slack; 2004.

5.BIOCHEMISTRY-II

CREDIT HOURS 3(2-1)

COURSE DESCRIPTION

This course will provide the knowledge and skills in fundamental organic chemistry and introductory biochemistry that are essential for further studies. It will also cover the 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 course also covers the section of nutritional biochemistry

LEARNING OBJECTIVES

- Explain biochemical description of different human tissues
- Describe respiration at cellular and molecular level
- Explain metabolism of carbohydrates, protein and lipids

COURSE CONTENTS

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

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- 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

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18. Serum Urea Estimation
19. Serum Creatinine Estimation

RECOMMENDED 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.

6. MEDICAL PHYSICS

CREDIT HOURS: 2(2-0)

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, electromegnetic radiations and their effects & application in physical therapy

LEARNING OBJCTIVES

- Describe basic principles of physics used in electromedical equipment
- Define laws of physics various aspect of physical phenomena and their interaction with human body
- Descibe 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

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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 affects 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 withmeters
- Electromagnetic induction
- Faraday's 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 Multivibrators circuit

CLASSIFICATION OF CURRENTS (OVERVIEW)

LOW FREQUENCY CURRENT

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

MEDIUM FREQUENCY CURRENT

- Interferential current
- Russian current.

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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

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- Effect of ionizing and non-ionizing radiation
- Internal and external hazards
- Main principle to control external hazard
- Distance and shielding

RECOMMENDED BOOKS

1. Clayton's Electrotherapy and actinotherapyby: 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-Instrumention by Richard A. Normann.
6. Hand book of Biomedical Instrumentation by R. S. Khanpur
7. Basic Radiation Protection Technology by Gollnick

6- SUPERVISED CLINICAL PRACTICE-I

CREDIT HOURS 3(0-3)

HISTORY TAKING

SEMESTER	SUPERVISION	FOCU	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

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- Growth and development
- Lab values
- Imaging
- Consultations
- Documentation of the history.

Note

It is mandatory for each student to document minimum 16 cases per semester (1 cases per week) in clinical logbook duly checked and signed by clinical supervisor on weekly basis and head of institute at completion

Incharge

Topic	Details
Semester/Level	In some discipline 5th semester and in some discipline 6th Semester/ BS (5th Semester intake) 1st / 2nd
Course Code	URCG-5111
Course Title	Translation of the Holy Quran - III
Credit Hours	1(0-1)
Objectives	• To introduce ethics and highlight its importance, need and relevance for individual and collective life. • To illuminate the students with the Quranic norms of Morality i.e. truthfulness, patience, gratitude, modesty, forgiving, hospitality etc. • To familiarize the students with immoral values like falsify, arrogance, immodesty, extravagance, backbiting etc. • To inculcate ethical and moral values in our youth. • To develop a balanced dynamic and wholesome personality. • To introduce the students to Quranic Arabic grammar in practical manner.
Course Contents:	o اخلاق (تعارف، ضرورت واہمیت، اقسام، معنویت) اخلاق حسنہ: • برائی کو نیکی سے مٹانا • نیکی کے کاموں میں مسابقت • لوگوں کے درمیان صلح • عدل وانصاف • سچائی • ایثار • سلیم قلب • مہمان نوازی • لغویات سے اعراض • عاجزی وانکساری • نگاہ اور آواز کو پست رکھنا • چال میں میانہ روی • شرمگاہوں کی حفاظت • صبر • شکر • امور میں میانہ روی اخلاق سیئہ: • ظلم اور زیادتی • غرور وتکبر • نفسانی خواہشات کی پیروی • بدگمانی • جھوٹ • چغلی اور تہمت

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	• تمسخر اور شیخی خوری • لہو ولعب • برے ناموں سے پکارنا • احسان جتانا اور تکلیف دینا • فضول خرچی اور حد سے بڑھنا • حسد اور تنگ دل • بے پردگی
Grammar:	• قرآنی عربی گرامر کے اصول اور انکے اطلاقات (متن قرآنی پر اطلاق سے توضیحات)
Details of Chapters and verse Numbers:	• منتخب آیات مع ترجمہ و تجوید • البقرہ(۱۱۲،۲۳۵،۸۳،۸۴۲،۱۷۲،۱۵۲،۱۷۲،۵۳،۱۵۳،۲۵۰،۲۵۵،۲۲۲،۲۷،۲۷۷،۱۸۲،۱۳۸،۱۸۷،۱۰۹،۲۶۴،۲۶۳،۲۶۲، ۳۱۲،۶۷،۲۳۱،۴۰،۳۴،۱۲۴،۲۵۸،۲۷،۱۷۱،۸۳،۲۳۶،۱۹۵،۲۶) • آل عمران(۱۵۴،۱۳،۱۸۵،۲۴،۱۳۲،۱۳۸،۱۳۴،۱۳۵،۱۷،۲۰۰،۱۲۵،۱۳۳،۱۱۴،۱۰۴،۱۰۳،۲۶،۱۴۱،۱۴۷،۱۵۹) • النساء(۱۳۵،۲۳،۲۲،۱۰۸،۱۰۷،۱۰۵،۱۰۴،۲۰،۲۷،۱۷۳،۳۶،۲۵،۲۴،۴۷،۵۷،۲۴) • المائدۃ(۵۸،۵۷،۹۳،۱۳،۶،۳۱،۱۹) • النحل(۱۲۶،۹۰،۱۰۵،۱۱۳،۳۰،۱۲۶،۱۲۵) • الرعد(۲۵،۲۰،۲۴،۲۲،۶) • الاعراف(۳۱،۶۶،۵۱،۱۳۶،۴۰،۲۰،۴،۱۴۴،۱۹۹،۹۵،۸۱) • القصص(۵۴،۸۴) • فصلت(۳۴) • الانعام(۳۲،۷۰،۷۰،۱۳۰،۱۵۵،۱۶۰) • النمل(۹۰،۳۶) • الحج(۳۰،۵۸،۶۰،۸۸،۷۷) • الحجرات(۹،۱۱،۶،۱۱،۳،۱۲،۱۵،۱۰) • الاحزاب(۲۳،۵۰،۵۸،۵۸،۵۲،۵۵،۵۹،۳۵،۲۴،۳۵) • الحشر(۹) • طٰہٰ(۷۲) • الانعام(۱۶۴،۱۴۱،۱۱۶،۱۵۱،۶۳،۱۲۷) • ق(۳۴) • الانفال(۲۷،۳۶،۶۱) • الفتح(۱۵) • یونس(۱۰،۱۹،۶۲،۲۲،۲۲) • الفرقان(۶۳،۲۱،۶۷،۶۳) • النور(۲۳،۶،۳۰،۳۱،۳۳،۶۱،۳۱،۲۲) • لقمان(۶،۳۳،۱۹،۳۲،۱۸) • الاسراء(۳۷،۱۱۰،۵،۳۷) • المزمل(۱۸) • المدثر(۶،۳) • المدثر(۴۳) • فاطر(۳۲) • الفتح(۲۹)

Incharge

	▪ البلد(۷۶) ▪ الزمر(۱۰،۳) ▪ الحجر(۸۵) ▪ النجم(۳۱) ▪ الرحمٰن(۶۰) ▪ ھود(۳،۱۰۲،۸) ▪ الکہف(۵۶،۲) ▪ الشوریٰ(۳۷) ▪ غافر(۲۷،۳۸) ▪ الحدید(۲۰،۲۰) ▪ مریم(۵۹) ▪ النازعات(۴۱) ▪ التوبہ(۷۷،۶۳،۶۵) ▪ الھمزہ(۱)	

Department of Allied Health Sciences
Sargodha Medical College
University of Sargodha

SIXTH SEMESTER

1. PATHOLOGY & MICROBIOLOGY-II
2. PHARMACOLOGY & THERAPEUTICS-II
3. PHYSICAL AGENTS & ELECTROTHERAPY-II
4. MANUAL THERAPY
5. COMMUNITY MEDICINE & BEHAVIORAL SCIENCES
6. SUPERVISED CLINICAL PRACTICE - II

1. PATHOLOGY & MICROBIOLOGY-II

CREDIT 3(2-1)

COURSE DESCRIPTION

This course will cover the basic concepts, terminology, etiology, and characteristics of pathological processes. The course includes the diseases of the Integumentary System, Cardiovascular System, the Lymphatic System, the Respiratory System, the Nervous System, and Pathology of the musculoskeletal System, Pathology of Aging and medical microbiology. Also help the student to provide with a working knowledge of clinical pathology lab importance in Physical Therapy

COURSE OBJECTIVES

- Describe consequences of pathologic processes on the structure and function of the human body.
- Discuss selected disorders/diseases common to acute care in the physical therapy.
- Explain normal structure and function, in relation to disease processes in the physical therapy.

COURSE CONTENTS

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

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- 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.

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 Tumours
- Primary Malignant Bone Tumours

- Multiple Myeloma
- Primary Soft Tissue Tumours
- Metastatic Tumours.

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 Tumours
- Specific Primary Brain Tumours
- Primary IntraspinalTumours
- Metastatic Tumours
- Paraneoplastic Syndromes
- Leptomeningeal Carcinomatosis
- Pediatric Tumours.

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

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- Staphylococci
- Streptococci.

G -VE COCCI
- Nessessia.

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.

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 tumour
- Examination of urine.

RECOMMENDED BOOKS
1. *Pathology: implications for the Physical therapist* by: Catherine Cavallaro Goodman, 4th edition
2. *Basics &advanced Human Pathology* by Robbins 9th edition

3. *Lecture notes on Pathology by* Thomas and Cotton Published by Blackwell Scientific Publications, Oxford
4. *General Pathology* by Lord Horward Florey 4th edition by Lloyd-Luke (Medical Books) Ltd
5. *Medical Microbiology and Immunology* By: Levinson and Jawetz, 9th Ed., Mc Graw-Hill.

2. PHARMACOLOGY & THERAPEUTICS-II

CREDITHOURS 2(2-0)

COURSE DESCRIPTION

This course is designed to acquaint the students with the study of properties, effects, and therapeutic value of the primary agents in major drug categories. The topics include pharmacology of the respiratory system, gastrointestinal system, treatments of infectious diseases, and the drugs used in iontophorosis and phonophoresis

LEARNING OBJECTIVES

- Describe theoretical background of pharmacological treatment in physical therapy.
- Explain pharmacological background for clinical treatment of patient referred to physical therapy.
- Define basic principles and drugs for respiratory system, gastrointestinal system and disorders in endocrine system.
- Discuss basic principles and drugs of anti-microbial, antiviral drugs, immunosuppressive drugs and drugs used in iontophorosis and phonophorosis

COURSE CONTENTS

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 Iontophorosis and Phonophrosis
- Potential Interactions between Physical Agents and Therapeutic drugs.

RECOMMENDED BOOK

1. Pharmacology in Rehabilitation (5rd Edition-2015) By Charles D. Ciccone.
2. Pharmacology, Richard A, Harvey, 3rd Edition, Lippincott's.
3. A Textbook of Clinical Pharmacology and Therapeutics, 5th Edition by James Ritter 2012

3. PHYSICAL AGENTS & ELECTROTHERAPY-II

CREDIT HOURS 3(2-1)

COURSE DESCRIPTION

This course covers the basic principle of electrotherapy modalities used in physical therapy, including thermal, mechanical, physical agents and electromagnetic tools. Also help to understand the Indication, Contraindication and Methods of application in physical therapy.

LEARNING OBJECTIVES

- Explain physiological basis of different modalities
- Discuss selection of appropriate modalities in different condition
- Demonstrate the application of thermal, mechanical & electromagnetic tools in different conditions

COURSE CONTENTS

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 Vapour Lamp: Air cooled mercury vapour 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.

HELIOTHERAPY

- 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

Incharge

- Immersion baths, full, plain and medicated, partial baths, packs, general local methods of application
- Hot air, vapors, the car 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

LAB WORK

- The practical training will be practiced in physiotherapy treatment ward under the supervision of qualified physiotherapists.
- Practical application of Interferential therapy
- 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
- Supervised application of Wax therapy
- Practical application of Infra-red Rays
- Practical application of Mechanical traction
- Supervised application of Hot packs, Electric Heating pads
- Paraffin Wax bath application
- Practical application of SWD
- Practical application of LASER
- Supervised application of Shock wave therapy
- Practical application of Magnetic therapy
- 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 BOOKS

1. Clayton's Electrotherapy and Actinotherapy, 10th edition by PM Scott.

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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.
7. Textbook of Electrotherapy & Practical application by Jagmohen Singh 2nd Edition

4. MANUAL THERAPY

3(2-1)

COURSE DESCRIPTION

This course provides review of all Manual Therapy techniques, covering spine, peripheral joint mobilizations, Temporo-Mandibular joint, advanced myofascial trigger point therapy, Proprioceptive training, muscle energy techniques, strain counter strain techniques, neuromobilization combination techniques and mobilization, manipulation techniques.

LEARNING OBJECTIVES

- Discuss various concepts of manual therapy techniques
- Discuss principles of manual therapy
- Demonstrate skills in application of manual therapy techniques

COURSE CONTENTS

FOUNDATION CONCEPTS TO MANUAL THERAPY

OMT 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
- Non resting positions
- Joint locking
- Bone and joint movement
- Rotations of a vertebral bone
- Standard bone movements
- Combined bone movements
- Coupled movements
- Non coupled 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 Kaltenborn Treatment Plane
- Translatoric Joint Play Movements
- Determining the direction of restricted gliding
- Glide test
- Kaltenborn 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

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- 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

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- 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

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- 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

PERIPERAL JOINT MOBILIZATION TECNIQUES

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.

LAB WORK

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 BOOKS

1. *Manual Mobilization of the Joints TheKaltenborn Method of Joint, Examination and Treatment Volume I, The Extremities* By. Freddy M. Kaltenborn in collaboration with Olaf Evjenth,

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TraudiBaldauf. Kaltenborn, Dennis Morgan, and Eileen Vollowitz,OPTP Minneapolis, Minnesota, USA.
2. *Manual Therapy* By: Ola Grimsby, the Ola Grimsby institute San Diego.
3. *Integrative Manual therapy for the upper and lower extremities* By: Sharon weiselfish, North Atlantic books Berkeley, California.
4. *Orthopedic manual therapy an evidence-based approach* by: Chad Cook.
5. *Orthopaedic Manual Therapy Diagnosis Spine and Temporomandibular Joints* By: Aad van der.
6. *Translatoric Spinal Manipulation* By: John R. Krauss, Olaf Evjenth, and Doug Creighton John R. Krauss A Lakeview Media L. L.C. Publication.
7. *euromusculoskeletal Examination and Assessment A Handbook for Therapists.*
8. By: Nicola J Petty, Ann P Moore &G D Maitland, Second Edition Churchill Livingstone.
9. *Myofascial Manipulation Theory and Clinical Application*, Second Edition By: Robert I. Cantu, Alan J. Grodin an Aspen Publication Aspen Publishers, Inc. Gaithersburg, Maryland 2001.
10. *Maitland's Vertebral Manipulation* Seventh Edition By: Geoffrey D. Maitland.
11. *Musculoskeletal manual medicine, diagnosis and treatment by* Jiri Dovark, Vaclav Dovark, Werneir Schneider etc.
12. *Manual therapy, NAGS, SNAGS, MWMS etc*by Brian R Mulligan fifth edition.

3. COMMUNITY MEDICINE & BEHAVIOURAL SCIENCES
CREDIT HOIURS 3(3-0)

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 Programs, Health care delivery in the community, National Health Policy, National Health programs including, Rehabilitation, Evaluation of Health Programs, Health Planning Organization.

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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, Spina 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.

INTRODUCTION OF BEHAVIORAL SCIENCES
Define Behavioral Sciences, Discuss its importance In health, Discuss Bio-Psycho-Social Model of Healthcare

BEHAVIOR OF INDIVIDUAL
Nature/nurture debate
Behaviorism and learning theories
Behavioral modifications

COGNITION
cognition
cognitive development throughout lifespan

SCIENCE OF RELATIONSHIP
Define and discuss communication skills, its types, modes, barriers and factors affecting
Discuss Counseling: steps, scope, indication and contraindications in health setting
Discuss conflict management: Dealing with real life crisis and conflict situations in health settings
Discuss interviewing and its psychosocial factors in health care.
Define clinician-patient / client relationship
Discuss Concept of boundaries and psychological reactions in clinician – patient relationship such as transference and counter transference.
Discuss Problem solving and decision making strategies in health care

STRESS MANAGEMENT
Define and classify of stress
Discuss effects of stress on health and coping strategies
Discuss Relationship of stress and stressors with illness
Define Anxiety
Discuss Psychological defense mechanisms, Adjustment and maladjustment

APPLICATION OF BEHAVIORAL PRINCIPLES IN HEALTH AND DISEASE
Importance of psychological consideration in physical therapy management of
- Mentally, emotionally and physically compromised patients
- Terminally Ill and home bound patients

ETHICS
Define ethics, medical ethics, and values, value system, virtues, mores, moral rules and morality
Discuss ethical theories
Discuss principle based approach for physical therapist in ethics such as;
- Non-maleficence, beneficence, autonomy, fidelity, veracity, paternalism, and Justice.

Discuss code of ethics for physical therapist
Discuss ethical dimension of the physical therapist patient relationship, confidentiality, information sharing, and informed consent and ethical dilemmas

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
7. Rana MH, Ali S & Mustafa M. A handbook of behavioral sciences for medical and dental students. 2nd ed. Lahore : university of health sciences; 2013.
8. Dowrick C. Medicine in society: behavioral sciences for medical students. CRC Press; 2001
9. Billingham KA, Feldman HS & Lopez MA. Developmental psychology for health care profession. Michigan: westviewpress ;1982.
10. Purtilo RB & Doherty RF. Ethical dimensions: in the health professions. 6th ed. St. Louis: Elsevier; 2016
11. Veatch RM. Medical ethics. 2nd ed. USA: Jones & Bartlett. 1997

6. SUPERVISED CLINICAL PRACTICE-II

CREDIT HOURS 3(0-3)

'SYSTEMS REVIEW

SEMESTER	SUPERVISION	FOCUS	WARDS	COMPETENCIES
6	SUPERVISED BY TRAINED PT	SYSTEMS REVIEW	ALL WARDS	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

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- 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 (balance, gait, locomotion, transfers, and transitions) and motor function (motor control and motor learning).
- Documentation of all listed competencies in SOAP notes format

Note

It is mandatory for each student to document minimum 16 cases per semester (1 cases per week) in clinical log book duly checked and signed by clinical supervisor on weekly basis and head of institute at completion

SEVENTH SEMESTER

1. **MEDICINE - I**
2. **SURGERY - I**
3. **RADIOLOGY & DIAGNOSTIC IMAGING**
4. **MUSCULOSKELETAL PHYSICAL THERAPY**
5. **CLINICAL DECISION MAKING & DIFFERENTIAL DIAGNOSIS**
6. **SUPERVISED CLINICAL PRACTICE-III**
7. **TRANSLATION OF THE HOLY QURAN – IV (*Non-Credit*)**

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1. 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 systemic diseases, focusing on epidemiology, pathology, histology, etiology, as well as primary and secondary clinical characteristics and their management.

LEARNING OBJECTIVES

- Describe medical terminologies, abbreviations, epidemiology, etiology, primary and secondary clinical characteristics of Cardiovascular, Rheumatology and bone, and Respiratory diseases.
- Explain briefly an overview of medical management of listed diseases/disorders.

COURSE CONTENTS

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

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- 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
- Pharangitis
- Acute laryngeo-trcheobronchitis
- Influenza
- Inhalation of the foreign bodies.

DISEASE OF LOWER RESPIRATORY TRACT

- Acute & chronic Bronchitis
- Bronchiectasis
- Cystic fibrosis

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- Asthma
- Emphysema
- Pneumonias
- Tuberculosis
- Pulmonary fibrosis
- Radiation damage
- Common tumours 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 BOOKS

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

2. SURGERY-I

CREDIT HOURS 3(3-0)

COURSE DESCRIPTION

This course intends to familiarize the students with principles of othopaedic surgery along with detail description of surgical terminologies 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.

LEARNING OBJECTIVES

- Describe in detail surgical terminologies, abbreviations, etiology, primary and secondary clinical characteristics, classifications, indications and complications for surgeries listed orthopedic conditions
- Explain briefly an overview of surgical management of the listed conditions.

COURSE CONTENTS

ORTHOPEDIC SURGERY FRACTURES

- Definition

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- 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 & management of traumatic dislocation/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
- Cervico-lumber injuries
- Whiplash of the cervical spine
- Crush injuries
- Spinal pain
- Degenerative and Inflammatory Conditions:
- Osteo-orthosis/Arthritis
- Spondylosis

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- 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

TUMOURS

- 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

- Torticolis
- Scoliosis
- Kyphosis
- Lordosis
- Flat back.

DEFORMITIES OF THE LOWER LIMB

- CDH
- Coxavera
- Coxavalga
- Anteversion
- Retroversion
- Genu valgum
- Genu varum
- Genu recurvatum
- CDK
- Talipescalcaneous equines, varus& valgus
- Talipescalcaneovarus
- Talipescalcaneovalgus
- Talipesequinovarus
- Pescavus
- Pesplanus
- Hallux valgus &varum,
- Hallux rigidus and hammer toe.

DEFORMITIES OF SHOULDER AND UPPER LIMB

- Sprengels shoulder
- Cubitusvarum
- Cubitusvalgum
- Deputryn's contracture.

RECOMMENDED BOOKS

1. Short practice of surgery by Baily and Love's.
2. Text Book of Surgery by Ijaz Ahsan.
3. Outline of Fractures.

3. 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.

- **LEARNING OBJECTIVES**

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- Describe in detail examination and understanding of radiological imaging (X-Rays) of Extremities, Spine and Chest.
- Explain briefly an overview of radiological imaging including Mammography, Fluoroscopy, Computer Tomography, Magnetic Resonance Imaging, Ultrasound, Endoscopy, Nuclear Medicine and Interventional Radiology.
- Explain briefly indications to prescribe X-Rays, Mammography, MRI and Ultrasound.

COURSE CONTENTS

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

- 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)

- 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)

- MRI
- Equipment used for MRI
- Indications and Contra indications

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- 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

- 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

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

INTERVENTIONAL RADIOLOGY

RECOMMENDED BOOKS

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

4. MUSCULOSKELETAL PHYSICAL THERAPY

CREDIT HOURS 3(2-1)

COURSE DESCRIPTION

This course includes a study of applied anatomy and physiology of the musculoskeletal system and pathological changes of the system and function, including diagnostic tests and measurements. The use of evidence-based physical therapy intervention for musculoskeletal conditions will be emphasized. The course will focus on medical terminologies, clinical examination, evaluation, comparing contemporary,

traditional interventions and the impact of evolving technology in the area of musculoskeletal physical therapy

LEARNING OBJECTIVES

- Describe in detail applied anatomy and physiology of the musculoskeletal system.
- Explain physiotherapy terminologies regarding musculoskeletal system.
- Describe in detail principles and concepts of musculoskeletal physical therapy examination, evaluation, assessment, documentation and management.

COURSE CONTENTS

MEDICAL TERMINOLOGY REGARDING MUSCULOSKELETAL SYSTEMPRINCIPLES 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
- 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

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- 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.

EXERCISE INTERVENTIONS BY BODY REGION
THE SPINE AND POSTURE: STRUCTURE, FUNCTION, POSTURAL IMPAIRMENTS & MANAGEMENT GUIDELINESPOSTURE 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 Hypomobility: 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 post-operative 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

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- 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: non-operative 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: non-operative management
- Joint surgery and post-operative management
- Fractures of the hip–surgical and postoperative management
- Painful hipsyndromes/overuse syndromes:non-operative 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: non-operative management
- Joint surgery and post-operative management

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- Patellofemoral dysfunction: non-operative management
- Patellofemoral and extensor mechanism dysfunction: Surgical and postoperative management
- Ligament injuries: non-operative management
- Ligament injuries: surgical and postoperative Management
- Meniscal tears: non-operative management
- Meniscal tears: surgical and postoperative management
- Exercise interventions for the knee
- Exercise techniques to increase flexibility and range of motion.

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: non-operative management
- Joint surgery and post-operative management
- Overuse (repetitive trauma) syndromes: non-operative management
- Ligamentous injuries: non-operative 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

LAB WORK

- Musculoskeletal comprehensive assessment and management of cervical, thoracic, lumbosacral spine disorders including pre and post operative conditions.
- Musculoskeletal comprehensive assessment and management of shoulder, elbow, wrist & hand disorders including pre and post operative conditions.
- Musculoskeletal comprehensive assessment and management of hip, knee, ankle complex disorders including pre and post operative conditions. Comprehensive assessment of posture and gait. Reflective clinical case studies relevant to above mentioned areas.

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

RECOMMENDED BOOKS

1. Therapeutics Exercises and Technique, By: Carolyn Kisner& Lynn Allen Colby 4th 5th edition.

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2. Therapeutics Exercises: Techniques for Intervention By: Willim D.Banddy.
3. Clinical decision making in therapeutic exercise By: Patricia e. Sullivan & prudence d. Markos, Appleton & Lange Norwalk, Connecticut.
4. Hertling, D, and Kessler RM. Management of Common Musculoskeletal Disorders: Physical Therapy Principles and Methods. 3rd ed. Philadelphia, PA: WB Saunders 1995.
5. Orthopaedic Physical Therapy By: Donatelli& Michael J. Wooden 4th Edition.
6. Physiotherapy in Orthopaedics, A problem-solving approach By: Atkinson, Coutts &Hassenkamp2nd Edition.
7. Clinical orthopaedic rehabilitation By S. Brent. Brotzman& Kevin. E. Wilk, 2nd edition, Mosby publishers.
8. Management of Common Musculoskeletal Disorder by: Hertling, D, and Kessler RM Physical Therapy Principles and Methods. 3rd ed. Philadelphia.PA: WB Sunders.
9. Orthopedic Physical Assessment. Magee, D.4th ed. Philadelphia PA: WB Sunders 1995.
10. Physical Rehablitations Assessments and Treatment". By Susan B,O'Sullivan&Thomas J. Schmitz , 4th edition.
11. Tidy's Physiotherapy by Thomas A Skinner & Piercy.

5. 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.

LEARNING OBJECTIVES

- Discuss the screening and differentiate the medical conditions
- Discuss clinical decision making in physical therapy.

COURSE CONTENTS

SCREENING AND INTERVIEWING, THE PT SCOPE OF PRACTICE:

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TO REFER OR TREATINTRODUCTION 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
- Multi segmental 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

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- 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

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- 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

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- 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.

CLINICAL DECISION MAKING (CDM)

- Definition
- Process of CDM
- Skills required for CDM
- Models of CDM

RECOMMENDED BOOKS

1. Goodman CC, Snyder TEK. *Differential Diagnostics for Physical Therapists: Screening for Referral*. Saint Louis, MO: Saunders: Elsevier; 2006. ISBN: 978-0-7216-0619-4.

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2. APTA. *Guide to Physical Therapy Practice: Revised second edition.* Alexandria, VA: American Physical Therapy Association; 2003. ISBN: 978-1-887759-85.
3. Additional readings as assigned by the instructors.

6. SUPERVISED CLINICAL PRACTICE – III

CREDITS 3 (0-3)

MUSCULOSKELETAL

SEMESTER	SUPERVISION	FOCUS	WARDS	COMPETENCIES
7	Supervised by Trained PT	Musculoskeletal	All wards	As 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.

CLINCAL 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
- Bed mobility
- Transfers (level surfaces and floor)
- Wheelchair management

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- 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 nocioception
- 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.

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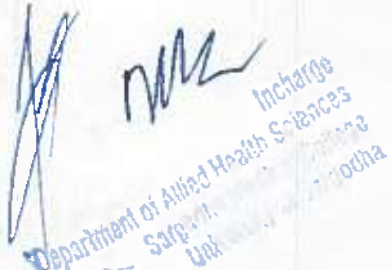
- Remediation of impairments in body function and structure, activity limitations, and participation restrictions with use of orthotic, protective, and supportive device.
- Residual limb or adjacent segment, including edema, range of motion, skin integrity and strength.
- Safety during use of orthotic, 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 (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.

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- Articulate a specific rational 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.

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- 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

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- 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 concentdc, 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

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- 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 non-thrust)
- Spinal and peripheral joints (thrust and non-thrust)
- 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

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- 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(e.g., 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

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- 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

Note
It is mandatory for each student to document minimum 16 cases per semester (1 cases per week) in clinical log book duly checked and signed by clinical supervisor on weekly basis and head of institute at completion

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URCG-5111 **Translation of the Holy Quran – IV** **1 (0+1)**

Topic	Details
Semester/Level	In some discipline 7th semester and in some discipline 8th Semester/ BS (5th Semester intake) 3rd / 4th
Course Code	URCG-5111
Course Title	Translation of the Holy Quran – IV
Credit Hours	1(0-1)
Objectives	• To familiarize the students with commandments of trade and inheritance mentioned in the Quranic text (with the help of Urdu translation). • Students • To introduce the students to scientific facts and miracles of the Holy Quran and Quranic stress on deep study of Allah's explored universe. • To motivate the students for reading and exploring the last Holy Book revealed by Almighty Allah. • Through memorization students will develop their relation with last revelation.
Course Contents:	○ تجارت اور وراثت: • مال کی تقسیم • نادان کا مال • عوام الناس کا مال • عورتوں کا مال • یتیموں کا مال • کفار کا مال • جائداد • معاہدے • رہن • قرض ○ سائنسی حقائق: • تخلیق کائنات • اجرام فلکی • شجر و حجر • زمین و آسمان کے اسرار • ہوائیں اور طوفان • بہائم اور مویشی • حشرات الارض • پہاڑ اور سمندر
Grammar :	• قرآنی عربی گرامر کے اصول اور اسکے اطلاقات (متن قرآنی پر اطلاق سے توضیحات)
Details of	• منتخب آیات مع ترجمہ و تجوید

| Chapters and verse Numbers: | ■ البقرہ(۲۹۱،۲۲۱۵،۲۹۵،۲۱۹،۲۶۴،۲۷۵،۱۸۰،۲۶۵،۱۷۷،۲۶۵،۱۶۰،۲۶۵،۲۷۵،۲۸۲،۲۶۲،۲۷۳،۲۷۱،۸۳،۱۷۷،۲۱۵،۲۷۶،۲۷۸،۱۶۰،۲۷
■ آل عمران(۱۱۷،۱۳۴،۱۳۰،۱۹۰،۲۷،۵۹)
■ النساء(۲۹،۲،۲۹،۱۶۱)
■ المائدہ(۸۹،۹۵،۷۵،۶۹،۶۰)
■ التوبہ(۹۸،۲۳،۶۹،۲۳،۲۴،۶۰،۴)
■ الاعراف(۱۷۲،۱۸۵،۱۷۷،۵۸،۱۶۳،۱۶۰،۴۰،۱۳۳،۱۷۶،۱۶۶)
■ الرعد(۱۷،۴)
■ الطور(۳۴)
■ الانعام(۵۹،۱۶۳،۱۴۱،۱۴۶،۳۸)
■ الانفال(۲۸،۳۶،۴۱)
■ الکہف(۵۱،۱۰۹،۳۷،۳۲،۴۵،۱۷،۳۵)
■ الجاثیہ(۵)
■ فاطر(۲۷،۱۲،۱۳)
■ العنکبوت(۲۰،۶۳،۳۱)
■ الروم(۵۰)
■ الاسراء(۷۰،۹۹)
■ الرعد(۲)
■ السبا(۱۰،۳،۲۲)
■ یونس(۸۸،۱۰۱،۲۳،۲۳،۵۲،۲۲)
■ یوسف(۹۴،۱۴)
■ الفرقان(۶۲،۵۳)
■ لقمان(۲۹،۱۹)
■ طٰہٰ(۱۱۴،۵۳)
■ النحل(۷۵،۱۱،۶۱،۷۹،۴۹،۶۸،۶۸،۱۱۵،۸۰،۸)
■ النمل(۶۴،۸۸،۶۰،۸۲،۱۶،۱۷،۱۸)
■ السجدہ(۲۷)
■ الحدید(۶)
■ ھود(۴۳،۶)
■ یٰسین(۳۷،۴۱)
■ الروم(۳۹،۳۹،۵۰،۱۹،۲۴،۳۶)
■ فصلت(۳۹،۳۹)
■ الحج(۶۱،۶۵،۲۲،۷۳)
■ الحجر(۱۹،۲۲)
■ الانبیاء(۳۱،۳۰،۳۷،۴)
■ الذاریات(۴۷)
■ الزلزلہ(۱)
■ القصص(۷۶،۷۹،۸۰،۸۱،۸۲)
■ النور(۳۷،۴۲،۴۰،۳۵،۴۳)
■ الجن(۱۱،۶۲،۱۰،۱۱،۵) |
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		▪ القمر(۷) ▪ الواقعہ(۶۹) ▪ الفاطر(۲۰،۱۳) ▪ الملک(۱۹) ▪ الصف(۱۰) ▪ الجن(۱۳) ▪ الشوریٰ(۲۸) ▪ الزخرف(۱۱) ▪ الفیل(۱)

EIGHTH SEMESTER

1. MEDICINE - II
2. SURGERY - II
3. PROSTHETICS & ORTHOTICS
4. NEUROLOGICAL PHYSICAL THERAPY
5. SPORTS PHYSICAL THERAPY
6. AI Applications in Health Care
7. SUPERVISED CLINICAL PRACTICE - IV

1. 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 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.

LEARNING OBJECTIVES

- Discuss history and physical examination related to dermatology, diseases of the brain and the spinal cord, renal diseases, blood and other miscellaneous conditions mentioned in the course contents.
- Identify social and psychological components of patients' medical problems.
- Discuss disease process, indications and limitations of clinical sources such as laboratory and roentgen graphic studies, consults, family input and old records to request and interpret data pertinent to problem solving.

COURSE CONTENTS

DERMATOLOGY

- Acne vulgaris
- Psoriasis
- Boils
- Carbuncles
- Alopecia
- Mycosis fungoides
- Polymorphic light eruptions
- Vitiligo
- Pityriasis
- Hyperhydrosis

DISEASES OF BRAIN AND SPINAL CORD

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- Identify the common neurological symptoms including brain death, Sleep, Unconsciousness and Comma.
- Carry out general neurological examination
- Stroke, types of stroke, Parkinsons disease, Epilepsy, Multiple Sclerosis, Infective and Inflammatory diseases, 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
- Different types of Intracranial tumors

RENAL DISEASES

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

DISEASES OF THE BLOOD

- Describe Anaemia, Types of Anaemia, Bleeding and Coagulation, Haemophilia and Thrombosis

MISCELLANEOUS DISEASES

- Describe Diabetes Mellitus and its complications, Diabetic Neuropathy, Diabetic foot and Sterold Induced Myopathy.

RECOMMENDED BOOKS

1. Practice of medicine by: Davidson.
2. Clinical medicine by: Parveen j Kumar & Michael Clark.
3. Short text book by medicine by: M. Inam Danish.
4. Hutchison's clinical methods by: Michael swash. 21st edition
5.

2. SURGERY – II

CREDIT HOURS 3 (3-0)

COURSE DESCRIPTION

This course intends to familiarize students with principles of surgery along with familiarization with terminology and abbreviations for efficient and effective chart reviewing and documentation. It also explores various conditions needing surgical attention, focusing on epidemiology, pathology, as well as primary and secondary clinical characteristics and their surgical management

LEARNING OBJECTIVES

- Demonstrate the pre- and post-operative care of patients.
- Describe presentations of major surgical problems, establish correlations among clinical observation, surgical (operative) pathology, and the physiological alterations achieved through surgery.
- Differentiate the surgical health care delivery to both inpatients and outpatients in a variety of settings

- Describe the surgical management of disease.
- Recognize the entire treatment cycle of the surgical patient from diagnosis to operative management and through recovery.

COURSE CONTENTS

GENERAL SURGERY

- Describe the 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
- Explain chest and abdominal trauma, Hemorrhage, hemostasis and blood transfusion.
- Classification of shock, Fluid and electrolyte balance, Classification of body fluid changes, Pre, intra and post-operative fluid therapy.
- precautions for Surgery in diabetic patients
- Classify Burns, Types and degrees of Burns in pediatric and adults,
- Classify Grafts, Types of Grafts, Identify post- grafting precautions,
- Different types of tumors and their classifications.
- Discuss Preoperative assessment & preparation, Post -operative treatment, complications and their management.
- Describe the Types of anaesthesia, Local anaesthetic agents and Regional anaesthesia (spinal and epidural), Intravenous anaesthetic agents, Muscle relaxants, Inhalational anaesthetic agents, Anaesthesia and associated diseases, Complications of anaesthesia, Perioperative management, Recovery from anaesthesia.
- Review Pain management and postoperative care.
- Identify Ulcers, sinuses and fistulas
- Describe 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
- Describe the Indications of Transplantation, Post- Operative Complications and precautions of Transplantation of liver and kidney.

THORACIC SURGERY

PULMONARY SURGERY

- Explain the Indications of pulmonary surgery, types of incision, types of operation, complications of pulmonary surgery, drains, and tubes.
- Describe pneumonectomy, lobectomy, thoracoplasty and Operations on pleura.

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- Recognize the types of Chest injuries, Causes, management procedures.
- Describe the Diseases of chest wall and pleura, Diseases of bronchi
- Identify different types of Lung tumors and their classifications, Lung abscess, Hydatid disease of lung, pulmonary embolism, Mediastinal masses, Problems related to diaphragm

CARDIAC SURGERY

- Explain the Indications of Cardiac surgery, 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, Congenital heart diseaseAcquired heart diseases,Diseases of the pericardium
- Describe the Indications of Cardiac Transplantation, Post-Operative Complications and precautions of Transplantation.

VASCULAR SURGERY

- Describe the Indications of Vascular surgery, Investigation in vascular disease types of operation, Complication of vascular surgery, arterial occlusion, Gangrene, amputation and its types, 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

- Describe the Indications of Cranial surgery, Special investigation in brain diseases and traumas, Types of operations and complications of cranial surgery
- Explain Traumatic brain injuries, Acute intracranial hematomas and Fractures of the skull
- Describe the Intra cranial abscess, intracranial tumors, intracranial aneurysm and hydrocephalus.

SURGERY OF VERTEBRAL COLUMN, SPINAL CORD AND PERIPHERAL NERVES

- Describe Dislocation and management of dislocation of vertebral column, Tumors of vertebral column
- Explain Prolapse intervertebral disc, Disc protrusion, Spondylosis and spondylolisthesis.
- Classify Spinal cord injuries and syndromes.
- Assess the level, complete and incomplete spinal cord injuries and rehabilitation potential.
- Describe the Surgical, medical Management and post- operative care of Spinal cord injuries.

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- Describe Tumors of spinal cord types of operations performed on nerves, Nerve injuries and their surgical management,
- Describe the lesions of cranial and spinal nerves and their management.

RECOMMENDED BOOKS

- Short practice of surgery by Baily and Love's.
- Text Book of Surgery by Ijaz Ahsan.
- Outline of Fractures by davidhamblen, Hamish Simpsons.
- Outline of orthopedics. By davidhamblen, Hamish Simpsons.

3. 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 to utilize prosthetic or orthotic devices. Basic principles of mechanical physics and material characteristics will be applied.

LEARNING OBJECTIVE

- Describe various types of prosthetics & Orthotics
- Discuss the prescription of orthotics and prosthetics according to the different conditions

COURSE CONTENTS

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

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- 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.

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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 Prostheses for Recreation
- Future Prosthetic Advances and Challenges

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- Future Surgical and Educational Advances and Challenges.

RECOMMENDED BOOKS

1. Prosthetics and Patient Management: A Comprehensive Clinical Approach By: Kevin Carroll; Joan Edelstein.
2. Orthotics a comprehensive clinical approach By: Joan E Eldestein& Jan Bruckner.

4. NEUROLOGICAL PHYSICAL THERAPY

CREDIT HOURS 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. Clinical competence in the evaluation and treatment of persons with neurological impairments is to be developed. It will focus on medical terminology, clinical examination, evaluation, comparing contemporary, traditional interventions and the impact of evolving technology in this area.

LEARNING OBJECTIVES

- Demonstrate assessment of patients with various neurological pathologies.
- Explain various intervention strategies & procedures to manage patients with various neurological pathologies.
- Describe motor control & motor learning theories and their applications with regard to contemporary management of the neurological problems.
- Describe motor control & neuro developmental approaches of interventions.
- Discuss and demonstrate to manage patients with various neurological pathologies.

COURSE CONTENTS

APPLIED ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM

- Functional and applied anatomy of Brain, Spinal cord, CNS Support Structures, Neurons, Peripheral nervous system, autonomic Nervous System and Spinal Level Reflexes.

NEUROLOGICAL EXAMINATION

- Perform assessment of patients with various neurological pathologies.

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- Conduct & document clinical examination (History, System review, Test and measures, used in standardized assessment procedure
- Evaluate and Analyze clinical assessment procedures to construct a problem list, long term Goals, Short term goals, Treatment plan, Progression and discharge planning..

INTERVENTIONS

- Different theories of Motor Control and Motor Learning, their limitations and clinical implications
- Neurodevelopmental (NDT)approaches and their clinical implications in the management of patients with neurological pathologies such as;
    - Roods approach
    - Bobath approach
    - Kabat, Knott, Voss (Proprioception neuro facilitation PNF Approach).
    - Burnstorm Approach.
- Contemporary approaches and their clinical implications in the management of patients with neurological pathologies such as;
    - Motor Control / Motor Learning Approach
    - Neural plasticity/ adoptability
    - Constraint induced movement therapy (CIMT)
    - Modified Constrained Induced Movement Therapy (mCIMT)
    - Task-Related Training Approach
    - Compensatory Training Approach
    - Normal Reach, Grasp and Manipulation.
- Construct treatment strategies to improve, strength, Balance, coordination, locomotion and gait, skill acquisition, postural control, mobility functions.
- Role of sensory system in improving motor control and sensory rehabilitation.

NEUROLOGICAL DYSFUNCTIONS

- Stroke, types of stroke, problems associated with stroke
- Traumatic Brain Injury (TBI), Types and severity of Problems associated with TBI
- Spinal Cord Injury (SCI), Complete and incomplete SCI, clinical Syndromes of SCI.
- Brain and spinal cord disorders such as; Multiple Sclerosis (MS)
- Cerebellar Disorders
- Parkinson's Disease (PD)
- Motor Neuron Disease (MND)
- Poly Neuropathies.
- Post polio Syndrome (PPS)
- Vestibular Disorders

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- Cranial Nerves Disorders
- Myasthenia gravis
- Spinal muscular atrophy
- Peripheral nerve disorders

LAB WORK

- In the laboratory sessions, neurological physiotherapy skills will be demonstrated and practiced. Various reflective case studies related to the neurological rehabilitation will be assigned to the students.
- Assessment and management of different types of stroke, problems associated with stroke, traumatic Brain Injury (TBI).
- Assessment and management of Spinal Cord Injury (SCI), Complete and incomplete SCI, clinical Syndromes of SCI and problems associated with SCI.
- Assessment and management of brain and spinal cord disorders taught in course.
- Practical implementation of different neurological approaches taught in course.

RECOMMENDED BOOKS

- Physical Rehabilitation By Susan B. O'Sullivan, Thomas J. Schmitz, George D. Fulk
- 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

5. 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.

LEARNING OBJECTIVES

- Discuss common sports injuries and get insight into the mechanics and Pathomechanics of sports injuries
- Discuss responsibilities of sports physiotherapist

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- Evaluate the sports injuries
- Formulate rehabilitation plan for sports injuries.

COURSE CONTENTS

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 ATHLETEETHICS AND SPORTS MEDICINECASE HISTORIES
- Principles of assessment and outcome measures
- Documentation in SOAP notes format
- Evidence based sports Physical Therapy Treatment protocols.

RECOMMENDED BOOKS

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

6. ARTIFICIAL INTELLIGENCE (AI) APPLICATIONS IN HEALTH CARE

CREDIT HOURS 2 (2-0)

Course Outcomes:

After completion of this course students should be able to:

- Understand what is Artificial Intelligence (AI) and Machine learning (ML)
- Understand the concept of Internet of Things (IoT) and its applications in healthcare
- Analyze the healthcare data and process it using data analysis and statistical tools
- Explore the applications of AI and ML with respect to healthcare domain

Course content

Introduction to **Artificial Intelligence (AI) and Machine learning (ML)**

- Importance and Applications of AI and ML in Healthcare

Types of Machine Learning and its classification

- Decision Tree, Bayesian Classifier, Regression

Neural Networks, their types, and processing

- Neural Networks – learning Models.
- Deep Neural Network, Convolution Neural Networks & Recurrent Neural Networks
- Natural Language Processing
- Commonly Used and Advanced Neural Network architectures
- Computer Vision

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Internet of Things (IoT)

- Introduction
- Process flow and Tools
- Use Cases
- Remote Patient Monitoring

Data Representation:

- Introduction to data, data frames
- Data standardization
- Dealing with noise and missing values
- Transforming and normalizing data

Data Analytics:

- Overview of tools like R, Python
- Statistical and Visualization tools

Healthcare data Analysis:

- Sources of the healthcare data
- Pre-processing of the healthcare data
- Handling of the healthcare data
- Creation of analysis-ready datasets

Healthcare datasets – Examples and Case studies
Case studies and Future trends in AI Healthcare

References:

1. Russell, S. and Norvig, N. Artificial Intelligence: A Modern Approach. Prentice Hall Series in Artificial Intelligence 3.
2. Bishop, C. M. Neural Networks for Pattern Recognition. Oxford University Press.
3. Hastie, T., Tibshirani, R. and Friedman, J. The Elements of Statistical Learning, Springer
4. Adam Gibson, Josh Patterson, Deep Learning, O'Reilly Media, Inc.
5. Guoguang Rong, Arnaldo Mendez, Elie Bou Assi, Bo Zhao, Mohamad Sawan, Artificial Intelligence in Healthcare: Review and Prediction Case Studies,

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Engineering, Volume 6, Issue 3, 2020, Pages 291-301, ISSN 2095-8099, https://doi.org/10.1016/j.eng.2019.08.015.

6. 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

- Analyze data 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:

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- 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.
- Recognize and characterize signs and symptoms of inflammation.
- Perform neurological tests and measures including:
    - Arousal, attention and cognition tests and measures.
    - 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)
- Neuromotor development and sensory integration tests
- Acquisition and evolution of motor skills, including age-appropriate development
    - Sensorimotor integration, including postural responses, equilibrium, and righting reactions
- 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
- Sensory integrity tests and measures that characterize or quantify including:
    - Light touch
    - Sharp/dull
    - Temperature
    - Deep pressure
    - Localization
    - Vibration
    - Deep sensation
    - Stereognosis
    - Graphesthesia.

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EVALUATION

- 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

- Perform 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 rational 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

- Perform Safety, Emergency Care, CPR and First Aid, Standard Precautions, Body Mechanics and Positioning
- Demonstrate appropriate sequencing of events related to 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.

APPLY 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:

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- 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
- 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

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- 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 o. 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

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- 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

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- Intermittent
- Positional
- Sustained
- Documentation of all listed competencies in SOAP notes format.

Note
It is mandatory for each student to document minimum 16 cases per semester (1 cases per week) in clinical log book duly checked and signed by clinical supervisor on weekly basis and head of institute at completion

NINTH SEMESTER

1. OBSTETRICS & GYNAECOLOGICAL PHYSICAL THERAPY
2. SCIENTIFIC INQUIRY & RESEARCH METHODOLOGY
3. EXERCISE PHYSIOLOGY
4. EVIDENCE BASED PRACTICE IN PHYSICAL THERAPY
5. PAEDIATRIC PHYSICAL THERAPY
6. INTEGUMENTARY PHYSICAL THERAPY
7. SUPERVISED CLINICAL PRACTICE-V

1. OBSTETRICS & GYNEACOLOGICAL 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, 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.

LEARNING OBJECTIVES
- Discuss common gynecological conditions relevant to physical Therapy
- Evaluate the women's health problems
- Discuss rehabilitation plan for gynecological patients.

COURSE CONTENTS

MEDICAL TERMINOLOGY REGARDING GYNECOLOGY, OBSTETRICSAND WOMEN'S HEALTH
- Anatomy

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- Physiology of pregnancy
- Physical and physiological changes of labour and the peurperium
- The antenatal period
- Relieving the discomforts of pregnancy
- Preparation of labour
- 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 BOOKS

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

2. SCIENTIFIC INQUIRY & RESEARCH METHODOLOGY

CREDIT HOURS 2(2-0)

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, co relational statistic & designs, interclass correlation coefficients, and critical appraisal of the literature.

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LEARNING OBJECTIVE

- Identify the basic concepts of research and scientific inquiry and its methodologies
- Identify appropriate research topics
- Define appropriate research problem and parameters
- Construct a project proposal to undertake a research project.
- Discuss scientific Inquiry, its principle and application in medical research.
- Describe Search techniques for literature review
- Differentiate between different levels of evidence, appraisal and different studies with respect to their effectiveness in literature.

COURSE CONTENTS

RESEARCH FUNDAMENTALS

- Research in physical therapy and rehabilitation
- Role, importance, principles and application of Ethics in Rehabilitation research.
- Basic vs applied research.
- Research Problems / Questions, and Hypotheses, Research Paradigms, Research Validity and reliability

SAMPLING

- Discuss Selection of sample: sample & population, basic considerations in sampling, determination of sample size, elimination of sampling bias and types of sampling such as: Random sampling, stratified random sampling, cluster sampling and systematic sampling.

RESEARCH DESIGN

- Describe different research designs
- Differentiate between experimental & non-experimental, qualitative and quantitative and epidemiological research designs.
- Discuss different research methodologies used in experimental, and non-experimental, qualitative and qualitative and epidemiological research designs

RESEARCH PROJECT

- Discuss various components of research synopsis and Thesis
- Develop a Research Plan while taking into account, the ethical, legal and professional obligations

INSTRUMENTATION AND DATA COLLECTION

- Discuss, objectivity and standardization, types of tests and scales, validity and reliability of an instrument, assessment of validity and reliability, development of tests/scale

DATA ANALYSIS & INTERPRETATION

- Analyze data
- Describe types of measurement scales, descriptive statistics and inferential statistic.

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- Perform data entry and Analysis using statistical package for Social Sciences (SPSS)

PREPARATION OF A RESEARCH REPORT

- Use Formatting & styling, citation, references & bibliography
- Differentiate theses writing, dissertations & journal articles writing.

SCIENTIFIC INQUIRY

- Describe scientific inquiry, Evidence based approach to scientific inquiry, Principles of scientific inquiry, the application of scientific inquiry to physical therapy.
- Access digital libraries and different research databases, Effective searching and reviewing literature material.
- Interpret Critical appraisal of published research in the areas of:
  - Examination and Evaluation
  - Diagnosis
  - Prognosis
  - Intervention
  - Harm
- Interpret Critical evaluation of Randomized Control Trial (RCT), Systemic review, Diagnosis and screening tests, Case reports
- Discuss how to conduct clinical research and hierarchy of evidences in clinical researches

RECOMMENDED BOOKS

1. *Essentials of clinical research* By Stephan P. Glasser.
2. Rehabilitation Research (Principles and Applications) 3rd Edition By Elizabeth Domholdt.

3. EXERCISE PHYSIOLOGY

CREDIT HOURS: 3(2-1)

COURSE DESCRIPTION

This course aims to develop a critical appreciation of exercise and applied physiology. The course will also enable the readers to understand injury prevention, rehabilitation and performance enhancement strategies.

LEARNING OBJECTIVES

- Define homeostasis, types of systems involved in maintaining Human Internal environment
- Discuss the responses, including hormonal, circulatory, respiratory and thermal to exercise
- Define principles of cardiopulmonary training
- Discuss the effects of exercise on VO2 max and lactic acid
- Describe training of Female athlete, children and old population.

COURSE CONTENTS

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

- 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

- 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

- 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.

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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.

LAB WORK

Measurement of work, power, and energy expenditure by using

- Bench step, Ergometer, Treadmill

Testing aerobic endurance:

- Predicting VO2 max using the Harvard step test, Astrand Treadmill Test, Time limit test, Astrand Cycle Test, The effects of endurance and strength exercise on CV response, Lactate threshold testing

Testing anaerobic capacity:

- Wingate test, Jumping power tests, Quebec 10-second test.

Assessing muscular efficiency:

- Muscle Length Testing:
- Muscle Length Assessment techniques (Lower-Quarter Muscles, Upper-Quarter Muscles) Hypermobility
- Muscle strength, speed, and power:
- Quantitative muscle strength assessment, Core Muscle Strength and Stability Test, Grip Strength Test, Wall Squat Test, 10 Stride Test, Kosmin Test

Physiological testing protocols for flexibility, Balance, and Agility:

- Modified Sit & Reach Test, Static Flexibility Test, Standing Stork Test, Hexagonal Obstacle Test, Static

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balance, quantitative and qualitative assessment of balance, Janda's perturbation test.

Body Composition analysis:

- Body Mass index, Skin fold caliper Testing, Bioimpedance testing

Physiological Protocols for the Assessment of Athletes in Specific Sports:

- Cricket, hockey, football, volleyball, Runners, Rugby, cyclist, Tennis

Monitoring during Training and exercise:

- Heart rate measurement, Body weight maintenance and hydration status, Fluid loss evaluation, Evaluation of external and internal training load, perceptual wellbeing and physical readiness, Stroop test and stretch reflex.

Body weight maintenance and hydration status,

- Fluid loss evaluation,
- Evaluation of external and internal training load,
- perceptual wellbeing and physical readiness, Stroop test and stretch reflex.

Note:

The students are expected to make a practical note book. The practical note book is a collection of evidence that learning has taken place and also a reflective record of student's achievements

RECOMMENDED BOOKS

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 Chichester, UK
3. A Physical Therapist's Guide to Health, Fitness, and Wellness by Catherine R Thompson, PhD, MS, PT
4. ACSM's guidelines for exercise testing and prescription by Linda S. Pescatello
5. 101 Performance Evaluation tests by Brain McKenzie
6. Physiological Tests for Elite Athletes by Rebecca K. Tanner and Christopher J. Gore
7. Assessment and Treatment of Muscle Imbalance by Phil page, Frank, Clark and Lardner, Robert
8. Additional study material as assigned by the tutor.

1. EVIDENCE BASED PRACTICE IN PHYSICAL THERAPY

CREDITHOURS 2(2-0)

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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. Current journal articles, texts, and online resources will be used in the course to develop critical reading and writing skills.

LEARNING OBJECTIVES

- Discuss in detail the concept of evidence based practice in physical therapy.
- Demonstrate the latest skills needed for obtaining, evaluating, critiquing and applying the scientific literature pertaining to physical therapy practice.

COURSE CONTENTS

EVIDENCE-BASED PHYSIOTHERAPY

- An Introduction about evidence-based Physiotherapy:
- High quality clinical research
- Patient preferences
- practice knowledge
- Additional factors
- Introduction to clinical decision making and process
- Importance of evidence-based Physiotherapy for patients, physiotherapists, profession and funders of physiotherapy services
- History of Evidence-Based Health Care
- Steps for practicing evidence-based Physiotherapy.

INFORMATIONAL NEEDS

- Relevant clinical questions
- Refining your question
- Effects of intervention
- Experiences
- Prognosis
- Diagnosis.

CONSTITUTION OF 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 OR

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- 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
- Unprofessional or multi professional guideline development?

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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.

LAB WORK

- 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 BOOKS:

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

5. PAEDIATRIC PHYSICAL THERAPY

CREDIT HOURS: 3(2-1)

MEDICAL TERMINOLOGY REGARDING PEDIATRICS

- History and Examination / Pediatric Examination
- Assessment and outcome measurement
- Theories of Development
- Medical Care of Children with Disabilities
- Approaches to working with children
- Normal Developmental Milestones
- Orthotic and Assistive Devices

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- 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

PRACTICALS & Lab activities

- Testing and evaluation the deep tendon reflexes in paediatric population
- Testing and evaluation of neonatal reflexes in neonates
- Testing and evaluation the normal and abnormal tone in paediatric population
- Measurement of popliteal angel
- Measurement of head circumference
- Measurement of leg length discrepancy
- Stretching exercises in cerebral palsy
- Test of coordination in children
- Use and measurement of GMFM-88
- Stretching technique in congenital muscular Torticollis
- Chest therapy in children
- Reflex inhibiting postures in cerebral palsy
- Sensory examination in paediatric population
- Principles of resistance training in paediatric population

RECOMMENDED BOOKS:

1. Physical Therapy for Children By, Suzann K. Campbell, Robert J. Palisano&Darl W. Vander Linden.

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2. Pediatric Rehabilitation Principles and practice (Fourth Edition) By, Michael A Alexander & Dennis J. Matthews.
3. Additional reading material as assigned

6. 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, 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.

LEARNING OBJECTIVES

- Evaluate and assess integumentary conditions
- Demonstrate physical therapy intervention in integumentary conditions.

MEDICAL TERMINOLOGY REGARDING INTEGUMENTARY SYSTEM

WOUND CARE CONCEPTS

- 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

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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 BOOKS

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

7. SUPERVISED CLINICAL PRACTICE – V

CREDIT HOURSS 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

CLINICAL COMPETENCIES

EXAMINATION

- Based on best available evidence select examination tests and measures that are appropriate for the patient/client

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- 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 nocioception
- 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

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- 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

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- 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 rational 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.

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- 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
- 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.

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- B. Admission and discharge planning.
- C. Case management.
- D. Collaboration and coordination with agencies, including:
- Home care agencies
- Equipment suppliers
- Schools
- Transportation agencies
- Payer groups
- E. Communication across settings, including:
- Case conferences
- Documentation
- Education plans
- F. Cost-effective resource utilization.
- G. Data collection, analysis, and reporting of:
- Outcome data
- Peer review findings
- Record reviews
- H. 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.

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THERAPEUTIC EXERCISE MAY INCLUDE PERFORMING

A. Aerobic capacity/endurance conditioning or reconditioning

- Gait and locomotor training
- Increased workload over time (modify workload progression)
- Movement efficiency and energy conservation training
- Walking and wheelchair propulsion programs
- Cardiovascular conditioning programs

B. RELAXATION

- Breathing strategies
- Movement strategies
- Relaxation techniques
- C. Airway clearance techniques may include
    - Breathing strategies
- Active cycle of breathing or forced expiratory techniques.
- Assisted cough/huff techniques
- Paced breathing
- Pursed lip breathing
- Techniques to maximize ventilation (e.g., maximum inspiratory hold, breath stacking, manual hyperinflation)
- Manual/mechanical techniques
- Assistive devices.
- Positioning
- Positioning to alter work of breathing
- 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
- 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 management

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- Injury prevention education during self-care management
- Injuryprevention or reduction with use of 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 (e.g., 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

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- Vapo-coolant 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
- Vaso pneumatic 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 competency in SOAP notes format

Note

It is mandatory for each student to document minimum 16 cases per semester (1 cases per week) in clinical log book duly checked and signed by clinical supervisor on weekly basis and head of institute at completion

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TENTH SEMESTER

1. CARDIOPULMONARY PHYSICAL THERAPY
2. GERONTOLOGY &GERIATRIC PHYSICAL THERAPY
3. EMERGENCY PROCEDURES & PRIMARY CARE IN PHYSICAL THERAPY
4. SUPERVISED CLINICAL PRACTICE - VI
5. RESEARCH PROJECT

1. CARDIOPULMONARY PHYSICAL THERAPY

CREDIT HOURS 3(2-1)

COURSE DESCRIPTION

This course includes applied anatomy, applied physiology and pathology of the cardiopulmonary system. This course discuss 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 cardiopulmonary systems disorders. The use of evidence-based physical therapy intervention for cardiopulmonary 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.

COURSE OBJETIVES

- Demonstrate the basic knowledge of applied anatomy, physiology & pathology.
- Demonstrate, evaluate & perform examination in cardiopulmonary conditions
- Apply evidence based physical therapy intervention.

COURSE CONTENTS

MEDICAL TERMINOLOGY REGARDING CARDIOPULMONARY SYSTEM

INTRODUCTION

APPLIED 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

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- 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.

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

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- 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 (Overview with reference to the Physical Therapist)

- Introduction
- Assessment
- The transplantation process
- Donors
- Operative procedures
- Postoperative care
- Rejection of the transplanted organs
- Immunosuppressant
- Special considerations for the physiotherapist
- Denervation of the heart/lungs
- Infection/rejection
- Physiotherapy management.

HYPERVENTILATION

- Introduction
- Signs and symptoms

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- 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 program.
- 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.

LAB WORK

- Principles of assessment and outcome measures
- Assessment of Respiratory Excursion
- Assessment of Elicit tactile fremitus
- Auscultation of the Lungs
- Peak expiratory flow rate (PEFR)
- Incentive spirometry
- Documentation in SOAP notes format
- Evidence based cardiopulmonary Physical Therapy Treatment protocols.
- Airway clearance
- Breathing exercises(ACBT)
- Postural drainage
- Suction

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- Cardio pulmonary exercise prescriptions
- Ambulation of patient
- Practical related to the course work

RECOMMENDED BOOKS

1. Physiotherapy in Respiratory Care; An evidence based approach to respiratory and cardiac management, By Alexandra Hough (3rd Edition) Nelson Thornes.
2. Essentials of Cardiopulmonary Physical Therapy (2nd Edition) By Hillegass and Sadowsky.
3. *Physiotherapy for respiratory and cardiac problems*, By: Jennifer A. Pryor & Barbara A. Webber, 2nd edition, Churchill Livingstone.
4. *Tidy's Physiotherapy* by Thomas A Skinner & Piercy.
5. *Therapeutics Exercises and Technique* by Carolyn Kisner&Laynn Allen Colby 5th& 6th edition.
6. *Cash's Text book of General Medical & Surgical Condition for Physiotherapists* by Patrica A. Downie.
7. *Cash's Textbook of chest, heart and vascular condition for physiotherapist* by Patrica A. Downie.
8. *Chest Physio for the War wounded, by Mahboob-urRehman, National Book Foundation.*

2. 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 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 geriatric conditions are discussed. The use of evidence-based physical therapy intervention for geriatric 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.

LEARNING OBJECTIVES

- Discuss common Geriatric conditions relevant to physical Therapy and get insight into the human development
- Evaluate the Geriatric problems
- Formulate effective rehabilitation plan for Geriatric patients.

COURSE CONTENTS

GERONTOLOGY

- Introduction to Gerontology

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- 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

MEDICAL TERMINOLOGY REGARDING GERIATRICSATTITUDES 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

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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
- Cerebral vascular 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.

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RECOMMENDED 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.*

3. EMERGENCY PROCEDURES & PRIMARY CARE IN PHYSICAL THERAPY

CREDIT HOURS 3(2-1)

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, first aid and emergency. The course is designed to provide knowledge and skills in emergency techniques and in the application of appropriate action necessary to take care of the patient/client.

LEARNING OBJECTIVE

- Provide knowledge and skill in emergency techniques
- Application of appropriate action necessary to take care of the patient/client
- Describe Basic life support
- Describe first aid and emergency preparedness

COURSE CONTENTS

ORGANIZATION AND ADMINISTRATION OF EMERGENCY CARE

- Developing and implementing emergency action plan, Emergency team.
- Initial patient assessment and care, Emergency equipment, Venue location, Emergency transportation, Emergency care facilities, Legal need and documentation.

PHYSICAL EXAMINATION OF THE CRITICALLY INJURED PATIENT/ATHLETE

- Conduct Scene assessment, Vital signs and safety
- Description of Body substance, isolation precautions
- Differentiate between Primary survey and Secondary survey

AIRWAY MANAGEMENT

- Air way anatomy, Air way compromise, Oxygen therapy and advanced airway devices.

SUDDEN CARDIAC DEATH

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

HEAD INJURIES

- Patho-mechanics of brain injuries
- Identify cerebral concussion, contusion, cerebral hematoma, Second impact syndrome.
- Performing Initial on site assessment, Sideline assessment, Special tests for assessment of coordination and cognition

EMERGENCY CARE OF CERVICAL SPINE INJURIES

- Mechanism of injuries to the spinal cord, Assessment and management.

EMERGENT GENERAL MEDICAL CONDITIONS

- Identify Sudden death, Exercise induced anaphylaxis, acute asthma, Diabetes mellitus, Mononucleosis, Sickle cell traits and Hypertension.

ENVIRONMENT-RELATED CONDITIONS

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

ORTHOPEDIC INJURIES

- Describe Basic emergency medical care, Fundamentals of skeletal fractures and
- Perform Splinting techniques for;
- Fractures and dislocations of upper extremity
- Fractures and dislocations of lower extremity
- Fractures and dislocations of spine.

ABDOMINAL INJURIES

- Describe Initial evaluation of abdominal injuries
- Identify abdominal wall contusions, splenic injuries, liver injuries, renal injuries, intestinal injuries, pancreatic injuries, Non-traumatic abdominal injuries: Appendicitis, ectopic pregnancy.

THORACIC INJURIES

- Describe initial Assessment and Management of different Types of injuries: fractures, Pneumothorax, hemothorax, pulmonary embolism.

THE PSYCHOLOGICAL AND EMOTIONAL IMPACT OF EMERGENCY SITUATIONS

- Defining psychological trauma
- Describe Psychological trauma in athletic environment and Pharmacologic considerations for the physical therapist

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- Define The psychological emergency response in both external and internal team members
- Describe the science behind the art the patient's interview.

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.
- Basic Life Supports & Supervised Intra Muscular/Intra venous Injection Therapy

DISASTER MANAGEMENT

- Floods
- Earth quakes
- Blasts

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- Fire
- War
- Foods and communication in disasters

PRACTICAL

- List of Practical in Emergency Procedures and Primary care in Physical Therapy
- Formulation of Emergency Action Plan
- Body Substance Isolation Precautions
- Primary Survey & Secondary Survey
- Trauma Assessment
- Assessment of Vitals
- Assessment of Air Ways and Lung Sounds including Assessment of Work of Breathing and Auscultation
- Air Way Adjuncts: NPA, OPA and advanced Airways
- High Performance CPR (Adult, Pediatric, Infant and Pregnant females)
- Management of Choking (Adult, Pediatric and Pregnant females)
- Assessment of Head Injuries (Glasgow comma scale)
- Concussion Assessment (SCAT-3, SCAT-5 tools etc) and Balance Assessment including BESS (Balance error scoring system)
- Spine Boarding (Log Roll, Straddle slide, Prone Log Roll, Helmet removal)
- Bracing, Splinting and application of slings.
- Emergency Management of Epistaxis, mild to moderate bleeding and Emergency Management of Extensive bleeding (Combat Tornique application)
- Emergency management of Seizures and demonstration of recovery position
- Emergency management of fractures and wounds and Fire safety
- Emergency management of common Abdominal and thoracic Injuries.
- Heat Index and Emergency management of Hyperthermia (Heat Exhaustion, Heat Stroke).
- Wind chill chart and Emergency management of Hypothermia (chills, Frostbite).

RECOMMENDED BOOKS

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

4. SUPERVISED CLINICAL PRACTICE-VI

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CREDIT HOURS 4 (0-4)

SEMESTER	SUPER VISION	FOCUS	WARDS	COMPETEN CIES
10	Supervised by trained PT	Evaluation, Examination, and Intervention	Integumentary, gynecology& obstetrics, Geriatric, 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, nonsurgical, 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.

CLINICAL 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)

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- Wheel chair 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 nocioception
- Specific body parts
- Recognize and characterize signs and symptoms of inflammation.
- Perform integumentary integrity tests and measures including
- Activities, positioning, and postures that produce or relieve trauma to the skin.
- Assistive, adaptive, orthotic, protective, supportive, or prosthetic devices and equipment that may produce or relieve trauma to the skin.
- Skin characteristics, including blistering, continuity of skin color, dermatitis, hair growth, mobility, nail growth, sensation, temperature, texture and turgor.
- Activities, positioning, and postures that aggravate the wound or scar or that produce or relieve trauma.
- Signs of infection.
- 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
- Synthesize available data on a patient/client expressed in terms of the International Classification of Function, Disability and

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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

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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 rational 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 reevaluation.
- 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

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- 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.

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- 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.
- Preferredinterventions, 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

- Integumentary repair and protection techniques may include
- Debridement-nonselective
- Enzymatic debridement
- Wet dressings
- Wet-to-dry dressings
- Wet-to-moist dressings
- Dressings
- Hydrogels
- Wound coverings
- Topical agents
- Cleansers

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- Creams
- Moisturizers
- Ointments
- 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:
- 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

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- 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
- Vaso pneumatic compression devices
- Taping

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- 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

Note
It is mandatory for each student to document minimum 16 cases per semester (1 cases per week) in clinical log book duly checked and signed by clinical supervisor on weekly basis and head of institute at completion

6. RESEARCH PROJECT

In the final year, a project will be allocated to a single or group of students, depending on available facilities. The In-charge / chairperson of the concerned department/institute shall allot a supervisor. Every student shall be evaluated keeping in view their contribution, thorough understanding of work done and comprehensive presentation. The details of the report are given below

- Title page
- Names of students
- Students I.D number
- Supervisor's name
- Program name
- Name of the department
- Session

Abstract

A maximum of one page (200-250 words) on the work performed and your main conclusions. Abstract should be structured with subheadings background, objective, material and methods, results and conclusion.

Chapter 1. Introduction

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i) Introduction (Very brief review of literature and indicate significance of study)

ii) Statement of Problem (Should include clear purpose of study)

iii) Questions/Hypothesis

iv) Outline Methodology

v) Definition of Terms

The introduction should 'set the scene' for the examiners and enable them to appreciate the relevance of your work in a particular research area.

Chapter 2. Literature Review

A literature review is an extended essay, which is based on source material. In simple terms, the merit of your literature review is proportional to the comprehensive nature and originality of your sources. Your writing should be confined to the questions/hypothesis being examined. A literature review is more than a listing of references. You should attempt to synthesize a new understanding of your topic and provide a critique of what other commentators have had to say on the subject.

Chapter 3. Methodology

i) Participant Selection (Including ethical considerations)

ii) Experimental Design

iii) Measurement Procedures

- Data collection procedures
- Rationale for selecting these procedures/questions

iv) Analysis of Data

The methodology should describe the characteristics of the subjects, award of ethical approval, and where appropriate the apparatus, calibration procedures, reliability of the methods used, experimental protocols and the statistical treatments of the data. Diagrams and photographs may be appropriate to illustrate procedures.

Chapter 4. Results

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Your results should consist of tables of your findings, illustrated with graphs where appropriate. The results section should contain text, which takes the reader through your graphs and tables, pointing out the salient features. Tables should wherever possible summarize the data from several subjects in the form of means and standard deviations. You do not need to give tables of every piece of original data. If you feel it is essential to include these, put them in an appendix.

Chapter 5. Discussion

It is good practice to begin with a summary of your findings. This is your opportunity to interpret your data in the context of what is already known from existing literature. However, make every effort to explain your findings first, justifying the arguments by reference to previously published work, NOT the other way around. The discussion is the place for explanations and opinions. Link your findings with the purpose/questions/hypothesis of your project. Include critical appraisal of your own work and that of others. Address what you would do differently with hindsight?

Chapter 6. Conclusion

- Summary of main findings
- Recommendations (Impact of findings and future research)
- Conclusion

This section should summarize main findings, highlight areas where more work is needed and suggest avenues for future development of this work. An overall conclusion from the study should be included to complete the project.

References:

A list of references must be included at the end of the project document and appropriately referenced within the text according to Harvard reference style by using endnote or any other reference management tool.

Appendices: In this section, if required, include any raw data, interview transcript, computer program listings, and questionnaires, Turnitin report etc., which were not in the results section, but which may need to be consulted.

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