

BACHELOR OF PHYSIOTHERAPY
PAPER CODE –03060301
PATHOLOGY & MICROBIOLOGY

Periods/Week Credits

T: 3 T: 1 4

TEACHING HOURS: 64

MAX. MARKS: 100

INTERNAL: 40

EXTERNAL: 60

TIME: 3Hrs.

PATHOLOGY

Course Description:

The course is designed to develop the basic knowledge about the concept of injury , its healing process and its resultant effects on the human body.

Course Objectives:

The objective of this course is that after 64 hours of lecture, the student will be able to understand the concepts of cell injury and changes in relation towards the pathological effects of infectious and non infectious diseases. Students will understand the disease process and their clinical significance (with special emphasis on neuro-musculoskeletal and cardio-respiratory system)

Course Outcomes:

At the end of the course, the student will be able to

- i. Acquire the knowledge of concepts of cell injury and changes Produced thereby in different tissues and organs; Capacity of the body in healing Process.
- ii. Recall the Etio-pathological effects and the Clinico pathological Correlation of common infection and noninfectious diseases.
- iii. Acquire the knowledge of concepts of Neoplasia with reference to the Etiology, gross and microscopic features diagnosis and prognosis in different tissues and organs of the body.
- iv. Correlate normal and altered morphology of different organ systems in different diseases needed for understanding disease process and their clinical significance (with special emphasis on neuro-musculoskeletal and cardio-respiratory system).
- v. Acquire knowledge of common immunological disorders and their resultant effects on the human body.
- vi. Understand in brief, about the Hematological diseases and their resultant effects on the human body

Date	Topic/ Theme	Duration	Learning Experiences & Learning Resources	Learning Objectives
	General	4 Hrs	Student Interactive session	Describe concepts of cell injury and

	Pathology		Text book of pathology by Harsh Mohan Basic pathology by cotran Kumar Robbins	changes produced thereby in different tissues and organs Discuss the types of cell Injury
	Inflammation and Repair	4 Hrs	Student Interactive session Text book of pathology by Harsh Mohan Basic pathology by cotran Kumar Robbins	Describe the inflammation process Explain the types of inflammation Describe the process of wound healing at various sites including bones, nerves and muscles Discuss the Regeneration & repair
	Immun-Pathology (Basic concepts)	4 Hrs	Student Interactive session Text book of pathology by Harsh Mohan Basic pathology by cotran Kumar Robbins	Describe the basic concept of immune system and organ transplantation
	Circulatory disturbances	5 Hrs	Student Interactive session Text book of pathology by Harsh Mohan Basic pathology by cotran Kumar Robbins	Describe the pathogenesis of Edema Explain its types Discuss the Chronic venous congestion Explain the thrombus formation & its effects Explain the Embolism, its types & clinical effects Discuss the infarction, its types & common sites Discuss the pathogenesis of shock, its types & morphological changes
	Growth Disturbance	4 Hrs	Student Interactive session Text book of pathology by Harsh Mohan Basic pathology by cotran Kumar Robbins	Describe the Neoplasia with reference to the etiology ,gross and microscopic features Explain diagnosis and prognosis in different tissues and organs of the body
	Diseases of Blood	2 Hrs	Student Interactive session Text book of pathology by Harsh Mohan Basic pathology by cotran Kumar Robbins	Describe the hematological diseases and their resultant effects on the human body
	Topics in Special Pathology	7 Hrs	Student Interactive session Text book of pathology by Harsh Mohan Basic pathology by cotran	Describe morphology of different organ systems in different diseases needed for understanding disease process and their clinical significance- Cardiovascular system, Respiratory System,

			Kumar Robbins	Neuropathology, Bone & joints & Hepatic disease
	Clinical pathology	2 Hrs	Student Interactive session Text book of pathology by Harsh Mohan Basic pathology by cotran Kumar Robbins	To understand and describe the clinical implications of Anemia, total leucocyte, differential leucocyte count, Deficiency disorders of vitamin A,B,C,D

MICROBIOLOGY

Course Description:

This course is designed to develop the basic knowledge of Microbiology and to understand its special needs in relation to interventions in physiotherapy which will help them to better correlate the disease and make a proper diagnosis

Course Objectives:

Understand the importance of microbiology in the relative field.
Understand the basic concepts of microbiology

Course Outcomes:

Date	Theme/ Topic	Duration	Learning Experiences & Learning Resources	Learning Objectives
	General Bacteriology	6	Student Interactive Session Text book of medical microbiology: Rajesh Bhatia. Text book of microbiology -R. Anantha Narayan & C.K Jayaram Paniker	Describe basic concept of medical microbiology, Understand its importance in diagnosis and Describe the natural ecology of microorganisms, Explain human use of microorganisms and how they function in disease Explain Sterlization and disinfection
	Systemic Bacteriology	6	Student Interactive Session Text book of medical microbiology: Rajesh Bhatia. Text book of microbiology -R. Anantha Narayan & C.K Jayaram Paniker	Describe the bacteriology and Explain its morphology, pathogenesis and laboratory diagnosis.

	Mycology	5	<p>Student Interactive Session</p> <p>Text book of medical microbiology: Rajesh Bhatia. Text book of microbiology -R. Anantha Narayan & C.K Jayaram Paniker</p>	<p>Describe the mycology and Explain its Characteristics, classification, morphology, pathogenesis and laboratory diagnosis</p>
	Virology	6	<p>Student Interactive Session</p> <p>Text book of medical microbiology: Rajesh Bhatia. Text book of microbiology -R. Anantha Narayan & C.K Jayaram Paniker</p>	<p>Describe the virology and Explain its classification, morphology, pathogenesis and laboratory diagnosis</p>
	Immunology	5	<p>Student Interactive Session</p> <p>Text book of medical microbiology: Rajesh Bhatia. Text book of microbiology -R. Anantha Narayan & C.K Jayaram Paniker</p>	<p>Describe the basic concept of immunology , Discuss the antigens, antibodies, Immune response & Hypersensitivity Explain different national immunization programme, nature of vaccines rationale and dosage</p>
	Applied Microbiology		<p>Student Interactive Session</p> <p>Text book of microbiology -R. Anantha Narayan & C.K JayaramPaniker Text book of medical microbiology: Rajesh Bhatia.</p>	<p>Describe the various infections affecting respiratory system, Central nervous system, wound, joints & bones. Describe how we mange biomedical waste</p>

**BACHELOR OF PHYSIOTHERAPY
PAPER CODE – 03060302
BIOMECHANICS -1 (THEORY)**

Periods/Week Credits

T: 4 4

TEACHING HOURS: 64

MAX. MARKS: 100

INTERNAL: 40

EXTERNAL: 60

TIME: 3 Hrs.

**BACHELOR OF PHYSIOTHERAPY
PAPER CODE – 03060302
BIOMECHANICS -I- PRACTICAL**

Periods/Week Credits

P: 4 2

TEACHING HOURS: 64

MAX. MARKS: 50

INTERNAL: 20

EXTERNAL: 3

Course Description:

This Course Supplements the Knowledge of anatomy and enables the student to have a better understanding of the principles of biomechanics and their application in musculoskeletal and various other dysfunctions.

Course Objectives:

1. The Basics of mechanics of force system, equilibrium, lever and pulley.
2. Describe the joint structure, classification and function of joints And biomechanics of Connective tissue

3. Describe the muscle structure and function of muscles, types of muscles, contractions and factors effecting muscle recruitment and function
4. Describe the biomechanics of the thoracic and chest wall and patho biomechanics associated with chest deformities
5. Describe the temporo mandibular joint structure, function and dysfunction
6. Describe the analysis of posture and gait during static and dynamic movement, relation with LOG, pathomechanics of abnormal gait and posture

Course Outcomes:

On successful completion of this programme, students should be able to describe the understanding of basics of mechanics, muscle structure and contraction, factors effecting muscle contraction and recruitment , explain mechanics of chest wall during various movements and the patho-mechanics associated with various chest conditions and deformities, understand normal mechanics and patho mechanics of TMJ associated with various conditions, analyse normal mechanics of posture and gait in various planes and axis and patho mechanics associated with abnormal posture and gait.

Date	Theme/ Topic	Duration	Learning Experiences & Learning Resources	Learning Objectives
	Basic Concept in Biomechanics: Kinematics And Kinetics	15 Hrs.	SIS charts models, videos Students Seminar Joint Structure & Functions : Cynthia Norkins	Describe the mechanics of force system, Explain the concept of gravity Explain the equilibrium, Discuss the lever and pulley. Describe the moment arm
	Joint Structure And Function. Biomechanics of Connective Tissue	10 Hrs.	SIS Explanation through, charts models, videos Joint Structure & Functions : Cynthia Norkins Biomechanics- Nordin	Describe the joint structure and function of joints Explain biomechanics of Connective tissues Discuss the general properties of connective tissues Explain human joint design, function & motion Describe the General effects of disease, injury and immobilization on joint structure & function
	Muscle Structure And Function.	10 Hrs.	Student Interactive session Explanation through , charts models, videos Poster presentation Joint Structure &	Describe the muscle structure and function of muscles Explain the Effects of immobilization, injury and aging on muscle structure & functions

			Functions : Cynthia Norkins Biomechanics- Nordin	
Biomechanics of the Thorax and Chest wall	4 Hrs.	Student Interactive session Explanation through, charts models, videos Horizontal integrated teaching Joint Structure & Functions : Cynthia Norkins	Describe General structure and function of Rib cage and the muscles associated with the rib cage Explain the Ventilatory motions, its coordination and integration Discuss the Developmental aspects of structure and function Describe the Changes in normal structure and function in relation to pregnancy, scoliosis and COPD	
The Temporomandibular Joint	5 Hrs.	Student Interactive session Explanation through, charts models, videos Joint Structure & Functions : Cynthia Norkins	Describe the temporo mandibular joint structure, function and dysfunction	
Analysis of Posture and Gait	20 Hrs.	Student Interactive session Biomechanical principles: Frenkel Joint Structure & Functions : Cynthia Norkins	Describe the analysis of posture and gait during static and dynamic movement Explain the effects of posture on age, pregnancy, occupation and recreation Explain effects of age, gender, assistive devices, disease, muscle weakness, paralysis, asymmetries of the lower extremities, injuries and mal alignments in gait Discuss the Movement Analysis in ADL activities like sitting – to standing, lifting, various grips , pinches.	

**BACHELOR OF PHYSIOTHERAPY
PAPER CODE – 03060303
EXERCISE THERAPY-1- THEORY**

Periods/Week	Credits
T: 4	4

***TEACHING HOURS: 64
MAX. MARKS: 100
INTERNAL: 40
EXTERNAL: 60
TIME: 3 Hrs.***

**BACHELOR OF PHYSIOTHERAPY
PAPER CODE – 03060303
EXERCISE THERAPY-1- PRACTICAL**

Periods/Week	Credits
P: 4	2

***TEACHING HOURS: 64
MAX. MARKS: 50
INTERNAL: 20
EXTERNAL: 30***

Course Description:

At the end of the course, the candidate will have a better understanding of the principles of exercise therapy both basic and advanced as well as assessment techniques. The student's skill will be enhanced through hands on training provided during the practical hours.

Course Objectives:

- Define the various terms used in Mechanics,
- Recall the basic principles of Physics related to mechanics of movement/ motion
- Describe basic concepts of exercise therapy-positions, types of movements, classification
- Acquire knowledge of different starting & derived positions
- Acquire knowledge of Movements – Classification, Principles, and Techniques & Uses.
- Acquire knowledge of resisted exercises , types and techniques
- Describe principles, techniques and clinical application of suspension therapy
- Describe types of pelvic tilt, normal and abnormal, muscle work involved
- Demonstrate principles, application of techniques like goniometry, MMT
- Acquire knowledge & skill of Relaxation techniques
- Describe & acquire the skill of use of various tools of the Therapeutic gymnasium
- Describe types, indications contraindications precautions of therapeutic exercises
- Be able to demonstrate General Fitness exercises & understand principles of General Fitness

Course Outcomes:

At the completion of course the student shall be able to describe the basics of mechanics involved in exercise therapy, describe and demonstrate fundamental and derived positions, describe and demonstrate active, passive, resisted movements, describe the skills involved and benefits of various equipments used in therapeutic gymnasium, demonstrate and apply relaxation techniques and positions and able to perform various assessment techniques needed during patient assessment and examination like goniometry and Manual muscle testing.

Date	Theme/ Topic	Duration	Learning Experiences & Learning Resources	Learning Objectives
	Basic Mechanics	10	Student Interactive Session Students Seminars Principle of exercise therapy Gardiner CBS Delhi.	Define the various terms used in Mechanics, Recall the basic principles of Physics related to mechanics of movement/ motion
	Introduction to exercise therapy Types of movements Fundamental and derived positions Resistance exercises Suspension	42	Student Interactive Session Practical demonstration Hands on training Principle of exercise therapy Gardiner CBS Delhi Practical exercise therapy - Hollis Blackwell scientific publication.	Describe basic concepts of exercise therapy- Describe the types of movements, classification Acquire knowledge of different starting & derived positions Acquire knowledge of Movements – Classification, Principles, and Techniques & Uses. Acquire knowledge of resisted

therapy		Therapeutic exercises foundations and techniques kisner& Colby La Davis.	exercises , types and techniques Describe principles, techniques and clinical application of suspension therapy
PELVIC TILT	8	Student Session Interactive Explain using PPTs and videos Practical Demonstration Problem based learning Principle of exercise therapy Gardiner CBS Delhi	Describe types of pelvic tilt, normal and abnormal, Explain muscles responsible for alteration and pelvic rotation. Identify the normal pelvic tilt, pelvic rotation and altered tilt and their corrective measures.
ASSESSMENT TECHNIQUES 1. MMT 2. DYNAMOMETRY 3. GONIOMETRY, INCLINOMETER	48	Student Session Interactive Practical Demonstration Hands on training Measurement of Joint Motion: Cynthia Norkins Manual Muscle Testing : Kendall Manual Muscle Testing : Daniel	Describe the MMT, Goniometry & Dynamometry Explain the principles of MMT, Goniometry & Dynamometry Demonstrate the application of techniques like goniometry, MMT, Inclinator
Relaxation	8	Student Session Interactive Explain using PPTs and videos Practical Demonstration Poster presentation Principle of exercise therapy Gardiner CBS Delhi Practical exercise therapy - Hollis Blackwell scientific publication.	Define the concept of relaxation, muscle fatigue, muscle spasm and tension Explain the Factors contributing to fatigue & tension Acquire knowledge & skill of Relaxation techniques Explain the indication & contraindication Discuss the Alexander method & Jacobson's method of relaxation
Therapeutic Gymnasium AND Therapeutic exercises	12	Student Session Interactive Explain using PPTs and videos Practical Demonstration Hands on training Practical exercise therapy - Hollis Blackwell scientific publication.	Discuss the Setup of Gymnasium & its importance Describe & acquire the skill of use of various tools of the Therapeutic gymnasium Classify the therapeutic exercises Explain the physiological and therapeutic effects of exercises Identify the indication & contraindications of therapeutic exercises

				Explain precautions of therapeutic exercises Be able to demonstrate General Fitness exercises & understand principles of General Fitness
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BACHELOR OF PHYSIOTHERAPY
PAPER CODE – 03060304
PHYSICAL ASSESSMENT- (THEORY)

Periods/Week Credits

T: 4 4

TEACHING HOURS: 64

MAX. MARKS: 100

INTERNAL: 40

EXTERNAL: 60

TIME: 3 Hrs.

BACHELOR OF PHYSIOTHERAPY
PAPER CODE – 03060304
PHYSICAL ASSESSMENT- (PRACTICAL)

Periods/Week Credits

P: 4 2

TEACHING HOURS: 64

MAX. MARKS: 50

INTERNAL: 20

EXTERNAL: 30

TIME: 3 Hrs.

Course Description:

The course is designed to assist the students and to make them understand the concept assessment and manual therapy used for the purpose of treatment in physiotherapy and it will also include the assessment of various joints of the human body and emphasis will be on assessment of pain, cardiopulmonary dysfunction, and neuromuscular system.

Course Objectives:

The objective of this course is that after lectures, demonstrations and Practical the student will be able to evaluate/assess the conditions of patient and plan and execute specific treatment according to the patient condition. The student will also learn and demonstrate various manual therapy techniques.

Course Outcomes:

1. To understand the basics of Electro diagnosis used in Physiotherapy, viz. EMG, SD Curve, and NCV.
2. To understand the assessment and evaluation of all joints of the human body.
3. To understand the assessment of Cardio Pulmonary dysfunction.
4. To understand the assessment of pain with its documentation.
5. To understand the full assessment of Hand

Date	Theme/ Topic	Duration	Learning Experiences & Learning Resources	Learning Objectives
	Electro diagnosis	16 Hrs.	SIS Practical Demonstration Case Discussion Physical Rehabilitation: O' Sullivan	Describe the electrical activities of nerve and muscle. Differentiate the nerve and muscle lesions. Identify different types of lesions in nerve and muscles. Explain the principles of SD Curve, Biofeedback, Electromyography, Nerve Conduction Velocity for assessment of nerve & muscle function Discuss SD Curve, Biofeedback, Electromyography, Nerve Conduction Velocity instrumentation, basic components, panel diagram, & types of electrodes.
	Assessment AND Evaluation	70 Hrs.	SIS Practical Demonstration Case Discussion Hands on training	Describe the Region wise Physical Therapy assessment & evaluation of patient in terms of Patient history, observation, examination, functional

			Physical Assessment: David J Magee Textbook of Rehabilitation: Sunder	assessment, joint play movements, diagnostic imaging & diagnosis
Assessment of Cardio-pulmonary dysfunction	20 Hrs.	SIS Practical Demonstration Case Discussion Hands on training Horizontal Integrated teaching Cardiopulmonary Physical Therapy: Donna Frown & Felter		Describe the cardiopulmonary assessment of patient. Demonstration and interpretation of different techniques & tests used in Cardiopulmonary Assessment Discuss the principles of exercise tolerance test
Assessment of Hand	12 Hrs.	SIS Practical Demonstration Case Discussion Hands on training Physical Assessment: David J Magee Textbook of Rehabilitation: Sunder		Describe the detailed Physical Assessment of hand in terms of patient history, observation, examination, functional assessment, joint play movements, diagnostic imaging and diagnosis Discuss the concept of clinical reasoning & decision making in terms of hand assessment
Assessment of pain	10 Hrs.	SIS Case Discussion Physical Rehabilitation: O' Sullivan		Describe the pain in terms of intensity and quality. Identify different scales used in pain assessment

**BACHELOR OF PHYSIOTHERAPY-
PAPER CODE- 03060305
ENVIRONMENTAL SCIENCES**

Periods/Week Credits

T: 2 2

TEACHING HOURS: 32

MAX. MARKS: 50

INTERNAL: 20

EXTERNAL: 30

TIME: 3 Hrs

Course Description:

The course is designed to develop the basic knowledge about the biodiversity and Ecosystem with respect to natural resources. It also helps to describe the social issues and environment.

Course Objectives:

The objective of this course is that, the student will be able to understand the population growth, human rights and value education. In addition student will also aware about the Women and Child Welfare. Student will also aware about the rural and urban problems and its conservation.

Course Outcomes:

At the end of the course, the student will be able to understand the

1. The multidisciplinary nature of environmental studies
2. Natural Resources Renewable and non-renewable resources
3. Ecosystems ,Biodiversity and its conservation
4. Social Issues and the Environment
5. Human Population and the Environment

Date	Theme/ Topic	Duration	Learning Experiences & Learning Resources	Learning Objectives
	The multidisciplinary nature of environmental studies	3	Student Interactive Session A Preserspective to Environmental Studues by CP Kaushik Envirommental Science by G.Tyler	Describe Environmental Sciences Understand the scope and importance of multidisciplinary nature of environmental studies. Understand the need for public awareness
	Natural Resources Renewable and non-renewable resources	4	Student Interactive Session Students seminars Group discussion A Preserspective to Environmental Studues by CP Kaushik Envirommental Science by G.Tyler	Describe various natural resources and associated problems Explain the role of an individual in conservation of natural resources Understand the Equitable use of resources for sustainable lifestyles.
	Ecosystems	3	Student Interactive Session Students seminars Group discussion A Preserspective to Environmental Studues by CP Kaushik Envirommental Science by G.Tyler	Describe concept of an ecosystem Explain its type characteristic features, structure and functions
	Biodiversity and its conservation	4	Student Interactive Session A Preserspective to Environmental Studues by CP Kaushik Envirommental Science by G.Tyler	Describe concept of biodiversity and its conservation Discuss the Bio geographical classification of India Understand the Value of biodiversity: consumptive use, productive use, social, ethical aesthetic and option values Explain Biodiversity at global, national and local levels, India as a mega-diversity nation, Hot-

				spots of biodiversity Identify Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts, Endangered and endemic species of India
Environmental Pollution	3	Student Interactive Session Students seminars Group discussion A Prespective to Environmental Studues by CP Kaushik Envirommental Science by G.Tyler		Describe various types of environmental pollution their causes, effects and measures of control. Explain Role of an individual in prevention of pollution Discuss the Disaster management: floods, earthquake, cyclone and landslides
Social Issues and the Environment	4	Student Interactive Session A Prespective to Environmental Studues by CP Kaushik Envirommental Science by G.Tyler		Describe the concept social issues and environment Discuss the Urban problems and related to energy Explain Water conservation, rain water harvesting, watershed management Describe the Environmental Protection Acts Discuss Issues involved in enforcement of environmental legislation
Human Population and the Environment	3	Student Interactive Session A Prespective to Environmental Studues by CP Kaushik Envirommental Science by G.Tyler		Describe the concept of Human population and the Environment Explain the Population explosion – Family Welfare Programmes Discuss the Environment and human health- Human Rights, Value Education, HIV / AIDS, Women and Child Welfare Discuss the Role of Information Technology in Environment and Human Health
Field Work	8	Field Visits		Recognize local area of environmental assets river/ forest/grassland/hill/mountain Identify the a local polluted site – Urban / Rural / Industrial /

At the completion of this course each student will be able to meet the following student learning objectives:

1. Evaluate physical fitness by participating in group fitness classes, weight training, aquatic fitness, walking, jogging, and group sport activities.
2. Develop understanding for various exercise and fitness principles. As well as develop a plan to track daily exercise.
3. Acquire a basic understanding of physical activity and exercise physiology.
4. Discuss the role of moderate levels of physical activity and exercise in the prevention and treatment of human disease.

Course Outcomes:

1. Assessment of physical fitness of the population in the society.
2. Implement awareness program regarding the importance of fitness and physical activities in prevention of various disease.

Date	Theme/ Topic	Duration	Learning Experiences & Learning Resources	Learning Objectives
	Basic concepts of Physical Fitness	6	Student Interactive Session Students Seminar Exercise Physiology: Katch & Katch	Define the concept of Physical Fitness & Understand the principles of Physical fitness Explain the techniques & Physiological principles involved in human movement
	Fitness Testing	3	Student Interactive Session Students Seminar Practical Demonstration Exercise Physiology: Katch & Katch	To identify and demonstrate the various tests used to measure the Physical fitness
	Body composition	3	Student Interactive Session Students Seminar Practical Demonstration Exercise Physiology: Katch & Katch	Discuss the composition of human body Explain the Desirable body mass To identify the various techniques to assess body composition
	Aging and exercise	10	Student Interactive Session Students Seminar K A Van Norman: Exercise & Wellness for older Adults: Practical Programming Strategies, 2010 Colleen Keller & Julie Fleury: Health Promotion for the Elderly, 2000, First Edition,	Understand the importance of physical activity for health and quality of life of older adults Explain the aging process and biological theories of aging Understand the effects of exercise on aging Understand the components of exercise programming for older people Able to assess/evaluate the

			Sage Publications	efficacy of exercise programs for older adults Formulate a physical activity plan for an older adults
Physiological basis and principles of training and conditioning	6	Student Interactive Session Students Seminar Exercise Physiology: Katch & Katch Dr. Lalita Ishwarn Punnya: Physical fitness and Wellness, 2017, First Edition, Khel Sahitya Kendra		To understand the physiological bases of the responses and adaptations to exercise Explain Acute and chronic effects of exercise on various body systems Discuss the Principles of training, exercise prescription Understand the role of physical activity in health and disease
Lifestyle disorders	4	Student Interactive Session Students Seminar Exercise Physiology: Katch & Katch Dr. Lalita Ishwarn Punnya: Physical fitness and Wellness, 2017, First Edition, Khel Sahitya Kendra		Identify the role of Physical Fitness in disease prevention