2023-24

Detailed Syllabus for Bachelor of Physiotherapy(BPT)

DEPARTMENT OF PHYSIOTHERAPY

UNIVERSITY OF ENGINEERING AND MANAGEMENT,JAIPUR

PREAMBLE

Physiotherapy (PT) is a Movement Science with an established theoretical and scientific base and widespread clinical applications in the Prevention, Restoration & Rehabilitation, Maintenance and Promotion of optimal physical function. Physiotherapists diagnose and manage movement dysfunction and enhance physical and functional abilities. This physical dysfunction may be the sequelae of involvement of any of the systems like Musculoskeletal, Neurological, Cardiovascular, Respiratory, or other body systems.

These practitioners contribute to society and the profession through practice, teaching, administration, and the discovery and application of new knowledge about physiotherapy experiences of sufficient excellence and breadth by research to allow the acquisition and application of essential knowledge, skills, and behaviors as applied to the practice of physiotherapy.

Physiotherapists (PT) are autonomous, effective, and compassionate professionals, who practice collaboratively in a variety of healthcare set ups such as neonatal to geriatric, from critical care to community fitness to sports training. Emerging graduate and post graduate students are required to demonstrate a substantial knowledge base, possess skills related to Physiotherapy practices, possess high emotional quotient to address family health and meet community responsibilities, demonstrate gender sensitivity and sociocultural relevant competence. They should be aware of legal issues governing professional practice and follow evidence-based clinical practices.

INTRODUCTION

Physiotherapy is a branch of modern medical science which includes examination, assessment, interpretation, physical diagnosis, planning and execution of treatment and advice to any personfor the purpose of preventing, correcting, alleviating and limiting dysfunction, acute and chronicbodily malfunction including life saving measures via chest physiotherapy in the intensive care unit, curing physical disorders or disability, promoting physical fitness, facilitating healing and pain relief and treatment of physical and psychological disorders through modulating psychological and physical response using physical agents, activities and devices including exercise, mobilization, manipulations, therapeutic ultrasound, electrical and thermal agents and electrotherapy for diagnosis, treatment and prevention.

Physiotherapist' is a qualified professional who has acquired all the above-mentioned knowledge and skills for entry into practice after being awarded a bachelor's degree in the subject of "Physiotherapy" from a recognized institute affiliated to the University conducting a fulltime course not less than four years and six months of internship.

OBJECTIVES OF THE BACHELOR'S IN PHYSIOTHERAPY (BPT) PROGRAM

This program is formulated to enable students to gain adequate knowledge, skills and clinical hands-on experience leading to an ability to establish independent professional practice. The overall content of the curriculum focuses on learning experiences and clinical education experiences for each student that encompasses the following:

1. Ethical, evidence-based, efficient Physiotherapy treatment of adult as well as pediatric patients/clients with an array of conditions (e.g., musculoskeletal, neuromuscular, cardiovascular/pulmonary, integumentary etc) across the lifespan and the continuum of care, toall people irrespective of gender, caste, nation, states and territories, region, minority groups orother groups.

2. Ability to prevent movement dysfunction or maintain/restore optimal function and quality of life in individuals with movement disorders.

3. Ability to operate as independent practitioners, as well as members of health service providerteams, act as first contact practitioners, from whom patients/clients may seek direct services without referral from another health care professional.

4. Ability to promote the health and wellbeing of individuals and the public/society, emphasizingthe importance of physical activity and exercise.

5. Prevent impairments, activity limitations, participatory restrictions, and disabilities in individuals at risk of altered movement behaviors due to health factors, socio-economic stressors,environmental factors and lifestyle factors.

6. Provide interventions/treatment to restore integrity of body systems essential for movement, maximize function and recuperation, minimize incapacity, and enhance the quality of life, independent living and workability in individuals and groups of individuals with altered movement behaviors resulting from impairments, activity limitations, participatory restrictions,and disabilities.

7. Ability to modify environmental, home and work access and barriers to ensure full participation in one is normal and expected societal roles.

8. Become an essential part of the health and community/welfare services delivery systems, practice independently of other health care/service providers and also within interdisciplinary rehabilitation/habilitation programs, independent professional practice in self-employed set up oremployment at the multiple settings such as hospitals, nursing homes, institutions catering services to specific conditions (like paraplegic /geriatric homes), primary as well as rural & urban health care set up, community health , domiciliary practice like residential areas, education & research centers, fitness /wellness centers like health clubs, occupational health centers, Schools including special schools, geriatric care units, and others.

PROGRAM OUTCOMES (PO)

The program learning outcomes relating to BPT degree program are summarized below:

PO1	To demonstrate behavioral skills and humanitarian approach while communicating with patients, relatives, society at large and co-professionals
PO2	To develop healthy Physiotherapist – Patient relationship
PO3	To demonstrate and relate moral, ethical values and legal aspects concerned with Physiotherapy management
PO4	To demonstrate academic skills and knowledge related to understanding the structural and functional of human body and applied anatomy, physiology in physiotherapy practice
PO5	To apply and outline pathology of medical conditions in context with Physiotherapy, interpret& use medical communication.
PO6	To apply knowledge of biomechanics of human movement in musculoskeletal, neurological, and cardio-respiratory conditions in planning, recommending, and executing Physiotherapy management.
PO7	To outline and implement Physiotherapy management by co-relating assessment and examination skills of clinical subjects like Orthopedics, General Surgery, Medicine, Neurology, Pediatrics, Dermatology & Gynecology & Obstetrics, Community Medicine and Sociology
PO8	To demonstrate skill in maneuvers of passive movements, massage, stretching, strengthening, and various manual therapy techniques. Students will integrate Physiotherapy evaluation skills including electro diagnosis on patients to arrive at a Functional/ Physical Diagnosis in musculoskeletal, neurological, cardiovascular, and pulmonary conditions.

PROGRAM SPECIFIC OBJECTIVES

PSO1	Employability: The students can work in the following: Defense Ministry of India, in central and state level governmental hospitals, private multi-specialty hospitals and academic institutes, in private companies like MNCs, BSNL, Amazon, Infosys etc.
PSO2	Environment and Sustainability: Student can work and sustain in his field in country and as well as abroad it has vast field across the globe.
PSO3	Modern Tool Usage: The student would be able to use different physiotherapeutic modalities as well as techniques (MFR, TAPING, CUPPING, NEEDLING, NDT, PNF) etc.
PSO4	Lifelong learning: The student would be able to deal with patient, take history of the patient, differentially diagnose the patient, and prescribe the treatment accordingly.
PSO5	Entrepreneurship: The student would be able to set up his/her own clinic or joint ventures.
PSO6	Understand basic life sciences: The student would be able to know anatomical, physiological, and biomechanical working of human body.
PSO7	Skill development: The student would be able to perform various manual techniques to treat the patients.

Second Year
(1 Year Duration)

S.NO.	SUBJECT CODE	SUBJECT	CREDIT HOURS
1.	BIK201	Biomechanics & Kinesiology	**4**
2.	COM201	Community Medicine	**4**
3.	ELT201	Electrotherapy-II	**4**
4.	ELT291	Electrotherapy-II Practical	**2**
5.	EXT201	Exercise Therapy-II	**4**
6.	EXT291	Exercise Therapy-II Practical	**2**
7.	PAM201	Pathology & Microbiology	**4**
8.	PHA201	Pharmacology	**4**
		TOTAL	**28**

SUBJECT: BIOMECHANICS & KINESIOLOGY
SUBJECT CODE: BIK201
CREDITS: 4

Course Objectives:

Kinesiology is not studied merely to incite our interest in a fascinating and mysterious subject. It has a useful purpose. We study kinesiology to improve performance by learning how to analyze the movements of the human body and to discover their underlying principles. The study of kinesiology is an essential part of the educational experience of students of physical education, dance, sport, and physical medicine. Knowledge of kinesiology has a threefold purpose for practitioners in any of these fields. It should enable them to help their students or clients.

Course Outcomes (CO):

After taking this course a student will:

CO1: Define kinesiology and explain its importance to the student of human motion.
CO2: Describe the major components of a kinesiological analysis.
CO3: Prepare a description of a selected motor skill, breaking it down into component phasesand identifying starting and ending points.
CO4: Determine the simultaneous-sequential nature of a variety of movement skills.CO5: Classify motor skills using the classification system presented.
CO6: State the mechanical purpose of a variety of movement skills.
CO7: Utilize methods of observation and palpation to identify the joints and basic muscle groupsactive in a movement skill.

Mapping of Course Outcomes (CO) and Program Outcomes (PO):

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	✓					✓		
CO2	✓					✓		
CO3	✓					✓		
CO4	✓					✓		
CO5	✓	✓				✓		
CO6	✓	✓				✓		
CO7	✓	✓				✓	✓	

Course Contents:

S. No.	Topics	Hours
1	**Essential Concepts**	15H
	a. Motion and forces, Axis and planes, Mechanical lever, lever in Human body.	
	b. Force distribution-linear force, resultant force & equilibrium, parallel forces in one plan concurrent force.	
	c. Newton's law – Gravity and its effects on human body	
	d. Forces and moments in action	
	e. Concepts of static equilibrium and dynamic equilibrium	
	f. Composition and resolution of forces	
	g. Friction	
	i. Pulleys.	
2	**Joint Structure and Functions**	10H
	a. Basic Principles of joint structure and function.	
	b. Tissues present in and around joints including fibrous tissue, bone cartilage, connective tissue, ligaments, tendons etc.	
	c. Classification of joints.	
3	**Muscle Structure and Functions**	15H
	a. Mobility and Stability functions of muscle	
	b. Elements of muscle structures and its properties.	
	c. Types of muscle contraction and muscle work.	
	d. Classification of muscles and their functions	
	e. Group action of muscles, coordinated movement.	
4	**Kinematics and Kinetics Concepts of**	25H
	a. Upper Extremity	
	i) Scapulo-shoulder Joint	
	ii) Elbow Joint	
	iii) Wrist Joint & Hand	
	b. Lower Extremity	
	i) Hip & pelvis	
	ii) Knee joint	
	iii) Patello femoral joint	
	iv) Ankle and foot	
	c. Temporomandibular joint	
5	**Biomechanics of vertebral column**	10H
6	**Biomechanics of Gait:**	15H

	a. Gait cycle	
	b. Spatio-temporal parameters of gait	
	c. Kinematics and Kinetics of human gait	
	d. Determinants of gait	
	e. Gait deviations in various orthopedic/neurological conditions	
7	**Posture:**	10H
	a. Anatomical aspects of posture	
	b. Factors affecting posture	
	c. Assessment of Posture	
	d. Types of Posture	
	e. Postural deviation	

Suggested Reading:

Textbook:

1. Joint Structure and Function- Cynthia Norkins & Pamela Lavengie.
2. Kinesiology: The Mechanics and Pathomechanics of Human Movement, Carol A. Oatis, Jaypee, All chapters.

Reference:

1. Fundamentals of biomechanics- Nihatozkaya, Margareta nordin

Essential Courses:

Biomechanics By Prof. Varadhan | IIT Madras |
https://onlinecourses.nptel.ac.in/noc23_bt04/preview
Anthropometry, Biomechanics, and Motor Skills in User Design | Arizona State University
https://www.coursera.org/learn/anthropometry-biomechanics-and-motorskills-in-user-design

SUBJECT: COMMUNITY MEDICINE

SUBJECT CODE: COM201

CREDITS: 4

Course Objectives:

1) Help Students understand health and potential interventions from a community/consumer perspective.
2) Provide opportunities for Students to develop skills in working collaboratively when addressing health issues.
3) Help community partners understand and use research skills to advance their own missions.
4) Experience the translation of research into action. Instill in students a sense of responsibility to the communities in which they work.
5) Take the skills developed through the community project to other settings in which the students may practice in the future.

Course Outcomes (CO):

After taking this course a student will:

CO1: Education and training in community-based and collaborative research that will have transferability to other settings.
CO2: Strengthening relationships in the benefit of community-based projects of current and future students.
CO3: Advancing knowledge on community research experiences in a scholarly manuscript.

Mapping of Course Outcomes (CO) and Program Outcomes (PO):

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	✓	✓	✓		✓		✓	
CO2	✓	✓	✓				✓	
CO3	✓	✓	✓					

Course Contents:

S. No.	Topics	Hours
1	General concepts of health diseases, with reference to natural history of disease with pro-pathogenic and pathogenic phases. The role of socio-economic and cultural environment in health and disease. Epidemiology, definition, and scope.	10H
2	Public health administration an overview of the health administration set up at Central and state levels.	8H
3	The national health program -highlighting the role of social, economic, and cultural factors in the implementation of the national program.	8H
4	Health problems of vulnerable groups-pregnant and lactating women, infants and pre-school children, occupational groups.	8H
5	Occupational Health-definition, scope occupational disease prevention of occupational disease and hazards.	6H
6	Social security and other measurement for the protection from occupational hazard accident and diseases. Details of compensation acts.	8H
7	Family planning – objectives of national family planning programs and family methods. A general idea of advantage and disadvantages of the methods.	8H
8	Mental health emphasis on community aspects of mental, role of Physiotherapy in mental health problems such as mental retardation etc.	6H
9	Communicable disease- an overall view of communicable disease classifies according to principal mode of transmission role of insect and other factors.	8H
10	International health agencies.	6H
11	Community medicine and rehabilitation epidemiology, habitat, nutrition, environment anthropology. a) The philosophy and need of rehabilitation b) Principles of physical medicine c) Basic principles of administration or organization	18H
12	Introduction to community health.	6H

Suggested Reading:

Textbook:

1. K. Park – Park's Textbook of Preventive & Social Medicine.

Essential Courses:

1. https://onlinecourses.swayam2.ac.in/nou24_es06/preview
2. https://www.coursera.org/learn/mental-health
3. https://www.coursera.org/learn/non-communicable-diseases-in-humanitarian-settings

SUBJECT: ELECTROTHERAPY-II

SUBJECT CODE: ELT201

CREDITS: 4

Course Objective:

This course is an ideal way to bring up to date with current procedures in this field. It will expand the knowledge of the underlying principles of modalities such as ultrasound and laser therapy and will enhance the ability to adapt 'standard' treatment protocols to the specific needs of each individual patient.

Course Outcomes (CO):

After taking this course a student will:

CO1: To consider the basic issues of each modality.
CO2: What the energy can (and cannot) do in terms of physiological & therapeutic effect. CO3: To relate these issues to both the research evidence & to the clinical application of eachmodality.
CO4: Explain the basic nature of the applied energy.
CO5: Identify the key physiological effects of the modality.
CO6: Rationalize the main therapeutic effects.
CO7: Justify the appropriate clinical application.
CO8: Establish appropriate clinical doses.
CO9: List the key contraindications, dangers & precautions.

Mapping of Course Outcomes (CO) and Program Outcomes (PO):

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1		✓						✓
CO2		✓						✓
CO3		✓		✓				✓
CO4				✓			✓	✓
CO5				✓			✓	✓
CO6		✓		✓			✓	✓
CO7		✓		✓			✓	✓
CO8		✓		✓			✓	✓
CO9		✓		✓			✓	✓

Course Contents:

S. No.	Topics	Hours
1	**MEDIUM FREQUENCY CURRENT (interferential current)**	10H
	Definition, characteristics, physiological/therapeutic effect of I.F current, indication, technique of application, contraindication, and precaution.	
2	**HIGH FREQUENCY CURRENT**	20H
	a. SHORT WAVE DIATHERMY - Introduction, physiological effect and therapeutic effect of SWD, method of application (capacitor field method and cable method etc.) technique of treatment, indication, contraindication and Dangers.	
	b. PULSED SWD - Definition, characteristics, mechanism of work, physiological effect and therapeutic effects, indications, techniques of application, principle of treatment and contraindication.	
	c. MICROWAVE DIATHERMY -	
	· Introduction and characteristics.	
	· Physiological effect.	
	· Therapeutic effect	
	· Techniques of application and principle of treatment.	
	· Dangers of microwave diathermy	
3	**LASER**	10H
	· Introduction and characteristics.	
	· Effect on tissue.	
	. Therapeutic effect	
	· Indication, contraindication, and dangers.	
4	**ULTRASONIC THERAPY**	15H
	· Introduction and characteristics.	
	· U.S therapy parameters.	
	· Coupling media	
	· Therapeutic effects.	
	· Indications, contraindications, and dangers.	
	· Testing of apparatus	
	· Technique of application and dosage	
5	**CRYOTHERAPY**	10H
	· Introduction, physical principles	
	· Physiological effects	
	· Indication and contraindication	
	· Therapeutic effects and technique of application	
6	**BIO-FEEDBACK**	15H
	· Introduction, principles of biofeedback	

	· Therapeutic effects of biofeedback	
	· Indication and contraindication	
	· Technique of treatment	
7	**Electro diagnosis**- EMG techniques, Iontophoresis etc.	10H
8	**ADVANCED ELECTROTHERAPY**	10H
	Combined therapy-principle, therapeutic uses, and indication like U.S therapy with stimulation or TENS etc.	

SUBJECT: ELECTROTHERAPY-II PRACTICAL

SUBJECT CODE: ELT291

CREDITS: 2

S. No.	Topics	Hours
1	Testing of Electrotherapy apparatus**.**	10H
2	Technique of application of electrotherapy treatment modalities (demonstration and practice).	50H
3	Electro-diagnosis (demonstration and practice of following electro-diagnostic measures) a. F.G test	20H
4	Observe EMG and NCV- demonstration only	10H
5	Observe Biofeedback Unit.	10H

Suggested Readings:

Textbooks:

1) Basanta Kumar Nanda, Electrotherapy simplified, jaypee, all chapters.
2) Angela Forster, Clayton's Electrotherapy, CBS, all chapters.

References:

1) Low and Reed – Electrotherapy Explained: Principles and Practice
2) Jagmohan Singh – Textbook of Electrotherapy.
3) Kahn - Principles and Practices of Electrotherapy
4) Lehmann – Therapeutic Heat and Cold

SUBJECT: EXERCISE THERAPY-II

SUBJECT CODE: EXT201

CREDITS: 4

Course Objective:

This area offers students a life span approach to physical fitness, performance, and health to prepare them for a career in the physical therapy field. Exercise therapy study is designed to expand upon information provided in the basic sciences of anatomy/physiology and chemistry. By design students learn about the effects of physical activity on children, then young adults, followed by geriatric populations. The exercise science majorly prepares students for a variety of possible careers in athletic training, physical therapy, fitness and sport enterprises, education, sport science & coaching Such occupations include, aerobics instructor, cardiopulmonary rehabilitation specialist, exercise physiologist, occupational physiologist, personal trainer, strength, and conditioning specialist and more.

Course Outcomes (CO):

After taking this course a student will:

CO1: Demonstrate a sound foundational knowledge and understanding of the principles of biology, chemistry, and nutrition, and an advanced understanding of human anatomy and physiology as they relate to responses and adaptations to physical activity and exercise.
CO2: Demonstrate basic laboratory skills pertaining to assessments, laboratory methods, sound experimental and analytical practices, data acquisition and reporting in the exercise sciences.
CO3: Demonstrate knowledge of the importance and influence of physical activity, kinesiology, nutrition, and exercise on health and be an advocate for physically active lifestyles as a means to improve quality of life and reduce the risk and prevalence of lifestyle related diseases.
CO4: Plan, administer, and evaluate wellness and fitness programs, nutrition projects, and exercise physiology tracks based in sport, clinical, industrial, and/or corporate environments. CO5: Demonstrate requisite skills and abilities for meaningful employment in exercise science related areas or pursue graduate studies in an exercise therapy related area.

Mapping of Course Outcomes (CO) and Program Outcomes (PO):

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	✓						✓	✓
CO2	✓						✓	✓
CO3	✓			✓			✓	✓
CO4	✓			✓			✓	✓
CO5	✓			✓			✓	✓

Course Contents:

S. No.	Topics	Hours
1	Therapeutic exercises – impact on physical function, classification, techniques, indications, contraindications, assessment, and evaluation of patient**.**	15H
	Range of motion & types of ROM exercises. Resistance exercises and adaptation of skeletal muscles.	
2	Principles of aerobic exercises & its physiological response, testing as basis of aerobic program. Determinants of exercise program. Stretching Techniques and its determinants. Peripheral and spinal joint mobilization techniques. Individual, group and mass exercises, maintenance exercises, plan of exercise-therapy tables and schemes	25H
3	Functional Re-education- techniques to re-educate ADL functions. Principles of Traction, physiological and therapeutic effects, classification, types, indications, contraindications, techniques of application, operational skills, and precautions. Taping and bandaging techniques. P.N.F: Detail theory of proprioceptive neuro muscular facilitation techniques.Co-ordination Exercises: Definition of coordination movements. Uncoordinated movements, Factors for coordinated movements, technique of coordination exercises. Techniques to improve static and dynamic balance.	26H
4	Posture: Types, factors responsible for good posture, factors for poor posture, principles of development of good posture, assessment of Posture. Gait: Analysis of normal gait with muscle work, various pathological gaits. 2point, 3point & 4point gait: Introduction, crutch measurement, crutch balance, various types of crutch gait in details. Breathing exercises: Physiology of respiration, types of breathing exercises, technique if various types of breathing excises, its effects and uses. Pulmonary exercises & postural drainage	20H
5	Hydrotherapy: Introduction, various types of hydrotherapy units, construction and equipment used in hydrotherapy Principles, indications, contraindication, effects and uses of hydrotherapy. Precautions towards patient, towards therapist, equipment unit etc. Exercises for normal person – Importance and effects of exercise to maintain optimal health and its role in prevention of disease. Exercise prescription for different age groups/ occupational demands etc. Yoga-Definition-History-Principles-Concepts, General effects of yogic posture on the body.	14H

SUBJECT: EXERCISE THERAPY-II PRACTICAL

SUBJECT CODE: EXT291

CREDITS: 2

Course Contents:

S.No.	Topics	Hours
1	Assessment and evaluative procedures including motor, sensory, neuromotor.Coordination, vital capacity, limb length.	10H
2	Resistive Exercise.	10H
3	Range of motion exercise.	10H
4	Stretching.	10H
5	Traction techniques.	5H
6	Functional re-education.	10H
7	Taping and bandaging techniques.	5H
8	Assessment of Posture using plumb line.	5H
9	Assess and evaluate equilibrium/ balance and techniques to improve balance.	5H
10	Peripheral Joint Mobilization techniques.	10H
11	Breathing exercise and postural drainage	10H
12	Gait and crutch walking	5H
13	Application of PNF techniques and patterns.	5H

Suggested Reading:

Textbooks:

1. M. Dena Gardiner, Principles of Exercise Therapy. CBS, all chapters.
2. Progressive resisted exercises – by Margaret Hollis
3. Therapeutic Exercises- foundations and Techniques- Kisner and Colby.

References:

1.. Muscle Testing and Function- Kendall
2. Practical Exercise Therapy – Hollis.
3. Beard's Massage – Wood.
4. Motor control- theory and practical application- Shumway.
5. Hydrotherapy – Principles and practice – Campion.
6. Measurement of Joint Motion – A guide to goniometry – Norkin and White Davis.
7. PNF – Knott and Voss

SUBJECT: PATHOLOGY & MICROBIOLOGY

SUBJECT CODE: PAM201

CREDITS: 4

Course Objectives:

Demonstrate an investigative and analytic approach to clinical and pathological problems.
Demonstrate applied knowledge of Pathology, by describing the four aspects of the major disease processes covered in the course:
1) Cause (etiology)
2) Mechanisms of development (pathogenesis)
3) Functional consequences of the molecular and morphologic changes (clinical significance)
4) Apply the basic and clinically supportive sciences appropriate to pathology (such as anatomy, biochemistry, histology/histopathology, cytogenetic, and physiology).

Course Outcomes (CO):

After taking this course a student will:

CO1: Gather and apply essential information from patient cases necessary to discuss clinic-pathologic processes in Small Group Discussions.
CO2: Develop a differential diagnosis when presented with clinical information or a histo-pathologic finding.
CO3: Utilize laboratory studies to diagnose and monitor disease states and conditions.
CO4: Demonstrate the ability to support self-education (i.e., active learning).
CO5: Demonstrate the ability to find additional information when confronted with a question or unfamiliar term, particularly when preparing for case-based exercises.
CO6: Investigates new and exciting material about microbes and our world, including health concerns, microbial anatomy and physiology, genetics, epidemiology, and use of antimicrobialsand disinfectants.
CO7: Compare and contrast the characteristics for various microbes with regards to infections, treatment, and control. (This includes prions, viruses, bacteria, protozoans, and multicellular parasites)
CO8: Explain the dynamics of commensal, opportunistic, and pathological relationships particularly between microbes and humans.
CO9: Evaluate and apply the proper methods of microbial control necessary in sample scenariosor case studies.
CO10: Describe microbial metabolic pathways in general terms and specifically evaluate the implications for food production and human disease.

Mapping of Course Outcomes (CO) and Program Outcomes (PO):

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1		✓			✓		✓	
CO2		✓			✓		✓	
CO3		✓			✓		✓	
CO4			✓		✓		✓	
CO5			✓		✓		✓	
CO6			✓		✓		✓	
CO7			✓		✓		✓	
CO8			✓		✓		✓	
CO9			✓		✓		✓	
CO10					✓		✓	

Course Contents:

S. No.	Topics	Hours
	PATHOLOGY	
1	Aims and objectives of study of pathology.	2H
2	Brief outline of cell injury, degeneration, necrosis, and gangrene.	3H
3	Inflammation: Definition, vascular and cellular phenomenon difference between Transudate and exudates. Granuloma.	4H
4	Circulatory disturbances: Hemorrhage, Embolism Thrombosis Infraction, shock, Volkmann's ischemic contracture.	4H
5	Blood disorder: Anemia, Bleeding disorder.	3H
6	CVS: Heart and Blood vessels, Coronary heart disease.	3H
7	Respiratory System: Ch. Bronchitis, Asthma Bronchiectasis, Emphysema, COPD etc.	5H
8	Bones and Muscles: Arthritis & Spondyloarthropathy.	3H
9	PNS and Muscles: Neuropathies, Poliomyelitis & Myopathies etc.	4H
10	CNS: Infection, Demyelinating disease, Degenerative disease etc.	4H
11	Neoplasia.	3H
12	Growth and its disorders like hypertrophy hyperplasia & atrophy.	3H
13	Autoimmune diseases.	3H
14	Healing and repair.	3H
15	Diabetes mellitus and gout	3H

	MICROBIOLOGY	
1	Introduction and History of Microbiology	3H
2	General lectures on Microorganisms (brief).	3H
3	Sterilization and asepsis.	3H
4	Infection- Source of infection and Entry and its Spread	4H
5	Immunity- Natural and Acquired	4H
6	Allergy and hypersensitivity.	3H
7	Outline of common pathogenic bacteria and diseases produced by them. Respiratory tract infections. Meningitis. Enteric infections. Anaerobic infections. Urinary tract infections. Leprosy, tuberculosis, and miscellaneous infections. Wound infections. Sexually transmitted diseases. Hospital acquired infections.	22H
8	Virology- virus infections with special mention of Hepatitis.	4H
9	Poliomyelitis & rabies.	4H

Suggested Reading:

Textbook:

1) Textbook of Pathology, Harsh Mohan, Ivan Damjanov, Jaypee,
2) Textbook of Microbiology, R. Ananthanarayan, All chapters.
3) General Pathology – by Bhende

SUBJECT: PHARMACOLOGY

SUBJECT CODE: PHA201

CREDITS: 4

Course Objectives:

This course introduces the student to basic pharmacology of common drugs used, their importance in the overall treatment including Physiotherapy. The student after completing the course will be able to understand the general principles of drug action and the handling of drugsby the body. The student will be aware of the contribution of both drug and physiotherapy factors in the outcome of treatment.

Course Outcomes (CO):

After taking this course a student will:

CO1: Possess a relevant knowledge in basic principles of pharmacology and its recent advances.
CO2: Understand the basic pharmacology of common drugs used, their importance in the overall treatment including Physiotherapy.
CO3: Understand the general principles of drug action and the handling of drugs by the body.
CO4: Understand the contribution of both drug and physiotherapy factors in the outcome of treatment.

Mapping of Course Outcomes (CO) and Program Outcomes (PO):

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	✓		✓					
CO2	✓		✓		✓			
CO3	✓		✓		✓			
CO4	✓		✓		✓		✓	

Course Contents:

S. No.	Topics	Hours
1	General Pharmacology: Introduction and definitions, Nature, and sources of drugs: Dosage forms of drugs. Routes of drug administration, Pharmacokinetics (Absorption, Bioavailability, Distribution, Metabolism Excretion, first order Zero order Kinetics); Pharmacodynamics (sites and mechanisms of drug action in brief, Adverse drug reactions, Margin of safety of drugs and factors influencing dosage and drug response)	12H
2	Drugs Affecting ANS: General Introduction, Drug affecting parasympathetic nervous system, Drug affecting sympathetic nervous systems.	10H
3	Drugs Affecting Peripheral (Somatic) nervous System: Skeletal Muscle Relaxants: Local Anesthetics.	10H
4	Renal and CVS: Diuretics; Renin-angiotensin system and its inhibitors, Drug treatment of Hypertension, Angina pectoris, Myocardial infarction Heart failure, and hypercholesterolemia.	10H
5	Anti-inflammatory drugs and related autacoids: Histamine, Bradykinin, 5-HT, and their antagonists; Prostaglandin's and leukotriene; Non-steroidal Anti-inflammatory drug, Anti-rheumatic drugs and drugs used in gout.	10H
6	Drugs Affecting CNS: General anesthetics, Anxiolytics; Alcohol, Opioid analgesics. Drug dependence and abuse Antiepileptic drugs, Drug therapy for neurodegenerative disorders.	10H
7	Endocrines: Parathyroid hormone, Vitamin D, calcitonin, and drugs affecting Calcium balance, Thyroid and anti-thyroid drugs; Adrenocortical and anabolic steroids, Insulin and Oral Hypoglycemic agents.	10H
8	Drugs Affecting Respiratory System: Drug therapy of bronchial asthma and chronic obstructive pulmonary disease.	10H
9	Chemotherapy: Introduction; sulfonamides, Fluor quinolones, Penicillin, Cephalosporin, newer B-lactam antibiotic, aminoglycosides Macrolides and Newer antibiotics, Tetracycline Chloramphenicol, Chemotherapy of Tuberculosis and leprosy, antiseptics-disinfectants.	10H
10	Miscellaneous Topics: Management of stroke, Toxicology and heavy metal poisoning, special aspects of pediatric and geriatric pharmacology; Drug interactions with drugs commonly used by physiotherapists; Hematinic, vitamins and antioxidants.	8H

Suggested Reading:

Textbook:

1. Essentials of Medical Phramacology, K.D. Tripathi, Jaypee
2. Pharmacology and Pharmaco therapeutics – R.S. Satoskar.

References:

1. Medical Pharmacology by Drill
2. Pharmacology principle of Medical practice – by Krantx & Carr