

KHALSA UNIVERSITY, AMRITSAR



**Faculty of Pharmaceutical and
Allied Health Sciences**

**School of Allied & Healthcare Sciences
Department of Physiotherapy**

**Bachelor of Physiotherapy (BPT)
(Four years and six months)
Undergraduate Programme
Annual System**

Session 2026-2027

KHALSA UNIVERSITY, AMRITSAR

PROGRAMME NAME: Bachelor of Physiotherapy (BPT)

I. Program Outcomes (PO)

Students who complete four and half year's undergraduate program in Physiotherapy would earn a Bachelor of Physiotherapy (BPT) degree. The learning outcomes that a student should be able to demonstrate on completion of a degree level program include academic, personal, behavioral, entrepreneurial and social competencies. It is expected that a student completing a particular course must have a level of understanding of the course and its sub-areas in consonance with the learning outcomes mentioned at the end of that course. Program learning outcomes include Physiotherapy specific skills, generic skills, transferable global skills and competencies that prepare the student for employment, higher education, and research thereby developing students as contributing members for overall benefit to the society.

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

PO-1	To demonstrate behavioral skills and humanitarian approach while communicating with patients, relatives, society at large and co-workers at work place.
PO-2	To demonstrate and relate moral, ethical values and legal aspects concerned with Physiotherapy management
PO-3	To demonstrate academic skills and knowledge related to understanding the structure and function of human body and applied anatomy, physiology in physiotherapy practice.
PO-4	To outline and implement Physiotherapy management by co-relating assessment and examination skills of clinical Courses like Orthopedics, General Surgery, Medicine, Neurology, Pediatrics, Dermatology & Gynecology & Obstetrics, Community Medicine and Sociology.
PO-5	To describe and analyze concepts of energy conservation, global warming and pollution and justify optimal use of available resources.
PO-6	To demonstrate ability of critical thinking, scientific enquiry, experiential learning, personal finance, entrepreneurship and managerial skills related to task in day-to-day work for personal & societal growth.
PO-7	To demonstrate and apply basic computer applications for data management, data storage, generating databases and for research purposes.

II. Program Specific Outcomes (PSO) for Bachelor of Physiotherapy Program

PSO-1	Acquire, assess, apply and integrate new knowledge, learn to adapt to changing circumstances and ensure that patients receive the highest level of professional care.
PSO-2	Establish the foundations for lifelong learning and continuing professional development through attendance in various seminars, CMEs and conferences.
PSO-3	Function effectively as a mentor and teacher contributing to the appraisal, assessment and review of colleagues, providing effective feedback, and taking advantage of opportunities to develop these skills.
PSO-4	Analyze the roles and expertise of health care professionals and social workers in the context of working and functioning as a multidisciplinary team for the delivery of safe and high-quality care.
PSO-5	Explain the scientific basis for common musculoskeletal, neurological, cardio-respiratory, women's health related, geriatric and sports related disorders, compare and contrast Physiotherapy treatment techniques applicable in relevant case scenarios.
PSO-6	Justify selection of appropriate clinical examination technique or tools and investigation procedure for common clinical conditions and critically analyze clinical findings and plan appropriate rehabilitation goals for common disorders and design management protocols.
PSO-7	Examine the role of environmental and occupational hazards in ill-health and discuss ways to mitigate their effects.
PSO-8	Critically appraise the results of relevant qualitative and quantitative studies as reported in scientific literature and outline the ethical issues involved in clinical research.
PSO-9	Communicate clearly, sensitively and effectively with patients, caregivers, and colleagues from the medical and other professions, by listening, sharing and responding.
PSO-10	Demonstrate confidentiality, use data protection legislation and codes of practice in all dealings with information.

Scheme of Examination

BACHELOR OF PHYSIOTHERAPY (BPT)

BPT- Part-II (Second Year)

Subjects	Subject Code	Marks		Internal Assessment		Total Marks	Teaching Hours	
		Theory	Practical	Theory	Practical		Theory	Practical
Pathology & Microbiology	KUBPT-201	75	--	25	--	100	200	--
Pharmacology	KUBPT-202	75	--	25	--	100	100	--
Electrotherapy-II	KUBPT-203	75	75	25	25	200	100	200
Exercise Therapy-II	KUBPT-204	75	75	25	25	200	100	200
Biomechanics	KUBPT-205	75	--	25	--	100	100	--
Psychology	KUBPT-206	75	--	25	--	100	150	--
Sociology & Community Health	KUBPT-207	75	--	25	--	100	100	--
Environmental Study*	KUEVS-208	75	--	25	--	100	60	--

***Environmental Study is a non-credit subject (Qualifying)**

BACHELOR OF PHYSIOTHERAPY (PART-II)

KUBPT-201: Pathology & Microbiology

Credit Hours (Per week): 6

Total Hours: 200

M. Marks: 100

Time: 3 hrs

Theory: 75

Internal Assessment: 25

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The answer should not exceed 50 words. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To impart knowledge about terminology used in pathology, its aims and objectives.
2. To study microbiology through classification of micro-organisms, infections spread by them, prevention and control through disinfection and sterilization.
3. To deeply study about causative organisms, mode of transmission, pathogenesis, prevention and diagnostic tests of various infectious diseases.
4. To study etiology, pathogenesis and general features of diseases related to blood, blood vessels, heart, respiratory system, bones, muscles and nervous system.
5. To understand about the knowledge of pathology, microbiology including immunity, virology, antiseptics and allergy.

COURSE CONTENTS:

Section – I

Pathology (Part 1) General Pathology

1. Aims and objectives of the study of pathology. Meaning of terms, etiology, pathogenesis and lesions.
2. Causes of disease .cell injury – causes of cell injury features of cell injury mechanism of cell injury – hypoxia, free radical injury. Necrosis and gangrene.
3. Inflammation–definition, events of acute inflammation, chemical mediator of inflammation, morphological types of acute inflammation, chronic inflammation, difference between acute and chronic inflammation.

4. REPAIR–primary healing, secondary healing, factors affecting healing and repair healing of skin, muscle and bone.
5. Fluid and hemodynamic derangements–oedema, hyperemia, Haemorrhage, shock, embolism, thrombosis, infarction
6. Immunity–natural and acquired. Immunological mechanisms of tissue injury, hypersensitivity reactions, general features of autoimmune diseases and immunodeficiency diseases.
7. Neoplasia: characteristic of benign and malignant tumors, grading and staging of malignant tumors, a brief outline of the carcinogenic agents and methods of diagnosis of malignancy and general effects of malignancy on the host
8. Nutritional Disorders: deficiency disorders (protein deficiency, vitamin deficiency (A,B,C,D,E) causes , features , a brief outline of the methods of diagnosis (details not required).

Part 2

Systemic pathology: a brief outline of etiology, pathogenesis and general features of disease of the following systems. (The morphology, microscopic details and details of diagnostic procedures are not required).

1. Blood: disorders of RBC, WBC, platelets
2. Blood Vessels: atherosclerosis, thromboangitis obliterance, varicose vein, DVT, thrombophlebitis, lymphoedema.
3. Disease of heart: congestive cardiac failure, ischemic heart disease, rheumatic heart disease, infective heart disease (pericarditis, myocarditis, endocarditis)
4. Respiratory System: Pneumonias, Bronchiectasis, Emphysema, Chronic bronchitis, Asthma, Tuberculosis.
5. Joints disorders: Arthritis- types and their features.
6. Bone Disorders: osteoporosis, Paget's disease, osteogenesis imperfecta, osteomyelitis, tumors–osteosarcoma, chondrosarcoma, Ewing's sarcoma, multiple myeloma (a brief outline)
7. Muscles: muscular dystrophy, myasthenia gravis.
8. Nervous System: meningitis, encephalitis, vascular diseases of brain, poliomyelitis, nerve injuries

Section – II **Microbiology**

Part–I

1. An introduction to microbiology, Classification of microorganisms,
2. Infection – types, source, portals of entry, spread.
3. Prevention and control of infection, Disinfection and antiseptics Sterilization

Part–II

An outline of the following infectious diseases with respect to the causative organism, mode of transmission, pathogenesis, prevention, and diagnostic tests (details of the execution and interpretation of the tests not required)

Chicken Pox, Measles, Mumps, Influenza, Diphtheria, Whooping Cough, Tetanus, Tuberculosis, Leprosy, Rubella, Cholera, Gastroenteritis, Food Poisoning, Hepatitis, AIDS, Typhoid, Rabies,

STD, Ameobiasis Kalaazar, Malaria, Filaria.

BOOKS RECOMMENDED:

1. Robbins Pathological Basis of Disease - Cotran, Kumar & Robbins - W.B. Saunders.
2. General Pathology - Walter & Israel - Churchill Livingstone.
3. Muirs Textbook of Pathology - Anderson - Edward Arnold Ltd.
4. Text book of Pathology - Harsh Mohan - Jaypee Brothers.
5. Pathology: Implications for Physical Therapists - Goodmann and Boissonnault - W.B. Saunders.
6. Essential of Medical Microbiology - Bhatia & Lal - Jaypee Brothers.
7. Medical Microbiology - Mims - Jaypee Brothers.
8. Microbiology: An Introduction for the Health Sciences – Ackerman and Richards - W.B. Saunders Co.

COURSE OUTCOMES (CO):

By the end of this session, the students will be able to-

CO-1	Different infections and their causative organism with treatment of that infection, how to reduce the risk and spread of infection.
CO-2	Signs and symptoms of various pathologies, any red flags for an ailment.
CO-3	Immunological and deficiency disorders, their effect on body, when to seek help of other health provider and investigations required for diagnosis
CO-4	Correlate normal and disturbed morphology of different organ systems in different diseases and their clinical significance and understand how a pathology affects the concerned tissue/organ and its effect on other major systems of the body, how repair occurs and normal function is restored
CO-5	Aetiology and pathogenesis of infectious and non-infectious diseases and their clinical relevance.
CO-6	Understand how to protect themselves and their patients from infections during interactions and therapy sessions

BACHELOR OF PHYSIOTHERAPY (PART-II)

KUBPT-202: Pharmacology

Credit Hours (Per week): 4

Total Hours: 100

M. Marks: 100

Theory: 75

Internal Assessment: 25

Time: 3 hrs

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The answer should not exceed 50 words. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. It aims to cover the basic knowledge of pharmacology including administration, physiologic response and adverse effects of drugs under normal and pathologic conditions.
2. The students are taught about various kinds of drugs acting on different systems of body for instance CNS, respiratory system, cardiovascular system, endocrine system and so on.
3. Impart knowledge regarding chemotherapeutic agents and drugs for pain management.

COURSE CONTENTS:

Section – I

1. General action of drugs.
2. Drug allergy and idiosyncrasy.
3. Drug toxicity
4. Metabolic fate of drug
5. Methods of administration
6. Chemical character of drugs
7. Drugs acting on respiratory system
8. Vitamins

Section – II

1. Drugs acting on Central nervous system – anaesthetics, alcohols, alkaloids, narcotics, antipyretics, hypnotics, sedatives, anticonvulsants, stimulants, psychotherapeutics. (brief description)
2. Drugs acting on peripheral nervous system – stimulating and inhibiting cholinergic and anticholinergic activity.
3. Drugs acting on neuromuscular junction and muscles
4. Drugs for pain management.

Section – III

1. Hormones and drugs affecting endocrine functions
2. Drugs acting on cardiovascular system- (antianginal drugs, Drugs for MI, Brief outline of drugs for CHF, antihypertensive drugs).
3. Chemotherapeutic agents- Modern antibiotics, antitubercular drugs, antiamoebic drugs etc.

BOOKS RECOMMENDED:

1. Pharmacology and Pharmacotherapeutics - R.S. Satoskar – Popular Publications, Bombay.
2. The Pharmacologic Principles of Medical Practice - Krantg & Jelleff - Calcutta Scientific Book Agency.
3. Pharmacology - Praseem K. Das. – Churchill Livingstone
4. Essential of Medical Pharmacology - K.D. Tripathi - Jaypee Brothers

COURSE OUTCOMES (CO):

By the end of this session, the students will be able to-

CO-1	Becomes well aware about pharmacological effects, route of administration, formulations, indications, contra-indications, adverse reactions and precautions if any about different drugs used by patients.
CO-2	Understand the contribution of both drug and physiotherapy protocol in the outcome of physiotherapy treatment.
CO-3	Can identify if the pharmacological effect of a drug interferes with therapeutic effect of physiotherapy and vice-versa.
CO-4	With better clarity about action and effect of drug, while reading patient files in hospital environment will be able to understand why a particular drug is being used in the clinical conditions on the basis of knowledge regarding action of drug.

BACHELOR OF PHYSIOTHERAPY (PART-II)

KUBPT-203: Electrotherapy – II

Credit Hours (Per week): Theory: 4, Practical: 6

Total Hours: (Theory: 100, Practical: 200)

M. Marks: 200

Time: 3 hrs

Theory: 75, Practical: 75

Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The answer should not exceed 50 words. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To recall neuro-muscular physiology and use it to understand effects and working of electrical stimulator.
2. To study about production of high frequency currents and medium frequency currents.
3. To study electro-diagnosis, its principles, instrumentation and techniques of electromyography (EMG) and nerve conduction study (NCS).
4. To study instrumentation, principles of working, merits and demerits, indications and contra-indications and patient preparation for various electrotherapy modalities.

COURSE CONTENTS:

SECTION – I

1. Review of Neuro – muscular Physiology including effects of electrical stimulation.
2. Physiological responses to heat gain or loss on various tissues of the body.
3. Therapeutic effects of heat, cold and electrical currents.
4. Physical principles of Electro – magnetic radiation.
5. Physics of sound including characteristics and propagation.

SECTION – II

1. **High frequency currents (S.W.D. and M.W.D.)** – Production, biophysical effects, types, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.

2. **(a) Medium frequency currents (Interferential Therapy)** – Conceptual framework of medium frequency current therapy, production, biophysical effects, types, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.
- (b) Di-Dynamic Currents, Russian Current** – Production, types, therapeutic uses and contraindications of Russian currents and dynamic currents.
3. **High frequency sound waves (Ultrasound)** – Production, biophysical effects, types, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.

SECTION – III

1. **Therapeutic light in Physiotherapy (LASER)** – Definition, historical background, physical principles, biophysical effects, types, production, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.
2. **Therapeutic cold (Cryotherapy)** – Sources, biophysical effects, types, therapeutic effects, indications, contraindications, precautions, application techniques and patient preparation.
3. **Traction-** principles, physiological & therapeutic effects classification, types, indications, contraindications, techniques of application, operational skills & precautions
4. **Therapeutic mechanical pressure (Intermittent compression therapy)** – Principle, biophysical effects, types, therapeutic effects, indications, contraindications, precautions, operational skills and patient preparation.

SECTION – IV

1. **Electro – diagnosis** – Instrumentation, definition & basic techniques of E.M.G. and E.N.G.
2. **Bio-feedback** – Instrumentation, principles, therapeutic effects, indications, contraindications, limitations, precautions, operational skills and patient preparation

Electrotherapy – II (Practical)

Marks: 75

1. To study a short wave diathermy unit, its operation and different methods of application –region wise.
2. To study a Micro wave diathermy unit, its operation unit, its operation and different methods of application – region wise.
3. To study an Ultrasound unit, its operation and different methods of application – region wise.
4. To study a Laser unit, its operation and different methods of application – region wise.
5. To study various forms of therapeutic cold application region wise including – ice, cold packs, vapour coolant sprays, etc.
6. To study a Intermittent therapy unit, its operation and different methods of application – region wise.
7. To study a Interferential pneumatic therapy unit, its operation and different methods of application – region wise.
8. To observe various Electro – myography (EMG) procedures.
9. To observe various Electro – neurography (ENG) procedures.
10. To study a Bio feedback unit, its operation and different methods of application – region wise.
11. To study & practice various traction techniques, including manual and mechanical Procedures.

BOOKS RECOMMENDED:

1. Electrotherapy Explained: Principles & Practice Low & Reed – Butterworth Heinmann.
2. Clayton's Electrotherapy (10th edition) – Kitchen & Bazin – W.B. Saunders.
3. Therapeutic Heat and Cold Lehmann – Williams & Wilkins.
4. Principles and Practice of Electrotherapy – Kahn – Churchill Livingstone.
5. Electrotherapy: Clinics in Physical Therapy – Wolf – Churchill Livingstone

COURSE OUTCOMES (CO):

By the end of this session, the students will be able to-

CO-1	Be able to easily apply different electrotherapy modalities because of knowledge of their working, techniques of application, patient preparation, in what conditions to apply and when to avoid, safety measure to be followed and any dangers involved.
CO-2	Acquire the skill of application of electrotherapeutic modalities for assessment and treatment.
CO-3	Student starts understanding how to develop a patient-therapist relationship and handles patients well.
CO-4	Know the importance of following all the standards and safety guidelines while application of electrical modalities and outcome for failing to do so.
CO-5	Understands importance of patient positioning before beginning any treatment – for safely reason, his own as well as patient's comfort and the range of movement and limitation to movement that a wrong positioning may provide.
CO-6	Can plan treatment protocol recommending exercises and modalities through the knowledge gained so far.

BACHELOR OF PHYSIOTHERAPY (PART-II)

KUBPT-204: Exercise Therapy – II

Credit Hours (Per week): Theory: 4, Practical: 6

Total Hours: (Theory: 100, Practical: 200)

M. Marks: 200

Time: 3 hrs

Theory: 75, Practical: 75

Internal Assessment: 50 (Th-25; Pr-25)

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The answer should not exceed 50 words. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To recall surface landmarks such as bony prominences and their relationship with underlying structures.
2. To study physiological and therapeutic effects, indications and contra-indications for therapeutic exercises.
3. To study how to assess and evaluate a patient for exercise program, prepare assessment perform, make diagnosis and prognosis.
4. To study exercises for normal persons to maintain overall fitness.

COURSE CONTENTS:

Section – I

Therapeutic Exercises

1. Principle, classification, techniques, physiological & therapeutic effects, indications & contraindications of therapeutic exercises.
2. Assessment & evaluation of a patient (region wise) to plan a therapeutic exercise program.
3. Joint Mobility – Etiogenesis of Joint stiffness, general techniques of mobilization, effects, indications, contraindications & precautions.
4. Muscle Insufficiency – Etiogenesis of muscle insufficiency (strength, tone, power, endurance & volume), general techniques of strengthening, effects, indication, contraindications & precautions.
5. Neuromuscular Inco-ordination – Review normal neuromuscular coordination, Etiogenesis of neuromuscular in co-ordination & general therapeutic techniques, effects, indications, contraindications & precautions.
6. Functional re-education – General therapeutic techniques to re-educate ADL function.

Section – II

Posture, Balance, Gait:

1. Normal Posture – Overview of the mechanism of normal posture.
2. Abnormal Posture – Assessment, Types, etiology, management, including therapeutic exercises.
3. Static and Dynamic Balance – Assessment & management including therapeutic exercises.
4. Gait – Overview of normal gait & its components. Gait deviations - Assessment, Types, etiology, management, including therapeutic exercises.
5. Types of walking aids, indications, effects & various training techniques.

Section – III

Manual Muscle Testing

- a) Principles and application techniques of Manual muscle testing.
- b) Testing position, procedure and grading of muscles of the upper limb, lower limb and trunk etc.

Section – IV

Goniometry

Goniometers and its types:

- a) Principles, techniques and application of Goniometry.
- b) Testing position, procedure and measurement of R.O.M. of the joints of upper limbs, lower limbs and trunk.

Section – V

Soft Tissue Manipulation (Therapeutic Massage)

- a) History, various types of soft tissue manipulation techniques.
- b) Physiological effects of soft tissue manipulation on the following systems of the body; Circulatory, Nervous, Musculoskeletal, Excretory, Respiratory, Integumentary system and Metabolism.
- c) Classify, define and describe: - effleurage, stroking, kneading, petrissage, deep friction, vibration and shaking etc.
- d) Preparation of patient: Effects, uses, indications and contraindications of the above manipulation.

Section – VI

Hydrotherapy:

1. Basic principles of fluid mechanics, as they relate to hydrotherapy.
2. Physiological & therapeutic effects of hydrotherapy, including joint mobility muscle Strengthening & wound care etc.
3. Types of Hydrotherapy equipment, indications, contraindications, operation skills & patient preparation.

Section – VII

Special Techniques:

5. Introduction to special mobilization & manipulation techniques, effects, indications & contraindications.
6. Conceptual framework, principle of proprioceptive neuromuscular facilitation (PNF) techniques, including indications, therapeutic effects and precautions.

7. Review normal breathing mechanism, types, techniques, indications, contraindications, therapeutic effects & precautions of breathing exercises.
8. Group Theory – Types, advantages & disadvantages.
9. Exercises for the normal person – Importance and effects of exercise to maintain optimal health & its role in the prevention of diseases. Types, advantages, disadvantages, indications, contraindications & precautions for all age groups.
10. Introduction to Yoga – Conceptual framework, various “asanas”, the body – mind relationship, effects & precautions.
11. Role of muscle energy technique.
12. Introduction to common ailments: Respiratory disorders, Cardiovascular disorders, Endocrine & Metabolic disorders and Obstetrics & Gynecological disorders in the light of Yoga Management

Exercise Therapy – II (Practical)

Marks: 75

1. To practice all soft tissue manipulative techniques region wise – upper limb, lower limb, neck, back and face.
2. To practice the measurement of ROM of joints – upper limb, lower limb & trunk.
3. To practice the grading of muscle strength region wise – upper limb, lower limb and trunk.
4. To practice assessment & evaluative procedures, including motor, sensory, neuromotor coordination, vital capacity, limb length & higher functions.
5. To study & practice the various techniques of mobilization of joints region wise.
6. To study & practice the various techniques of progressive strengthening exercises of muscles region wise.
7. To study & practice the use of various ambulation aids in gait training.
8. To assess & evaluate ADL's and practice various training techniques.
9. To study & practice mat exercises.
10. To assess & evaluate normal & abnormal posture & practice various corrective techniques.
11. To assess & evaluate equilibrium / balance & practice various techniques to improve balance.
12. To study the structure & functions of hydrotherapy equipments & their applications.
13. To study & practice various group exercise therapies.
14. To practice & experience effects of basic yoga “asanas”.
15. To study, plan & practice exercise programmes for normal persons of various age groups.

BOOKS RECOMMENDED:

1. Practical Exercise Therapy - Hollis - Blackwell Scientific Publications.
2. Therapeutic Exercises - Basmajian - Williams & Wilkins.
3. Therapeutic Exercises Foundations and Techniques - Kisner & Colby -F.A. Davis.
4. Proprioceptive Neuromuscular Facilitation - Voss et al - Williams and Wilkins.
5. Principle of Exercise Therapy - Gardiner - C.B.S. Delhi.
6. Orthopaedic Physical Therapy - Woods - Churchill Livingstone.
7. Manipulation and Mobilisation Extremities and Spinal Techniques - Edmond - Mosby.
8. Aquatic Exercise Therapy - Bates and Hanson-W.B. Saunders.
9. Manual Examination and Treatment of Spine and Extremities - Wadsworth - Lippincott.
10. Hydrotherapy: Principles and Practices - Campion - Butterworth Heinmann.

11. Muscle testing and functions - Kendall - Williams & Wilkins.
12. Daniels and Worthingham's - Muscle Testing - Hislop & Montgomery - W.B. Saunders.
13. Measurement of Joint Motion: A Guide to Goniometry - Norkins & White - F.A. Davis.
14. . Beard's Massage - Wood – W. B. Saunders

COURSE OUTCOMES (CO):

By the end of this session, the students will be able to-

CO-1	Be well aware of therapeutic movement, its effects and know how, when and when not to apply to enable better function.
CO-2	Have basic understanding of patient-centered care and knows its importance in physiotherapy.
CO-3	Be able to understand the complexity of human movement.
CO-4	Demonstrate and apply various types of exercise to restore physical function on self and peers keeping in mind the principles of exercise.
CO-5	Practice different techniques of varied exercise therapies and gain confidence in performing these skills before implementing them on patients so that high quality patient-care is ensured.
CO-6	Recall the effect of exercise on different body systems when designing a treatment protocol.

BACHELOR OF PHYSIOTHERAPY (PART-II)

KUBPT- 205: Biomechanics

Credit Hours (Per week): 4

Total Hours: 100

M. Marks: 100

Time: 3 hrs

Theory: 75

Internal Assessment: 25

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The answer should not exceed 50 words. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To study basic terminology of biomechanics and mechanics such as motion, forces, Newton's laws, gravity, equilibrium and so on.
2. To recall muscle contraction and muscle work and study how different components work with each other in producing a movement; group action of muscles.
3. To understand kinetic chain, types and application
4. To recall joint classification and study joint structure, function and range of motion.
5. To study biomechanics of different joints.
6. To study static and dynamic stabilizers of joints
7. To study posture, factors affecting, postural deviations, causes, effects on other structures and their correction.

COURSE CONTENTS:

Section – I

Mechanics

- a) Introduction to mechanics including motion, forces, parallel forces system
- b) Newton's law of motion, concurrent force systems – composition forces, muscle action line etc.
- c) Centre of Gravity, line of gravity, stability and equilibrium.
- d) Introduction to Bio-Mechanics and terminology.

Section – II

Joint Structure and Function:

- a) Basic principles of Joint design and a human joint.
- b) Tissues present in human joint including fibrous tissue, bone cartilage and connective tissue.

- c) Classification of joints.
- d) Joint function, Kinematics chains and range of motion.
- e) Recall anatomy and study the biomechanics of the spine, shoulder girdle, joints of the upper extremity, pelvic girdle and the joints of the lower extremity.

Section – III

Muscle Structure and function:

- a) Mobility and stability functions of muscle.
- b) Elements of muscle structure and its properties.
- c) Types of muscle contractions and muscle work.
- d) Classification of muscles and their functions.
- e) Group action of muscles, Co-ordinated movement.

Section – IV

Posture & Gait:

- a) Posture – Definition, factors responsible for posture, relationship of gravity on posture.
- b) Postural imbalance – factors responsible for imbalance in Static and dynamic positions including ergonomics.
- c) Description of Normal gait, determinants of gait, spatio temporal features and analysis.
- d) Gait deviations – Types, Causative factors and analysis

Practical:

Marks: 75

- 5. To study the effects of forces on objects.
- 6. To find out the C.G. of an object.
- 7. To identify axis and planes of motion at the joints of spine, shoulder girdle, joints of upper extremity, Pelvic girdle and joints of lower extremity.
- 8. To study the different types of muscle contraction, muscle work, group action of muscles of coordinated movements.
- 9. Analysis of Normal posture respect to L.O.G. and the optimal position of joints in anteroposterior and lateral views.
- 10. Analysis of normal gait and measurement of spatio temporal features.

BOOKS RECOMMENDED:

- 1. Joint Structure and Function – A Comprehensive Analysis - Norkins & Levangie - F.A. Davis.
- 2. Measurement of Joint Motion – A Guide to Goniometry - Norkins & White - F.A. Davis.
- 3. Brunnstrom's Clinical Kinesiology - Smith et al - F.A. Davis.
- 4. Basic Biomechanics Explained - Low & Reed - Butterworth Heinmann.
- 5. Kinesiology: Applied to Pathological Motion - Soderberg Lippincott.

COURSE OUTCOMES (CO):

By the end of this session, the students will be able to-

CO-1	Analyze human movement from a global perspective, integrating biomechanics, muscle mechanics and motor control theory.
CO-2	Analyze restriction in muscle movement, trick movement, use of another muscle to do a desired movement.
CO-3	Understand and demonstrate open and closed kinetic chains and their importance which will help him to incorporate these into his practice.
CO-4	Assess gait pattern, any deviations from normal and their correction.
CO-5	Understand and demonstrate qualitative and quantitative methods of movement analysis.
CO-6	Acquire knowledge of joint and muscle response to varied movements for efficacy in therapeutic application.

BACHELOR OF PHYSIOTHERAPY (PART-II)

KUBPT-206: Psychology

Credit Hours (Per week): 4

Total Hours: 150

M. Marks: 100

Theory: 75

Internal Assessment: 25

Time: 3 hrs

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The answer should not exceed 50 words. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. To introduce terminology of psychology, different schools, methods and branches of psychology.
2. To study about heredity and environment and their effects on personality, physical characteristics, intelligence, and nature.
3. To study development and growth behaviour during different stages of life – infancy, childhood, adulthood, middle age and old age.
4. To study about counselling, its principles, difference from guidance, personality qualities of counsellors.
5. To understand emotional and psychological needs of geriatric and paediatric patients.
6. To study and apply various conditioning and learning principles to modify patient behaviour.
7. To learn different personality styles of patients.

COURSE CONTENTS:

Section – I General Psychology

1. Definition of Psychology: Definition of psychology, information in relation to following schools methods and branches.
 - a. Schools: Structuralism, functionalism, behaviourism psychoanalysis, gestalt psychology.
 - b. Methods: Introspection, observation, inventory and experimental method.
 - c. Branches: General, child, social, abnormal, industrial, clinical, counseling, educational.
2. Development and Growth Behavior: Infancy, childhood, adolescence, adulthood, middle age, old age.
3. Intelligence: Definitions, IQ, Mental Age, List of various intelligence tests – WAIS, WISC, Bhatia's performance test, Raven's Progressive Matrices test.

4. Motivation: Definitions: Motive, drive, incentive and reinforcement, Basic information about primary needs: hunger, thirst, sleep, elimination activity, air, avoidance of pain, attitude to sex. Psychological Needs: Information, security, self-esteem, competence, love and hope.
5. Emotions: Definitions: Differentiate from feelings, physiological changes of emotion, Role of RAS, hypothalamus, cerebral cortex, sympathetic nervous system, adrenal gland, heredity and emotion, Nature and control of anger, fear and anxiety.
6. Personality: a) Definition, Role of heredity, family and culture in personality development.
b) Basic concepts of Freud: unconscious, conscious, Id, ego and superego, List and define the oral, anal and phallic stages of personality development, list and define the 8 stages as proposed by Erikson, 4 concepts of learning as proposed by Dollard and Miller; drive, cue, response and reinforcement.
c) Personality assessment: interview, standardized, non-standardized. Exhaustive, and stress interviews, list and define inventories BAI, CPI and MMPI, projective test: Rorschach, TAT and sentence completion test.
7. Learning: Definition: List the laws of learning as proposed by Thorndike. Types of learning: Briefly describe classical conditioning, operant conditioning, insight, observation and Trial and Error type, list the effective ways to learn: Massed Vs. Spaced, Whole Vs. Part, Recitation Vs. Reading, Serial Vs. Free Recall, knowledge of results, Association, Organization, Mnemonic methods, incidental Vs. Intentional learning, role of language.
8. Thinking: Definition, concepts, creativity, steps in creative thinking, list the traits of creative people, delusions.
9. Frustration: Definition, sources, solution, Conflict; Approach – approach, Avoidance – avoidance, and approach – avoidance, solution.
10. Sensation, Attention and Perception a) List of Senses: Vision, Hearing, Olfactory, Gustatory and cutaneous sensation, movement, equilibrium and visceral sense. Define attention and list factors that determine attention: nature of stimulus, intensity, colour, change, extensity, repetition, movement, size, curiosity, primary motives.
b) Define perception and list the principles of perception: Figure ground, constancy, similarity, proximity, closure, continuity, values and interests, past experience, context, needs, moods, religion, sex and age, and socioeconomic status.
c) Define illusion and hallucination. d) List visual, auditory, cutaneous, gustatory and olfactory hallucination.
11. Democratic and Authoritarian Leadership: Qualities of leadership: Physical factors, intelligence, self-confidence, sociability, will and dominance. Define attitude. Change of attitude by: Additional information, changes in-group – affiliation, enforced modification by law and procedures that affect personality. (Psychotherapy, Counseling and religious conversion).
12. Defence Mechanisms of the Ego: Denial, rationalization, projection, reaction formation, identification, repression, emotional insulation, undoing, interjection, acting out, depersonalization.

Section – II Health Psychology

1. Psychological Reactions of a Patient: Perceived susceptibility, perceived seriousness, perceived benefits, Psychological reactions of a patient during admission and treatment anxiety, shock, denial, suspicion, questioning, loneliness, regression, shame, guilt, rejection, fear, withdrawal, depression, egocentricity, concern about small matters, narrowed interests, emotional over reactions, perpetual changes, confusion, disorientation, hallucinations, delusions, illusions, anger, hostility, loss of hope.

2. Reactions to Loss: Reactions to loss, death and bereavement shock and disbelief, development of awareness, restitution, resolution. Stages of acceptance as proposed by Kubler – Ross.
3. Stress: Physiological and Psychological relation to health and sickness: psychosomatic, professional stress burnout.
4. Communication: a) Types verbal, non-verbal, elements in communication, barriers to good communication, developing effective communication, specific communication techniques. b) Counseling: Definition, Aim, differentiate from guidance, principles in counseling and personality qualities of counselors.
5. Compliance: Nature, factors, contributing to non – compliance, improving compliance.
6. Emotional Needs: Emotional needs and psychological factors in relation to unconscious patients, handicapped patients, bed – ridden patients, chronic pain, spinal cord injury, paralysis, cerebral palsy, burns, amputations, disfigurement, head injury, degenerative disorders, parkinsonism, leprosy, incontinence and mental illness.
7. Geriatric Psychology: Specific psychological reactions and needs of geriatric patients.
8. Pediatric Psychology: Specific psychological reactions and needs of pediatric patients.
9. Behavior Modifications: Application of various conditioning and learning principles to modify patient behaviours.
10. Substance Abuse: Psychological aspects of substance abuse: smoking, alcoholism and drug addiction.
11. Personality Styles: Different personality styles of patients.
12. Health beliefs, Behavior and Behavior change: Stages of change model, The health action process approach (HAPA), The Health belief model, Reasoned action and planned behavior.

BOOKS RECOMMENDED:

1. Introduction to Psychology - Mums - I.D.P. Co.
2. Foundation of Psychology - Weld - Publishing House, Bombay.
3. Introduction to Social Psychology – Akolkar – Oxford Publishing House.
4. Psychology and Sociology – Applied to Medicine – Porter & Alder - W.B. Saunders.
5. Behavioural Sciences for Medical Undergraduates – Manju Mehta - Jaypee Brothers.
6. Elementary Psychology - Mohsin - Moti Lal Banarsi Dass, Delhi.

COURSE OUTCOMES (CO):

By the end of this session, the students will be able to-

CO-1	Recognize and help with the psychological factors involved in disability, pain, disfigurement, unconscious patients, chronic illness, death, bereavement and medical surgical conditions.
CO-2	Perform psychosocial assessment of patients in various developmental stages.
CO-3	Understand the concept of stress and its relationship to health, sickness and one's profession.
CO-4	Find reasons for non-compliance among patients and improving compliance behavior.

BACHELOR OF PHYSIOTHERAPY (PART-II)

KUBPT-207: Sociology & Community Health

Credit Hours (Per week): 4

Total Hours: 100

M. Marks: 100

Theory: 75

Internal Assessment: 25

Time: 3 hrs

Instructions for paper setters and students:

Section-A (10 Marks): There will be 10 questions of one mark each. All questions are compulsory. The questions may be short answer type or objective type. The answer should not exceed 50 words. The questions should be equally distributed in whole syllabus.

Section-B (50 Marks): It consists of eight questions. Each question carries 10 marks. The candidate will have to attempt any five questions. The questions should be equally distributed in whole syllabus.

Section-C (15 Marks): It consists of two questions. Each question carries 15 marks. The candidate will have to attempt any one question.

COURSE OBJECTIVES:

1. It aims to introduce the student to basic sociological concepts, principles and social processes, social institutions in relation to individual, family and community along with various social factors affecting rural and urban communities.
2. Teaches about the concept of culture, its components and impact on human behaviour, culture induced sickness/disease.
3. Throws light on various social problems such as population explosion, poverty, alcoholism and so on.
4. Describes the role of social worker and importance of social security.
5. Describes community health and rehabilitation of various medical conditions along with their prevention, compares community based rehabilitation and institution based rehabilitation.

COURSE CONTENTS:

1. **Introduction:** Definitions of sociology, sociology as a science of society, uses of the study of sociology, application of knowledge of sociology in physiotherapy and occupational therapy.
2. **Sociology & Health:** Social factors affecting health status, social consciousness and perception of illness, social consciousness and meaning of illness, decision making in taking treatment. Institutions of health, their role in the improvement of the health of the people.
3. **Socialization:** Meaning of socialization, influence of social factor on personality, socialization in hospitals, socialization in the rehabilitation of patients.

4. **Social Groups:** Concept of social groups, influence of formal and informal groups on health and sickness, the role of primary groups and secondary groups in the hospitals and rehabilitation settings.
5. **Family:** Influence of family on human personality, discussion of changes in the functions of a family, influence of family on the individual's health, family and nutrition, the effects of sickness on family, and psychosomatic disease.
6. **Community:** Concept of community, role of rural and urban communities in public health, role of community in determining beliefs, practices and home remedies in treatment.
7. **Culture:** Components of culture. Impact of culture on human behavior, cultural meaning of sickness, response & choice of treatment (role of culture as social consciousness in moulding the perception of reality), culture induced symptoms and disease, sub – culture of medical workers.
8. **Caste System:** Features of modern caste system and its trends.
9. **Social Change:** Meaning of social change, factors of social change, human adaption and social change, social change and stress, social change and deviance, social change and health programmes, the role of social planning in the improvement of health and in rehabilitation.
10. **Social Control:** Meaning of social control, role of norms, folkways, customs, morals, religion, law and other means of social control in the regulation of human behavior, social deviance and disease
11. **Social Problems of the Disabled:** Consequences of the following social problems in relation to sickness and disability; remedies to prevent these problems:
 - a) Population explosion
 - b) Poverty and unemployment
 - c) Beggary
 - d) Juvenile delinquency
 - e) Prostitution
 - f) Alcoholism
 - g) Problems of women in employment
12. **Social Security:** Social security and social legislation in relation to the disabled.
13. **Social Worker:** The role of medical social worker.

Community Health:

14. Introduction to Community Health, community and rehabilitation.
15. Community based rehabilitation in relation to different medical and surgical conditions e.g. Cholera, Typhoid, Diptheria, Leprosy, Poliomyelitis, HIV & AIDS, Hepatitis etc. Prevention of diseases at different levels.
16. Community based rehabilitation vs. institutional based rehabilitation – comparison and different aspects. Community resources and their uses.

BOOKS RECOMMENDED:

1. Mcgee - Sociology - Drydon Press Illinois.
2. Kupuswamy - Social Changes in India - Vikas, Delhi.
3. Ahuja - Social Problems - Bookhive, Delhi.
4. Ginnsberg - Principles of Sociology - Sterling Publications.
5. Parter & Alder - Psychology & Sociology Applied to Medicine - W.B. Saunders.
6. Julian - Social Problems - Prentice Hall.

COURSE OUTCOMES (CO):

By the end of this session, the students will be able to-

CO-1	Demonstrate an understanding of the role of socio-cultural factors as determinants of health and behaviour in health and sickness.
CO-2	Understand the role of family and community in the development of behaviours.
CO-3	Develop a holistic outlook toward the structure of society and community resources.
CO-4	Identify the subtle influence of culture in the development of human personality, the role of beliefs and values as determinants of individual and group behaviour
CO-5	Understand the social and economical aspects of a community that influence the health of the people.
CO-6	Learn to assess social problems and participate in social planning.

BACHELOR OF PHYSIOTHERAPY (PART-II)

Course Code: KUEVS-208

Course Title: Environmental Studies (Compulsory)

Credit Hours (Per week): 2

Total Hours: 60

M. Marks: 100

Theory: 75

Internal Assessment: 25

Time: 3 hrs

Instructions for Paper Setters: The question paper will consist of three sections. Candidate will be required to attempt all the sections. Each unit of the syllabus should be given equal weightage of marks. Paper to be set in English.

Section–A (30 Marks): It will consist of eight short answer type questions. Candidates will be required to attempt six questions, each question carrying five marks. Answer to any of the questions should not exceed two pages.

Section–B (40 Marks): It will consist of six questions. Candidates will be required to attempt four questions, each question carrying ten marks. Answer to any of the questions should not exceed four pages.

Section–C (30 Marks): It will consist of three questions. Candidate will be required to attempt two questions only of fifteen marks each. Answer to the question should not exceed 5 pages.

COURSE OBJECTIVES:

CO-1	The main goal of Environmental studies is to create the environmental awareness to create a safe, green and sustainable environment.
CO-2	To make aware students about the importance of nature and natural resources.
CO-3	To stress upon the usage of alternative and green sources of energy.
CO-4	To create awareness regarding environmental pollution, its causes and effects and preventive measure to control the different types of pollution.
CO-5	To make students aware of Biodiversity – role, importance, values and its conservation.
CO-6	Growing human population – causes and concern
CO-7	Role of National Service Scheme (NSS) – a volunteer organization, in making up a better environment. Road safety (Traffic) rules.

COURSE CONTENTS:

Unit-I

The multidisciplinary nature of environmental studies: Definition, scope & its importance. Need for public awareness.

- a) **Natural resources:** Natural resources and associated problems. **Forest resources:** Use of over exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.

- b) **Water resources:** Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
- c) **Mineral resources:** Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
- d) **Food resources:** World food problems, change caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problem, salinity, case studies.
- e) **Energy resources:** Growing of energy needs, renewable and non-renewable energy resources, use of alternate energy sources, case studies.
- f) **Land resources:** Land as a resource, land degradation, soil erosion and desertification.
- g) Role of an individual in conservation of natural resources, equitable use of resources for sustainable lifestyles.

Ecosystem:

Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids.

Introduction, types, characteristic features, structure and function of the following ecosystems:

- a. Forest ecosystem
- b. Grassland ecosystem
- c. Desert ecosystem
- d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

Unit-II

Biodiversity and its Conservation:

Definition: Genetic, species and ecosystem diversity, Biogeographical classification of India.

Value of Biodiversity: Consumptive use; productive use, social, ethical, aesthetic and option values. Biodiversity of global, National and local levels, India as mega-diversity nation "Hot-spots of biodiversity.

Threats to Biodiversity: Habitat loss, poaching of wild life, man wildlife conflicts Endangered and endemic species of India.

Conservation of Biodiversity: *In situ* and *Ex-situ* conservation of biodiversity

Environmental Pollution:

Definition, Causes, effects and control measures of:

- a) Air Pollution
- b) Water Pollution

- c) Soil Pollution
- d) Marine Pollution
- e) Noise Pollution
- f) Thermal Pollution
- g) Nuclear Hazards

Solid Waste Management: Causes, effects and control measures of urban and industrial wastes.
Role of an individual in prevention of pollution.

Pollution case studies Disaster Management: Floods, Earthquake, Cyclone and Landslides

Unit-III

Social Issues and Environment:

- From unsustainable to sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case studies
- Environmental ethics: Issues and possible solutions.
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation
- Consumerism and waste products
- Environmental Protection Act
- Air (prevention and Control of Pollution) Act
- Water (prevention and Control of Pollution) Act
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation
- Public awareness

Human population and the environment

- Population growth, variation among nations
- Population explosion-Family welfare programme
- Environment and human health
- Human rights
- Value education
- HIV/AIDS
- Women and child welfare
- Role of information technology in environment :and human health
- Case studies

- Road Safety Rules & Regulations: Use of Safety Devices while Driving, Do's and Don'ts while Driving, Role of Citizens or Public Participation, Responsibilities of Public under Motor Vehicle Act, 1988, General Traffic Signs
- Accident & First Aid: First Aid to Road Accident Victims, Calling Patrolling Police & Ambulance

Unit-IV

National Service Scheme

- **Introduction and Basic Concepts of NSS:** History, philosophy, aims & objectives of NSS; Emblem, flag, motto, song, badge etc.; Organizational structure, roles and responsibilities of various NSS functionaries.
- **Health, Hygiene & Sanitation:** Definition, needs and scope of health education; Food and Nutrition; Safe drinking water, water borne diseases and sanitation (Swachh Bharat Abhiyan); National Health Programme; Reproductive health.
- **Entrepreneurship Development:** Definition & Meaning; Qualities of good entrepreneur; Steps/ways in opening an enterprise; Role of financial and support service Institutions.
- **Civil/Self Defense:** Civil defense services, aims and objectives of civil defense; Needs for self-defense training.

Field Visits:

- Visit to a local area to document environmental assets—river / forest / grassland / hill / mountain.
- Visit to a local polluted site—Urban / Rural / Industrial / Agricultural.
- Study of common plants, insects, birds.
- Study of simple ecosystems—pond, river, hill slopes, etc.
- Contribution of the student to NSS/any other social cause for service of society.

Note: In this section the students will be required to visit and write on the environment of an area/ ecosystem/village industry/disaster/mine/dam/agriculture field/waste management/hospital etc. with its salient features, limitations, their implications and suggestion for improvement.

References/Books:

1. Agarwal, K. C. 2001. Environmental Biology, Nidhi Publications Ltd. Bikaner.
2. Bharucha, E. 2005. Textbook of Environmental Studies, Universities Press, Hyderabad.
3. Down to Earth, Centre for Science and Environment, New Delhi.
4. Jadhav, H. & Bhosale, V. M. 1995. Environmental Protection and Laws. Himalaya Pub.
5. Joseph, K. and Nagendran, R. 2004. Essentials of Environmental Studies, Pearson Education (Singapore) Pte. Ltd., Delhi.
6. Kaushik, A. & Kaushik, C. P. 2004. Perspective in Environmental Studies, New Age International (P) Ltd, New Delhi.
7. Miller, T. G. Jr. 2000. Environmental Science, Wadsworth Publishing Co.

10. Sharma, P. D. 2005. Ecology and Environment, Rastogi Publications, Meerut.
11. Booklet on Safe Driving. Sukhmani Society (Suvidha Centre), District Court Complex, Amritsar
12. Kanta, S., 2012. Essentials of Environmental Studies, ABS Publications, Jalandhar.

COURSE OUTCOMES (CO):

CO-1	To learn about the sustainable environment.
CO-2	To gain the knowledge about the judicious use of natural resources for a green environment.
CO-3	To know about the causes of different forms of pollution and their control measures.
CO-4	To know about the importance of green programs like <i>vana mahotasava</i> to promote afforestation.
CO-5	To know about the meaning of Biodiversity and its role in environment.
CO-6	To know the family (welfare) planning programs, role of NSS and road safety rules.