BACHELOR OF PHYSIOTHERAPY

Era University, Lucknow

Course Outline: 2024-2025

Name of the Program	**Bachelor of Physiotherapy**			**Year/Semester:**	**II year/ III sem**
Course Name	**Microbiology**	**Course Code:**	**BPT- 301**	**Type:**	**Theory**
Credits	**04**			**Total Sessions Hours:**	**60 Hours**
Evaluation Spread	**Internal Continuous Assessment:**		**30 Marks**	**End Term Exam:**	**70 Marks**
Type of Course	Compulsory		✓ Core	Creative	Life Skill
Course Objectives	• understand the importance of microbiology, the basic concept of microbiology, the importance of sterilization & nosocomial infection and its prevention in the related field				

Course Outcomes(CO):*After the successful course completion ,learners will develop following attributes:*

CO1	Know about prevalent communicable diseases
CO2	Describe the agent responsible for causing clinical infection to CNS, musculoskeletal, respiratory and genitourinary system
CO3	Illustrate the best method to prevent development of infection
CO4	Understand to recognize signs and symptoms considered red flag for serious diseases
CO5	Acquire knowledge of common immunological disorders and their effect on human body. they will be able to perform, demonstrate, implement and apply the concept of microbiology in better understanding with relevance to human disease
Pedagogy	Interactive, discussion-based, student-centered, presentation.
Internal Evaluation Mode	Mid-term Examination: 30 Marks Class test: 12 Marks Class participation or any other : 04 Marks Assignments/Project: 04 Marks Attendance: 04 Marks Class Presentation: 04 marks Bed Side behavior or Interaction in Class: 02 marks

Session Details	**Topic**	**Hours**	**Mapped CO**
Unit 1	**General microbiology** Introduction & General terms used in Microbiology, Morphology of bacteria, Growth & Nutrition in bacteria, Classification of bacteria, Sterilization and Disinfection	10	CO1
Unit 2	**Immunology** Infection , immunity , Antigen, Antibody , Complement System, Antigen-Antibody reaction, Structure of Immune system , Function of Immune system, Hypersensitivity, Autoimmunity, IDD	10	CO2

Unit 3	**Bacteriology** Staphylococcus aureus, Streptococcus pyogenes, Pneumococcus, Bacillus, Clostridium, Neisseria, E.Coli, Corynebacteria, Vibrio, Proteus, Klebsiella, M. tuberculosis, M. Leprae, Malaria., Filaria	10	CO3
Unit 4	**Virology** General Virology, Herpes Virus, Influenza Virus, Dengue, HIV, Polio virus, Rabies, stool parasites	10	CO4
Unit 5	General Mycology, Candida, Superficial Mycoses, Subcutaneous Mycoses, Deep Mycoses, Normal Flora, UTI, Meningitis	10	CO5
Practical	Visit to Microbiology Labs, Microscope, Gram staining, Z.N. staining, ELISA & Latex Card test demonstration, Culture Media, Motility, Bio-chemicals test, Culture Plate demonstration , AST Plate, Hand washing , STD, Wound Infection, Demonstration of PPE Hospital acquired infection, Kalazar, Specimen Collection , Opportunistic infection, Hepatitis, Stool Examination, PUO, Mycology , Zoonoses	10 hours	

CO-POandPSOMapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	3	2	2	2	1	-	-	-	-	-	-
CO2	3	2	2	3	2	2	2	1	-	-	-	-	-	-
CO3	3	2	2	3	2	2	2	1	-	-	-	-	-	-
CO4	3	2	2	3	2	2	2	1	-	-	-	-	-	-
CO5	3	2	2	3	2	2	2	1	-	-	-	-	-	-

Strongcontribution-3, Averagecontribution-2, Lowcontribution-1,

Suggested Readings:

Reference Books	1. Text book of Microbiology by Anantha Narayanan 2. Text book of Microbiology by Jayaram Panicker 3. Microbiology by Baveja
Para Text	https://youtu.be/H0xmxeh6qoo?si=94ZwUMGwtgnqmJ2C https://youtu.be/1CXudj9yFFc?si=ujDu6SAipQ4-5Eyy https://youtu.be/DLTbpTXox08?si=SrfsFsupkqTQ-m9A https://youtu.be/CT9q9MWkE2Y?si=1_E7PGyl8CI9Gf_e

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	**Marks**	**Pattern**
Class test	12	Contains **01 long question.** question carries **04**Marks. **02 Short questions.** Each question carries **02**Marks **04 multiple choice questions.** Each question carries **01**Marks
Class participation or any other	04	This to be made on activities and instruction given by subject teacher.
Marks Assignments/Project:	04	Assignment to be made on topics and instruction given by subject teacher
Class Presentation:	04	This to be made on topics and instruction given by subject teacher
Bed Side behavior or Interaction in Class	02	This to be made on activities and instruction given by subject teacher.
Attendance	04	As per policy
Total Marks	**30**	

BACHELOR OF PHYSIOTHERAPY

Era University, Lucknow

Course Outline: 2024-2025

Name of the Program	**Bachelor of Physiotherapy**			**Year/Semester:**	**II year/III sem**
Course Name	**Pharmacology**	**Course Code:**	**BPT 302**	**Type: 3rd Sem**	**Theory**
Credits	**04**			**Total Sessions Hours:**	**60 Hours**
Evaluation Spread	**Internal Continuous Assessment:**		**30 Marks**	**End Term Exam:**	**70 Marks**
Type of Course	Compulsory		✓ Core	Creative	Life Skill
Course Objectives	1. The objective of this course is to provide the students with an in depth knowledge of basic pharmacology of various common medication used & it's effects on patients in physical therapy. 2. Students will develop the understanding of treatment of ailment of CVS, GIT, Endocrine system by drug. 3. Students will develop the understanding of contribution of drug & physiotherapy in the outcome of the treatment.				

Course Outcomes(CO): *After the successful course completion ,learners will develop following attributes:*	
CO1	To understand the various routes of drugs administration, pharmacodynamics & pharmacokinetics of drugs.
CO2	To understand the various drugs used for the treatment of ANS, PNS & CNS conditions with their mechanism of action & adverse effects.
CO3	To understand the various drugs used for the treatment of endocrine system with their mechanism of action & adverse effects.
CO4	To understand the various drugs used for the treatment of GIT problems with their mechanism of action & adverse effects.
CO5	To understand the various drugs used for the treatment of ailment of cardiovascular system, bronchial asthma, skin lesions with their mechanism of action & adverse effects.
Pedagogy	Interactive, discussion-based, student-centered, presentation.
Internal Evaluation Mode	Mid-term Examination: 30 Marks Class test: 12 Marks Class participation or any other : 04 Marks Assignments/Project: 04 Marks Attendance: 04 Marks Class Presentation: 04 Marks Bed Side behavior or Interaction in Class: 02 Marks

Session Details	**Topic**	**Hours**	**Mapped CO**
Unit 1	**A General Pharmacology** Introduction, Definitions, Nomenclature of drugs, Classification of drugs, Sources of drugs, Routes of drug administration, Distribution of drugs, Metabolism and Excretion of drugs Pharmacokinetics, Pharmacodynamics, Factors modifying drug response, adverse effects.	06	CO1

Unit 2	**Autonomic Nervous system** a. General considerations – The Sympathetic & Parasympathetic systems, receptors, somatic nervous system. b. Cholinergic and Anti-Cholinergic drugs, Adrenergic and Adrenergic blocking drugs, Peripheral Muscle relaxants. **Neuro-pharmacology** a. Sedative-Hypnotic Drugs: Barbiturates, Benzodiazepines b. Antianxiety Drugs: Benzodiazepines, Other Anxiolytics c. Drugs Used in Treatment of Mood Disorders: Monoamine oxidase Inhibitors, Tricyclic Antidepressants, Atypical Antidepressants, Lithium d, Antipsychotic drugs **Disorders of Movement** a. Drugs used in Treatment of Parkinson's disease b. Antiepileptic drugs c. Spasticity & skeletal muscle relaxants.	15	CO2
Unit3	**Inflammatory/Immune Diseases** a. Non – Narcotic Analgesics & Non-Steroidal Anti-Inflammatory Drugs: Acetaminophen, NSAIDS, Aspirin, Non-Aspirin NSAIDS, Drug Interactions With NSAIDS b. Glucocorticoids: Pharmacological Uses Of Glucocorticoids, Adverse Effects, Physiologic Use Of Glucocorticoids. c. Drugs Used In The Treatment of arthritic diseases: rheumatoid arthritis, osteoarthritis, gout d. Drugs Used In The Treatment Of Neuromuscular Immune/Inflammatory Diseases: Myasthenia Gravis, Idiopathic Inflammatory Myopathies, Systemic Lupus Erythematous, Scleroderma, Demyelinating Disease	14	CO3
Unit 4	**Digestion & Metabolism-** Gastrointestinal pharmacology: peptic ulcer disease, constipation, diarrhea, Drugs used in the treatment of diabetes mellitus: insulin, oral hypoglycemic	08	CO4
Unit 5	**Respiratory Pharmacology-** Obstructive airway diseases, drugs used in the treatment of obstructive airway diseases, Allergic rhinitis **Cardiovascular Pharmacology** – a. Drugs used in the treatment of heart failure : Digitalis, Diuretics, Vasodilators, ACE Inhibitors Antihypertensive drugs : Diuretics, Beta blockers, Calcium channel blockers, ACE Inhibitors, Central acting alpha agonists, Peripheral Alpha agonists, Direct acting Vasodilators b. Antiarrhythmic drugs c. Drugs used in the treatment of vascular disease and tissue ischemia: Vascular disease, Hemostasis Lipid lowering agents, Antithrombotic, Anticaogulants and Thrombolytics Ischemic Heart Disease – Nitrates, Beta blockers, Calcium channel blockers, cerebral ischemia, Peripheral vascular Disease	17	CO5

	Chemotherapy & Antibiotics- General principles, sulfonamides & fluoroquionolones, beta-lactam antibiotics-I (penicillin), beta-lactam antibiotics-II(Cephalosporin's), macrolides, aminoglycoside, tetracycline & chloramphenicol (broad spectrum antibiotics) anti-tuberculosis drugs, anti-leprosy drugs		

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	-	-	1		-	-	-	-	
CO2	-	-	-	2	-	-	1	-	-	
CO3	-	-	-	2	-	-	1	-		
CO4	-	-	-	2	-	-	1	-		
CO5	-	-	-	2	-	-	1	-		

Strongcontribution-3, ***Averagecontribution-2,*** ***Lowcontribution-1,***

Suggested Readings:

Reference Books

1. Essentials of Medical Pharmacology,
   Author: K.D. Tripathi
2. Clinical Pharmacology,
   Authors: Peter N. Bennett, Morris J. Brown, and Pankaj Sharma
3. Lippincott's Illustrated Reviews: Pharmacology,
   Authors: Karen Whalen, Richard Finkel, and Michelle A. Clark
4. Pharmacology: An Introduction,
   Authors: Henry Hitner and Barbara Nagle
5. Rang & Dale's Pharmacology,
   Authors: James M. Ritter, Rod J. Flower, Graeme Henderson, Yoon Kong Loke, and David MacEwan
6. Basic and Clinical Pharmacology,
   Author: Bertram Katzung
7. Goodman & Gilman's: The Pharmacological Basis of Therapeutics,
   Authors: Laurence L. Brunton, Randa Hilal-Dandan, and Björn C. Knollmann

ParaText

1. https://youtube.com/@speedpharmacology?feature=shared
2. https://youtube.com/playlist?list=PLL3y4VLBMQfgNvyK8q0nvoi_VaDhz2YYY&feature=shared
3. https://youtu.be/47QLbE3D9gg?feature=shared
4. https://youtu.be/tobx537kFaI?feature=shared
5. https://youtu.be/Yo2MDlWv_kc?feature=shared

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	Marks	Pattern
Class test	12	Contains **01 long question.** question carries **04**Marks. **02 Short questions.** Each question carries **02**Marks **04 multiple choice questions.** Each question carries **01**Marks
Class participation or any other	04	This to be made on activities and instruction given by subject teacher.
Marks Assignments/Project:	04	Assignment to be made on topics and instruction given by subject teacher
Class Presentation:	04	This to be made on topics and instruction given by subject teacher
Bed Side behavior or Interaction in Class	02	This to be made on activities and instruction given by subject teacher.
Attendance	04	As per policy
Total Marks	**30**	

BACHELOR OF PHYSIOTHERAPY

Era University, Lucknow

Course Outline: 2024-2025

Name of the Program	**BPT**			**Year/ Semester:**	**II year/III sem**
Course Name	**Exercise Therapy I**	**Course Code:**	**BPT 304/ BPP 304**	**Type:**	**Theory + Practical**
Credits	**05**			**Total Sessions Hours:**	**60 Hours**
Evaluation Spread	**Internal Continuous Assessment:**	**30 Marks**		**End Term Exam:**	**70 Marks**
Type of Course	Compulsory	• **Core**		Creative	Life Skills
Course Objectives	To prepare the students well to use exercise therapy as a valuable tool in the rehabilitation and management of patients with a wide range of conditions.				
Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*					
CO1	Students will be able to explain the physiological responses to exercise, including cardiovascular, respiratory, muscular, and metabolic changes.				
CO2	Students will be able to analyze human movement patterns and apply biomechanical principles to exercise prescription.				
CO3	Students will be able to assess a patient's functional limitations, muscle strength, range of motion, and other relevant factors to inform exercise programming.				
CO4	Students will be able to demonstrate and teach a variety of exercise techniques, including resistance training, aerobic conditioning, balance exercises, and stretching.				
CO5	Students will be able to design and implement individualized exercise programs based on patient goals, functional limitations, and medical conditions.				
CO6	Students will be able to integrate exercise therapy into the management of specific conditions, such as musculoskeletal injuries, neurological disorders, and chronic diseases.				
Pedagogy	Interactive, discussion-bases, student-centered, presentation.				
Internal Evaluation Mode	Mid-term Examination: 30 Marks Class test: 12 Marks Class participation or any other : 04 Marks Assignments/Project: 04 Marks Attendance: 04 Marks Class Presentation: 04 Bed Side behavior or Interaction in Class: 02:				
Session Details	**Topic**			**Hours**	**Mapped CO**
UNIT 1	**Introduction to exercise therapy**: Mechanical principle applied in human body - gravity, center of gravity, line of gravity, base of support, equilibrium, axis and planes, Lever and pulley. **Exercise Physiology -** Effect of exercise in various systems - musculoskeletal, neuromuscular, cardiovascular, respiratory system Assessment of patient's condition - Measurements of Vital			**6**	**CO1 CO2**

	parameters, Starting Positions - Fundamental positions & derived Positions, Planning of Treatment. **Disability models** - ICIDH model of disability, Nagi model of disability, ICF model		
UNIT 2	**Movements** a. Passive Movements: Causes of immobility, Classification of Passive movements, Specific definitions related ot passive movements, Principles of giving passive movements, Indications, contraindications, effects of uses, Techniques of giving passive movements. b. Active Movements c. Definition of strength, power & work, endurance, muscle actions. **Physiology of muscle performance:** a. structure of skeletal muscle, chemical & mechanical events during contraction & relaxation, muscle fiber type, motor unit, force gradation. b. Causes of decreased muscle performance c. Physiologic adaptation to training: Strength & Power, Endurance. d. Types of active movements **Free exercise:** a. Classification, principles, techniques, indications, contraindications, effects and uses.	**10**	**CO2** **CO5** **CO6**
UNIT 3	**a. Active Assisted Exercise:** principles, techniques, indications, contraindications, effects and uses Assisted-Resisted Exercise: principles, techniques, indications, contraindications, effects and uses **b. Resisted Exercise:** Definition, principles, indications, contraindications, precautions & techniques, effects and uses. **c. Types of resisted exercises:** Manual and Mechanical resistance exercise, Isometric exercise, Dynamic exercise: Concentric and Eccentric, Dynamic exercise: Constant versus variable resistance, Isokinetic exercise, Open-Chain and Closed-Chain exercise.	**14**	**CO3** **CO4**
UNIT 4	**Methods of Testing** **1. Functional tests** a. Measurement of Joint range: ROM- Definition, Normal ROM for al peripheral joints & spine, Goniometer- parts, types, principles, uses, Limitations of goniometry, Techniques for measurement of ROM for al peripheral joints **2. Tests for neuromuscular efficiency .** a. Electrical tests b. Manual Muscle Testing: Introduction to MMT, Principles & Aims, Indications & Limitations, Techniques of MMT for group & individual: Techniques of MMT for upper limb/Techniques of MMT for lower limb/Techniques of MMT for spine. c. Anthropometric Measurements: Muscle girth- biceps, triceps, forearm, quadriceps, calf d. Static power Test	**20**	**CO3** **CO4** **CO5** **CO6**

	e. Dynamic power Test f. Endurance test g. Speed test **3. Tests for Co-ordination** **4. Tests for sensation** **5. Pulmonary Function tests** 6. **Measurement of Limb Length**: true limb length, apparent limb length, segmental limb length, Measurement of the angle of Pelvic Inclination		
UNIT 5	a. **Stretching:** Definition, properties of soft tissue, mechanical and neurophysiological properties of connective tissue, mechanical properties of non contractile tissue. Determinants, type and effect of stretching, precautions, general applications of stretching technique. **b. Relaxation:** Definitions: Muscle Tone, Postural tone, Voluntary Movement, Degrees of relaxation, Pathological tension in muscle, Stress mechanics, types of stresses, Effects of stress on the body mechanism, Indications of relaxation, Methods & techniques of relaxation- Principles & uses, Types: General, Local, Jacobson's, Mitchel's, Heartfulness Relaxation.	**5**	**CO3** **CO4**
UNIT 6	**a. Suspension** Definition, types, uses and therapeutic application **b. Therapeutic Gymnasium** Set-up of gymnasium & its importance, Various equipment in the gymnasium, Operational skills & uses of the equipment.	**5**	**CO5** **CO6**

PRACTICAL:

1. Exercise therapy lab exposure
2. General exercises
3. Range of motion
4. Goniometry
5. Goniometry
6. Manual muscle testing
7. Fundamental positions
8. Relaxation exercises
9. limb length testing
10. passive and active mobilization
11. stretching exercises

CO-PO and PSO Mapping

CO	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	1	2	-	-	-	-	-	-	-
CO2	3	1	2	1	-	-	-	-	-	-
CO3	2	2	3	-	-	-	-	-	-	-
CO4	2	3	3	-	-	-	-	-	-	-
CO5	2	2	1	-	-	-	-	-	-	-
CO6	2	2	1	-	-	-	-	-	-	-

Strong contribution-3, Average contribution-2 , Low contribution-1,

Suggested Readings:

Text- Books	1. The Principles Of Exercise Therapy 4Ed, GARDINER M.D., CBS; Fourth edition 2. Therapeutic Exercise: Foundations and Techniques: Lynn Allen Kisner, Carol Colby F A Davis Co; 5th edition

Reference Books	1. Kendall's Muscles: Testing and Function, With Posture and Pain: Vincent M. Conroy (Author), Jr. Murray, Brian N. Lippincott Williams & Wilkins; 6th edition 2. MEASUREMENT OF JOINT MOTION: A GUIDE TO GONIOMETRY: Cynthis C. Norkin, D.J, White, F.A. Davis Company; 5th edition
Para Text	• **https://www.youtube.com/watch?v=_dcQW2L_i64** • **https://www.youtube.com/watch?v=20Jb_eP0JVw&list=PLi0iUQVOGdu1EbYnOEKTDoJETHB_m-A1A** • **https://www.youtube.com/watch?v=TVj9IqUyL5Y**

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	**Marks**	**Pattern**
Class Test	12	Contains **01 long question.** Question carries **04**Marks. **02 Short questions.** Each question carries **02**Marks **04 multiple choice questions.** Each question carries **01**Marks
Class participation or any other	04	This to be made on activities and instruction given by subject teacher.
Marks Assignments/Project:	04	Assignment to be made on topics and instruction given by subject teacher
Class Presentation:	04	This to be made on topics and instruction given by subject teacher
Bed Side behavior or Interaction in Class	02	This to be made on activities and instruction given by subject teacher.
Attendance	04	As per policy
Total Marks	**30**	

BACHELOR OF PHYSIOTHERAPY

Era University, Lucknow

Course Outline: 2024-2025

Name of the Program	**BPT**			**Year/Semester:**	**II year/ III SEM**
Course Name	**Electrotherapy 1**	**Course Code:**	**BPT 303/ BPP 303**	**Type:**	**Theory/ Practical**
Credits	**05**			**Total Sessions Hours:**	**75 Hours**
Evaluation Spread	**Internal Continuous Assessment:**	**30 Marks**		**End Term Exam:**	**70 Marks**
Type of Course	Compulsory	✓ Core		Creative	Life Skill
Course Objectives	The objective of this course is that the student will be able to list the indications, contraindication, dosage of electrotherapy modalities, demonstrates the different techniques, and describe their effects on various conditions and acquire basic knowledge of applied physics in electrotherapy.				
Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*					
CO1	Recall principles of Physics and laws of Electricity and their working, physiology and therapeutic effects, Merits/demerits; and also acquire the skill of application.				
CO2	To understand basic of different electrical currents & its application in practice of physiotherapy..				
CO3	Acquire knowledge of different types electric stimulation used on human body, its working parameter, its effects and side effects.				
CO4	Describe about and effects of various Radiation therapy and Cryotherapy & its application in practice of physiotherapy.				
CO5	Describe about and effects of various Superficial heating Modalities & its application in practice of physiotherapy.				
Pedagogy	Interactive, discussion-based, student-centered, presentation.				
Internal Evaluation Mode	Mid-term Examination: 30 Marks Class test: 12 Marks Class participation or any other : 04 Marks Assignments/Project: 04 Marks Attendance: 04 Marks Class Presentation: 04 Marks Bed Side behavior or Interaction in Class: 02 Marks				

Session Details	**Topic**	**Hours**	**Mapped CO**
Unit 1	**Basics of Electrotherapy-** Current Electricity: Units of Electricity: farad, Volt, Ampere, Coulomb, Watt. Condensers: Definition, principle, Types, construction and working, capacity & uses. Magnetism: Definition, Properties of magnets, Electromagnetic induction, Transmission by contact, Magnetic field and magnetic forces, Magnetic effects of an electric field. Conductors, Insulators, Potential difference, Resistance and intensity Ohm's law and its application to DC and AC currents, Fuse: construction, working and application. Transmission of electrical energy through	10	CO1

	solids, liquids, gases and vacuum. Rectifying Devices - Thermionic valves, Semiconductors, Transistors, Amplifiers, transducer and Oscillator circuits. Display devices and indicators – analogue and digital.Transformer: Definition,Types,Principle,Construction,Eddy current, working uses. Chokes: Principle, Construction and working, Uses		
Unit 2	**Types of Electrical Current and their Therapeutic effects –** Basic types of current. Direct Current: types, physiological & therapeutic effects. Alternating Current Types of Current used in Therapeutics Faradic Current: Definition, Modifications, Techniques of Application of Individual, Muscle and Group Muscle stimulation, Physiological & Therapeutic effects of Faradic Current, Precautions, Indications & Contra-Indications, and Dangers. Galvanic Current: Definition, Modifications, Physiological & Therapeutic effects of Galvanic Current, Indications & Contra-Indications, Dangers, Effect of interrupted galvanic current on normally innervated and denervated muscles and partially denervated muscles. Sinusoidal Current & Diadynamic Current in Brief. HVPGS– Parameters & its uses Ionization/Iontophoresis: Techniques of Application of Iontophoresis, Indications, Selection of Current, commonly used Ions (Drugs) for pain, hyperhidrosis, would heal. Cathodal/Anodal galvanism. Micro Current & Macro Current Types of Electrical Stimulators NMES- Construction, component. Principles of Application: Electrode tissue interface, Tissue Impedance, Types of Electrodes, Size & Placement of Electrode – Water bath, Unipolar, Bi- polar, Electrode coupling, Current flow in tissues, Lowering of Skin Resistance.	15	CO2
Unit 3	**Types of Electrical Stimulation and their therapeutic Effects-** NMES- Construction component, Neuro muscular diagnostic stimulator- construction component TENS: Define TENS, Types of TENS, Conventional, Types of Electrodes & Placement of Electrodes, Dosage parameters, Physiological & Therapeutic effects, Indications & Contraindications.4. Pain: Define Pain, Theories of Pain (Outline only), and Pain Gate Control theory in detail.	10	CO3
Unit4	**Actinotherapy-** IRR: Define IRR, wavelength & parameters, Types of IR generators, Physiological & Therapeutic effects, Duration & frequency of treatment, Indication &Contraindication. UVR: Define UVR, Types of UVR, and UVR generators: Physiological &Therapeutic effects. Indications, contraindications, Dangers. Calculation of different Dosages and their therapeutic effects, **Cryotherapy-** Define- Cryotherapy, Principle- Latent heat of fusion, Physiological & Therapeutics effects, Techniques of Applications, Indications & Contraindications, Dangers,	15	CO4

	Methods of application with dosages.		
Unit5	**Superficial heating Modalities-** Wax Therapy: Principle of Wax, Composition of Wax Bath, Methods of application of Wax, Physiological & Therapeutic effects, Indications & Contraindication, Dangers. Contrast Bath: Methods of application, Therapeutic uses, Indications & Contraindications. Moist Heat Therapy: Hydro collator packs – in brief, Methods of applications, Therapeutic uses, Indications & Contraindications. Cyclotherm: Principles of production, Therapeutic uses, Indications & Contraindications. Fluidotherapy: Construction, Method of application, Therapeutic uses, Indications & Contraindications. WhirlPool Bath: Construction, Method of Application, Therapeutic Uses, Indications & Contraindications.	10	CO5
Practical	Demonstrate the technique for patient evaluation–receiving the patient and positioning the patient for treatment using electrotherapy. Collection of materials required for treatment using electrotherapy modalities and testing of the apparatus. Demonstrate placement of electrodes for various electrotherapy modalities. Electrical stimulation for the muscles supplied by the peripheral nerves Demonstrate treatment techniques using IRR and UVR exposure for various conditions– calculation of test dose Technique of treatment and application of Hydro collator packs, cryotherapy, contrast bath, wax therapy Demonstrate the treatment method using whirlpool bath Winding up procedure after any electrotherapy treatment method.	30	

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	1	1	-	-	-	1	-	-	2
CO2	3	3	2	1	1	-	-	-	-	1
CO3	3	3	2	1	-	-	1	-	-	1
CO4	3	1	1	1	-	-	2	1	-	1
CO5	2	1	2	1	-	-	-	1	-	1

Strong contribution-3, Average contribution-2, Low contribution-1,

Suggested Readings:

Text-Books	1. Clayton's Electrotherapy by Forster & Plastanga 2. Electrotherapy by Khokher
ReferenceBooks	1. Electrotherapy Explained by Low & Reed
ParaText	**Unit1:** **https://www.youtube.com/watch?v=rp_1AnZtVoQ** **Unit2:** **https://www.youtube.com/watch?v=dYBeHZBp-yI** **Unit3:** **https://www.youtube.com/watch?v=MHnxWIjruwY**

Recapitulation & Examination Pattern		
Internal Continuous Assessment:		
Component	**Marks**	**Pattern**
Class test	12	Contains **01 long question.** Question carries **04**Marks. **02 Short questions.** Each question carries **02**Marks **04 multiple choice questions.** Each question carries **01**Marks
Class participation or any other	04	This to be made on activities and instruction given by subject teacher.
Marks Assignments/Project:	04	Assignment to be made on topics and instruction given by subject teacher
Class Presentation:	04	This to be made on topics and instruction given by subject teacher
Bed Side behavior or Interaction in Class	02	This to be made on activities and instruction given by subject teacher.
Attendance	04	As per policy
Total Marks	**30**	

BACHELOR OF PHYSIOTHERAPY

Era University, Lucknow

Course Outline: 2024-2025

Name of the Program	**BPT**			**Year/Semester:**	**II year. III sem**
Course Name	**BIOMECHANICS & KINESIOLOGY - I**	**Course Code:**	**BPT 305/ BPP 305**	**Type:**	**Theory & Practical**
Credits	**05**			**Total Sessions Hours:**	**75 Hours**
Evaluation Spread	**Internal & Continuous Assessment**	**30 Marks**		**End Term Exam:**	**70 Marks**
Type of Course	○ Compulsory	◉ Core		○ Creative	○ Life Skill
Course Objectives	1. Comprehend the shoulder complex, including its components, motions, and integrated function. 2. Understand the elbow complex, its structure, function, and the balance between mobility and stability. 3. Familiarize with the wrist and hand complex, including joints, structures, and their roles in prehension and grip. 4. Understand the biomechanics of the vertebral column, including structure, function, and effects of aging, as well as the role of associated muscles in stability and mobility. 5. Understand posture, including its static and dynamic aspects, control, and influencing factors				
Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*					
Course Outcome (CO)	**Attributes**				
CO1	Proficiency in explaining the shoulder complex's function and kinematics				
CO2	Ability to assess and describe the structural and functional aspects of the elbow complex				
CO3	Competence in understanding the wrist and hand complex and its significance in various hand activities				
CO4	Ability to analyze the structural and functional aspects of different regions of the vertebral column and implement strategies for maintaining spinal health and mobility across the lifespan				
CO5	Ability to analyze the elements of posture and the effects of age, gender, occupation, pregnancy, and recreation on postural habits, facilitating the promotion of healthy postural practices				
Pedagogy	Interactive, discussion-bases, student-centered, presentation.				
Internal Evaluation Mode	Mid-term Examination: 30 Marks Class test: 12 Marks Class participation or any other : 04 Marks Assignments/Project: 04 Marks Attendance: 04 Marks Class Presentation: 04 marks Bed Side behavior or Interaction in Class: 02 marks				

Session Details	Topic	Hours	Mapped CO
UNIT 1	**1. Shoulder Complex :** Components of Shoulder Complex : SC Joint – SC Motions, AC Joint – AC Motions, ST Joint – Resting Position of Scapula, Motions of Scapula, GH Joint - GH Motions, Static & Dynamic Stabilization of GH Joint, Integrated Function of Shoulder Complex.	12	CO1
UNIT 2	**1. Elbow Complex :** Introduction of Structure, Function – Humeroulnar & Humeroradial Articulations, Structure - Proximal & Distal Radioulnar Articulations, Function – Radioulnar Joint, Mobility & Stability - Elbow Complex.	12	CO 2
UNIT 3	**2. Wrist & Hand Complex :** Wrist Complex, Radiocarpal Joint Structure, Midcarpal Joint Structure, Functions of Wrist Complex, Hand Complex,Palmar Arches, MCP, IP Joints of Fingers, Structure of the Thumb, Prehension, Power Grip, Precision Handling	12	CO 3
UNIT 4	**3. Biomechanics of Vertebral Column :** General structure & Function, Regional Structure & Function : Structure & Function of Cervical Region, Structure & Function of Thoracic Region, Structure & Function of Lumbar Region, Structure & Function of Sacral Region, Muscles of Vertebral Column, Effects of Aging.	12	CO4
UNIT 5	**4. Posture** Static & Dynamic Posture, Postural Control, Major Goals & Basic Elements of Control, Kinetics & Kinematics of Posture, Coincident Action Lines, Optimal Posture : Standing, Sitting & Lying, Effects of Age, Gender, Occupation, Pregnancy & Recreation on Posture	12	CO5
	PRACTICALS: 1. Goniometry – Measurement of joint ROM. 2. Identification of Muscles of Shoulder Elevation & Depression 3. Identification of Axis of humerus & forearm 4. Identification of Carrying Angle 5. Identification of functional position of Wrist & Hand 6. Analysis of Posture	15	

CO-POMapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	1	1	1	-	2	-	-	1
CO2	3	2	1	1	1	-	2	-	-	1
CO3	3	2	1	1	1	-	2	-	-	1
CO4	3	2	1	1	1	-	2	-	-	1
CO5	3	2	1	1	1	-	2	-	-	1

Strongcontribution-3, Averagecontribution-2, Lowcontribution-1,

SuggestedReadings:

Text-Books

1. Joint Structure and Function – A comprehensive Analysis, By Cynthia Norkins
2. Basic Biomechanics Explained - Low & Reed – Butterworth Heinmann
3. Basic Biomechanics. Nordins

Reference Books	1. Kinesiology: Applied to Pathological Motion - Soderberg Lippincott 2. Basic Biomechanics & clinical Kinesiology. Otis 3. Biomechanics of Human Movement. D Winter
ParaText	1. https://youtu.be/j5873VW2ohw 2. https://youtu.be/0mqbfA8Zz4A?list=PLvHpMUaCG10Qf5uKW4lgmVcqLgWLDYNHI 3. https://youtu.be/gQz18YlLEwI 4. https://youtu.be/p1Lf_iafOjQ?list=PLvHpMUaCG10SU6m8kcu78y8z9GJ6txEVM 5. https://youtu.be/WyawJsth8vw?list=PLvHpMUaCG10Rs3tOl5BHRERk6c62sHZgj

Recapitulation&ExaminationPattern

InternalContinuousAssessment:

Component	**Marks**	**Pattern**
Class test	12	Contains 01 long queation. question carries 04 marks 02 short questions. each question carries 02 marks 04 multiple choice questions. each question carries 01 marks
Class participation or any other	04	This to be made on activities and instruction given by subject teacher
Marks assignments/project	04	Assignment to be made on topics and instruction given by subject teacher
Class presentation	04	This to be made on topics and instruction given by subject teacher
Bed side behavior or interaction in class	02	This is to be made on activities and instruction given by subject teacher
Attendance	04	As per policy
Total marks	30	