

National Curriculum of Pakistan
2022-23

TECHNICAL EDUCATION

MEDICAL SCIENCE

Physiotherapy Techniques

Grades 11



NATIONAL CURRICULUM COUNCIL SECRETARIAT
MINISTRY OF FEDERAL EDUCATION AND
PROFESSIONAL TRAINING, ISLAMABAD
GOVERNMENT OF PAKISTAN

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

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It is with great pride that we, at the National Curriculum Council Secretariat, present the first core curriculum in Pakistan's 75-year history. Consistent with the right to education guaranteed by Article 25-A of our Constitution, the National Curriculum of Pakistan (2022-23) aspires to equip every child with the necessary tools required to thrive in and adapt to an ever-evolving globalized world.

The National Curriculum is in line with international benchmarks, yet sensitive to the economic, religious, and social needs of young scholars across Pakistan. As such, the National Curriculum aims to shift classroom instruction from rote learning to concept-based learning.

Concept-based learning permeates all aspects of the National Curriculum, aligning textbooks, teaching, classroom practice, and assessments to ensure compliance with contemplated student learning outcomes. Drawing on a rich tapestry of critical thinking exercises, students will acquire the confidence to embark on a journey of lifelong learning. They will further be able to acknowledge their weaknesses and develop an eagerness to build upon their strengths.

The National Curriculum was developed through a nationwide consultative process involving a wide range of stakeholders, including curriculum experts from the public, private, and non-governmental sectors. Representatives from provincial education departments, textbook boards, assessment departments, teacher training departments, *deeni madaris*, public and private publishers, private schools, and private school associations all contributed their expertise to ensure that the National Curriculum could meet the needs of all Pakistani students.

The experiences and collective wisdom of these diverse stakeholders enrich the National Curriculum, fostering the core, nation-building values of inclusion, harmony, and peace, making the National Curriculum truly representative of our nation's educational aspirations and diversity.

I take this opportunity to thank all stakeholders, including students, teachers, and parents who contributed to developing the National Curriculum of Pakistan (2022-23)

Dr. Mariam Chughtai

Director

National Curriculum Council Secretariat

Ministry of Federal Education and Professional Training

Physiotherapy Techniques I
Grade 11
Progression Grid

Domain A: Electromechanics

Standard: The student will list and explain the topic of Electromechanics.

Grade 11

Benchmark: The topic of Electromechanics will prepare students to apply principles of electromechanics in medical use.

[SLO: PT-11-A-01]:

List and explain use of current for treatment.

[SLO: PT-11-A-02]:

Define sinusoidal and Faradic currents.

[SLO: PT-11-A-03]:

Define high frequency current production.

[SLO: PT-11-A-04]:

Define low Frequency Currents

[SLO: PT-11-A-05]:

Define interrupted direct current

[SLO: PT-11-A-06]:

Describe electro diagnosis

[SLO: PT-11-A-07]:

Describe Inferential Therapy

[SLO: PT-11-A-08]:

List and illustrate electro checks/electrical shocks

[SLO: PT-11-A-09]:

List and describe physical effects of heat and temperature

[SLO: PT-11-A-10]:

List and describe Infra-red rays

[SLO: PT-11-A-11]:

List and describe Ultraviolet rays, its sources and choices for treatment.

[SLO: PT-11-A-12]:

List and discuss sound waves

[SLO: PT-11-A-13]:

List and discuss currents from cell and Main's supply, Ohm's Law, technique and application of Galvanic current, technique and application of Faradic current

Domain B: Electrotherapy (Theory)

Standard: The student will list and explain topic of Electrotherapy.

Grade 11

Benchmark: The topic of Electrotherapy will prepare students to identify applications of electrotherapy in medical use.

[SLO: PT-11-B-01]:

List and explain use of current for treatment.

[SLO: PT-11-B-02]:

Describe technique and application of Galvanic current.

[SLO: PT-11-B-03]:

List effects, uses, indications and precautions of galvanic current.

[SLO: PT-11-B-04]:

Describe technique and application of Faradic current.

[SLO: PT-11-B-05]:

List effects, uses, indications and precautions of Faradic current.

[SLO: PT-11-B-06]:

List uses of short wave diathermy and its general consideration.

[SLO: PT-11-B-07]:

List effects of short wave diathermy in heating of tissues.

[SLO: PT-11-B-08]:

Describe the machine and patient circuit of diathermy.

[SLO: PT-11-B-09]:

List physiological and therapeutic effects of diathermy.

[SLO: PT-11-B-10]:

Describe side effects of shortwave diathermy.

[SLO: PT-11-B-11]:

Describe physiological effects of infrared rays.

[SLO: PT-11-B-12]:

Describe therapeutic effects of infrared rays.

[SLO: PT-11-B-13]:

List technique of irradiation from infrared rays.

[SLO: PT-11-B-14]:

List dangers and precautions of infrared rays.

[SLO: PT-11-B-15]:

Describe physiological effects of ultraviolet rays.

[SLO: PT-11-B-16]:

Describe therapeutic effects of ultraviolet rays.

[SLO: PT-11-B-17]:

List technique of irradiation from ultraviolet rays.

[SLO: PT-11-B-18]:

List dangers and precautions of ultraviolet rays.

[SLO: PT-11-B-19]:

Describe technique of application of ultraviolet rays.

Domain B: Electrotherapy (Practical)

Standard: The student will list and relate medical practices of Electrotherapy.

Grade 11

Benchmark: The practical of Electrotherapy will prepare student to identify applications of electrotherapy in medical use.

[SLO: PT-11-B-20]:

Define Low frequency currents

[SLO: PT-11-B-21]:

Define Electrical stimulation

[SLO: PT-11-B-22]:

List types of electrical stimulation current used - low or high

[SLO: PT-11-B-23]:

List electrical stimulation apparatus – Developing diagram, identification of main parts, electrodes, connections etc.

[SLO: PT-11-B-24]:

Describe Low frequency currents – types like TENS etc.

[SLO: PT-11-B-25]:

List indications of low frequency currents for use like Bell's Palsy

[SLO: PT-11-B-26]:

List safety precautions for self and for patients.

[SLO: PT-11-B-27]:

Describe electrodes and their application.

[SLO: PT-11-B-28]:

Describe methods to avoid electric shock.

[SLO: PT-11-B-29]:

List situations in which burns may occur.

[SLO: PT-11-B-30]:

List different faults in the electrical system and their effects.

Domain C: Biomechanics

Standard : The student will be able to describe biomechanics and its use in physiotherapy.

Grade 11

Benchmark: The topic of biomechanics will prepare student to describe applications of biomechanics in physiotherapy.

[SLO: PT-11-C-01]:

Define Low frequency currents

[SLO: PT-11-C-02]:

Define preliminary exercise on measurement, involving different geometrical dimensions.

[SLO: PT-11-C-03]:

Describe and summarise force, measurements of force and its effects, tensile & compressive forces.

[SLO: PT-11-C-04]:

Describe and summarise moments, its kinds, effects of opposite moment & principle of moments.

[SLO: PT-11-C-05]:

Describe and summarise reaction or supporting forces of a horizontal beam & reaction at sacrum.

[SLO: PT-11-C-06]:

Describe and summarise work done in machines used for lifting, principle of work applied machine.

[SLO: PT-11-C-07]:

Explain some simple machines.

[SLO: PT-11-C-08]:

Discuss power, power of engines & pumps its mechanical efficiency.

[SLO: PT-11-C-09]:

Discuss transmission of motion & Power.

[SLO: PT-11-C-10]:

Define the inclined plane and screw.

[SLO: PT-11-C-11]:

Define energy.

[SLO: PT-11-C-12]:

Explain application of physical principles to body system.

[SLO: PT-11-C-13]:

Describe and explain mode of transmission of heat and light.

[SLO: PT-11-C-14]:

Describe and explain wave motion, different kinds of wave motion, reflection & refraction of waves.

[SLO: PT-11-C-15]:

Describe and explain sound, factors necessary for production of sound. Sound as energy. The nature of sound, propagation of sound in air, water & solid.

[SLO: PT-11-C-16]:

List characteristics of sound waves used in physiotherapy.

Domain C: Biomechanics (Practical)

Standard: The student will be able to experiment biomechanics.

Grade 11

Benchmark: The topic of biomechanics will prepare students to describe applications of biomechanics in physiotherapy.

[SLO: PT-11-C-17]:

Describe the centre of gravity of a irregular shape bodies.

[SLO: PT-11-C-18]:

Apply the principle of lever $\text{load} \times \text{load} = \text{Effort} \times \text{effort area}$.

[SLO: PT-11-C-19]:

Apply the forces of a weight rolling down on an inclined plane.

[SLO: PT-11-C-20]:

Describe the different forces at different angles on a single joint and to find their net effect on that joint.

[SLO: PT-11-C-21]:

Describe the centre of gravity of a lever area placed on a fulcrum under specific loading.

[SLO: PT-11-C-22]:

Find unknown reaction of a lever under a specific concentrated loading.

[SLO: PT-11-C-23]:

Resolve an inclined force making an angle with X-axis and to find the component forces of that inclined force by making use of trigonometric function.

Domain D: Electromagnetism (Theory)

Standard: The student will describe and explain topic of electromagnetism.(Theory)

Grade 11

Benchmark: The topic of biomechanics will prepare student to describe applications of biomechanics in physiotherapy.

[SLO: PT-11-D-01]:

Describe the structure of the atom.

[SLO: PT-11-D-02]:

Describe Isotopes.

[SLO: PT-11-D-03]:

Describe Ionization and excitation.

[SLO: PT-11-D-04]:

Describe electric charges.

[SLO: PT-11-D-05]:

Describe electric introduction-electroscopes.

[SLO: PT-11-D-06]:

Describe electric charge and electrical potential.

[SLO: PT-11-D-07]:

Recall capacitance and capacitors.

[SLO: PT-11-D-08]:

Define electric current-ampere, volt, and resistance.

[SLO: PT-11-D-09]:

Define resistance and ohms law.

[SLO: PT-11-D-10]:

Define circuit laws.

[SLO: PT-11-D-11]:

Describe energy and power.

[SLO: PT-11-D-12]:

Define heating effect of electric current.

[SLO: PT-11-D-13]:

Describe sources of electrical energy. Define magnetism and magnetic effect of electric current.

[SLO: PT-11-D-14]:

Describe applications of magnetic effect.

[SLO: PT-11-D-15]:

Define electro-magnetic induction.

[SLO: PT-11-D-16]:

Define mutual induction and self-induction.

[SLO: PT-11-D-17]:

Introduction to alternating current (A.C)

[SLO: PT-11-D-18]:

Define transformer-theory.

[SLO: PT-11-D-19]:

List transformer-practical aspects.

[SLO: PT-11-D-20]:

List A.C. circuits.

[SLO: PT-11-D-21]:

Define reactance, resonance, impedance.

[SLO: PT-11-D-22]:

Describe power factor-power in single-phase circuit.

[SLO: PT-11-D-23]:

Describe Single phase three phase, comparison and contrast.

[SLO: PT-11-D-24]:

Describe electrical distribution system in Pakistan.

[SLO: PT-11-D-25]:

List different supply systems.

[SLO: PT-11-D-26]:

Define A.C. in three-phase system.

[SLO: PT-11-D-27]:

List electrical machines

[SLO: PT-11-D-28]:

Define generator-A.C. & D.C. Principle, working-main parts.

[SLO: PT-11-D-29]:

Define motor-principle, main parts working.

[SLO: PT-11-D-30]:

Define electrical measuring instruments and measurements indicating instrument-types, principle and working.

[SLO: PT-11-D-31]:

Define thermionic emission and P.N. Junction. 36. Define diode structures and working.

[SLO: PT-11-D-32]:

List characteristic of diodes.

[SLO: PT-11-D-33]:

Define Triode-its working and characteristics.

[SLO: PT-11-D-34]:

Define rectification.

[SLO: PT-11-D-35]:

Define amplification.

Domain E : Physiotherapy instruments

Standard : The student describes the use of physiotherapy instruments.

Grade 11

Benchmark: The students will describe the use of physiotherapy instruments and application of electrical technology in physiotherapy equipment

[SLO: PT-11-E-01]:

Describe ultra-sonic Therapy Unit (Circuit Description, Dosage control, Constant and pulsed operation).

[SLO: PT-11-E-02]:

Define microwave diathermy.

[SLO: PT-11-E-03]:

List surgical diathermy machines.

[SLO: PT-11-E-04]:

Define precautions to be used while using Physiotherapy Instruments.

[SLO: PT-11-E-05]:

List all types of Baths.

[SLO: PT-11-E-06]:

List exercise machines. List types of exercise machines and their usage.

[SLO: PT-11-E-07]:

Give brief introduction to circuits

Standard A, B, C, D:

Student Learning Outcomes

<p>Knowledge: Students will describe...</p> <ul style="list-style-type: none"> • Electromechanics • Electrotherapy • Biomechanics • Electromagnetism 	<p>Skills: Students will be able to apply...</p> <ul style="list-style-type: none"> • Electrotherapy • Biomechanics • Physiotherapy instruments
<p>Assessments</p> <p>Formative Assessments</p> <ul style="list-style-type: none"> • Daily Log of Teaching activities that will include taught topic and reflecting upon it. • Maintenance of Practical Journals <p>Summative Assessments</p> <ul style="list-style-type: none"> • Annual Examination comprising of Theoretical and practical components 	
<p>Learning Activities</p> <ul style="list-style-type: none"> • Didactic Lectures • Tutorial • Dry Lab • Hands on Performance • Presentation 	

Physiotherapy Techniques II

Grade 12

Domain A: Special physiology

Standard: The student will describe and explain the topic of special physiology

Grade 12

Benchmark: *The students will describe special physiology to memorize natural human facts.*

[SLO: PT-12-A-01]:

Describe physical principles of resting membrane potential in nerve & muscle action.

[SLO: PT-12-A-02]:

Describe nerve action potential and physiology of nerve impulse synaptic transmission.

[SLO: PT-12-A-03]:

Describe Sympathetic and parasympathetic system.

[SLO: PT-12-A-04]:

Describe Sensory systems, various types of sensations, their pathways and brain centers.

[SLO: PT-12-A-05]:

Describe Special senses.

[SLO: PT-12-A-06]:

Describe Eye, ear, taste, and olfaction.

[SLO: PT-12-A-07]:

Describe Motor system pyramidal and Extrapyramidal.

[SLO: PT-12-A-08]:

Describe Cerebellum RAS. Sleep, higher brain functions.

[SLO: PT-12-A-09]:

List Functions of Hypothalamus.

[SLO: PT-12-A-10]:

Describe Physiology skeletal muscle, smooth, cardiac muscle Neuromuscular Physiology.

[SLO: PT-12-A-11]:

Describe electromyography and myoneural junctions.

[SLO: PT-12-A-12]:

Describe physiology of respiration, cardiovascular system, Endocrine GIT, urinary system,

[SLO: PT-12-A-13]:

Describe blood, immune system.

[SLO: PT-12-A-14]:

Describe Physiology of bones and Ca ++ metabolism.

[SLO: PT-12-A-15]:

Describe Physiology of Exercise.

[SLO: PT-12-A-16]:

Describe Metabolism Diet & Nourishment especially in handicapped & paralyzed individuals.

[SLO: PT-12-A-17]:

Describe Electrolyte physiology, water & Electrolyte balance, PH regulation.

Domain B: Special anatomy

Standard: The student will describe and explain the topic of special anatomy.

Grade 12

Benchmark : *The topic of Special Anatomy will prepare students to list, classify and describe human anatomy relevant to physiotherapy techniques*

[SLO: PT-12-B-01]:

Classify skeletal system.

[SLO: PT-12-B-02]:

Describe classification and general features of bones & joints.

[SLO: PT-12-B-03]:

Describe bones of upper limb.

[SLO: PT-12-B-04]:

Describe bones of lower limb.

[SLO: PT-12-B-05]:

Describe foot, carpus, metacarpus and phalangeal bones.

[SLO: PT-12-B-06]:

Describe phalangeal movements.

[SLO: PT-12-B-07]:

Describe joints of upper & lower limbs.

[SLO: PT-12-B-08]:

Describe essential features of each type of bone and joint.

[SLO: PT-12-B-09]:

Describe general features of skull.

[SLO: PT-12-B-10]:

Describe constituent bones of skull and their position.

[SLO: PT-12-B-11]:

Describe vertebral column.

[SLO: PT-12-B-12]:

Describe Sternum and Ribs.

[SLO: PT-12-B-13]:

Describe general anatomy of muscles.

[SLO: PT-12-B-14]:

Classify muscles and describe their actions.

[SLO: PT-12-B-15]:

Describe nerve supply & actions of various limbs & body muscles including diagrams.

[SLO: PT-12-B-16]:

Describe muscle group action as against antagonist, synergist.

[SLO: PT-12-B-17]:

Describe mechanism and action of muscles acting on joints and movements they produce.

[SLO: PT-12-B-18]:

Describe cardiovascular system.

[SLO: PT-12-B-19]:

Describe digestive system.

[SLO: PT-12-B-20]:

Describe endocrines pituitary thyroid & parathyroid suprarenal etc.

Domain C: Surface Anatomy

Standard: The student will describe the topic of surface anatomy.

Grade 12

Benchmark: *The topic of Surface Anatomy will prepare students to list, classify and describe surface human anatomy*

[SLO: PT-12-C-01]:

Distinguish various bony and soft landmarks on body.

[SLO: PT-12-C-02]:

Demonstrate correlation of surface landmarks marks with deep structures.

[SLO: PT-12-C-03]:

Sketch surface marking of various deep structures in the body.

[SLO: PT-12-C-04]:

Use measurements in limbs – recognition of various parts in limbs, abdomen, and thorax.

Domain D: Kinesiology

Standard: The student will describe the topic of Kinesiology to interpret the science of movement.

Grade 12

Benchmark: *The topic of kinesiology will prepare students to describe human body movements.*

[SLO: PT-12-D-01]: List and classify passive movements.

[SLO: PT-12-D-02]: List relaxed passive movements.

[SLO: PT-12-D-03]: List forced passive movements.

[SLO: PT-12-D-04]:

List technique and effects of forced passive movements.

[SLO: PT-12-D-05]:

List and of active movements.

[SLO: PT-12-D-06]:

Define assisted active movement, its technique and effect.

[SLO: PT-12-D-07]:

Define resisted movement, its technique and effect.

[SLO: PT-12-D-08]:

Define free active movements, its technique and effect.

[SLO: PT-12-D-09]:

Describe breathing exercises, their effect and technique.

[SLO: PT-12-D-10]:

Describe suspension therapy.

[SLO: PT-12-D-11]:

List simple methods of suspension, its effects and uses.

[SLO: PT-12-D-12]:

Describe pulley and weight circuits.

[SLO: PT-12-D-13]:

Describe effects and uses of pulley circuits.

[SLO: PT-12-D-14]:

Describe different postures: effects, uses and muscle work;

[SLO: PT-12-D-15]:

Define relaxation

[SLO: PT-12-D-16]:

Define methods of promoting relaxation, its effects and uses.

[SLO: PT-12-D-17]:

Proprioceptive Neuromuscular Facilitation (PNF) Techniques.

Standard A, B, C:

Student Learning Outcomes

Knowledge:

Students will describe...

- Special physiology
- Special anatomy
- kinesiology

Skills:

Students will be able to recognize...

- *human anatomy*
- *surface landmarks of human body*

Assessments

Formative Assessments

- Daily Log of Teaching activities that will include taught topic and reflecting upon it.
- Maintenance of Practical Journals

Summative Assessments

- Annual Examination comprising of Theoretical and practical components

Learning Activities

- Didactic Lectures
- Tutorial
- Dry Lab
- Hands on Performance
- Presentation



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