

Subject Title:	ELECTROTHERAPY
Subject Code:	1PT1010206
Year	Second Year
Pre-requisite:	-NONE-

Objectives:

At the end of the course the candidate will be able to

1. Recall the Physics – Principles and laws of electricity, Electromagnetic spectrum, Ultrasound
2. Describe the electrical main supply, Electric shock – precautions
3. Describe and identify various types of electrodes used in therapeutics, resistance offered by the skin and significance of various media used to reduce the same
4. Describe the production, physiological effects, therapeutic uses, merits/ demerits, indications and contraindication of various Low, Medium and High frequency currents and modes. Describe the panel diagrams of the machine
5. Acquire the skill of application of Low, Medium and High frequency currents on models for the purpose of treatment
6. Describe the physiological effects and therapeutic uses of various therapeutic ions to be used for the application of Iontophoresis
7. Describe effects of electromagnetic field at the cellular level and risk factors on prolonged exposure
8. Describe the physiological effects and therapeutic uses of various topical pharmaco-therapeutic agents to be used for the application of phonophoresis
9. Acquire an ability to select the appropriate mode as per the tissue specific and area specific application.

Teaching Scheme (Hours)			Evaluation Scheme (Marks)					
Lecture	Practical	Total	Theory(T)		Practical(P)		Total Marks	
			University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	Theory	Practical
175	175	350	80	20	80	20	100	100

Subject Contents			
Sr. No.	Topic	Total Hours	Weight (%)
1	<u>LOW FREQUENCY CURRENTS</u> Review of physics: Current, electricity, Ohm's law, Resistance, Rheostats, potentiometers, Electromagnetic induction, capacitors, valves, semiconductors and transistors Nerve Muscle Physiology: Resting potential, action potential, propagation of action potential, motor unit, synapse and synaptic transmission of impulses. Effect of negative and positive electrodes on nerve & accommodation Electric shock: Causes, severity, treatment and precautions Earth shock and its precautions		

	Faradic Current: Definition, characteristic and modified faradic current, sinusoidal current, parameters of faradic stimulation, physiological and therapeutic effects of faradic-stimulation. Indication, contra-indications and precautions, techniques of stimulation- group muscle stimulation, faradic foot bath, faradism under pressure and pelvic floor muscle re-education Interrupted Direct Current: Introduction & characteristics, Parameters of stimulation, physiological and therapeutic uses of stimulation, precautions Galvanic Current: Introduction & characteristics, Parameters of stimulation, physiological and therapeutic uses of stimulation, precautions Iontophoresis: Definition, principles of iontophoresis, physiological and therapeutic uses, indications, techniques of iontophoresis, principles of treatment, contra-indications and dangers TENS: Definition, types, Theories of pain modulation emphasizing on “Pain gate” theory, techniques of treatment, indication and contra –indications		
2	<u>MEDIUM FREQUENCY CURRENT</u> Interferential current: Definition, characteristics, physiological & therapeutic effects of Interferential current, techniques of application, indications, contra-indications and precautions Bio-feedback: Introduction, principles of Bio-feedback, therapeutic effects of bio-feedback, Indications and contra-indications, techniques of treatment Advanced Electrotherapy: Computerization in electrotherapy, Programming of parameters of treatment, appropriate selections of parameters and combination therapy, Combination therapy-principles, therapeutic uses and indications like, Ultrasound therapy with stimulation or TENS etc. Introduction to Russian current, Dia-dynamic current, HVPGS and Micro currents Electrical currents for Care of the wound		
3	<u>HIGH FREQUENCY CURRENT</u> Short Wave Diathermy (SWD): Introduction, physiological effects and Therapeutic effects of SWD, methods of application (capacitor field method and cable method etc.) Techniques of treatment, indication, contra-indications and dangers Pulsed SWD: Definition, characteristics, mechanism of work, physiological effects and therapeutic effects, indications, techniques of application, principles of treatment and contra-indications Ultrasonic Therapy: Introduction and characteristics, Ultrasound Therapy		

	parameters, coupling media, therapeutic effects, indications contra-indications and dangers, testing of apparatus, techniques of application & dosage, Phonophoresis Electromagnetic waves: Electromagnetic spectrum, physical properties of electromagnetic radiations-reflection, refraction, absorption penetration, Grothus' law, Cosine law, Inverse square law and its practical application Cellular bio-physics – reception and emission of electromagnetic signals Environmental currents and fields – risk factors on prolonged exposure to electromagnetic field Infra Red Rays (IRR): Production of infra red rays, luminous and non – luminous generators, penetration, technique of application, physiological effects and therapeutic uses of infra-red rays, duration and frequency of treatment, indications and contra indications, dangers and precautions. Ultra Violet Rays(UVR): Production of UVR, test dose, physiological effects of UVR dosimetry in UVR. PUVA LASER: Introduction and characteristics, effects on tissue, therapeutic effects, principles of application, indications, contra-indications and dangers Microwave Diathermy (MWD) : Introduction and characteristics, physiological effects, therapeutics effects, techniques of application and principles of treatment, indications, contra-indications and dangers Superficial heat modalities: Paraffin wax bath: structure of the apparatus, composition of wax and mineral oils physiological effects and therapeutic uses of wax bath, technique of application Other Heating Modalities: Heating pad, moist heat and fluid therapy Cryotherapy: Physiological effects and therapeutic uses of ice therapy, Techniques of application, contra – indication to ice treatment Hydrotherapy: Properties of water buoyancy, effects of buoyancy on movement, Hubbard tank, contrast bath, whirlpool bath Care of the wound: UVR, LASER and Ultrasound		
	Total Hours	350	