

COURSE	FACULTY OF PHYSIOTHERAPY
PROGRAM	BACHELOR OF PHYSIOTHERAPY
SEMESTER	2
COURSE TITLE	ELECTROTHERAPY
COURSE CODE	17PT1205
COURSE CREDITS	9

Course Outcomes: After completion of this course, student will be able to:

1. Know the principles, production, physiological effects, therapeutic uses, merits/demerits, technique and effects of electrotherapy as a therapeutic modality in the restoration of physical function in conditions like nerve injuries.
2. List the indications and contraindications of various types of electrotherapy, demonstrate different techniques and describe their effects.
3. Apply different electrotherapeutic modality to patients.

Pre-requisite of course: At the end of course, the candidate will be able to... Know the principles, production, physiological effects, therapeutic uses, merits/demerits, technique and effects of electrotherapy as a therapeutic modality in the restoration of physical function in conditions like nerve injuries. List the indications and contra-indications of various types of electrotherapy, demonstrate different techniques and describe their effects. Apply different electrotherapeutic modality to patients

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
120	0	120	50	30	20	50	50

Contents : Unit	Topics	Contact Hours
1	Low Frequency Currents Faradic Current: Definition, Characteristic and modified faradic 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., Galvanic Current: Introduction, types, 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, contraindications and dangers., Transcutaneous Electrical Nerve Stimulation (TENS): Definition, types, Theories of pain modulation emphasizing on "Pain gate" theory, techniques of treatment, indication and contraindications., Other Current: Sinusoidal current.	25
2	Medium Frequency Current	15

	Interferential current: Definition, characteristics, physiological & therapeutic effects, techniques of application, indications, contraindications and precautions., Other Currents: Introduction to Russian current, Di-dynamic current, High Voltage Pulsed Galvanic Stimulation (HVPGS) and Micro-currents.	
3	High-Frequency Current Short Wave Diathermy (SWD): Introduction, physiological effects and Therapeutic effects, 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 (US): Introduction and characteristics, parameters, coupling media, therapeutic effects, indications contra-indications and dangers, testing of apparatus, techniques of application & dosage, Phonophoresis., Infrared Rays (IRR): Production of infrared rays, luminous and non-luminous generators, penetration, the technique of application, physiological effects and therapeutic uses of infrared rays, duration and frequency of treatment, indications and contraindications, dangers and precautions., Ultra Violet Rays (UVR): Production, test dose, physiological effects of UVR dosimetry in UVR. Psoralen UVA (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.	25
4	Electro-Diagnosis Faradic-Galvanic (FG) Test., Strength Duration (SD) Curve: Methods of Plotting SD Curve, Apparatus selection, Characters of Normally innervated Muscle, Characters of Partially Denervated Muscle, Characters of Completely denervated Muscle, Chronaxie & Rheobase., Nerve conduction velocity studies: Introduction, physiology and basics of its application and uses., Electromyography (EMG): Introduction, physiology and basics of its application and uses., Late Responses: F-wave, H-reflex.	15
5	Superficial Heating & Cryotherapy Superficial heat modalities: Paraffin Wax Bath, Heating pad, Moist heat, Fluidotherapy, Whirlpool bath: Construction, Method of application, Therapeutic uses, Indications & Contraindications., Cryotherapy: Definition, Principles, Latent heat of fusion, Physiological & Therapeutics effects, Techniques of Applications, Indications & Contraindications, Dangers, Methods of application with dosages., Contrast Bath: Methods of application, Therapeutic uses, Indications & Contraindications.	20
6	Recent Advances Computerization in electrotherapy., Combination therapy: Principles, therapeutic uses and indications like Ultrasound therapy with stimulation or Trans-Cutaneous Electrical Nerve Stimulation (TENS) etc., Advanced Therapies: High-intensity Laser Amplification by Stimulated Emission of Radiation (LASER), Shockwave, Pulsed Electromagnetic Energy (PEME), Long Wave Diathermy (LWD), Variable Muscle Stimulation, Spinal	20

Decompression, Pneumatic Compression therapy, Functional Electrical Stimulation (FES), Virtual Reality (VR) training., Biofeedback: Introduction, principles, therapeutic effects, indications and contra-indications, techniques of treatment.	
Total Hours	120

Suggested List of Experiments:

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1	Low Frequency Currents Faradic Current: Definition, Characteristic and modified faradic 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, Galvanic Current: Introduction, types, 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, contraindications and dangers., Transcutaneous Electrical Nerve Stimulation (TENS): Definition, types, Theories of pain modulation emphasizing on “Pain gate” theory, techniques of treatment, indication and contraindications, Other Current: Sinusoidal current	25
2	Medium Frequency Current Interferential current: Definition, characteristics, physiological & therapeutic effects, techniques of application, indications, contraindications and precautions, Interferential current: Definition, characteristics, physiological & therapeutic effects, techniques of application, indications, contraindications and precautions	15
3	High-Frequency Current Short Wave Diathermy (SWD): Introduction, physiological effects and Therapeutic effects, 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 (US): Introduction and characteristics, parameters, coupling media, therapeutic effects, indications contra-indications and dangers, testing of apparatus, techniques of application & dosage, Phonophoresis, Infrared Rays (IRR): Production of infrared rays, luminous and non-luminous generators, penetration, the technique of application, physiological effects and therapeutic uses of infrared rays, duration and frequency of treatment, indications and contraindications, dangers and precautions., Ultra Violet Rays (UVR): Production, test dose, physiological effects of UVR dosimetry in UVR. Psoralen UVA (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	23

	dangers.	
4	Electro-Diagnosis Faradic-Galvanic (FG) Test., Strength Duration (SD) Curve: Methods of Plotting SD Curve, Apparatus selection, Characters of Normally innervated Muscle, Characters of Partially Denervated Muscle, Characters of Completely denervated Muscle, Chronaxie & Rheobase., Nerve conduction velocity studies: Introduction, physiology and basics of its application and uses., Electromyography (EMG): Introduction, physiology and basics of its application and uses, Late Responses: F-wave, H-reflex	15
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6	Recent Advances Computerization in electrotherapy, Combination therapy: Principles, therapeutic uses and indications like Ultrasound therapy with stimulation or Trans-Cutaneous Electrical Nerve Stimulation (TENS) etc., Advanced Therapies: High-intensity Laser Amplification by Stimulated Emission of Radiation (LASER), Shockwave, Pulsed Electromagnetic Energy (PEME), Long Wave Diathermy (LWD), Variable Muscle Stimulation, Spinal Decompression, Pneumatic Compression therapy, Functional Electrical Stimulation (FES), Virtual Reality (VR) training., Biofeedback: Introduction, principles, therapeutic effects, indications and contra-indications, techniques of treatment	25
Total Hours		120

References:

- 1 Textbook of Electrotherapy - Jagmohan Singh
- 2 Electrotherapy explained - Low & Reed
- 3 Basics of Electrotherapy - Subhash Khatri
- 4 Clayton's electrotherapy (6th and 9th Ed.)
- 5 Clinical electrotherapy - Nelson & Currier
- 6 Clinical electrophysiology: Electrotherapy & electrophysiological testing – Andrew J. Robinson & Lynn Snyder Mackler