ELECTROTHERAPY

MODULE I- Syllabus

Basics of Physics &Introduction to electrotherapy

- **Introduction to Physics & Electricity.**
- **Types of currents.**
- **Faculty :Mr Vijay**
- **PG: Sports department**

Unit	TOPIC	Type of instruction	Pre-requisite	Learning objectives and outcome	Prescribed Reference	REFERENCE	Assessment
1.	**Electricity**	Students Seminar	Student should be familiar with different	Students should be able to	Electrotherapy Explained, Principlesand practice, John Low,	Electrotherapy Evidence based practice –	Oral
			forms of energy, basics of matter and structure of an atom	- Define and explain the types - Relate the flow of electrons to current - Explain the static electricity - Describe the Production of electrical charges - Name the charges and its properties - Identify the	Reed 4th ed, pg 535-6,72-87 Claytons Electro therapy, Angela Forster, Nigel 9th ed, pg 1-3,	Sheila Kitchen 11th ed Pg 9-11 Applied Electronics , R.S Sedha – pg 19-24 Principles of Electronics V.K Mehta.	

				connection between the type of charge on an		Pg 1- 4	
						Principles of Electronics V.K Mehta.	MCQs
.	**Static electricity** **Production of electrical charges.** **Characteristics of charged body.** **Characteristics of lines of forces.** **Potential difference and EMF.**	Students Seminar - demo		object and thetype of interaction (attraction and repulsion) - Explain the potential difference	Claytons Electro therapy, Angela Forster, Nigel 9th ed, pg 7-12 Electrotherapy Explained, Principles and practice, John Low, Reed 4th ed, pg 39- 41	Pg 4- 6 Applied Electronics , R.S Sedha – pg 8-18	
				(voltage) and its relationship with EMF			

	Conductors, semiconduct ors and Insulators	Students Seminar	Atoms and how they are placed in a material	Students will be able to - know what are conductors, SC and Insulators - how electrons differ in these components - what are the materials classified under these - differentiate the applications in electrotherapy treatment. - describe the uses in treatment	Claytons Electro therapy, Angela Forster, Nigel 9th ed, pg 4-5	Principles of Electronics V.K Mehta. Pg 113 -132 Applied Electronics , R.S Sedha – pg 142- 146	QUIZ
	Current Electricity a. Units of Electricity, faraday, volt, ampere, coulomb, watt.	Students Seminar	Units of Electricity and its parameters	Students will be able to define and correlate all the units of electricity	Claytons Electro therapy, Angela Forster, Nigel 9th ed, pg 242-243		ORAL question and answers

	b.**Resistance** .	Students Seminar	Electrical Resistance	Students will be able to - Define resistance - Explain the resistance through a conductor - describe the electrical circuit with resistance connected in different routes - explain and diffentiate resistance in series and parallel	Claytons Electro therapy, Angela Forster, Nigel 9th ed, pg 11-14	Applied Electronics , R.S Sedha – pg 30-31	Assignmen ts

	c. **Ohms law**	Students Seminar	DC and AC Ohms law	Students will able to - Define Ohms law - Correlate current/volt age and resistance - State the application of ohms' law in treatment with respect to DC /AC	Claytons Electro therapy, Angela Forster, Nigel 9th ed, pg 12 Electrotherapy Explained, Principlesand practice, John Low, Reed 4th ed, pg 58- 59, 214	Applied Electronics , R.S Sedha – pg 35- 37 Electrothera py in rehabilitatio n , Meryl Roth Gersh 16-19 Electrothera py Evidence based	Assignmen ts

						practice – Sheila Kitchen 11th ed Pg 11-12	
	d**. Fuse.**	Didactic	Resistance /current	State importance of fuse	Claytons Electro therapy, Angela Forster, Nigel 9th ed, pg 46-47	Applied Electronics , R.S Sedha – pg 119	
	e. Earthing	Didactic	Electrical supply Circuit	Students will be able to - understand Earthing techniques - precautions. - importance and uses	Claytons Electro therapy, Angela Forster, Nigel 9th ed, pg 41-43,47		MCQs
	f. Electric Shock:	Didactic	Currents / dangers of electricity	Students will be able to - Define Electric shock, - Define Micro, Macro currents - Classify shock - Relate with EMF & Resistance	Claytons Electro therapy, Angela Forster, Nigel 9th ed, pg 50-54. Electrotherapy Explained, Principlesand practice, John Low, Reed 4th ed, pg 209 - 218	Electrothera py in rehabilitatio n , Meryl Roth Gersh 87-99	

LESSON PLAN

				- Describe preventive measures - Understand assessment and managemen t procedures after shock			Quiz
	g. **Burns**:	Didactic	Electrolyte/ Resistance	- electrical & chemical burns - prevention and managemen t.	Claytons Electro therapy, Angela Forster, Nigel 9th ed, pg 63,153,109,160,14 0,174 Electrotherapy Explained, Principles and practice, John Low , Reed 4th ed, pg 49	Electrothera py in rehabilitatio n , Meryl Roth Gersh 183-184 Electrothera py Evidence based practice – Sheila Kitchen 11th ed Pg 395, 227, 264, 160, 375-376.	
	h. **Condensers** (capacitor):	Students Seminar	Insulator, dielectric	- Definition - Principles - Types - construction , - working and uses. Student will be able	Claytons Electro therapy, Angela Forster, Nigel 9th ed, pg 32-36	Electrothera py in rehabilitatio n , Meryl Roth Gersh 4-7	MCQs

LESSON PLAN

				- to understand Principle of Capacitor - types and working principle - uses		Electrothera py Evidence based practice – Sheila Kitchen 11th ed Pg 12-13	
3.	**Magnetism**:	Students seminar	Magnet Molecular theory of magnetism	Students will be able to - Define - State the properties - Explain the process of production of electricity from magnetism - Explain electromagn etic induction	Claytons Electro therapy, Angela Forster, Nigel 9th ed, pg 15-19	Electrothera py Evidence based practice – Sheila Kitchen 11th ed Pg 16-20	MCQs
4.	**Electro-Magnetic Spectrum**	Students Seminar	Terms: Wavelength, Frequency, reflection and refraction.	Describe EMS with its properties	Claytons Electro therapy, Angela Forster, Nigel 9th ed, pg 22-28 Therapeutic modalities for physical therapist,		diagramma tic representat ion of EMS in Chart

LESSON PLAN

					William A Prentice, 2nd ed, pg 3-13		
5.	**Valves**	Students Seminar	Electrons Anode and cathode Semiconduct ors	Types of valves, its structure and function	Claytons Electro therapy, Angela Forster, Nigel 9th ed, pg 36-38		Assignmen ts
6.	**Transforme rs**	Students Seminar	EMF Earthing Electro magnetism	types, principles, construction and working	Claytons Electro therapy, Angela Forster, Nigel 9th ed, pg 29-32		
7.	**Ionization**:	Didactic	Electrolytes Electrolysis Cathode and anode	- Principles - Application - Effects of various technique of medical ionization. - Iontophores is	Electrotherapy Explained, Principlesand practice, John Low, Reed 4th ed, 193- 95,536-537 Claytons Electro therapy, Angela Forster, Nigel 9th ed, pg 85-86	Physical agents in rehabilitaio n – from research to Practice . 3rd ed – Michelle H.Camerron , pages 16, 211,223-225	Group presentatio n on "benefits of ionization in the field of physiother apy

LESSON PLAN

Sample Questions

- Define Electricity. What are the different types of electricity?
- Name the common types of current used in physiotherapy? What is static electricity?
- Explain the Characteristics of charged body and the lines of forces?
- What is potential difference and EMF?
- What are conductors, semiconductors and insulators, explain its application in electrotherapy treatment?
- Define faraday, volt, ampere, coulomb and watt Unit?
- Define Resistance. Correlate resistance with treatment application using low frequency currents?
- Describe the application of Ohm law in treatment?

- What is fuse? Explain its application and uses.
- Explain the Importance of Earthing? Define Electric shock? Describe the preventive measures of electric shock?
- Guidelines for evaluation of safety of devices (NTK)
- What are the possible causes of burns in electrotherapy department?
- Write a note on importance of evaluation and checking apparatus in prevention of burns.
- Explain the application of capacitor. How does body act as a capacitor to low frequency currents?
- Describe the electromagnetic spectrum? Which of the therapeutic modalities produce electromagnetic radiation?
- What is electromagnetic induction? What are the applications of valves in equipment's?
- Explain the type of transformers. Uses of transformers?
- Explain the principle of ionization used in the treatment using DC current?

	Topics	Reference
	Physical agents – history and role in physiotherapy	Physical agents in rehabilitaion – from research to Practice . 3rd ed – Michelle H.Camerron
	Skin battery	Electrotherapy Explained, Principles and practice, John Low , Reed 3rd ed, Pg.14
	Guidelines for evaluation of safety of devices	Electrotherapy in rehabilitation , Meryl Roth Gersh , Pg 87-99
	Application of ohms law in electrotherapy	Electrotherapy in rehabilitation , Meryl Roth Gersh ,Pg. 16- 19 Electrotherapy Evidence based practice – Sheila Kitchen 11th ed, Pg 11- 12

LESSON PLAN

MODULE II

Faculty: Mr. Asif
PG: Neurology department

Types of Electrical Stimulators [1 Hour]

- NMES- Construction component.
- Neuro muscular diagnostic stimulator- construction component.
- Components and working Principles.

Principles of Application:

Electrode tissue interface, Tissue Impedance,
Types of Electrode, Size & Placement of Electrode – Water bath, Unipolar, Bi-polar, Electrode coupling,
Current flow in tissues, Lowering of Skin Resistance. [2 Hours]

Faculty :Ms Shruti patil
PG: Neurology department

FG Test

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. [2 Hours]

LESSON PLAN

Unit No	Lesson name	Type of instruction	Learning objectives- at the end of the lesson, the student must be able to	Prescribed Reference	Reference	Practical reference	Method of assessment
1	Types of stimulators	Didactic Tp	differentiate different types of ES	Clinical electro physiology - Andrew Robinson Pages 27-50			Assignment
2	NMES component	Didactic Tp	identify different parts of NMES	Clinical electro physiology -Andrew Robinson Pages 51-61	Experiments & demonstrations in Physiotherapy -Stephen Dicarlo Pages 74 to 77		MCQ
3	Principles of application	Practicals	identify types of electrodes, size of electrodes	Clinical electro physiology -Andrew Robinson Pages 51-61			Practical demonstration
4	Positioning of electrodes	Practicals	Demonstrate positioning of electrodes Lowering skin resistance	Clinical electro physiology -Andrew Robinson Pages 51-61			Practical demonstration
5	Demonstration of Faradic stimulation- motor points	Practicals	Identify different motor points for UL & Face	Clayton's electrotherapy Angela Foster Pages 70-78		Practical Manual page no 33	Practical demonstration
6	Demonstration of Faradic stimulation- motor points	Practicals	Identify different motor points for LL & upper back	Clayton's electrotherapy Angela Foster		Practical Manual	Practical demonstration

LESSON PLAN

				Pages 70-78		page no 33	
7	Demonstratio Galvanic stimulation- m	nPracticalsof otor points	Identify different motor points for UL & Face	Clayton's electrotherapy Angela Foster Pages 70-78		Practical Manual page no 34	Practical demonstration
8	Demonstratio Galvanic stimulation- m	nPracticalsof otor points	Identify different motor points for LL & upper back	Clayton's electrotherapy Angela Foster Pages 70-78		Practical Manual page no 34	Practical demonstration
9	Faradic stimulation- motor points	Practicals (revision)	Identify different motor points for UL, LL, face and upper back	Clayton's electrotherapy Angela Foster Pages 70-78		Practical Manual page no 33-34	Practical revision
10	Galvanic stimulation- motor points	Practicals (revision)	Identify different motor points for UL, LL, face and upper back	Clayton's electrotherapy Angela Foster Pages 70-78		Practical Manual page no 33-34	Practical revision
11	Faradic stimulation- motor points	Practicals (revision)	Identify different motor points for UL, LL, face and upper back	Clayton's electrotherapy Angela Foster Pages 70-78		Practical Manual page no 33-34	Practical revision
12	Galvanic stimulation- motor points	Practicals (revision)	Identify different motor points for UL, LL, face and upper back	Clayton's electrotherapy Angela Foster Pages 70-78		Practical Manual page no 33-34	Practical revision
13	Faradic foot bath	Practicals	Perform faradic foot bath on model	Clayton's electrotherapy Angela Foster Pages 90-96		Practical manual	Practical demonstration

LESSON PLAN

						page no 19,20	
14	Faradism under pressure	Practicals	Demonstrate FUP for UL & LL			Practic al manual page no 21	Practical demonstrat ion
15	types of stimulators	Seminar		Clinical electro physiology - Andrew Robinson Pages 27-50			
16	Components of NMES	Seminar		Clinical electro physiology - Andrew Robinson Pages 27-50			
17	FG test & SD Curve	didactic	interpret results of FG test, SD curve and differentiate normal & abnormal curves	Electrotherapy explained Low and Reid Pages 124-129	Clayton's electrother apy Angela Foster Pages 90-96	Practic al manual page no 19,20	Assignme nt
18	SD Curve	practicals	perform SD curve, with differentiation of normal and abnormal SD curves	Clayton's electrotherapy Angela Foster Pages 90-96		Practic al manual page no 40	
19	Faradic & Galvanic stimulation	Practicals (revision)					Demonstra tion
20	SD Curve	practicals	Interpret different types of curves				Demonstra tion on patients

Sample questions

- Mention different types of electric stimulators?
- Name different parts of NMES?
- Describe the procedure of . faradic foot bath?
- Mention merits and demerits of SD curve?
- What is rheobase & chronaxie?
- Types of nerve lesions?
- Differentiate different types of curves?

MODULE III- Syllabus

Faculty :Mrs Kalashree & Mrs Bhavithra
PG: MSK department

Superficial heating Modalities

1. Wax Therapy: Principle of Wax Therapy application – latent Heat, Composition of Wax Bath Therapy unit, Methods of application of Wax, Physiological & Therapeutic effects, Indications & Contraindication, Dangers. [2Hours]
2. Contrast Bath: Methods of application, Therapeutic uses, Indications & Contraindications.[1 Hour]
3. Moist Heat Therapy: Hydro collator packs – in brief, Methods of applications, Therapeutic uses, Indications &Contraindications.[1hour].
4. Cyclotherm: Principles of production, Therapeutic uses, Indications & Contraindications. [1 Hour].
5. Fluidotherapy: Construction, Method of application, Therapeutic uses, Indications & Contraindications. [1Hour]
6. Whirl Pool Bath: Construction, Method of Application, Therapeutic Uses, Indications& Contraindications. [1Hour]
7. Magnetic Stimulation, Principles, Therapeutic uses, Indications & contraindication. [1 Hour].
8. Cryotherapy: Define- Cryotherapy, Principle- Latent heat of fusion, Physiological & Therapeutics effects, Techniques of Applications, Indications & Contraindications, Dangers, Methods of application with dosages. [4Hours]

Sample questions:

- Mention effects of heat on body?
- Effects and uses of wax bath and hydro collator packs?
- Methods of application of wax bath and hydro collator packs?
- Principles of use of cryotherapy?
- Principles of cyclotherm and fluidotherapy?
- Effects and contra indications of cryotherapy?
- Methods of application of cryotherapy?
- Explain the different methods of cold applications? Add a note on its precautions?
- What are the indications of whirlpool therapy?
- What is contrast bath? Mention any two uses of hot collateral packs?
- What is cyclotherm? What are the benefits of fluidotherapy?
- What are the different Methods of wax applications in post traumatic stiffness and its benefits?

9. LIST OF ASSIGNMENT MODULE III

SR. NO.	ASSIGNMENT TOPIC
1	Physiological effects of rise in temperature on tissues
2	Therapeutic effects of contrast bath, cyclotherm and fluidotherapy
3	Principles of application and methods of application of cryotherapy
4	Rationale of use of superficial heating modalities to relieve pain

MODULE IV- Syllabus

Faculty: Mr. Vijay

PG: sports department

Interferential Therapy:

- Define IFT, Principle of Production of IFT, Static Interference System, Dynamic Interference system, Dosage Parameters for IFT, Electrode placement in IFT, Physiological & Therapeutic effects, Indications & Contraindications. [2 Hour]

TENS:

- Define TENS, Types of TENS, Conventional TENS, Acupuncture TENS, Burst TENS, Brief & Intense TENS, Modulated TENS. Types of Electrodes & Placement of Electrodes, Dosage parameters, Physiological & Therapeutic effects, Indications & Contraindications. [3 Hours]

Faculty: Mrs. Kalashree

PG: MSK department

Pain:

- Define Pain, Theories of Pain (Outline only), and Pain Gate Control theory in detail. [2 Hours]

Unit No	Lesson name	Type of instruction	Learning Objectives	Prescribed Reference	Reference	Practical reference	Method of assessment
1	Pain gate theory	Didactic Tp	Explain the mechanism of pain relief by pain gate theory	*Clinical electro therapy Roger M Nelson Pages 210-214; * Electrotherapy explained Low and Reid Pages 78-80			Assignment
2	TENS- • Definition • Types effects • Uses • Dangers • C/I	Didactic Tp	Describe the • principles of application of TENS • Types of TENS • Uses • Dangers	*Clinical electrotherapy Nelson Pages 209-210 * Electrotherapy explained Low and Reid Pages 46-48, 80-84, 96-97	Experiments & demonstrations in Physiotherapy -Stephen Dicarlo Pages 74 to 77		MCQ
3	TENS- methods of application	Practicals (demonstration)	Application of TENS for different case scenarios	*Electrotherapy explained Low and Reid Pages 92-96; *Clinical electrotherapy Nelson Pages 216-226		Practical manual page no 94-95	Practical demonstration
4	TENS- methods of application	Practicals (supervised)	Apply TENS for different case scenarios	*Electrotherapy explained Low and Reid Pages 92-96;		Practical manual	Practical demonstration

				*Clinical electrotherapy Nelson Pages 216-226		page no 94-95	
5	TENS- methods of application	Practicals (supervised practise)	Apply TENS for different case scenarios	*Electrotherapy explained Low and Reid Pages 92-96; *Clinical electrotherapy Nelson Pages 216-226		Practical manual page no 94-95	Practical demonstration

6	IFT- • Definition • Principles of production • Interference system	Theory & Seminar	Describe the principles of production of IFT	*Electrotherapy explained Low and Reid Pages 101-104 * Clayton's electrotherapy Angela Foster Pages 107-108			Practical demonstration
7	IFT- • Dosage • Effects &uses • Contraindications	Theory	Explain the effects and uses & dosage of IFT on tissues	*Electrotherapy explained Low and Reid Pages 105-109; * Clayton's electrotherapy Angela Foster Pages 109-110			Practical demonstration
8	IFT- • Methods of application • Placement of electrodes	Practicals (demonstration)	Demonstrate the application of IFT	Clayton's electrotherapy Angela Foster Pages 110-111		Practical manual page no 96-97	

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9	IFT • Methods of application • Placement of electrodes	Practicals- (supervised)	Demonstrate methods of IFT application			Practical manual page no 96-97	

10	IFT • Methods of application • Placement of electrodes	Practicals- (supervised practise)	Demonstrate methods of IFT application			Practical manual page no 96-97	

SAMPLE QUESTIONS:

- Principle of pain relief by pain gate theory?
- Different types of TENS and uses?
- Method of application of TENS for pain relief?

- Define IFT and principles of production?
- Dosage of IFT. Contra-indications and uses of IFT?
- Method of application of IFT?
- Describes uses of IFT in stress incontinences?
- How TENS does help in management of back pain?
- Describe pain modulation by TENS?
- What is beat frequency in IFT?
- What is stereo dynamic interference field?
- What is conventional TENS?
- What are the indication and contraindication of IFT and describe about its application on shoulder?
- Name different parts of NMES?
- Mention different types of electric stimulators?

LIST OF ASSIGNMENT

SR.NO	ASSIGNMENT TOPIC
1	Principles of IFT production, dosage parameters in acute, sub-acute and chronic conditions
2	Pain relief by pain gate theory
3	Rationale and dosage of TENS in different painful syndromes

MODULE V

Faculty: Mrs. Kalashree & Mrs. Bhavithra

PG: MSK department

- SWD
- PEME
- MWD
- IRR

Detailed Lesson Plan

Unit No	**Lesson name**	**Type of instruction**	**Learning objectives- at the end of the lesson, the student must be able to**	**References**	**Test question**
Unit 1	SWD- definition & principles of production	Theory	explain the principles of production of SWD	Electrotherapy explained Low and Reid Pages 240-245; Clayton's electrotherapy Angela Foster Pages 114-117	Production of SWD
Unit 2	Methods of Heat Production by SWD, Types of SWD Electrode and effects	Theory	explain physiological &therapeutic effects of SWD on tissues, types of SWD electrodes	Electrotherapy explained Low and Reid Pages 245-246; Clayton's electrotherapy Angela Foster Pages 119-123	Types of electrodes in SWD. Effects and uses of SWD

Unit 3	Methods of application of SWD, spacing & types of electrodes, Tuning, testing and dosage	Practicals	describe the methods of application of SWD; must know how to test apparatus	Electrotherapy explained Low and Reid Pages 249-252; Clayton's electrotherapy Angela Foster pages 134-137 Practical manual page no39.	Methods of application of SWD Dosage of SWD

Unit 4	Methods of application of SWD, spacing & types of electrodes, Tuning, testing	Practicals	describe the methods of application of SWD; must know how to test apparatus	Electrotherapy explained Low and Reid Pages 249-252; Clayton's electrotherapy Angela Foster pages 134-137 Practical manual page no39.	
Unit 5	Methods of application of SWD, spacing & types of electrodes, Tuning, testing	Practicals	describe the methods of application of SWD; must know how to test apparatus	Electrotherapy explained Low and Reid Pages 249-252; Clayton's electrotherapy Angela Foster pages 134-137 Practical manual page no39.	
Unit 6	Effects & uses of SWD, dangers & C/I	Theory	explain the physiological and therapeutic effects, dangers and C/I of SWD	Electrotherapy explained Low and Reid Pages 247-249; 261-265; Clayton's electrotherapy Angela Foster pages 137-144	
Unit 7	PEME	Theory	highlight the principles of application of PEME on tissues	Electrotherapy explained Low and Reid Pages 265-272; Clayton's electrotherapy Angela Foster pages 145-146	What is PEME?
Unit 8	MWD- definition, production, effects & uses, types of emitters, dangers & C/I, dosage	Theory	highlight the principles of production of MWD, with its physiological and therapeutic effects and uses, C/I	Electrotherapy explained Low and Reid Pages 290-301; Clayton's electrotherapy Angela Foster Pages 157-162	Effects and uses of MWD. What is magnetron? Dosage of MWD.
Unit 9	IRR- definition, types of generators & production	Theory	explain the principles of production of IRR, differentiate types of IRR generators	Electrotherapy explained Low and Reid Pages 303-307; Clayton's electrotherapy Angela Foster Pages 147-149	Production of IRR. Types of IRR generators.
Unit 10	IRR- methods of application, dosage & C/I, effects & uses	Theory	elaborate the methods of application, with dosage & C/I of IRR	Electrotherapy explained Low and Reid Pages 308-310; Clayton's electrotherapy Angela	Effects and uses and contra

				Foster Pages 149-150, 152-154.	indications of IRR.
Unit 11	IRR- method of application & dosage	Practicals	demonstrate the application of IRR	Electrotherapy explained Low and Reid Pages 310-312; Clayton's electrotherapy Angela Foster Pages 150-152, Experiments & demonstrations in Physiotherapy- Stephen Dicarlo Pages 43-45, 52.	Dosage of IRR
Unit 12	IRR- method of application & dosage	Practicals	demonstrate the application of IRR	Electrotherapy explained Low and Reid Pages 310-312; Clayton's electrotherapy Angela Foster Pages 150-152, Experiments & demonstrations in Physiotherapy- Stephen Dicarlo Pages 43-45, 52.	

SAMPLE QUESTIONS:

- Explain the production of SWD with circuit diagram? Mention about its therapeutics effects?
- Mention the dangers and contraindication of MWD?
- What are the physiological and therapeutic effects of MWD?
- Describe the methods of SWD application in Pelvic inflammatory diseases?
- What is the role of diode value in SWD?
- Describe contraindication of IRR?
- Classify visible and IR radiations?

- Describes PEME?
- What is the importance of spacing in SWD?

LIST OF ASSIGNMENT MODULE V

SR. NO.	ASSIGNMENT TOPIC
1	Dosage parameter of SWD in subacute and chronic conditions
2	Types of IRR generators, Dosage parameters of IRR application
3	various methods of application of SWD for shoulder joint

MODULE VI

Faculty: Ms. Sruti patil & Vijay

PG: MSK & sports department

NCV

- Biofeedback
- EMG

Detailed lesson plan

Unit No	Lesson name	Instructor	Type of instruction	Learning objectives- at the end of the lesson, the student must be able to	Reference	Test question
Unit 1	Bio feedback- applications and uses		Theory	explain the concept of bio-feedback, with its uses	Electrotherapy explained Low and Reid Pages 134-143	Principles of bio feedback and uses.
Unit 2	Biofeedback- effectiveness		Theory	elaborate the effects of application of bio feedback	Electrotherapy explained Low and Reid Pages 144-146; Clinical electrophysiology Andrew Robinson Pages 394-397	
Unit 3	Biofeedback-		Practicals	Demonstrate working of biofeedback equipment	Clinical electrophysiology Andrew Robinson Pages 394-397	
Unit 4	Biofeedback-		Practicals	Demonstrate working of biofeedback equipment	Clinical electrophysiology Andrew Robinson Pages 394-397	
Unit 5	NCV- components		Theory	identify the components of NCV apparatus	Electrophysiology Andrew Robinson Pages 410-422	Components of NCV

Unit 6	NCV- procedure and		Theory	perform the procedure of NCV; differentiate	Electrophysiology Andrew Robinson Pages 423-441	Procedure of NCV and interpretation of results
	interpretation of results			between normal and abnormal findings		
Unit 7	NCV- procedure and interpretation of results		Practicals	perform the procedure of NCV; differentiate between normal and abnormal findings	Electrophysiology Andrew Robinson Pages 423-441	
Unit 8	NCV- procedure and interpretation of results		Practicals	perform the procedure of NCV; differentiate between normal and abnormal findings	Electrophysiology Andrew Robinson Pages 423-441	
Unit 9	EMG		Theory	explain the principles of EMG, with interpretation of results	Electrotherapy in Rehabilitation Meryl Roth Gersh Pages 292-304; Clinical electrophysiology Andrew Robinson Pages 390-395, Experiments & demonstrations in Physiotherapy - Stephen Dicarlo Pages 59-62.	

SAMPLE QUESTIONS:

What is EMG? What is its effect in physiotherapy?

Describe NCV? and explain the procedure of NCV for median nerve?

Describe biofeedback? What is the role of EMG biofeedback?

LIST OF ASSIGNMENTS

SR. NO.	ASSIGNMENT TOPIC
1	NCV procedure and interpretation of results
2	Principles and uses of biofeedback
3	EMG and application of EMG in therapeutics

MODULE VII- Syllabus

Faculty: Mrs kalashree & Bhavithra

PG: MSK department

Ultrasound: Define Ultrasound, Frequency, Piezzo Electric effects: Direct, Reverse, Production of US, Treatment Dosage parameters: Continuous & Pul Attenuation, Coupling Media.

Thermal effects, Non thermal effects, principles & application of US: direct contact, water bag, water bath, solid sterile gel pack method for wound

Uses of US, Indications & Contraindications, Dangers of Ultrasound.

Phonophoresis: Define Phonophoresis, Methods of application, Commonly used drugs, Uses. Dosages of US. [8 Hours]

UVR: Define UVR, Types of UVR, UVR generators: High pressure mercury vapour lamp, Water cooled mercury vapour lamp, tube, Theraktin tunnel, F

Physiological & Therapeutic effects. Sensitizers& Filters.

Test dosage calculation. Calculation of E1, E2, E3, E4 doses. Indications, contraindications. Dangers. Dosages for different therapeutic effects,

Distance in UVR lamp [8 Hours]

LASER: Define LASER. Types of LASER.Principles of production. Production of LASER by various methods.

Methods of application of LASER. Dosage of LASER. Physiological & Therapeutic effects of LASER.

Safety precautions of LASER. Classifications of LASER. Energy density & power density [8 Hours]

Unit No	Lesson name	Type of instruction	Learning objectives- at the end of the lesson, the student must be able to	Prescribed Reference	Reference	Practical reference	Method of assessment
1.	UVR- definition, principles of production	Didactic Tp	state the principles of production of UVR	Electrotherapy explained -Low &Reid Pages 331-332	Clayton's electrotherapy -Angela Foster Pgs 180-182		Assignment
2.	UVR- types of generators, PUVA apparatus	Didactic Tp	Differentiate different types of UV generators	Electrotherapy explained -Low &Reid Pages 361-361	Clayton's electrotherapy -Angela Foster Pgs 183-185		Assignment
3.	UVR- test dose	Practicals	perform test dose of UVR	Electrotherapy explained -Low &Reid Pages 355-359	Clayton's electrotherapy -Angela Foster Pgs 191-193.	Practical manual pg no 35.	Practicals
4.	Physiological and therapeutic Effects, dangers, contra indications of UVR	Didactic Tp	State uses, uses, dangers and C/L of UVR	Electrotherapy explained -Low &Reid Pages 341-354; 361-364, 367-369	Clayton's electrotherapy -Angela Foster Pgs 185-191.		assignment
5.	UVR- sensitizers & filters	Didactic Tp	state what are sensitizers & filters in UVR	Electrotherapy explained -Low and Reid Pages 365-366.			assignment

LESSON PLAN

6.	UVR test dose calculation	Practicals (revision)	Demonstrate UVR test dose & E1 calculation				
7.	UVR revision	Seminar					
8.	UST- definition & principles of production	Didactic Tp	explain principles of production of UST	Electrotherapy explained -Low and Reid Pages 149-153;	Clayton's electrotherapy -Angela Foster Pages 165-168.		assignment
9.	UST- fields, attenuation, Coupling media	Didactic Tp	State what are the different fields of US, What is attenuation & importance of coupling media	Electrotherapy explained -Low and Reid Pages 154-158	Clayton's electrotherapy - Angela Foster Pages 168-172.		assignment
10.	UST- methods of application, Dosage parameters	Practicals	Demonstrate different methods of application of US with dosage	Electrotherapy explained -Low and Reid Pages 166-175	Clayton's electrotherapy Pages 177-179.	Practical manual page no 38	Practicals
11.	Physiological & therapeutic effects, uses of US Dangers & contra indications	Didactic Tp	State effects & uses, dangers, contra indications of UST	Electrotherapy explained Low and Reid Pages 158-166	Clayton's electrotherapy Angela Foster Pages 172-176.		assignment
12.	Phonophoresis in UST	Didactic	state the principles and	Electrotherapy explained			assignment

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			procedure of Phonophoresis	Low and Reid Pages 163-164.			
13.	Common drugs used in Phonophoresis and method of application	Didactic	identify different drugs used in Phonophoresis and their effects	Electrotherapy explained Low and Reid Pages 164-166.			MCQ
14.	LASER- introduction, principles & types of LASER	Didactic	State principles of production & types of LASER	Electrotherapy explained Low & Reid Pages 316-322			Assignment
15.	Therapeutic uses, principles of application & Contra indications of LASER	Didactic	State principles of application, uses & contra indications of LASER	Electrotherapy explained Low & Reid Pages 323-328			Assignment
16.	LASER- dosage calculation	Practicals	Calculate dosage of LASER for different conditions			Practical manual page 34	Practicals

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Sample question

- Mention principles of production of UVR?
- Mention different types of UV generators?
- Explain effects & C/I of UVR?
- What are sensitizers and filters in UVR?
- What is Piezzo electric effect?

- Explain production of UST?
- What are near and far fields in US. Importance of using coupling media?
- What is standing wave?
- Explain dosage calculation of UST?
- What are the effects and uses of UST?
- Explain principles of Phonophoresis?
- Name drugs used in phonophoresis?
- Explain principles of production of LASER?
- Mention different types of LASER?
- Mention effects and uses of LASER?
- Mention contra-indications of LASER?

LIST OF ASSIGNMENT MODULE VII

SR. NO.	**ASSIGNMENTS TOPICS**
1	Test dose of UVR
2	Physiological and therapeutic effects of UVR on skin conditions with appropriate dosage
3	Dosage rationale of US for different conditions
4	Methods of application of US
5	Properties of LASER; Principles of LASER production
6	LASER dosage calculation

ELECTROTHRERAPY BOOK LIST

Sl no	Title	Author		Edition	Year	No of copies	Recommended
		First	Second				
1	Electrotherapy explained Principles & Practice	Low John	Reed Ann	3rd	2000	05	RGUHS
				4th	2002	01	
				2nd	1993	01	
2	Clinical Electrotherapy	Nelson Roger M	Haypes Karen W	3rd	1999	04	Reference

3	Electrotherapy in Rehabilitation	Mery Roth Geresh		1st	1989	01	Reference
4	Physical agents modalities	Barcciano Alferd G		1st	2000	01	Reference
5	Claytons Electrotherapy	Kitchen Sheila	Bazin Sarah	10th	2001	03	RGUHS
6	Principles of Electronics	Mehta VK		7th	2001	01	Reference
7	TB of Applied Electronics	Seedha RS		2nd	2001	05	Reference
8	Claytons Electrotherapy –Theory & Practice	Forster Angela	Palastanga Nigel	8th	1987	02	Reference
				9th	2000	09	
9	Thermal agents in rehabilitation	Susan L Michlovitz		3rd	1986	01	RGUHS
10	Principles and Practice of Electrotherapy	Saeed Ahamad		1st	2001	03	Reference
11	Physical agents : A Comprehensive text for PT	Bernadette Hecox	Mehreteab Tsega Andemicael	1st	1994	01	Reference

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12	Electrotherapy EBP	Sheila Kitchen		11th	2002	02	RGUHS
13	Electrotherapy in rehabilitation	Merly Roth Gersh		1st	1992	01	Reference
14	Basics of Electrotherapy	Subash Khatri		1st	2003	03	Reference
15	Therapeutic physical modalities	Shankar Kamal	Randall Kenneth D	1st	2002	01	Reference
16	Integrating Physical Agents in	Hecox	Mehreteab	2nd	2006	01	Reference
	Rehabilitation	Bernadette	Tserg				
			Andemica				

17	TB of Electrotherapy	Singh Jagmohan		2nd	2012	04	Reference
				1st	2005	01	
				3rd	2015	02	
18	A Physical agents; Theory & Practice for P.T Assistant	Behrens, Barber. J	Michlovitz Susan L	1st	1996	01	RGUHS
19	Practical Electrotherapy :A guide to safe	Fox john	Sharp Tim	1st	2007	01	Reference

	application						
20	Electrotherapy simplified	Nanda Basanth Kumar		1st	2008	01	Reference
21	Physical agents in rehabilitation	Cameron , Michellle.H		3rd	2009	01	RGUHS
22	Clinical electrophysiology and electrotherapy	Robinson , Andrew.J				01	Reference
23	Electrical stimulation: Iontophorosis , Management of paralysis & use for other	Volume 4		1st	1993	01	Reference
	medical condition						
24	Physical agent in Physiotherapy, Principles & Practice	Solomen Subin	Aaron Pravin	1st	2017	01	Reference
25	Physical Modalities: A primer for chiropractic	Hooper Paul D		1st	2014	01	Reference