

SAVEETHA AMARAVATI UNIVERSITY



IST SEMESTER Syllabus for BPT

BPT -COURSE OF THE STUDY- SUBJECTS AND HOUR DISTRIBUTION

S.No	Course Code	Subjects	Teaching hours/Sem			Total Hours/Sem
			L	P	Credits	
Semester-I						
1.		Anatomy I	90	60	6+2	150
2.		Physiology I	90	60	6+2	150
3.		General Psychology And Sociology	90	-	6	90
4.		Disaster Management	30	15	NC	45
5.		Environmental Science	30	15	NC	45
6.		Basic Sciences	60		NC	60
Total No of Credits and Hours/Semester					22	540

S.No	Course Code	Subjects	Teaching hours/Sem			Total Hours/Sem
			L	P	Credits	
Semester-II						
1.		Anatomy II	90	60	6+2	150
2.		Physiology II	90	60	6+2	150
3.		Biochemistry	60		4	45
4.		Yoga For Physiotherapy	30		NC	30
5.		First Aid And Basic Life Science	60		NC	60
6.		Information And Communication Technology In Health Education	45	45	NC	45
7.		Introduction To Physiotherapy	60		NC	60
Total No of Credits and Hours/Semester					20	540

TIME TABLE - BPT (1ST SEMESTER)

Days/Hours	8.30-10.30	10.30-12.30	12.30-1.30	1.30-4.30
Monday	Psychology	Physiology	L	Batch B- Anatomy Lab Batch A- Physiology Lab
Tuesday	Sociology	Anatomy	U	Batch A- Anatomy Lab Batch B- Physiology Lab
Wednesday	English	Anatomy	N	Disaster Management
Thursday	Anatomy	Physiology		Physics
Friday	Physiology	Library	C	Environmental Science
Saturday	Clinical Observation	Mentorship Program	H	Meditation/Extracurricular Activities

BPT SYLLABUS

ANATOMY –I

Didactic-90hrs, Pratical-60hrs-total-150hrs

1. HUMAN ANATOMY 1

The major focus of this course is an in-depth study and analysis of the basic elements of human anatomy, embryology, formation and types of bones, muscles and joints. Emphasis is placed upon structure and function of human movement concerned with upper limb, lower limb, thorax, abdomen and pelvis. A comprehensive study of human anatomy with emphasis on the respiratory system and cardio vascular systems are incorporated. Introduction to general anatomy lays the foundation of the course. Dissection and identification of structures in the cadaver supplemented with the study of charts, models, prosected material and radiographs are utilized to identify anatomical landmarks and configurations of the upper limb, thoracic region, lower limb, abdomen pelvis.

Sr. No.	Topics	Didactic Hours	Practical/Laboratory Hours	Total Hours
1	INTRODUCTION	02		02
2	GENERAL EMBRYOLOGY	03	02	05
3	TISSUES	03	02	05
4	INTRODUCTION TO BONES (OSTEOLOGY)	04	04	08
5	INTRODUCTION TO JOINTS (ARTHROLOGY)	04	03	07
6	INTRODUCTION TO MUSCLES (MYOLOGY)	03	04	07
7	UPPER EXTREMITY	20	13	33
8	LOWER EXTREMITY	25	12	37
9	RESPIRATORY SYSTEM	05	05	10
10	CARDIO VASCULAR SYSTEM	05	05	10
11	THORAX	06	05	11
12	ABDOMEN & PELVIS	10	05	15
TOTAL		90	60	150

Learning Objectives

Cognitive

At the end of the training, the student should be able to –

1. Describe the gross anatomy of the human body and correlate the knowledge of structure and function of thorax, abdomen, pelvis, upper limb and lower limb.
2. Describe the cross section anatomy of the human body and correlate the knowledge of structure and function.
3. Interpret the anatomical basis of symptoms and signs of clinical conditions related to of thorax, abdomen, pelvis upper limb and lower limb.
4. Describe the formation and maturation of various systems in the body.
5. Describe the anatomical structure and clinical aspects of cardio vascular and respiratory system.

Psychomotor

At the end of the training, the student should be able to –

1. Dissect and demonstrate organelles of thorax, abdomen, pelvis, upper limb and lower limb.
2. Demonstrate surface landmarks and living anatomy pertaining to muscle power, testing of nerves and palpating vessels.
3. Prepare and deliver lectures on various topics of human anatomy using audio – visual aids.
4. Present paper / poster in conference emphasizing on the anatomy and clinical anatomy.

Affective Domain

At the end of training the student should be able to -

The student should be able to correlate the knowledge of anatomy and its relevance in the physiotherapy profession.

SYLLABUS

Sr. Num	Topic	Didactic Hrs	Practical/ laboratory Hrs	Total Hrs
1	INTRODUCTION:	02		02
	<ul style="list-style-type: none"> • Define anatomy and its subdivisions • Name regions, cavities and systems of the body. • Define anatomical positions and anatomical terms Development of limbs-Axial and appendicular skeleton			
2	GENERAL EMBRYOLOGY	03	02	05
	<ul style="list-style-type: none"> • Define a cell • Mention shape, size and parts of a cell • Reproduction of cells • Review of Mitosis, Meioses, chromosomes and Genes • Process, organisation and gestational period of human embryo • Nutrition of embryo • Development of various systems. 			
3	TISSUES	03	02	05
	<ul style="list-style-type: none"> • Types of Tissues • Classify Microscopic structure of epithelial connective, muscular, nervous tissue • Appendages of skin. 			
4	INTRODUCTION TO BONES (OSTEOLOGY)	04	04	08
	<ul style="list-style-type: none"> • Define skeleton • Mention subdivisions, Name the bones in each subdivisions, number of bones. • Classify the bones with examples • Define ossification, types of ossification with examples. Identify surface, border, muscular and ligamentous attachments on the bone			
5	INTRODUCTION TO JOINTS (ARTHROLOGY)	04	03	07
	<ul style="list-style-type: none"> • Define joint or articulation. • Classify joints with examples, individual articulations and bones. • Basic feature of synovial joints • Define the axis and movements possible in a synovial joint • Define range of movement and limiting factors • Indicate the blood supply and nerve supply • Define stability of joint • Chief muscles producing movement in all individual joints 			
6	INTRODUCTION TO MUSCLES (MYOLOGY)	03	04	07
	<ul style="list-style-type: none"> • Define a skeletal muscle, fascia, tendon, aponeurosis. • Classify skeletal muscles with examples. 			

	<ul style="list-style-type: none"> • Mention the position ,origin,insertion,nerve supply and action of skeletal muscles. 			
	UPPER EXTREMITY	20	13	33
7	<ul style="list-style-type: none"> • Pectoral region. <ul style="list-style-type: none"> ○ a.features of pectoral region. ○ b. sternum,clavicle,scapula,andhumerus-borders,surfaces. ○ c.Identify muscles of pectoral region-origin,insertion,nerve supply and action. • Scapular region. <ul style="list-style-type: none"> ○ Features of region. ○ Bony landmarks of scapula,humerus and clavicle. ○ Muscles of region-origin,insertion,nerve supply, action. • Axilla. <ul style="list-style-type: none"> ○ Identify boundaries and contents of axilla. ○ Branches of axillary artery ○ Identify and illustrate the formation of brachial plexus. • Shoulder girdle <ul style="list-style-type: none"> ○ features and function of the joints ○ movements of scapula ○ muscles of shoulder girdle ○ Articular disc and ligaments. • Shoulder Joint <ul style="list-style-type: none"> ○ Type ,articular surface and ligaments of shoulder joint ○ b. movements of shoulder joint ○ c. muscles producing the movements and limiting factors ○ blood and nerve supply of the joint. • Upper arm <ul style="list-style-type: none"> ○ identify borders ,surfaces of humerus ○ Muscles at front and back of upper arm ○ Identify course,relation and distribution of Radial and Musculo-cutaneous nerve. • Elbow joint. <ul style="list-style-type: none"> ○ Type,articular surface and ligaments ○ movements possible and muscles producing the movements ○ factors for stability and limiting factors. ○ Carrying angle cubitusvarus and valgus . • Forearm,Wrist and Hand. <ul style="list-style-type: none"> ○ Features of radius,ulna,carpal,metacarpal bones and phalanes. ○ Muscles of front and back of the forearm-origin,insertion,nerve supply and action. ○ Movements and muscles producing these movements. ○ Identify course relation and distribution of median, ulnar and radial nerves. ○ Blood and nerve supply. 			

	<ul style="list-style-type: none"> ○ Prehension, types of grip ● Lymphatic drainage and location of lymph nodes in upper limb. <p>Identify cutaneous nerves and illustrate the areas of their distribution, dermatomes</p>			
8	LOWER EXTREMITY	25	12	37
	<ul style="list-style-type: none"> ● Features of hip bone, femur, tibia, fibula and patella. <ul style="list-style-type: none"> ○ Muscles in front of thigh-origin, insertion, nerve supply and action ○ Mention the boundaries and contents of femoral triangle and subsartorial canal ○ Indicate the position, course and distribution of femoral nerve ○ Indicate the course and main branches of femoral artery and mention the blood supply of neck of femur ○ Indicate the position of femoral vein ● Medial side of thigh: <ul style="list-style-type: none"> ○ Name and identify the muscles of the medial side of thigh. Mention their origin, insertion, nerve supply and action. ○ Indicate the course, relations and distribution of obturator nerve ● Back of thigh: <ul style="list-style-type: none"> ○ Identify and mention the position, origin, insertion, nerve supply and action of the hamstring muscles. ○ Indicate the position, course, relation and distribution of sciatic nerve ● Gluteal region: <ul style="list-style-type: none"> ○ Identify and mention the position, origin, insertion, nerve supply and action of the muscles. ○ Name and mention the position and course of the nerves found there and name the arteries there. ● Hip joint: <ul style="list-style-type: none"> ○ Mention the type, articular surface and ligaments. ○ Define the movement and name the chief muscles producing the movements. ○ Mention the blood supply, nerve supply, factor for stability and limiting factors. ○ Indicate applied anatomy ● Knee joint: <ul style="list-style-type: none"> ○ Mention the type, articular surfaces and ligaments. ○ Define the movement and name the chief muscles for the movements. ○ Analyse the movements ○ Know the blood supply and nerve supply 			

	<ul style="list-style-type: none"> ○ Indicate applied anatomy ○ Define locking and unlocking of the joint ● Popliteal fossa: <ul style="list-style-type: none"> ○ Indicate the boundaries and contents ○ Mention the position and branches of tibial and common peroneal nerves. ● Front of leg and dorsum of foot: <ul style="list-style-type: none"> ○ Name and identify the tarsal bones, metatarsal bones and phalanges in an articulated foot ○ Name and identify the muscles. ○ Mention the positions, origin, insertion, nerve supply and action of the muscles. ○ Position and distribution of deep peroneal nerve ○ Indicate the position and attachment of extensor retinaculae ○ Mention and identify the features of the tibia and fibula ● Lateral side of leg: <ul style="list-style-type: none"> ○ Name and identify the muscles ○ Mention the position, origin, insertion, nerve supply and action of muscles ○ State the position, course and distribution of superficial peroneal nerve ○ State the position and attachment of peroneal retinacula ● Back of leg and sole of foot: <ul style="list-style-type: none"> ○ Name and identify the features of the bones of the foot ○ Name and identify the muscles of back of leg ○ Mention the position, arrangement, origin, insertion, nerve supply and action of the muscles. ○ State the position course and distribution of tibial artery ○ State the position, and distribution of posterior tibial artery ○ Mention the position, and attachment of flexor retinaculum. ○ Mention the arrangement, origin, insertion, nerve supply and action of muscles of the foot. ○ Indicate the type of formation, and factors for the maintenance of the arch of foot ○ Mention the type, articular surface, ligaments, movements chief muscles for the movement. Axis of movements and applied anatomy of tibiofibular joints, ankle joints, subtalar joints, M.P. joints and I.P. joints. ○ Palpate and identify the tendons around the ankle and dorsum of foot. 			
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	<ul style="list-style-type: none"> • Nerves: <ul style="list-style-type: none"> ○ Indicate the position, formation and branches of lumbar and sacral plexuses. ○ Mention the root value of the nerves ○ Mention the position, course, relation and distribution of the Nerves ○ Predict the result of injury to the nerves ○ Illustrate cutaneous innervation of dermatomes • Blood vessels: <ul style="list-style-type: none"> ○ Indicate the position of arteries and their main branches ○ Indicate the position of veins and their main tributaries ○ Indicate the position of lymph nodes. 			
9	RESPIRATORY SYSTEM	05	05	10
	<ul style="list-style-type: none"> • Parts of respiratory system with basic functional Anatomy • Position extent of bronchi, bronchioles and lungs. • Arrangement & Microscopic structure of parietal pleura. • Extent of trachea • Distinguishing feature of the right and the left lung – border and surfaces • Name the bronchopulmonary segments • Mechanics of respiration & diaphragm 			
10	CARDIO VASCULAR SYSTEM	05	05	10
	<ul style="list-style-type: none"> • Position of heart – chambers, borders, valves of Heart • Identify – aorta, pulmonary vessels, venacava • Blood supply and nerve supply of heart • Myocardium and its functions • Coronary artery and coronary system • Conductive system of heart • Microscopic structure of blood vessels • Myocardial infarction and prognosis 			
11	THORAX	06	05	11
	<ul style="list-style-type: none"> • Define thoracic wall & thoracic cavity • Thoracic vertebrae – features • Sternum – deformities and clinical implications • Ribs & joints of thorax • Phrenic nerves • Intercostal space & contents 			
12	ABDOMEN & PELVIS	10	05	15
	<ul style="list-style-type: none"> • Define Lumbar & sacral Vertebra • Pelvis – distinguish between male & female pelvis • Articular surfaces, Ligaments and movements of joints of pelvis • Layer of muscles forming the abdominal wall • Origin 			

	<ul style="list-style-type: none"> • Insertion • Nerve supply • Action of muscle • Inguinal canal – Position, extent, formation and contents <ul style="list-style-type: none"> ○ Define Inguinal hernia and its clinical implications. • Formation and location of Lumbar plexus – its branches • Branches and distribution of abdominal aorta & iliac arteries. • Identify muscles of pelvic floor and mention their attachments, actions & nerve supply. 			
	Total	90	60	150

PRACTICALS

- Upper extremity including surface Anatomy
- Lower extremity including surface Anatomy
- Identification of body prominences on inspection and by palpation especially of extremities
- Thorax including surface anatomy, abdominal muscles joints
- Histology-Elementary tissue including surface Anatomy
- Embryology-models, charts & X-rays
- Demonstration of the muscles of the whole body and organs in thorax and abdomen.
- Demonstration of movements in important joints.
- Surface making of the lung, pleura, fissures and lobes of lungs, heart, liver, spleen, Kidney.

Practical procedure:

- Learning through charts models and specimens.
- Identification and location of systems in models and cadaver
- Location of anatomical parts in dissected cadaver
- Identification of specimens

Recommended Text books:

1. Gray's anatomy 37th edition edited by – Peter L. Williams, Mary Dyson
2. Text book of human anatomy by T.S. Ranganath
3. SNELL [Richard S], Clinical Anatomy for Medical students : Ed. 6. Little Brown and Company Boston. 1995, p898,
4. B.D Chaurasia's Human Anatomy – Regional And Applied; Volume I, Volume Ii And Volumelii.
5. MOORE [Kieth L], Clinically Oriented Anatomy. Ed.3., Williams and Wilkins, Baltimore,1992, p917
6. DATTA[A.K], Essentials of human Anatomy: Thorax and Abdomen Ed 2. Vol. I Current Book International, Culcutta 1994, p433,
8. SINGH [Inderbir], Text book of Anatomy with colour atlas: Introduction, Osteology, UpperExtremity, Lower Extremity. Vol I. P Brothers, New Delhi 1996,
9. SINGH [Inderbir], Text book of Anatomy with colour Atlas: Thorax and Abdomen. Vol II. JPBrothers, New Delhi 1996,
10. SINGH [Inderbir], Human Osteology. JP Brothers, New Delhi 1990,p191,

PRACTICALS

1. ROMANES [G J], Cunningham manual of practical anatomy: upper and lower limb ed 15 Vol 1 Oxford Medical Publication, Oxford 1996, P263,
2. ROMANES [G J], Cunningham manual of practical anatomy : Thorax and abdomen ed15 Vol II Oxford Medical Publication, Oxford 1996, P298,

SCHEME OF UNIVERSITY EXAMINATION

THEORY		Marks
*The question paper will give appropriate weightage to all the topics in the syllabus		100
I	Essay Q1-Essay-15 Marks Q2-Essay-15 Marks Essay Should give break up of 15 marks-e.g. [3+5+7]	30
II	Short Notes Answer all the questions 10 questions- 5 marks each 10x5=50	50
III	Short Answer questions Answer all the questions 10 questions- 2 marks each 10x2=20	20
Total Marks		100

PRACTICALS /VIVA VOICE-50 Marks	Maximum Marks
Total	50

INTERNAL ASSESSMENT: (50marks)

Internal assessment (Theory and Practicals) as per University pattern

PHYSIOLOGY I

Didactic 90hrs+practical 60hrs=total 150hrs

COURSE DESCRIPTION

The course along with the anatomy forms the fundamental basis for every physiotherapy professional. The course is designed to study the function of the human body at the molecular, cellular, tissue and systems levels. The major emphasis is placed on general physiology, physiology of exercise and applied physiology. The general physiology focus on blood, nerve muscle function, cardiovascular and respiratory system. The applied physiology focus on the functions and dysfunctions of cardio respiratory system, nervous system and muscular system.

Sr. No.	Topics	Didactic Hours	Practical/Laboratory Hours	Total Hours
1	General Physiology	60	20	80
2	Physiology of exercise	10	20	30
3	Applied physiology	20	20	40
TOTAL		90	60	150

Learning Objectives

Cognitive

- 1) To know about the principles related to maintenance of body equilibrium and composition.
- 2) To understand the basic mechanism operating across the biological membrane.
- 3) To understand the functional mechanisms of cardio respiratory system, nervous system and muscular system.
- 4) To understand interaction and integration of cardio respiratory system, nervous system and muscular system in health and diseases.
- 5) To understand the influence of various environmental factors including personal stressors like exercise on various systems.

Psychomotor

- 1) To be able to perform the tests or techniques to evaluate the functions of cardio respiratory system, nervous system and muscular system
- 2) To be efficient to handle the equipment related to these tests.
- 3) To be able to derive, analyze, interpret the test results.

4) To be able to present the facts in a precise manner regarding knowledge and skill acquired.

Affective

At the end of training the student should be able to -

The student should be able to correlate the knowledge of physiology and its relevance in the physiotherapy profession.

SYLLABUS

Sr. Num	Topic	Didactic Hrs	Practical/laboratory Hrs	Total Hrs
1	General Physiology	60	20	80
	<p>Cell Morphology: Organelles: their structure and functions Transport Mechanisms across the cell membrane Body fluids: Distribution, composition. Tissue fluid – formation.</p> <p>Blood Introduction: Composition and functions of blood. Plasma: Composition, formation, functions. Plasma proteins. RBC: count and its variations. Erythropoiesis-stages, factors regulating. Reticulo-endothelial system (in brief) Haemoglobin - Anemia (in detail), types of Jaundice. Blood indices, PCV,ESR. WBC: Classification. Morphology, functions, count, its variation of each. Immunity</p> <p>Platelets: Morphology, functions, count, its</p>			

<p>variations</p> <p>Hemostatic mechanisms: Blood coagulation–factors, mechanisms. Their disorders. Anticoagulants.</p> <p>Blood Groups: Landsteiner’s law. Types, significance, determination, Erythroblastosisfoetalis.</p> <p>Blood Transfusion: Cross matching. Indications and complications.</p> <p>Lymph: Composition, formation, circulation and functions.</p> <p>Nerve Muscle Physiology</p> <p>Introduction: Resting membrane potential. Action potential – ionic basis and properties.</p> <p>Nerve: Structure and functions of neurons. Classification, Properties and impulse transmissionof nerve fibres. Nerve injury – degeneration and regeneration.</p> <p>Neuroglia: Types and functions.</p> <p>Muscle: Classification. Skeletal muscle: Structure. Neuromuscular junction : Structure. Neuromuscular transmission, myasthenia gravis.Excitation- Contraction coupling.Rigormortis.</p> <p>Motor unit. Properties of skeletal muscles, Strength- Duration curve, Length-tension relationship, fatigue, load.</p> <p>Smooth muscle: Structure, types, mechanism of contraction. Plasticity</p> <p>Cardiovascular System</p> <p>Introduction: Physiological anatomy and nerve supply of the heart and blood vessels.Organisation of CVS. Cardiac muscles: Structure. Ionic basis of action potential and pacemaker potential,Properties.</p> <p>Conducting system: Components. Impulse conduction Cardiac Cycle:Definition. Phases of cardiac cycle.Pressure and volume curves. Heart sounds – causes, character.</p> <p>ECG: Definition.Different types of leads. Waves and their causes.P-R interval.Heart block.</p> <p>Cardiac Output: Definition. Normal value.Determinants.Stroke volume and its regulation.Heart rate and its regulation. Their variations</p> <p>Arterial Blood Pressure: Definition. Normal values and its variations.Determinants.Peripheral resistance.Regulation of BP.</p> <p>Arterial pulse.</p> <p>Shock – Definition. Classification–causes and features</p>			
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	<p>Regional Circulation: Coronary, Cerebral and Cutaneous circulation. Cardiovascular changes during exercise</p> <p>Respiratory System Introduction: Physiological anatomy – Pleura, tracheo-bronchial tree, alveolus, respiratory membrane and their nerve supply. Functions of respiratory system. Respiratory muscles. Mechanics of breathing: Intrapleural and Intrapulmonary pressure changes during respiration. Chest expansion. Lung compliance: Normal value, pressure-volume curve, factors affecting compliance and its variations. Surfactant – Composition, production, functions. RDS Spirometry: Lung volumes and capacities. Timed vital capacity and its clinical significance, Maximum ventilation volume, Respiratory minute volume. Dead Space: Types and their definition. Pulmonary Circulation. Ventilation-perfusion ratio and its importance. Transport of respiratory gases: Diffusion across the respiratory membrane. Oxygen transport – Different forms, oxygen-haemoglobin dissociation curve. Factors affecting it. P50, Haldane and Bohr effect. Carbon dioxide transport: Different forms, chloride shift. Regulation of Respiration: Neural Regulation. Hering-breuer's reflex. Voluntary control. Chemical Regulation. Hypoxia: Effects of hypoxia. Types of hypoxia. Hyperbaric oxygen therapy. Acclimatization Hypercapnoea. Asphyxia. Cyanosis – types and features. Dysbarism Disorders of Respiration: Dyspnoea. Orthopnoea. Hyperpnoea, hyperventilation, apnoea, tachypnoea. periodic breathing – types Artificial respiration Respiratory changes during exercise.</p>			
2	Physiology of exercise	10	20	30
	<p>A. Effects of acute and chronic exercise on</p> <ol style="list-style-type: none"> 1) O₂ transport 2) Muscle strength/power/endurance 3) B.M.R./R.Q. 4) Hormonal and metabolic effect 5) Cardiovascular system 6) Respiratory system 7) Body fluids and electrolyte <p>B. Effect of gravity / altitude /acceleration / pressure on physical parameters</p> <p>C. Physiology of Age</p>			

3	Applied physiology	20	20	40
	CVS The heart and circulation 1. Determinants of cardiac performance 2. Normal& Abnormal E.C.G. 3. Maintenance of blood pressure 4. Cardiac arrest and heart failure 5. Cardiovascular compensation for postural and gravitational changes. 6. Hypertension 7.oedema Central and peripheral venous pressure Nervous system and muscles 1. Reflex action, reciprocal innervation 2. Degeneration and regeneration of nerves 3. Control of posture 4. Outline of voluntary movement 5. Cutaneous, deep and superficial sensation 6. Synaptic transmission 7. Neuro muscular transmission Respiration 1. Normal& abnormal Breath sounds 2. Gas tension in air at sea level, tracheal air, cellular air, mixed air, plasma, arterial blood and mixed venous blood. 3. Altered Lung volume 4. Oxygen and carbon dioxide transport 5. Acid base reactions in blood 6. Effects off exercise on respiration 7. Artificial respiration. ertension 7. Oedema 8. Central and peripheral venous pressure.			
	Total	90	60	150

Practical

I. Haematology

1. Haemoglobinometer and total R.B.C. count.
2. Total W.B.C. count
3. Preparation and staining of blood smears, determination of differential W.B.C. count.
4. Blood grouping
5. Erythrocyte sedimentation rate
6. Bleeding and clotting time.

II. Clinical Examination

1. Examination of Radial pulse.
2. Recording of blood pressure
3. Examination of CVS
4. Examination of Respiratory system

II. Demonstration and Dry chart Explanation

1. Simple muscle curve.
2. Effect of increasing the strength of the stimuli
3. Effect of temperature on muscle contraction.
4. Effect of two successive stimuli.
5. Effect of Fatigue.
6. Effect of load on muscle contraction
7. Genesis of tetanus and clonus.
8. Velocity of impulse transmission.
9. Normal cardiogram of amphibian heart.
10. Properties of Cardiac muscle
11. Effect of temperature on cardiogram.

III. Recommended Demonstrations

1. Spirometry
2. Artificial Respiration
3. 6 Minute walk test
4. 12 Minute walk test
5. ECG
6. Perimetry
7. Mosso's Ergometry

RECOMMENDED TEXT BOOKS

- a) Text book on Medical Physiology – Guyton
- b) Textbook of Physiology – A K Jain
- c) Text book of medical physiology- Sembulingam

RECOMMENDED REFERENCE BOOKS

1. Review of Medical Physiology – Ganong
2. Samson & Wright's Applied Physiology
3. Textbook of Medical Physiology – Bern and Levy

SCHEME OF UNIVERSITY EXAMINATION

THEORY		Marks
*The question paper will give appropriate weightage to all the topics in the syllabus		100
I	Essay Q1-Essay-15 Marks Q2-Essay-15 Marks Essay Should give break up of 15 marks-e.g. [3+5+7]	30
II	Short Notes Answer all the questions 10 questions- 5 marks each 10x5=50	50
III	Short Answer questions Answer all the questions 10 questions- 2 marks each 10x2=20	20
		Total Marks 100

PRACTICALS /VIVA VOICE-50 Marks	Maximum Marks
Total	50

INTERNAL ASSESSMENT: (50marks)

1. Internal assessment (Theory and Practicals) as per University pattern

GENERAL PSYCHOLOGY & SOCIOLOGY

Didactic 90hrs -total 90hrs

COURSE DESCRIPTION

This course serves as a broad introduction to the field of contemporary psychology, which is explored as a science, a profession, and a means of promoting human welfare. Students are exposed to psychology and sociology as both a natural and social science through reading assignments, lectures, discussions, and demonstrations. Physiotherapy as a profession necessitates socialization and analyzing the psychology of patients with suffering.

Sr. No.	Topics	Didactic Hours	Practical/ Laboratory Hours	Total Hours
1	Definition of Psychology	02		02
2	Heredity and Environment	03		03
3	Development and Growth Behavior	04		04
4	Intelligence	03		03
5	Motivation	04		04
6	Emotions	03		03
7	Personality	07		07
8	Learning	05		05
9	Thinking	02		02
10	Frustration	02		02
11	Sensation, Attention and Perception	06		06
12	Defense mechanisms of the ego	02		02
13	Democratic and Authoritarian leadership	02		02
TOTAL		45		45

OBJECTIVES:

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

Cognitive:

- a. Define the term Psychology & its importance in the Health delivery system, & will gain knowledge of Psychological maturation during human development & growth & alterations during aging process.
- b. Understand the importance of psychological status of the person in health & disease; environmental & emotional influence on the mind & personality.
- c. Have the knowledge and skills required for good interpersonal communication, learning and situational analysis.

Psychomotor:

- a. Enumerate various Psychiatric disorders with special emphasis to movement / Pain & ADLs, intelligence, motivation, emotion and personality.
- b. Apply the knowledge in brief, about the pathological & etiological factors, signs / symptoms & management of various Psychiatric conditions in profession.
- c. Demonstrate skills of understanding the patient more empathetically giving due consideration to social issues and problems in socialization.

Affective

The student should be able to correlate the knowledge of general psychology and sociology and understand the clinical application of the same in patient handling, evaluation and treatment in the physiotherapy profession. The student should respect others without showing bias or prejudices on the grounds of age, race and gender. The student should learn to respect and positively respond to the instructions and suggestions of the peers, superiors and respect the values of physiotherapy profession.

SYLLABUS

Sr. Num	Topic	Didactic Hrs	Practical/aboratory Hrs	Total Hrs
1	Definition of Psychology	02		02
	Define of Psychology, basic information in relation to following schools methods and branches. a. Schools : Structuralism, functionalism, behaviourism, psychoanalysis, gestalt psychology. b. Methods :Introspection, observation, inventory and Experimental method. c. Branches : General, child, social, abnormal, Industrial, clinical, counseling, Educational.			
2	Heredity and Environment	03		03
	Twins relative importance of heredity and environment, their role in relation to physical characteristics, intelligence .and personality, nature-nature controversy.			
3	Development and Growth Behavior	04		04
	Infancy, childhood, adolescence, adulthood, middle age, old age.			
4	Intelligence	03		03
	Definitions – IQ, Mental Age, List of various intelligence testes- WAIS, WISC, Bhatia’s performance test, Raven’s progressive matrices test.			
5	Motivation	04		04
	Definitions: motive, drive, incentive and reinforcement, Basic information about primary needs: hunger, thirst, sleep elimination activity, air, avoidance to pain, attitude to sex. Psychological needs: Information, security, self-esteem, competence, love and hope			
6	Emotions	03		03
	Definition, differentiate from feelings, physiological changes of emotion, role of RAS, hypothalamus, cerebral cortex, sympathetic nervous system, adrenal gland, heredity and emotion. Nature and control of anger, fear and anxiety.			
7	Personality	07		07
	Definition, List the components: Physical characteristics, character abilities, temperament interest and attitudes. Discuss briefly the role of heredity, nervous system, physical characteristics, abilities, family and culture on personality development. Basic concepts of Freud: Unconscious, conscious Ide, ego and superego list and define the oral, anal and phallic genita, latency stages of personality development . List and define the 8 stages as proposed by Erickson, 4 concepts of learning as proposed by Dollard and Miller, drive, cue, response and reinforcement. Personality assessment; interview, standardized non –			

	standardized, Exhaustive and stress interviews, list and define inventories BAI, CPI and MMPI. Projective tests, Rorschach, TAT and sentence completion test.			
7	Learning	05		05
	Definition, List the laws of learning as proposed by Thorndike. Types of learning: Briefly describe classical conditioning, operant conditioning, insight, observation and Trial and Error type. List the effective ways to learn: Massed Vs. Spaced, Whole Vs. Part, Recitation Vs. Reading, Serial Vs. Free recall, knowledge of results, Association, Organization, Mnemonic methods, Incidental Vs. International learning, role of language.			
8	Thinking	02		02
	Definition, concepts, creativity, steps in creative thinking, list the traits of creative people, delusions.			
9	Frustration	02		02
	Definition, Sources, solution – conflict: approach – approach, avoidance – avoidance, and approach – avoidance, solution.			
10	Sensation, Attention and Perception	06		06
	List the senses, Vision, hearing, Olfactory, Gustatory and cutaneous sensation, movement, equilibrium and viscera sense. Define attention and list factors that determine attention: nature of stimulus intensity, colour, change extensity, repetition, movement size curiosity, primary motives. Define perception and list the principles of perception: Figure ground, constancy, similarity, proximity, closure, continuity, values and interests, past experience context, needs, moods, religion, sex and age, perceived benefits, and socioeconomic status. Define illusion and hallucination List visual, auditory, cutaneous, gustatory and olfactory hallucination.			
11	Defense mechanisms of the ego	02		02
	Denial, rationalization, projection, reaction formation, identification, repression, emotional insulation, undoing, introjection, acting out, depersonalization.			
12	Democratic and Authoritarian leadership	02		02
	Qualities of leadership: Physical factors, intelligence, self-confidence, sociability, will and dominance. Define attitude, change of attitude by: Additional information, changes in group, affiliation, enforced modification by law and procedures that affect personality Psychotherapy. Counseling and religious conversion.			
	Total	45		45

Recommended books

1. Clifford T. Morgan – Introduction to Psychology
2. Morgan & King – Introduction to Psychology
3. Hilgard & Atkinson – Introduction to Psychology

SOCIOLOGY

Sr. No.	Topics	Didactic Hours	Practical/ Laboratory Hours	Total Hours
1	Definition of Sociology	03		03
2	Sociology Approaches	05		05
3	Social Health	07		07
4	Family	10		10
5	Community	10		10
6	Social worker	10		10
TOTAL		45		45

Sr. Num	Topic	Didactic Hrs	Practical/laboratory Hrs	Total Hrs
1	Definition of Sociology	03		03
	1. Understanding Sociology 2. Definition and scope of Sociology 3. Its relation to Anthropology and Psychology 4. Sociological understanding and sociological thinking			
2	Sociology Approaches	05		05
	1. Sociological approaches to health care 2. Main features of positivistic and naturalistic approaches to sociological thinking and theorizing			

	3. Sociological approaches to health-care 4. Concepts of social groups; influence of formal and informal groups on health and sickness. 5. The SCP [Society-Culture-Personality] Model and the health care			
3	Social Health	07		07
	1. Social class and health experience 2. Culture types and practices universal and variability's of culture. 3. The role of primary groups and secondary groups in the hospital and rehabilitation. 4. Gender and health issues in India			
4	Family	10		10
	1. Family 2. The family, meaning and definitions. 3. Functions of types of family 4. Changing family patterns 5. Influence of family on the individuals health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their importance to physiotherapy.			
5	Community	10		10
	1. Rural community: Meaning and features – Health hazards of ruralities, health hazards to tribal community. 2. Urban community: Meaning and features- Health hazards of urbanities.			
6	Social worker	10		10
	1. Meaning of Social Work 2. The role of a Medical Social Worker			
	Total	45		45

Recommended books

1. Sachdeva and Vidyabushan (1990), *Introduction to the study of Sociology*, KitabMahal. Allahabad.
2. Indrani T K, *Text Books of Sociology for Graduates Nurses and Physiotherapy Students*, JP Brothers, New Delhi.
3. Gilbert (1973), *Fundamentals of Sociology*, 3rd ed. Bombay, Orient Longman
4. William J Goode (1977) *Principles of Sociology* McGraw-Hill Book Co. New York
5. Mark Walsh (2004). *Introduction to Sociology for Healthcares*. Nelson Thomes, UK

SCHEME OF UNIVERSITY EXAMINATION

THEORY		Marks
*The question paper will give appropriate weightage to all the topics in the syllabus Section A: Psychology Section B: Sociology		100
I	Essay Q1-Essay-15 Marks Q2-Essay-15 Marks Essay Should give break up of 15 marks-e.g. [3+5+7]	30
II	Short Notes Answer all the questions 10 questions- 5 marks each 10x5=50	50
III	Short Answer questions Answer all the questions 10 questions- 2 marks each 10x2=20	20
		Total Marks 100

INTERNAL ASSESSMENT: (50marks)

1. Internal assessment (Theory) as per University pattern

DISASTER MANAGEMENT
(Non-credit)

Didactic 30hrs+Practical 15hrs=45hrs

COURSE DESCRIPTION

The course gives an overview of issues related to disaster management including a history of the field, comprehensive emergency management and integrated emergency management, risk reduction and management and current issues in the field.

OBJECTIVES:

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

Cognitive:

- a. Defining disaster and the brief history of disasters and its classification
- b. Understanding the various approaches to disaster risk reduction and disaster management skills.
- c. Comprehending the relationship between disaster and development

Psychomotor

- a. To be able to present various disaster and relate it to development and analyse the same.
- b. Field work on minimizing the disaster and building the culture of safety.
- c. Performing project work, which is creatively designed based on the geographical location and hazard profile of the region where the college is located.

Affective

In the view of disaster, the student should be able to understand and volunteer towards the needs of the society based on the requirements.

The course gives an overview of issues related to disaster management including a history of the field, comprehensive emergency management and integrated emergency management, risk reduction and management and current issues in the field.

OBJECTIVES:

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

Cognitive:

- d. Defining disaster and the brief history of disasters and its classification
- e. Understanding the various approaches to disaster risk reduction and disaster management skills.
- f. Comprehending the relationship between disaster and development

Psychomotor

- d. To be able to present various disaster and relate it to development and analyse the same.
- e. Field work on minimizing the disaster and building the culture of safety.
- f. Performing project work, which is creatively designed based on the geographical location and hazard profile of the region where the college is located.

Affective

In the view of disaster, the student should be able to understand and volunteer towards the needs of the society based on the requirements.

Sr. No.	Topics	Didactic Hours	Practical/ Laboratory Hours	Total Hours
1	Introduction to Disasters	03		03
2	Disasters	05		05
3	Approaches to Disaster Risk reduction	06		06
4	Inter-relationship between Disasters and Development	08		08
5	Disaster Risk Management in India	08		08
6	Project Work: (Field Work, Case Studies)		15	
TOTAL		30	15	45

Sr. Num	Topic	Didactic Hrs	Practical/laborary Hrs	Total Hrs
1	I. Introduction to Disasters	03		03
	Concepts, and definitions (Disaster, Hazard, Vulnerability, Resilience, Risks)			
2	II. Disasters	05		05
	Classification, Causes, Impacts (including social, economic, political, environmental, health, psychosocial, etc.) Differential impacts- in terms of caste, class, gender, age, location, disability Global trends in disasters. urban disasters, pandemics, complex emergencies, Climate Change			
3	III. Approaches to Disaster Risk reduction	06		06
	Disaster cycle - its analysis, Phases, Culture of safety, prevention, mitigation			

	and preparedness community based DRR, Structural- nonstructural measures, roles and responsibilities of- community, Panchayati Raj Institutions/Urban Local Bodies (PRIs/ULBs), states, Centre, and other stake-holders.			
4	IV. Inter-relationship between Disasters and Development Factors affecting Vulnerabilities, differential impacts, impact of Development projects such as dams, embankments, changes in Land-use etc. Climate Change Adaptation. Relevance of indigenous knowledge, appropriate technology and local resources .	08		08
5	V. Disaster Risk Management in India Hazard and Vulnerability profile of India Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health, Waste Management Institutional Arrangements (Mitigation, Response and Preparedness, DM Act and Policy, Other related policies, plans, programmes and legislation).	08		08
6	VI. Project Work: (Field Work, Case Studies) The project /fieldwork is meant for students to understand vulnerabilities and to work on reducing disaster risks and to build a culture of safety. Projects must be conceived creatively based on the geographic location and hazard profile of the region where the college is located.		15	
	Total	30	15	45

Suggested Reading list:

- Alexander David, Introduction in 'Confronting Catastrophe', Oxford University Press, 2000
- Anandharia J. Vulnerability in Disaster Discourse, JTCDM, Tata Institute of Social Sciences Working Paper no. 8, 2008
- Blaikie, P, Cannon T, Davis I, Wisner B 1997. At Risk Natural Hazards, Peoples' Vulnerability and Disasters, Routledge.
- Coppola P Damon, 2007. Introduction to International Disaster Management,
- Carter, Nick 1991. Disaster Management: A Disaster Manager's Handbook. Asian Development Bank, Manila Philippines.
- Cuny, F. 1983. Development and Disasters, Oxford University Press.
- Document on World Summit on Sustainable Development 2002. Govt. of India: Disaster Management Act 2005, Government of India, New Delhi.
- Government of India, 2009. National Disaster Management Policy,
- Gupta Anil K, Sreeja S. Nair. 2011 Environmental Knowledge for Disaster Risk Management, NIDM, New Delhi Indian Journal of Social Work 2002. Special Issue on Psychosocial Aspects of Disasters, Volume 63, Issue 2, April.
- Kapur, Anu & others, 2005: Disasters in India Studies of grim reality, Rawat Publishers, Jaipur
- Kapur Anu 2010: Vulnerable India: A Geographical Study of Disasters, IIAS

- and Sage Publishers, New Delhi.
- Parasuraman S, Acharya Niru 2000. Analysing forms of vulnerability in a disaster, The Indian Journal of Social Work, vol 61, issue 4, October
- Prof. tanki B. Andharia Dr: Anil Kumar Gupta Dr Thurya Prakash Pelting Mark, 2003 The Vulnerability of Cities: Natural Disaster and Social Resilience Earthscan publishers, London
- Reducing risk of disasters in our communities, Disaster theory, Tearfund, 2006.
- UNISDR, Natural Disasters and Sustainable Development: Understanding the links between Development, Environment and Natural Disasters, Background Paper No. 5. 2002. IFRC, 2005. World Disaster Report: Focus on Information in Disaster, pp.182-225.
- Publications of National Institute Of Disaster Management (NIDM) and
- National Disaster Management Authority (NDMA)

ENVIRONMENTAL SCIENCE
(Non-credit)

Didactic 30hrs + Practical 15hrs = 45hrs

COURSE DESCRIPTION

The course gives an overview of multi disciplinary nature of environmental studies, natural resources, and ecosystem. The course also deals with issues of environmental pollution, population and human rights.

Sr. No.	Topics	Didactic Hours	Practical/ Laboratory Hours	Total Hours
1	Unit 1 : Multidisciplinary nature of environmental studies	02		02
2	Unit 2 : Natural Resources	04		04
3	Unit 3 : Ecosystems	03		03
4	Unit 4 : Biodiversity and its conservation	04		04
5	Unit 5 : Environmental Pollution	06		06
6	Unit 6 Environment Issues	05		05
7	Unit 7 : Population and Human rights	05		05
8	Unit 8 : Field work	1	15	16
TOTAL		30	15	45

Learning Objectives:

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

Cognitive:

- a. List down the natural resources and ecosystem.
- b. Define pollution and its impact on the society and various environmental issues.
- c. List down the human rights concerned to health, women and child welfare.

Psychomotor

- a. Perform community visits and carryout documentation of environmental asset
- b. Visit sites of pollution and analyse its impact on society

Affective

In the view of ecosystem, the student should be able to understand and treat all animals without harm and be a effective member of the ecosystem. The student should behave with respect to neighbors and work hand in hand with the society in controlling pollution of any form.

SYLLABUS

Sr. Num	Topic	Didactic Hrs	Practical/laboratory Hrs	Total Hrs
1	Unit 1 : Multidisciplinary nature of environmental Studies	02		02
	Definition, scope and importance Need for public awareness.			
2	Unit 2 : Natural Resources	04		04
	<p>Renewable and non-renewable resources : Natural resources and associated problems.</p> <p>a) Forest resources : Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people.</p> <p>b) Water resources : Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.</p> <p>c) Mineral resources : Use and exploitation, environmental effects of extracting and using mineral resources, case studies.</p> <p>d) Food resources : World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.</p> <p>e) Energy resources : Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies.</p> <p>f) Land resources : Land as a resource, land degradation, man induced landslides, soil erosion and desertification.</p> <ul style="list-style-type: none"> • Role of an individual in conservation of natural resources. • Equitable use of resources for sustainable lifestyles. 			
3	Unit 3 : Ecosystems	03		03
	<ul style="list-style-type: none"> • Concept of an ecosystem. • Structure and function of an ecosystem. • Producers, consumers and decomposers. • Energy flow in the ecosystem. • Ecological succession. • Food chains, food webs and ecological pyramids. • Introduction, types, characteristic features, structure and function of the following ecosystem :- <p>a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)</p>			

4	Unit 4 : Biodiversity and its conservation <ul style="list-style-type: none"> • Introduction – Definition : genetic, species and ecosystem diversity. • Biogeographical classification of India • Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values • Biodiversity at global, National and local levels. • India as a mega-diversity nation • Hot-spots of biodiversity. • Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts. • Endangered and endemic species of India • Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity. 	04		04
5	Unit 5 : Environmental Pollution <p>Definition</p> <ul style="list-style-type: none"> • Cause, effects and control measures of :- <ul style="list-style-type: none"> a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards • Solid waste Management : Causes, effects and control measures of urban and industrial wastes. • Role of an individual in prevention of pollution. • Pollution case studies. • Diastermanagement : floods, earthquake, cyclone and landslides. 	06		06
6	Unit 6 Environment Issues <ul style="list-style-type: none"> • From Unsustainable to Sustainable development • Urban problems related to energy • Water conservation, rain water harvesting, watershed management • Resettlement and rehabilitation of people; its problems and concerns. Case Studies • Environmental ethics : Issues and possible solutions. • Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. • Wasteland reclamation. • Consumerism and waste products. • Environment Protection Act. • Air (Prevention and Control of Pollution) Act. • Water (Prevention and control of Pollution) Act • Wildlife Protection Act • Forest Conservation Act • Issues involved in enforcement of environmental legislation. • Public awareness. 	05		05

7	Unit 7 : Population and Human rights	05		05
	<ul style="list-style-type: none"> • Population growth, variation among nations. • Population explosion – Family Welfare Programme. VII <ul style="list-style-type: none"> • Environment and human health. • Human Rights. • Value Education. • HIV/AIDS. • Women and Child Welfare. • Role of Information Technology in Environment and human health. • Case Studies. 			
8	Unit 8 : Field work	1	15	16
	<ul style="list-style-type: none"> • Visit to a local area to document environmental assetsriver/forest/grassland/hill/mountain • Visit to a local polluted site- Urban/Rural/Industrial/Agricultural • Study of common plants, insects, birds. • Study of simple ecosystems-pond, river, hill slopes, etc. 			
	Total	30	15	45

REFERENCE

- Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
- BharuchaErach, The Biodiversity of India, Mapin Publishing Pvt. Ltd.,
- Ahmedabad – 380 013, India, Email:mapin@icenet.net (R)
- Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
- Clark R.S., Marine Pollution, Clanderson Press Oxford (TB)
- Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001,
- Environmental Encyclopedia, Jaico Publ. House, Mumabai, 1196p
- De A.K., Environmental Chemistry, Wiley Eastern Ltd.
- Down to Earth, Centre for Science and Environment (R)
- Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev.,
- Environment & Security. Stockholm Env. Institute Oxford Univ. Press. 473p
- Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural
- History Society, Bombay (R)
- Heywood, V.H &Waston, R.T. 1995. Global Biodiversity Assessment.
- Cambridge Univ. Press 1140p.
- Jadhav, H &Bhosale, V.M. 1995. Environmental Protection and Laws.
- Himalaya Pub. House, Delhi 284 p.
- Mckinney, M.L. & School, R.M. 1996. Environmental Science systems &
- Solutions, Web enhanced edition. 639p.
- Mhaskar A.K., Matter Hazardous, Techno-Science Publication (TB)
- Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
- Odum, E.P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA, 574p
- Rao M N. &Datta, A.K. 1987. Waste Water treatment. Oxford & IBH Publ.
- Co. Pvt. Ltd. 345p.
- Sharma B.K., 2001. Environmental Chemistry. Geol Publ. House, Meerut
- Survey of the Environment, The Hindu (M)
- Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell
- Science (TB)

BASIC SCIENCES
PHYSICS (Non-credit)

Didactic 60hrs -total 60hrs

Course Objectives:

To understand the concept of application and the principles of basic physics applied in electrotherapeutic equipments.

This also enables the student to understand the components involved in the functioning of these equipments and identify the components.

PHYSICS

Electromagnetic waves

Electromagnetic spectrum

Light

Theories of the nature of light

Laws of Reflection of inverse square law

Laws of refraction‘

Interference of light – principle & condition of super position of waves

Interference

Emission and absorption spectrum

Principle of Laws

Characteristics of
laws Laser action

Optical pumping

Conditions to achieve Laser action

Ruby Laser

Application of Laser

Magnetism

Magnetic dipoles

Attraction & repulsion between magnetic poles

Magnetic field – magnetic Inductive /fluse density

Properties of magnet

Electro Statics

Coulomb‘s inverse square law

Lines of force

Electric potential – volt

Electrostatic induction

Electrophorus

Distribution of charge on a conductor

Capacitance of conductor

Principle of capacitor

Principle of capacitor

Effect of dielectric

Current electricity

Electric current

Flow of current in metal

Ohm's law

Resistivity

Conductivity

Potentiometer

Thermal effect of current

Heat produced in a conductor due to flow of current

Joule's law of heating

Magnetic effect of current

Magnetic field around current carrying conductor

Magnetic field due to circular loop

Magnetic field due to solenoid

Direction of magnetic field & current

Ampere's swimming rule

Maxwell's right hand cork screw rule

Magnitude of force

Direction of force – Fleming's left hand rule

Definition of Ampere

Electromagnetic Induction & alternating current
Magnetic flux

Electromagnetic induction

Faraday's law

Fleming's Right hand rule

Self-induction

Mutual Inductance

AC and DC generators

Eddy current

Transformer

Power losses

Alternating current

Atomic physics

Production of Cathode rays

X ray spectra

X ray diffraction

Bragg's law

Particle nature of energy

Photo electric effect

Laws of photo electric effect

Bohr's atom model

Microwave

Magnetron oscillator

Properties of microwaves