

# UNIVERSITY OF ENGINEERING & MANAGEMENT

## LECTURE WISE PLAN

Subject Name : Anatomy (Theory)

Subject Code - ANA101

Year - First Year

S.No.	Topics	Hours
	<b>General Anatomy</b>	<b>20 H</b>
1	Cell : (Parts, Name of Cytoplasm organelles and inclusion with their Functions)	1H
	Epithelium : Types with examples and light microscopic structure.	1H
	Connective Tissue : Classification with emphasis to tendon	1H
	Cartilage : Types with example	1H
	Bone : Types with example, types of Ossification (Stage of Ossification not required)	3H
	Joints : Classification with example, emphasis to synovial joint.	3H
	Muscles : Types (details of EM picture not required)	2H
	Nervous tissue : Structure of a Neuron, Synapse Reflex arc, Degeneration and Regeneration of the Nerve	3H
	Embryology : a) Ovum, Spermatozoa, fertilization and formation of germ layers and their derivations	1H
	b) Development of skin, fascia, blood vessels, lymphatic.	1H
	c) Development of bones, axial and appendicular skeleton and muscles.	1H
	d) Neural tube, brain vessels spinal cord.	1H
	e) Development of brain (brain stem) structures.	1H
	<b>Regional Anatomy</b>	
	<b>Upper Extremity</b>	<b>25 H</b>
2	Axilla,	2H
	Brachial plexus,	2H
	Shoulder joints,	2H
	Sterno-clavicular joints,	2H
	Axillary lymph Nodes,	2H
	Elbow joint,	2H
	Superior Radio-ulnar joint,	2H
	Nerves of arm and fore arm,	2H
	Synovial Bursa of hand and palmar space,	2H
	Ulnar Nerve in hand,	2H
	Cutaneous distribution according to dermatomes,	2H
	Clinical Anatomy,	2H

	Surface Anatomy.	1H
	<b>Inferior Extremity</b>	<b>30H</b>
<b>3</b>	Lumbar plexus,	3H
	Inguinal group of Lymph Nodes,	2H
	Hip joint,	3H
	Femoral triangle and femoral sheath,	3H
	Knee joint,	2H
	venous drainage of Inferior Extremity,	2H
	Sciatic Nerve and its distribution,	3H
	obturator Nerve,	2H
	Arches of foot,	3H
	Mid tarsal and sub-talar joint,	2h
	Cutaneous distribution according to myotome,	2H
	Clinical anatomy	2h
	Surface Markings.	1H
	<b>Abdomen &amp; pelvis</b>	<b>25H</b>
<b>4</b>	Abdominal wall,	2H
	inguinal canal,	2H
	Stomach,	2H
	Liver,	2H
	pancreas,	1H
	kidney with ureter and spleen,	3H
	small Intestine,	2H
	Large Intestine,	1H
	Abdominal Aorta,	2H
	Portal vein,	2H
	Diaphragm,	3H
	Sacral plexus,	1H
	Sacro-Iliac joint,	1H
	Intervertebral disc.	1H
	<b>Thorax</b>	<b>15H</b>
<b>5</b>	Thoracic cage and Mediastinum,	3H
	Heart with its internal and external features,	3H
	Blood vessels,	2H
	Typical spinal Nerve,	2H
	Typical Intercostal space,	2H

	Mechanism of Respiration,	2H
	Surface markings of Hearts and Lungs.	1H
6	<b>HEAD &amp; NECK</b>	<b>14H</b>
	Temporo-mandibular Joint,	4H
	Atlanto-occipital	3H
	Atlanto-Axial joint,	3H
	Cutaneous distribution of trigeminal Nerve.	4H
7	<b>NERVOUS SYSTEM</b>	<b>15H</b>
	General Introduction and classification,	1H
	Autonomic Nervous system (Idea about Sympathetic and Para Sympathetic with their difference in distribution and function).	2H
	Spinal cord with its meninges,	2H
	Spinal Reflex,	1H
	Pyramidal and extra-pyramidal tracts ( Detail Nucleus not required )	1H
	Blood supply.	1H
	Parts of brain & meninges,	1H
	Gross Discussion of Hind Brain,	2H
	Mid Brain (cranial Nerve Nucleus position should be mentioned)	2H
	Fore brain – Cerebral hemisphere, functional areas and blood supply	2H
8	<b>CRANIAL NERVES</b>	<b>6H</b>
	Names in order,	1H
	Individual Cranial Nerve distribution,	2H
	About upper Motor Neuron and Lower Motor Neuron,	2H
	Applied Anatomy	1H

# UNIVERSITY OF ENGINEERING & MANAGEMENT

## LECTURE WISE PLAN

Subject Name : Anatomy (Practical)

Subject Code - ANA191

Year - First Year

S.No.	Topics	Hours
<b>1</b>	<b>HISTOLOGY PRACTICAL</b>	<b>5H</b>
	Epithelium (Simple, Compound)	1H
	Connectivity tissue (Cartilage & Bone)	1H
	Muscle (smooth & skeletal)	1H
	Nervous tissue (Neuron)	1H
	Blood vessels (Large artery and vein)	1H
	<b>UPPER EXTREMITY</b>	<b>9H</b>
<b>2</b>	Pectoral Region,	1H
	Axilla	1H
	Scapula & Clavicle	1H
	Humerus,	1H
	Muscles of arm (Front & Back),	1H
	Radius & Front of forearm,	1H
	Ulna & Back of forearm,	1H
	Muscles of Palm & arterial arches,	1H
	Articulated hand ( Carpals and Meta Carpals name and arrangements in order only).	1H
	<b>INFERIOR EXTREMITY</b>	<b>10H</b>
<b>3</b>	Hip bone,	1H
	Glutei Muscles,	1H
	Femur,	1H
	Front of thigh,	1H
	Back of thigh,	1H
	Medial side of thigh,	1H
	Tibia, Anterior compartment of leg,	1H
	Fibula, Lateral compartment of leg,	1H
	Back of leg,	1H
	Articulated foot (Identification of tarsal and meta tarsal only).	1H

4	<b>ABDOMEN &amp; PELVIS</b>	<b>5H</b>
	Abdominal viscera,	1H
	Sacrum,	1H
	Bony pelvis,	1H
	Viscera of Pelvis	1H
	Blood vessels.	1H
5	<b>THORAX</b>	<b>7H</b>
	Superior Mediastinal structures,	1H
	Sternum, Ribs (only general features),	1H
	Vertebrae (Identification, general features, Functional Components, Development, Vertebral Column with weight transmission),	2H
	Heart,	1H
	Pleura	1H
	Lungs	1H
6	<b>HEAD &amp; NECK</b>	<b>9H</b>
	Mouth cavity,	1H
	Nasal cavity,	1H
	Pharynx and Larynx ( Parts, Sensory distribution),	2H
	Cranial bones( Identification of Individual bone general features, different foramina in relation to cranial Nerve, Cranial fossae and their relation to brain and Hypophysis).	2H
	Identification of Anterior and Posterior triangles of Neck with their contents.	2H
	Radiological Anatomy of Musculo Skeletal system.	1H
7	<b>NERVOUS SYSTEM</b>	<b>5H</b>
	Spinal cord (with its meninges & Blood supply)	2H
	Parts of brain (including meninges, Hind Brain, Mid Brain, Fore brain – Cerebral hemisphere, functional areas and blood supply).	3H

# UNIVERSITY OF ENGINEERING & MANAGEMENT

## LECTURE WISE PLAN

**Subject Name : Physiology (Theory)**

**Subject Code - PHY101**

**Year - First Year**

S.No.	Topics	Hours
<b>1</b>	<b>General Physiology - Unit I</b>	<b>20 H</b>
	Introduction and scope of Physiology	2H
	Cell and tissue-Its structure, principal constituents, properties and functions including cell division.	3H
	Body Fluid.	2H
	Blood: Composition and general functions of plasma. Blood cells – structure and function - Red Blood cells, white Blood Cells – including numbers and approximate length of life – position, structure and function of cells of Reticulo endothelial system.	7H
	Blood clotting including bleeding time and clotting time, factors accelerating or slowing the process. Blood groups and their significance, Rh-factor, Hemoglobin and E.S.R.	3H
	Formation of Blood, tissue fluid and lymph.	3H
<b>2</b>	<b>Unit II</b>	<b>30 H</b>
	Cardio-Vascular System - Introduction	2H
	Structure and properties of Heart Muscles and nerve supply of Heart.	2H
	Structure and functions of arteries, capillaries and veins.	3H
	Cardiac cycle and Heart sound.	3H
	Cardiac output measurements, factors affecting Heart Rate and its regulation,	2H
	Cardio-vascular reflexes.	2H
	Blood pressure, its regulation, physiological variation, peripheral resistance, Factors Controlling Blood Pressure, Hemorrhage.	3H
	ECG study and stress test.	2H
	Respiratory System.	2H
	Mechanism of Respiration, Changes in diameter of thorax-Intra-pleural and Intra-pulmonary pressure.	2H
	Quantities of lung volume, tidal and residual volume, vital capacity.	2H
	Gaseous inter-changes in lung and tissues.	2H
Control of respiration-Nervous and chemical significance of changes in rate and depth, transportation of oxygen and carbon dioxide.	3H	
<b>3</b>	<b>Unit :III</b>	<b>30H</b>
	Digestive System	2H
	General arrangement of alimentary canal, liver pancreas-position, structure and functions.	6H

	Nutrition and Diet-carbohydrate, protein fat, salts, water, vitamins and minerals digestion, absorption and Metabolism.	2H
	Reproductive System.	3H
	Sex determination and development of puberty, male sex hormones, spermatogenesis, Female sex hormones, menstrual cycle. Ovulation, pregnancy, Function of placenta, lactation.	7H
	Excretory System.	3H
	Gross and minute structures of kidney, renal circulation, Mechanism of formation of urine, Glomerular filtration rate and tubular function, renal function and renal tests. Physiology of micturition.	7H
4	<b>Unit : IV</b>	<b>20H</b>
	Endocrine System.	2H
	Structure and function of pituitary (anterior & posterior). Thyroid, Para-thyroid, adrenal cortex, adrenal medulla, Thymus and pancreas.	12H
	Blood sugar regulation.	2H
	Skin-Structure and functions.	4H
5	<b>NEUROMUSCULAR PHYSIOLOGY</b>	
	<b>Unit : V</b>	<b>50H</b>
	Cell membrane – Ionic and Potential gradient and transport.	2H
	Muscle – Types of muscular tissue – Gross and Microscopic structure – function. Basis of muscle contraction – changes in muscle contraction, Electrical – Biphasic and mono-phasic action potentials, chemical, Thermal and physical changes, Isometric and Isotonic contraction.	5H
	Motor units and its properties – clonus, tetanus, all or none law, Fatigue.	3H
	Nerve – Gross and microscopic structure of nervous tissue, one neuron – Generation of action potential – Nerve impulse condition.	5H
	Neuromuscular junction.	1H
	Degeneration – Regeneration of peripheral nerves Wallarian degeneration, electro tonus and Pflagers law.	3H
	Types and properties, of receptions, types of sensations, synapse, reflex, are its properties occlusion, summation, sub minimal fatigue etc.	3H
	Tracts – Ascending and descending and extra-pyramidal tracts,	10H
	Functions of E.E.G.	2H
	Functions of Cerebral cortex, cerebrum, cerebellum, Basal ganglia,	5H
	Thalamus – connection and functions.	2H
	Reticular formation – tone posture & equilibrium, Autonomic nervous system.	4H
Special Senses Eye-Errors of refraction, equilibrium, Autonomic nervous system.	2H	

Speech and its disorders.	1H
Ear and Vestibular apparatus, taste, olfactory, somatic sensations.	2H



# UNIVERSITY OF ENGINEERING & MANAGEMENT

## LECTURE WISE PLAN

Subject Name : Physiology (Practical)

Subject Code - PHY191

Year - First Year

S.No.	Topics	Hours
	<b>PRACTICAL PHYSIOLOGY/DEMONSTRATION</b>	<b>50H</b>
<b>1</b>	Hematology: RBC count, WBC count, different count. ESR, Bleeding & Clotting time, Estimation of hemoglobin, Blood groups.	20H
<b>2</b>	Human Physiology: Examination of (a) Respiratory system (b) heart and arterial pulse (c) deep and superficial reflexes (d) cranial nerves (e) motor system (f) sensory system including higher function (g) measurement of blood pressure.	20H
<b>3</b>	Effect of Exercises on body physiology	10H

# **UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR**

## **Lecture-wise Plan**

Subject Name: **BIO-CHEMISTRY**

Subject Code: BCH101

Year: **1st Year**

<b>Module Number</b>	<b>Topics</b>	<b>Number of Lectures</b>
1	<b>BIO-PHYSICS:</b> Concepts of Ph and buffers, Acid-base equilibrium, osmotic pressure and its physiological applications. <b>CELL:</b> Morphology, Structure and functions of cell, cell membrane, Nucleus, Chromatin, Mitochondria, endoplasmic reticulum, ribosome.	10H
2	<b>CARBOHYDRATES, LIPIDS &amp; PROTEINS &amp; METABOLISM:</b> Definition, functions, sources, classification & metabolism <b>VITAMINS:</b> Classification, Fat soluble vitamins A,D,E,K Water soluble vitamins-B Complex and Vitamin 'C', Daily requirement physiological functions and disease of vitamin deficiency;	10H
3	<b>BIO-ENERGETICS:</b> Concept of free energy change, Energetic reaction and endergenic reactions, Concepts regarding energy rich compounds. Respiratory chain and Biological oxidation. <b>WATER METABOLISM:</b> Fluid compartments, Daily intake and output, Dehydration, Sodium and potassium Metabolism.	10H
4	<b>MINERAL METABOLISM:</b> Iron, Calcium, Phosphorous, Trace elements. <b>NUTRITION:</b> Nutritional aspects of carbohydrate, fat and proteins, Balanced diet, Metabolism in exercise and injury, Diet for chronically ill and terminally ill patients.	10H

	<p><b>CONNECTIVE TISSUE:</b> Mucopolysaccharides, Connective tissue proteins, Glyco-proteins, Chemistry and Metabolism of bone and teeth.</p>	
5	<p><b>NERVE TISSUE:</b>Composition, Metabolism, Chemical mediators of nerve activities.</p> <p><b>MUSCLE TISSUE:</b> Structure, Metabolism of muscles, Muscle contraction.</p> <p><b>HORMONES:</b>General Characteristic and Mechanism of Hormone actions</p>	10H

# **UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR**

## **Lecture-wise Plan**

Subject Name Exercise Therapy  
Year: 1st Year

Subject Code: EXT101

<b>Module Number</b>	<b>Topics</b>	<b>Number of Lectures</b>
1	<p>Basic physics in exercise therapy. Mechanics: Force, Gravity, line of gravity, center of gravity in human body, Base, equilibrium, Axes and Planes, mechanical principles of lever, examples in human body, pendulum, spring.</p> <p>Introduction to exercise therapy.</p>	15L
2	<p>Massage: Definition of massage, type of massage, general effect and uses of massage, local effects of individual manipulation (physiological effects), contra-indications, techniques of application of all manipulations-stroking, Effleurage, kneading and picking up, skin rolling (back), clapping, tapping, friction etc.</p> <p>Suspension therapy: Principles of suspension, types of suspension therapy, effects and uses of suspension therapy-their application either to mobilize a joint increase joint range of motion or to increase muscle power-explaining the full details of components used for suspension therapy.</p>	35L
3	<p>Starting position-Fundamental starting position-standing, sitting, kneeling, lying and-hanging. All the derived positions of the above five fundamental starting positions.</p> <p>Classification movements in details: Voluntary movement: free exercise, assisted exercises, resisted exercise, Active-Assisted and Resisted exercise.</p> <p>Assisted Exercises: Technique and uses. Free</p>	35L

	<p>exercises-Classification, technique, effects of frequent exercises on various systems etc. Resisted exercises – Techniques and types of resistance, SET system (Heavy resisted exercises, Oxford method, De Lorme method, Mc queen method.</p> <p>Relaxed passive movements, basic knowledge of classification of relaxed passive movements, definition, technique, effects and uses of relaxed passive movement.</p>	
4	<p>Muscles strength: Anatomy and physiology of muscle tissue causes of muscle weakness paralysis, prevention of muscle weakness/paralysis Type of muscle work and contraction ranges of muscle work, prevention of muscle atrophy.</p> <p>Muscle assessment M.R.C. grading Principles of muscle strengthening/re-education, early re-education of a paralyzed muscle etc.</p> <p>Joint Movement and measurement:Goniometry. Classification of joint movements causes of restriction of joint movement, Principle and application of Goniometry.</p>	35L
5	<p>Bed Rest-Its necessity &amp; Complications. Motor Learning and motor control a) Introduction to motor learning, classification of motor skills, measurement of performance b) Theories of motor control and applications.c) Learning of skill, theories of feedback, practice conditions.</p> <p>Relaxation and Therapeutic Gymnasium</p> <ul style="list-style-type: none"> <li>• Describe relaxation, muscle fatigue, muscle spasm and tension.</li> <li>• Factors contributing to fatigue and relaxation.</li> </ul>	30L

	<ul style="list-style-type: none"><li>• Techniques of relaxation.</li><li>• Effects and uses, indications and contraindications.</li><li>• Set up of gymnasium and its importance</li><li>• Various equipments in the gymnasium.</li></ul>	
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# UNIVERSITY OF ENGINEERING & MANAGEMENT

## LECTURE WISE PLAN

Subject Name : EXERCISE therapy I (Practical)

Subject Code - EXT191

Year - First Year

S.No.	Topics	Hours
	<b>PRACTICAL EXERCISE THERAPY – I / DEMONSTRATION</b>	<b>50H</b>
1	Massage Therapy	7H
2	Suspension Therapy	3H
3	Relax passive movement/types of exercise	5H
4	MMT	10h
5	Goniometry	10H
6	Relaxation techniques- general and local	5H
7	Fundamental and derived positions	5H
8	Application of relaxed passive movements, active assisted and resisted movements to all joints in limbs.	5H

# **UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR**

## **Lecture-wise Plan**

Subject Name **ELECTROTHERAPY – 1**

Subject Code: ELT101

<b>Module Number</b>	<b>Topics</b>	<b>Number of Lectures</b>
1	<p><b>Physical Properties:</b> Structure and properties of matter-solids, liquids and gases; adhesions, surface tension, viscosity, density and elasticity. Structure of atom, molecules, elements and compounds. Conductors, insulators, potential difference, Resistance and Intensity.</p> <p>Ohm's Law – Its application to AC and DC a) Rectifying devices- thermionic valves, semiconductors, transistors, amplifiers, transducers, oscillator circuit. b) Capacitance, condensers and AC and DC circuits c) Display devices and indicators – analogue and digital</p> <p>Effects of current electricity: 1. Chemical effects - ions and electrolytes, ionization, production of EMF by chemical action 2. Magnetic effects, molecular theory of magnetism, magnetic effects, electromagnetic induction 3. Thermal effects- joule's law and heat production 4. Milli-ammeter and voltmeter, transformers and choke coil</p> <p>Physical principles of sound and its properties, Physical principles of light and its properties</p> <p>Electromagnetic spectrum- biophysical application.</p>	25L
2	<p><b>Electrical Supply:</b> a) brief outline of mains supply of current. b) dangers- short circuit, electric shock. c) Precautions- safety devices, earthing, fuses etc. d) first aid and initial management of electric shock</p>	15L
3	<p><b>Low frequency currents:</b> 1. Introduction to DC, AC and modified currents 2. Production of DC- physiological and therapeutic effects of DC, anodal and cathodal galvanism. 3) Iontophoresis- principles of clinical application, indication, contraindication, precaution, operational skills of equipment and patient preparation. 4) Modified DC –various pulses, duration and frequency and their effects on nerve and muscle tissue. Production of IDC and surged currents and their effects, principle of clinical application, physiological and therapeutic effects, indication,</p>	35L



	<p>contraindication, precaution, operational skills, equipment and patient preparation. 5) TENS a) Types of low frequency, pulse widths, frequencies and intensities used as TENS application b) Theories of pain relief. c) Principle of clinical application, physiological and therapeutic effects, indication, contraindication, precaution, operational skills, equipment and patient preparation. 6) Sinusoidal currents, didynamic pulses.</p>	
4	<p><b>Electrical Reactions and electrodiagnostic tests:</b> Electric stimuli and normal behavior or nerve and muscle tissue. Types of lesion and development of reaction of degeneration. Faradic/ IDC test (FG test). SD curve and its application. Rheobase and chronaxie and pulse ratio.</p>	20L
5	<p><b>Ultra Violet Radiation:</b> a) Wavelength, frequency, types and sources of UVR generation, techniques of irradiation, physiological and therapeutic effects, indication, contraindication, precaution, operational skills, equipment and patient preparation</p> <p>b) Dosage calculation of UVR.</p>	20L
6	<p><b>Superficial heat – Infrared Radiation, Paraffin wax bath, moist heat, electrical heating pads, fluidotherapy, contrast bath etc</b></p> <p><b>IRR-</b>Wavelength, frequency, types and sources of IRR generation, techniques of irradiation, physiological and therapeutic effects, indication, contraindication, precaution, operational skills, equipment and patient preparation</p> <p><b>PWB</b> – contents, methods of application, maintenance of equipment, indication, contraindication, precaution, operational skills, equipment and patient preparation</p> <p><b>Hydrocollator packs</b> – contents, methods of application, indication, contraindication, precaution.</p>	35L

<b>UNIVERSITY OF ENGINEERING &amp; MANAGEMENT</b>		
<b>LECTURE WISE PLAN</b>		
<b>Subject Name : Electrotherapy I (Practical)</b>		<b>Subject Code -</b>
<b>ELT191</b>		
<b>Year - First Year</b>		
<b>S.No.</b>	<b>Topics</b>	<b>Hours</b>
	<b>PRACTICAL ELECTROTHERAPY - I/DEMONSTRATION</b>	<b>50H</b>
<b>1</b>	To study the basic operation of electric supply to the equipment and safety devices.	3H
<b>2</b>	To experience sensory and motor stimulation of nerves and muscles by various types of low frequency currents.	8H
<b>3</b>	To locate and stimulate different motor points region wise.	10H
<b>4</b>	Therapeutic application of different low frequency current, faradic foot bath, faradism under pressure/tension, iontophoresis.	12H
<b>5</b>	To plot SD curve, find rheobase and chronaxie	5H
<b>6</b>	To study hydrocollator units, its operations.	2H
<b>7</b>	To study different types of IRR and its application.	1H
<b>8</b>	To study PWB unit and its application.	2H
<b>9</b>	To study different types of UVR, their operation, assessment of test dose and application.	2H
<b>10</b>	To study TENS stimulator, its operation and application.	5H