KAZI NAZRUL UNIVERSITY
School of Health Science and Technology
Department of Allied Health Science and Technology
UG Learning Outcome Based Curriculum (LOCF) for Bachelor of Physiotherapy

PROGRAM OUTLINE

Semester I

Course Code	Course Name	L - T - P	Credits	Total Marks
BPTC101	Human Anatomy	4-0-0	4	100
BPTC102	Human Anatomy Practical	0-0-4	2	100
BPTC103	Human Physiology	4-0-0	4	100
BPTC104	Human Physiology Practical	0-0-4	2	100
BPTC105	Medical Biochemistry	4-0-0	4	100
BPTC106	National Healthcare Delivery System	4-0-0	4	100
AECC101	Computer Application	4-0-0	4	100
AECC102	Computer Application Practical	0-0-4	2	100
AECC103	English Communication	3-0-0	3	100
TOTAL			**29**	**900**

KAZI NAZRUL UNIVERSITY
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Semester- I

Course Name: Human Anatomy
Course Code: BPTC101

Course Type: Core (Theoretical)	Course Details: CC-1			L-T-P: 4 - 0 - 0	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		….	30	….	70

Course Learning Outcomes:
1. Comprehend the normal disposition, inter-relationships, gross, functional and applied anatomy of various structures in the human body.
2. Identify the microscopic structures of various tissues, and organs in the human body and correlate the structure with the functions.
3. Comprehend the basic structure and connections between the various parts of the central nervous system so as to analyze the integrative and regulative functions on the organs and systems.

Module	Topics	No. of Lectures
Module 1	**Introduction to Human Anatomy:** Anatomy: Definition and its relevance Planes of the body, relationship of structures, organ system	4
Module 2	**Skeleton System:** Structure, Functions	4
Module 3	**Tissues of the Body:** Epithelium,connectivetissue,boneandcartilage,Embryology,histology, different types of each of them, types of cells, cellular differentiation and arrangements in different tissues	6
Module 4	**Muscles:** Different types of muscles, their functional differentiation, their relationship with different structures, their neural supply	4

Module 5	**Blood vessels:** Differentiation between arteries and veins, embryology, histology of both arteries and veins, Functional differences between the two, anatomical differences at different locations	6
Module 6	**Skin and appendages:** Embryology, anatomical differences in different areas, functional and protective variations, innervations, relationship with muscles and nerves	4
Module 7	**Lymphatic system:** Embryology, functions, relationship with blood vessels and organs	4
Module 8	**Glands:** Embryology, different types of glands (exocrine and endocrine), functional differences, neural control of glands	4
Module 9	**Nervous system:** Parts of Nervous system, cell types of nervous system, Blood-brain barrier, Reflex arc, Peripheral Nerves, Spinal nerves, Nerve fibers, Autonomic Nervous system	6
Module 10	**Brain and Cranial nerves:** Major parts of Brain, Protective coverings of the Brain, Cerebrospinal Fluid, Brain stem, Cerebellum, Diencephalon, Cerebrum, Cranial nerves	6
	Total Number of Hours= 48	

Text Books:-

1. MARIANO S.H. DIFIORE: Atlas of Human Histology, 5th Ed. 1981, Lea and Feliger.
2. B.D. CHAURASIA: Handbook of General Anatomy, 2nd Ed., CBS Publishers and Distributors, New Delhi - 110 032.

Reference Books:-

1. PETER L. WILLIAMS AND ROGER WARWICK: - Gray's Anatomy - Descriptive and Applied, 36th Ed., 1980, Churchill Livingstone.
2. R. KANAGASUNTHARAM, P. SIVANANDA-SINGHAM & A. KRISHNAMURTI: Anatomy- Regional, Functional, & Clinical, P.G. Publisher, Singapore1987.

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Course Name: Human Anatomy Practical
Course Code: BPTC102

Course Type: Core (Practical)	Course Details: CC-2			L-T-P: 0 - 0 - 4	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		60	----	40	----

Course Learning Outcomes:

1. Utilize compound microscope to perform microscopic study of epithelial, connective, muscular and nervous tissue.
2. Identify axial and appendicular bones of human body.
3. Practice use of Hemocytometer for enumeration of white blood cell (WBC) and red blood corpuscles (RBC).
4. Estimate bleeding time, clotting time, hemoglobin content and erythrocyte sedimentation rate (ESR).
5. Identify blood group, determine heart rate, pulse rate and record blood pressure.

Module	Topics	No. of Practical D + P*
Module 1	Study of compound microscope	2 + 2
Module 2	Identification of muscular and nervous system	4 + 4
Module 3	Identification of axial bones Identification of appendicular bones	4 + 4
Module 4	Introduction to hemocytometry	2 + 2
Module 5	Enumeration of white blood cell (WBC) count Enumeration of total red blood corpuscles (RBC) count	4 + 4
Module 6	Determination of bleeding time Determination of clotting time	2 + 2
Module 7	Determination of blood group. Determination of erythrocyte sedimentation rate (ESR).	4 + 4
Module 8	Determination of heart rate and pulse rate Recording of blood pressure	2 + 2

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	Total Number of Hours= 48

*** D - Demonstration & P - Practice**

Text Books:-

1. MARIANO S.H. DIFIORE: Atlas of Human Histology, 5th Ed. 1981, Lea and Feliger.
2. B.D. CHAURASIA: Handbook of General Anatomy, 2nd Ed., CBS Publishers and Distributors, New Delhi - 110 032.

Reference Books:-

1. PETER L. WILLIAMS AND ROGER WARWICK: - Gray's Anatomy - Descriptive and Applied, 36th Ed., 1980, Churchill Livingstone.
2. R. KANAGASUNTHARAM, P. SIVANANDA-SINGHAM & A. KRISHNAMURTI: Anatomy- Regional, Functional, & Clinical, P.G. Publisher, Singapore1987.

Course Name: Human Physiology
Course Code: BPTC103

Course Type: Core (Theoretical)	Course Details: CC-3			L-T-P: 4 - 0 - 0	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		….	30	….	70

Course Learning Outcomes:

1. Explain the normal functioning of various organ systems of the body and their interactions.
2. Elucidate the physiological aspects of normal growth and development.
3. Describe the physiological response and adaptations to environmental stresses.
4. Know the physiological principles underlying pathogenesis of disease.

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Module	Topics	No. of Lectures
Module 1	**CELL STRUCTURE & ORGANIZATION** Tissue organization Epithelium Connective tissue –Collagen fibers –Elastic fibers – Areolar fibers Cartilage –Bone Contractile tissue –striated –skeletal –cardiac –non striated – plain – myoepithelial General principles of cell physiology Physiology of skeletal muscle	6
Module 2	**BLOOD:** Composition Volume measurement & variations Plasma proteins –classification & functions. Red blood cells – development, morphology & measurements –functions & dysfunctions. White blood cells –development –classification, morphology – functions & dysfunctions. Platelets –morphology –development, functions & dysfunctions Clotting –factors –mechanism –anti- coagulants dysfunctions Blood grouping –classification –importance in transfusion, Rh factor & incompatibility Suspension stability Osmotic stability Reticulo endothelial system o Spleen, lymphatic tissue, Thymus, bone marrow, immune system, cellular, Humoral, Autoimmune	6
Module 3	**DIGESTION:** General arrangement Salivary digestion –functions & regulations Gastric digestion – functions & regulations Pancreatic digestion –functions & regulations Intestinal digestion –functions & regulations Liver & bile Functions of large intestine Neurohumoral regulations of alimentary functions, summary	4

Module 4	**EXCRETION:** Body fluids –distribution, measurement & exchange, Kidney – structure of nephron –mechanism of urine formation –composition of the urine and abnormal constituents –urinary bladder & micturition	2
Module 5	**ENDOCRINES**: Hormone mechanism –negative feed backs –tropic action – permissive action – cellular action, hypothalamic regulation Thyroid - hormones, actions, regulations Adrenal cortex - hormones, actions, regulations Adrenal medulla –hormones, actions, regulations Parathyroid - hormones, actions, regulations Islets of pancreas –hormones, actions, regulations Miscellaneous _ hormones, actions,regulations Common clinical disorders	4
Module 6	**REPRODUCTION:** Male reproductive system –control & regulation Female reproductive system –uterus –ovaries –menstrual cycle – regulation – pregnancy & delivery –breast –family planning	4
Module 7	**RESPIRATION:** Mechanics of respiration –pulmonary function tests –transport of respiratory gases- neural and chemical regulation of respiration – hypoxia, cyanosis, dyspnoea– asphyxia.	4
Module 8	**CIRCULATION:** Generalprinciples Heart: myocardium –innervation –transmission of cardiac impulse- Events during cardiac cycle –cardiac output. Peripheral circulation: peripheral resistances –arterial blood pressure – measurements –factors regulation variations –capillary circulation – venous circulation. Special circulation: coronary cerebral – miscellaneous	4
Module 9	**ENVIRONMENTAL PHYSIOLOGY** Body temperature regulation (including skin Physiology). Exposure to low and high atmospheric pressure	4
Module 10	**NERVOUS SYSTEM:** Neuron –Conduction of impulse –synapse –receptor. Sensory organization –pathways and perception Reflexes –cerebral cortex –functions. Thalamus –Basal ganglia Cerebellum. Hypothalamus.	6

	Autonomic nervous system –motor control of movements, posture and equilibrium – conditioned reflex, eye hand co-ordination	
Module 11	**SPECIAL SENSES** –(Elementary) Olfaction –Taste –Hearing	4
	Total Number of Hours	**48**

Text Books:-

1. L Prakasam reddy, Fundamentals of Medical Physiology, 4th Edition, Paras medical Publisher, Hyderabad,2008
2. Sujit K. Chaudhuri, Concise Medical Physiology, 6th edition, New Central Book Agency, Kolkata, 2008

Reference Books:-

1. A C Guyton: Text book of Medical Physiology, 8th edition, saunders company, Japan

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Course Name: Human Physiology Practical
Course Code: BPTC104

Course Type: Core (Practical)	Course Details: CC-4			L-T-P: 0 - 0 - 4	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		60	----	40	----

Course Learning Outcomes:

1. Handle microscopes on their own.
2. Perform different blood tests, e.g., blood counts (RBC, WBC, platelets, Hb and differential count), blood grouping, analysis of bleeding time and clotting time.
3. Perform examination on urine and detect presence of abnormal entities.
4. Demonstrate various parts of human Endocrine and Reproductive system.

5. Perform clinical examination of respiratory system like Spirometry, Breath holding test etc.
6. Practise routine examination of cardiovascular and circulatory system, including blood pressure and pulse rate measurement.
7. Demonstrate various parts of Central Nervous System.

Module	Topics	No. of Practical D + P
Module 1	Blood test: Microscope, Hemocytometer, Blood, RBC count, Hb, WBC count, Differential Count, Hematocrit demonstration, ESR, Blood group & Rh. type, Bleeding time and clotting time	4 + 4
Module 2	Digestion: Test salivary digestion	4 + 4
Module 3	Excretion: Examination of Urine, Specific gravity, Albumin, Sugar, Microscopic examination for cells and cysts	4 + 4
Module 4	Endocrinology and Reproduction: Dry experiments in the form of cases showing different endocrine disorders.	4 + 4
Module 5	espiratory System: Clinical examination of respiratory system, Spirometry, Breath holding test	4 + 4
Module 6	ardiovascular System: Clinical examination of circulatory system, Measurement of blood pressure and pulse rate, Effect of exercise on blood pressure and pulse rate	2 + 2
Module 7	entral Nervous System: Sensory system, Motor system, Cranial system, Superficial and deep reflexes	2 + 2
	Total Number of Hours= 48	

Text Books:-

3. L Prakasam reddy, Fundamentals of Medical Physiology, 4th Edition, Paras medical Publisher, Hyderabad,2008
4. Sujit K. Chaudhuri, Concise Medical Physiology, 6th edition, New Central Book Agency, Kolkata, 2008

Reference Books:-

2. A C Guyton: Text book of Medical Physiology, 8th edition, saunders company, Japan

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Course Name: Medical Biochemistry
Course Code: BPTC105

Course Type: Core (Theoretical)	Course Details: CC-5			L-T-P: 4 - 0 - 0	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		….	30	….	70

Course Learning Outcomes:

- Make decisions about the pathogenicity of organisms associated with human infections.
- Apply appropriate microbiology laboratory techniques, methodologies, instruments and equipment in accordance with current laboratory safety protocol.
- Calculate, record, and report clinical microbiology results according to industry standard criteria.

Module	Topics	Contact Lecture
Module 1	**Biophysics:** Concepts of PH and buffers, Acid-base equilibrium, osmotic pressure and its physiological applications.	4
Module 2	**Carbohydrate: -** Definition, functions, sources, classification, monosaccharide, Disaccharides, Polysaccharides, Muco-polysaccharides and its importance.	4
Module 3	**Lipid:** - Definition, functions, sources, classification, simple lipids, compound lipids, derived lipids, Saturated and unsaturated fatty acids, Essential fatty acids and their importance, Blood lipids and their implications, cholesterol and its importance.	4
Module 4	**Proteins:-** Definition, Sources, Functions, Classification, simple protein, congregated proteins and derived proteins properties and reactions of proteins.	4
Module 5	**Nucleic acids: -** Structure and functions of DNA, RNA, Nucleosides, Nucleotides, biologically important Nucleotides including energy rich compounds.	4

Module 6	**Enzymes: -** Definition, Classification, mode of action, factors, affection, enzyme action.	4
Module 7	**Vitamins: -** 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.	4
Module 8	**Carbohydrate Metabolism**: Glycolysis, TCA Cycle, Glycogenesis, Glycogenolysis, Gluconeogenesis, maintenance of Blood glucose, Inter conversion of different sugars.	4
Module 9	**Lipid metabolism**: Metabolism of cholesterol, Ketone bodies, Atherosclerosis and obesity, Lipo-Protein of their metabolism.	4
Module 10	**Protein metabolism**: Transamination, Transmethylation, Deamination, Fate of Ammonia Urea synthesis and synthesis of creatinine, inborn errors of metabolisms.	4
Module 11	**Water and electrolytes:** Fluid compartments, Daily intake and out-put, Dehydration, Sodium and potassium metabolism.	4
Module 12	**Nutrition:** Nutritional aspects of carbohydrate, fat and proteins, Balanced diet, metabolism in exercise and injury. Diet for chronically ill and terminally ill patients.	4
	Total Number of Hours	**48**

Text Books-

1. Text Book of Medical Biochemistry- Chatterji, M N, Jaypee, Bangalore
2. CBS Quick Review in Biochemistry- Ahuja, Lakshmi, CBS, New Delhi

Reference books-

1. Principles of Biochemistry- Lehninger, A.L.
2. Biochemistry by U Satyanarayana

Course Name: National Healthcare Delivery System
Course Code: BPTC106

Course Type: Core (Theoritical)	Course Details: CC-6		L-T-P: 4 - 0 - 0
	Full Marks:	CA Marks	ESE Marks

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Credit: 4	100	Practical	Theoretical	Practical	Theoretical
		----	30	----	70

Course Learning Outcomes:

1. Discuss the preliminary idea of health care and its delivery system related to various socio-economic aspect and community based approach.
2. Describe the different types of health policies, organizations and issues in health care delivery system in India.
3. Explain the national health programme and elaborate its objectives, targeted area, achievements and constraints.
4. Interpret the various AYUSH system of medicine and its integration/interrelation among Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy.
5. Illustrate the health scenario of public health in India based on two aspect demography and epidemiology.
6. Interpret principles of epidemiology, methods of epidemiological studies associated with communicable and non-communicable diseases

Module	Topics	No of lectures
Module 1	**Concepts of Health** Definition of health; evolution in concepts of public health; public health events sanitary awakening, germ theory of disease, rise of public health in various countries, changing concepts of health- biomedical concept, ecological concept, psycho-social concept and holistic concept.	4
Module 2	**Dimensions of Health** Physical dimension, mental dimension, Social dimension etc; Common health problems in India - Communicable diseases, Non communicable diseases, MCH problems, Nutritional problems, Environmental sanitation, Glance over National Health profile.	4
Module 3	**Evolution of health care delivery systems** History of health care delivery services; Genesis of primary health care; National health policy; MDGs.	6

Module 4	**Levels of health care** Primary health care, secondary health care, tertiary health care. Primary health care-principles of primary health care, elements of primary health care.	4
Module 5	**Primary health care: Delivery of services** troduction; Structure of health care delivery system; Delivery of primary health care services at village level; Village health guide, ASHA, ICDS: Subcentre: Primary health centre.	4
Module 6	**Secondary and tertiary health care: Delivery of services** Community Health centre; First referral unit; District hospital.	6
Module 7	**Primary health care - Current status in India** Status of health care infrastructure; Health team concept; Health insurance; Social security and social assistance in health; AYUSH.	6
Module 8	**National Health Programmes** Introduction; National Vector Borne Disease Control Programme; National Leprosy Eradication Programme; Revised National Tuberculosis Control Programme; National AIDS Control Programme; Universal Immunization Programme; National Rural Heath Mission.	4
Module 9	**National Health Programmes** Reproductive and Child Health Programme; Integrated Management of Neonatal and Childhood Illnesses; National Nutritional Anemia Prophylaxis Programme; National Programme for Control of Blindness; National Cancer Control Programme; National Mental Health Programme.	4
Module 10	**First aid** Basic terminologies; general guidelines; first aid in specific situations; Wound, bleeding, fracture, choking, burns, epistaxis, strains and sprain, animal bites (classification, causes and first aid), Cardio-pulmonary resuscitation.	6
	Total Number of Hours	**48**

Text Books

1. Park K. Park's Textbook of Preventive and Social Medicine. 23rd ed. Jabalpur:

BanarsidasBhanot Publishers, 2015.p.135-141

Reference Book:

1. Suryakantha. Textbook of Community Medicine with recent advances. 4th edition.

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Course Name: Computer Application
Course Code: AECC101

Course Type: Core (Theoretical)	Course Details: AECC-1			L-T-P: 4 - 0 - 0	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		….	30	….	70

Course Learning Outcomes:

1. Understand the fundamental hardware components that make up a computer's hardware and the role of each of these components
2. Understand the difference between an operating system and an application program, and what each is used for in a computer
3. Describe some examples of computers and state the effect that the use of computer technology has had on some common products
4. Be familiar with software applications
5. Understand file management
6. Accomplish creating basic documents, worksheets, presentations with their properties.
7. Experience working with email and recognize email netiquette.

Module 1
Introduction and Definition of Computer: Computer Generation, Characteristics of Computer, Advantages and Limitations of a computer, Classification of computers, Functional components of a computer system (Input, CPU, Storage and Output Unit), Types of memory (Primary and Secondary) Memory Hierarchy. Hardware: a) Input Devices- Keyboard, Mouse, Scanner, Bar Code Reader b) Output Devices – Visual Display Unit (VDU), Printers, Plotters etc. Software: Introduction, types of software with examples, Introduction to languages, Compiler, Interpreter and Assembler. Number System: Decimal, Octal, Binary and Hexadecimal Conversions, BCD, ASCII and EBCDIC Codes. (Lecture 12)

Module 2
MS – DOS: Getting Started on DOS with Booting the System, Internal Commands: CHDIR(CD),CLS, COPY, DATE, DEL(ERASE), DIR, CHARACTER, EXIT,MKDIR(MD), REM, RENAME(REN), RMDIR(RD), TIME, TYPE, VER, VOL, External Commands: ATTRIB, CHKDSK, COMMAND, DOSKEY, EDIT, FORMAT,HELP, LABEL, MORE, REPLACE, RESTORE, SORT, TREE,

UNDELETE, UNFORMAT,XCOPY.
Introduction of Internet: History of internet, Web Browsers, Searching and Surfing, Creating an E-Mail account, sending and receiving E-Mails. (Lecture 08)

Module 3
MS Word: Starting MS WORD, Creating and formatting a document, Changing fonts and point size, Table Creation and operations, Autocorrect, Auto text, spell Check, Word Art, Inserting objects, Page setup, Page Preview, Printing a document, Mail Merge. (Lecture 08)

Module 4
MS Excel: Starting Excel, Work sheet, cell inserting Data into Rows/ Columns, Alignment, Text wrapping , Sorting data, Auto Sum, Use of functions, Cell Referencing form, Generating graphs, Worksheet data and charts with WORD, Creating Hyperlink to a WORD document, Page set up, Print Preview, Printing Worksheets.
MS Power Point: Starting MS–Power Point,, Creating a presentation using auto content Wizard,

Blank Presentation, creating, saving and printing a presentation, Adding a slide to presentation, Navigating through a presentation, slide sorter, slide show, editing slides, Using Clipart, Word art gallery, Adding Transition and Animation effects, setting timings for slide show, preparing note pages, preparing audience handouts, printing presentation documents. MS – Access: creating table and database.
(Lecture 08)

Module 5
MS-POWERPOINT: Starting MS–Power Point,, Creating a presentation using auto content Wizard, Blank Presentation, creating, saving and printing a presentation, Adding a slide to presentation, Navigating through a presentation, slide sorter, slide show, editing slides, Using Clipart, Word art gallery, Adding Transition and Animation effects, setting timings for slide show, preparing note pages, preparing audience handouts, printing presentation documents.
(Lecture 12)

Text Books:
1. Sinha P.K., Computer Fundamentals, BPB Publishing.
2. Bill Bruck., The Essentials Office 2000 Book, BPB Publishing.
3. Leon A. & Leon M., Introductions to Computers, Vikas Publications.
Reference Books:
1. Peter Norton_s, Introductions to Computers, Tata McGraw Hill.
2. Price Michael, Office in Easy Steps, TMH Publication.

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Course Name: Computer Application Practical
Course Code: AECC102

Course Type: Core (Practical)	Course Details: AECC-2			L-T-P: 0 - 0 - 4	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		60	----	40	----

Computer fundamental and internet lab Practical **3x16 = 48**

1. Using basic DOS commands.
2. Using external DOS commands
3. Creating a email account
4. Using web browser for searching and surfing.
5. Creating and formatting a document in MS office
6. Using autocorrect, auto text and spell check operation in MS office.
7. Create tables in MS Word.
8. Inserting different kinds of object in MS word.
9. Use main merge options in MS office.
10. Create an Excel work sheet with following options rows and columns alignment.
11. Using excel formulas.
12. Create a graph with available data in MS excel.
13. Create a PPT presentation using auto content wizard.
14. Use Clip art animation effects and word art galleries in presentations.
15. Using transition and setting timings for slide show.
16. Use MS access to create data base and tables.

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Course Name: English Communication
Course Code: AECC103

Course Type: Core (Theoretical)	Course Details: AECC-3			L-T-P: 3 - 0 - 0	
Credit: 3	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		….	30	….	70

Course Learning Outcomes:

1. Students will realize the significance of English for their career progression
2. Benchmarking the students in the first semester to observe their progression in terms of LSRW
3. Students will be able to understand distinct sounds and improve pronunciation
4. Students will improve their English vocabulary of daily usage
5. Students will be able to form simple sentences to talk about themselves, friends and relatives.
6. Students will be able to imbibe the pre-requisites of personality development.

Module -1: Introduction to English language (7 Lectures)

a) Role and significance of English language in the present scenario
b) English Language: Its relevance for the Indian industry
c) Introduction to Listening, Speaking, Reading, Writing (LSRW) and benchmarking of the class

[Note: As part of classroom activity, a guest lecture from an industry representative/Director (CRC) and maintaining progress card for each student on LSRW for future reference]

Module -2: Phonetics& Functional Grammar (7 Lectures)

a) Pronunciation and daily usage correction (speak with differences between p/b, s/sh, f/ph, t/d, v/w sounds)

b) Parts of speech, articles, tenses, verbs and modals
c) Practice of daily use words, numerals and tongue twisters
d) Vocabulary building, Construction of simple sentences: Basic sentence pattern, subject and Predicate
[Note: As part of classroom activity, language games, tongue & jaw exercises, simple passages from the newspapers for oral drills in the classroom and practice tests (written and oral)]

Module -3: English Communication- About Myself (7 Lectures)
a) Let's talk, making conversation, meeting and greeting
b) Introducing myself, my family and my friends
c) My opinions, my likes and dislikes
d) Life at college, hostel and workplace
[Note: As part of classroom activity, use the Work book for reference for classroom and home assignments, carry out practice tests (written and oral)]

Module -4: Basic Communication & Soft Skills (7 Lectures)
a) Reading comprehension
b) Building conversational skills
c) Verbal & Non-verbal communication
[Note: As part of classroom activity, review and recap the last semester and carry out (oral and written) practice test to update the progress card of each student, refer to the Workbook]

Module -5: Vocabulary: Building Blocks (7 Lectures)
a) Word Formation: Prefix, suffix, conversion and compounding
b) Homophones and one-word substitution
c) Words often confused and misused
d) Idiomatic phrase, Antonyms and Synonyms
[Note: As part of classroom activity, organise and learning language games, initiate the learning of 5 new words per class]

Module-6: English Communication: World around Me (6 Lectures)
a) Market place, Bus stop, Bank, Post Office
b) Village, Town and City
c) Eating out: Stall, Dhaba and Restaurant
[Note: As part of classroom activity, refer Work book for classroom and home assignments, carry out practice tests (written and oral)]

Module -7: Personality Development (7 Lectures)

a) First impression: Dressing sense, good manners, speaking well and respectably
b) Positive Attitude: Being happy and alert, a good listener and a good friend
c) Consultation among peers: Soliciting advice and giving advice
d) Goal setting, confidence building& handling rejection

[Note: As part of classroom activity, refer Work book for classroom and home assignments, carry out practice tests (written and oral)]

Reference Books:

ILFS Bi-lingual Course in Basic English, ILFS Skill Development Corporation
English Grammar Composition & Usage by J.C. Nesfield, Macmillan Publishers The Business letters by Madan Sood, Goodwill Publishing House, New Delhi
Communication Skills by Sanjay Kumar &Pushpalata, Oxford University Press

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Semester II

Course Code	Course Name	L - T - P	Credits	Total Marks
BPTC201	Applied Human Anatomy and Physiology	4-0-0	4	100
BPTC202	Applied Human Anatomy and Physiology Practical	0-0-4	2	100
BPTC203	Sociology	4-0-0	4	100
BPTC204	Basics of Biomechanics	4-0-0	4	100
BPTC205	Basics of Biomechanics Practical	0-0-4	2	100
GEC-1	Generic Elective	4-0-0	4	100
AEE201	Environmental Studies	4-0-0	4	100
TOTAL			**24**	**700**

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Course Name: Applied Human Anatomy and Physiology
Course Code: BPTC201

Course Type: Core (Theoretical)	Course Details: CC-7			L-T-P: 4 - 0 - 0	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		….	30	….	70

Course Learning Outcomes:
1. Comprehend the normal disposition, inter-relationships, gross, functional and applied anatomy of various structures in the human body.
2. Identify the microscopic structures of various tissues, and organs in the human body and correlate the structure with the functions.
3. Comprehend the basic structure and connections between the various parts of the central nervous system so as to analyze the integrative and regulative functions on the organs and systems.

Module	Topics	Contact Lectures
Module 1	**Trunk-thorax & abdomen** 1. **Osteology** – Vertebral columns: Identify the parts of typical vertebra and state the main features, attachments and ossification. – Intervertebral disc and mention its part. – Ribs: Parts and main features of typical rib and define true, false and floating ribs. – Sternum: State the parts and anatomical features. 2. **Myology**	**16**

	– Fascia and muscles of back – Fascia and muscles connecting Upper Limb with vertebral column: origin, insertion, nerve supply and action. – Intercostal muscles and diaphragm: origin, insertion, nerve supply and action. – List layers of anterior abdominal wall and mention its origin, insertion, nerve supply and action of these muscles. – Fascia and muscles of posterior abdominal wall: origin, insertion, nerve supply and action. 3. **Joints of Thorax** Identify the various joints and explain in detail: – Manubriosternal joint – Costo vertebral joint – Costo transverse joint – Costo Chondral joint – Chondro sternal joints – Inter vertebral joint – Movements of vertebral column – Respiratory movements • Mention the course and branches and nerves, blood vessels and lymphatic drainage of trunk-thorax-abdomen. • Lumbar Plexus: Position, formation and branches. • Rectus sheath: formation and contents. • Contents of vertebral canal	

	• Intercostal space and its contents • Diaphragm-structures passing through it. • Applied Anatomy of structures of trunk – thorax – abdomen	
Module 2	Lower Extremity- Osteology: Hip bone, femur, tibia, fibula, patella, tarsals, metatarsals and phalanges. Soft parts: Gluteal region, front and back of the thigh (Femoral triangle, femoral canal and inguinal canal), medial side of the thigh (Adductor canal), lateral side of thethigh,poplitealfossa,anteriorandposteriorcompartmentofleg,soleofthe foot, lymphatic drainage of lower limb, venous drainage of the lower limb, arterial supply of the lower limb, arches of foot, skin of foot. Joints: Hip Joint, Knee joint, Ankle joint, joints of the foot.	6
Module 3	Neuro Anatomy: Organization of Central Nervous system - Spinal nerves and autonomic nervous system mainly pertaining to cardiovascular, respiratory and urogenital system	4
Module 4	Neuromuscular Physiology- 1. Cell Membrane: Ionic and potential gradient and transport 2. Muscle: Types of Muscular tissue, gross and microscopic structure, function, Basis of muscle contraction, changes in muscle contraction. Electrical – Biphasic and Monophasic action potentials, chemical, thermal and physical changes, Isometric and Isotonic contraction, Motor units and its properties – clonus, tetanus, all or none law, fatigue 3. Nerve: Gross and microscopic structure of nervous tissue 4. Neuromuscular transmission, Types of nerve fibers. 5. Action potential, Strength-duration curve, ECG, EMG, VEP, NCV 6. Degeneration and regeneration of nerve, Reactions of generations. 7. Synaptic transmission, Stretch reflex- Mechanism and factors affecting.	6
Module 5	Physiology of exercise– 1. Effects of acute and chronic exercise on i. O2transport ii. Muscle strength/power/endurance	6

	iii. B.M.R. /R.Q. iv. Hormonal and metabolic effect v. Cardiovascular system vi. Respiratory system vii. Body fluids and electrolyte 2. Effect of gravity / altitude /acceleration / pressure on physical parameters 3. Physiology of Age **4. environmental factors in exercises**	
Module 6	Pulmonary Functions 1. Properties of gases, Mechanics of respiration, Diffusion capacity, special features of pulmonary circulation and their application. 2. Respiratory adjustments in exercises. 3. Artificial respiration Breath sounds.	4
Module 7	Cardio vascular Functions- 1. Blood flow through arteries, arterioles, capillaries, veins and venules. 2. Circulation of Lymph, Oedema 3. Factors affecting cardiac output. 4. Circulatory adjustment in exercise and in postural and gravitational changes, 5. Pathophysiology of fainting and heart failure	6
	Total Number of Hours	**48**

Text Books:-

3. Sujit K. Chaudhuri, Concise Medical Physiology, 6th edition, New Central Book Agency, Kolkata, 2008
4. B.D. CHAURASIA: Handbook of General Anatomy, 2nd Ed., CBS Publishers and Distributors, New Delhi - 110 032.

Reference Books:-

3. PETER L. WILLIAMS AND ROGER WARWICK: - Gray's Anatomy - Descriptive and Applied, 36th Ed., 1980, ChurchillLivingstone.
4. R. KANAGASUNTHARAM, P. SIVANANDA-SINGHAM & A. KRISHNAMURTI: Anatomy- Regional, Functional, & Clinical, P.G. Publisher, Singapore1987.
5. AK Khurana, Indu Khurana: Anatomy and Physiology, Second edition,CBS Publishers, New Delhi,2006

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Course Name: Applied Human Anatomy and Physiology Practical
Course Code: BPTC202

Course Type: Core (Practical)	Course Details: CC-8			L-T-P: 0 - 0 - 4	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		60	----	40	----

Course Learning Outcomes:

6. Utilize compound microscope to perform microscopic study of epithelial, connective, muscular and nervous tissue.
7. Identify axial and appendicular bones of human body.
8. Practice use of Hemocytometer for enumeration of white blood cell (WBC) and red blood corpuscles (RBC).
9. Estimate bleeding time, clotting time, hemoglobin content and erythrocyte sedimentation rate (ESR).

Module	Topics	No. of Practical D + P*
Module 1	Upper extremity including surface Anatomy.	2+2
Module 2	Lower extremity including surface Anatomy.	2+2
Module 3	Head & Spinal cord and Neck and Brain including surface Anatomy.	2+2
Module 4	Thorax including surface anatomy, abdominal muscles.	2+2
Module 5	Histology-Elementary tissue including surface Anatomy.	2+2
Module 6	Embryology-models, charts &X-rays.	2+2
Module 7	Reflexes – Superficial and Deep Sensations	2+2
Module 8	Tests for functions of Cerebrum.	2+2
Module 9	Tests for functions of Cerebellum.	2+2
Module 10	Examination of cranial nerves	2+2
Module 11	Examination of Motor System	2+2
Module 12	Examination of Sensory system	1+1

Module 13	espiratory rate and Auscultation.	1+1
		Total Number of Hours= 48

*** D - Demonstration & P - Practice**

Text Books:-

1. Sujit K. Chaudhuri, Concise Medical Physiology, 6th edition, New Central Book Agency, Kolkata, 2008
2. B.D. CHAURASIA: Handbook of General Anatomy, 2nd Ed., CBS Publishers and Distributors, New Delhi - 110 032.

Reference Books:-

6. PETER L. WILLIAMS AND ROGER WARWICK: - Gray's Anatomy - Descriptive and Applied, 36th Ed., 1980, ChurchillLivingstone.
7. R. KANAGASUNTHARAM, P. SIVANANDA-SINGHAM & A. KRISHNAMURTI: Anatomy- Regional, Functional, & Clinical, P.G. Publisher, Singapore1987.
8. AK Khurana, Indu Khurana: Anatomy and Physiology of Eye, Second edition, CBS Publishers, New Delhi,2006

Course Name: Sociology
Course Code: BPTC203

Course Type: Core (Theoretical)	Course Details: CC-9			L-T-P: 4 - 0 - 0	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		….	30	….	70

Course Learning Outcomes:

- Explain the sociological perspective, broadly defined; use sociological theory to explain social problems and issues; make theoretically informed recommendations to address current social problems; and demonstrate the utility of the sociological perspective for their lives.
- Demonstrate the ability to interpret, locate, evaluate, generate, and use

sociologically relevant data to test hypotheses and draw evidence-based conclusions.

Module	Topics	Contact Hours
Module 1	Introduction: Meaning- Definition and scope of sociology Its relation to Anthropology, Psychology, Social Psychology. Methods of Sociological investigations- Case study, social survey, questionnaire, Interview and opinion poll methods. Importance of its study with special reference to Health Care Professionals.	6
Module 2	Sociology and Health , Social factors affecting health status	6
Module 3	Family: The family, meaning definition. Functions of types of family Changing family patterns 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.	6
Module 4	Community: Rural community: Meaning and features –Health hazards of realities, health hazards to tribal community. Urban community: Meaning and features- Health hazards of urbanities.	6
Module 5	Culture and Health: Concept of Health Concept of Culture Culture and Health Culture and Health Disorders	6
Module 6	Social Problems of disabled: Consequences of the following social problems in relation to sickness and disability, remedies to prevent these problems. Population explosion Poverty and unemployment Beggary Juvenile delinquency Prostitution Alcoholism Problems of women unemployment Geriatric problems Problems of underprivileged.	6
Module 7	ɔcial security: Definition	6

Module 8	Social worker: Meaning of Social Work The role of a Medical Social Worker	6
	Total Number of Hours	**48**

Text Books:-

1. Medical Sociology (william c cockerham) 14th edition.

Reference Books:-

1. Handbook of medical Sociology (by jaypee publication)

Course Name: Basics of Biomechanics
Course Code: BPTC204

Course Type: Core (Theoretical)	Course Details: CC-10		L-T-P: 4 - 0 - 0	
Credit: 4	Full Marks: 100	CA Marks	ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		….	30	….	70

Course Learning Outcomes:

1) Describe the biological, mechanical, and neurological mechanisms by which muscles produce movement
2) Identify and use engineering tools that are used to study movement
3) Write and solve equations of motion for simple models of human movement
4) Apply biomechanics principles to “real-world” clinical and biomechanical research.

Module	Topics	Contact Lectures
Module 1	Basic Concepts of Biomechanics, **Kinematics:** Description of Motion, Types of Motion, Location of	3

	Motion, Direction and Magnitude of Motion **Kinetics:** Analysis of Forces, Definition, Force of Gravity, Reaction of Forces, Equilibrium, Objects in Motion, Force of Friction, Concurrent Force Systems, Parallel Force Systems, Work, Moment arm of Force, Force Components, Equilibrium of Levers	
Module 2	**Joint Structure and Function**: Joint Design, Specific connective tissue structures, General Properties of Connective Tissue, Human Joint Design, Kinematic Chains, Arthrokinematics and Oste kinematics	5
Module 3	**Muscle Structure and Function**: Mobility and Stability Functions of Muscles, Elements of Muscle Structure, Muscle Function, Effects of Immobilization, Injury and Aging on Muscle Tissues	5
Module 4	**Biomechanics of Vertebral Column:** General structure and Function (Region wise), Mobility and Stability of Vertebral Column, Muscles of the Vertebral Column, Biomechanics pelvic girdle,	5
Module 5	**Biomechanics of Shoulder Complex:** Components of shoulder complex, Integrated Function of Shoulder Complex, Mobility and Stability of Shoulder Complex,	5
Module 6	**Biomechanics of Elbow Complex:** Structure and function of the Elbow Complex, Structure and Function of the superior and inferior Radio-ulnar Joints, Mobility and Stability of Elbow Complex,	5
Module 7	**Biomechanics of the Wrist and Hand Complex:** Structural components of the Wrist complex, function, structure and function of the Hand Complex, Finger Musculature, Functional Position of the Wrist and Hand	5
Module 8	**Biomechanics of Temporomandibular Joint**	5
	Biomechanics of the Hip Complex: Structure and Function of the Hip Joint, Arthrokinematics and Oste kinematics, Hip Joint Musculature, Stability, Muscle Function in Bilateral and Single leg Stance, Trabecular System,	5

Module 9	**Biomechanics of the Knee Complex:** Structure and Function of the Tibiofemoral Joint, Static and Dynamic stability of Tibiofemoral Joint, Structure and Function of the Patellofemoral Joint, Stability of Patella,	5
Module 10	**Biomechanics of the Ankle Complex:** Kinematics and Kinetics of the Tibiotalar Joint, Stability of the Ankle Joint, Arch of foot,	5
	Total Number of Hours	**48**

Text book:

1. Joint Structure and Function: A Comprehensive Analysis, Pamela K. Levangie Cynthia C. Norkin
2. Basics Of Biomechanics, January 2010, Bahl Ajay

Reference Book-

1. Basics Of Biomechanics, January 2010, Bahl Ajay
2. Joint structure & function, Cynthia norkins, FA Davis

Course Name: Basics of Biomechanics Practical
Course Code: BPTC205

Course Type: Core (Practical)	Course Details: CC-11			L-T-P: 0 - 0 - 4	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		60	----	40	----

Course Learning Outcomes:

8. Describe the biological, mechanical, and neurological mechanisms by which muscles produce movement
9. Identify and use engineering tools that are used to study movement

10. Write and solve equations of motion for simple models of human movement
11. Apply biomechanics principles to "real-world" clinical and biomechanical research.

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Module	Topics	Contact Lectures
Module 1	**Joint Structure and Function**: Joint Design, Specific connective tissue structures, General Properties of Connective Tissue, Human Joint Design, Kinematic Chains, Arthrokinematics and Oste kinematics	6
Module 2	**Muscle Structure and Function**: Mobility and Stability Functions of Muscles, Elements of Muscle Structure, Muscle Function, Effects of Immobilization, Injury and Aging on Muscle Tissues	6
Module 3	**Biomechanics of Vertebral Column:** General structure and Function (Region wise), Mobility and Stability of Vertebral Column, Muscles of the Vertebral Column, Biomechanics pelvic girdle,	6
Module 4	**Biomechanics of Shoulder Complex:** Components of shoulder complex, Integrated Function of Shoulder Complex, Mobility and Stability of Shoulder Complex,	6
Module 5	**Biomechanics of Elbow Complex:** Structure and function of the Elbow Complex, Structure and Function of the superior and inferior Radio-ulnar Joints, Mobility and Stability of Elbow Complex,	6
Module 6	**Biomechanics of the Wrist and Hand Complex:** Structural components of the Wrist complex, function, structure and function of the Hand Complex, Finger Musculature, Functional Position of the Wrist and Hand	6
Module 7	**Biomechanics of the Knee Complex:** Structure and Function of the Tibiofemoral Joint, Static and Dynamic stability of Tibiofemoral Joint, Structure and Function of the Patellofemoral Joint, Stability of Patella,	6
Module 8	**Biomechanics of the Ankle Complex:** Kinematics and Kinetics of the Tibiotalar Joint, Stability of the Ankle Joint, Arch of foot,	6
	Total Number of Hours	**48**

Text book:

1. Joint Structure and Function: A Comprehensive Analysis, Pamela K. Levangie Cynthia C. Norkin
2. Basics Of Biomechanics, January 2010, Bahl Ajay

Reference Book-

3. Basics Of Biomechanics, January 2010, Bahl Ajay
4. Joint structure & function, Cynthia norkins, FA Davis

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Semester III

Course Code	Course Name	L - T - P	Credits	Total Marks
BPTC301	Pathology and Microbiology	4-0-0	4	100
BPTC302	Physiotherapy Law and Ethics	4-0-0	4	100
BPTC303	Pharmacology	4-0-0	4	100
BPTC304	Applied Biomechanics	3-1-0	4	100
BPTC305	Applied Biomechanics Practical	0-0-4	2	100
GE-2	Generic Elective	4-0-0	4	100
TOTAL			**22**	**600**

Semester- III

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Course Name: Pathology and Microbiology
Course Code: BPTC301

Course Type: Core (Theoretical)	Course Details: CC-12			L-T-P: 4 - 0 - 0	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		….	30	….	70

Course Learning Outcomes:

Module	Topics	Contact Hours
Module 1	An introduction to microbiology, Classification of microorganisms	4
Module 2	Infection – Types, source, portals of entry, spread.	4
Module 3	Prevention and control of infection, Disinfection and antiseptics Sterilization	4
Module 4	An outline of the following infectious diseases with respect to the causative organism, mode of transmission, pathogenesis, prevention, and diagnostic tests (details of the execution and interpretation of the tests not required) Chicken Pox, Measles, Mumps, Influenza, Diphtheria, Whooping Cough, Tetanus, Tuberculosis, Leprosy, Rubella, Cholera, Gastroenteritis, Food Poisoning, Hepatitis, AIDS, Typhoid, Rabies, STD, Ameobiasis, Kalaazar, Malaria, Filaria	6
Module 5	Basic principles of immunity immunobiology: lymphoid organs and tissues. Antigen, Antibodies, antigen and antibody reactions with relevance to pathogenesis and serologicaldiagnosis. Humoral immunity and its role in immunity Cell mediated immunity and its role in immunity. Imunology of hypersensitivity, Measuring immunefunctions.	6
Module 6	**General Pathology** Aims and objectives of the study of pathology. Meaning of terms, etiology, pathogenesis and lesions 2. Causes of disease and cell injury – features of cell injury, mechanism of cell injury – hypoxia, free radical injury. Necrosis and gangrene 3. Inflammation- definition, events of acute inflammation, chemical mediator of inflammation, morphological types of acute inflammation, chronic inflammation, difference between acute and chronic inflammation 4. Repair –primary healing, secondary healing, factors affecting healing and repair healing of skin, muscle and bone.	8

Module 7	A brief outline of etiology, pathogenesis and general features of disease of the following systems Systemic pathology 1. Joints Disorders: Arthritis- types and their features. 2. Bone Disorders:Osteoporosis, Paget's disease, Osteogenesis Imperfecta, Osteomylitis, tumors–Osteosarcoma, Chonrosarcoma, Ewings sarcoma, Multiple myeloma (a brief outline only) 3. Muscles:Muscular dystrophy, Myasthenia gravis 4. Nervous System:Meningitis, encephalitis, vascular diseases of brain, poliomyelitis, nerve injuries 5. RespiratorySystem- Pneumonia, Bronchitis, Bronchiectasis, Asthma, Tuberculosis, Carcinoma of lungs, Occupational lungdiseases 6. Cardio vascular Pathology- Congenital Heart disease: Atrial septal defect, Ventricular septal defect, Fallot's tetralogy, Patent ductusarteriosus. Endocarditis. Rheumatic Heart disease. Vascular diseases: Atherosclerosis, monckeberg's medial calcification, Aneurysm and Arteritis and tumours of Blood vessels. Ischemic heart Disease: Myocardial infarction. Hypertension and hypertensive heart Disease. 7. Hematology- Disorders of RBC, WBC and platelets, Anemia types and pathogenesis	16
	Total Number of Hours	**48**

Text Book- 1. Textbook of Microbiology- Chakraborty, P. - NCB, Calcutta

Refrence Book-

1.Ananth Narayan, R.- Text Book of Microbiology- Orient Longman, Madras
2. Microbiology for Physiotherapy Students-"B S Nagoba"(2008)
3.Textbook of microbiology :ananthanarayan and paniker 7th edition
4.Textbook of Pathology 7th Edition by Harsh Mohan, Jaypee Brothers Medical Publishers
5.Robbins Basic Pathology,10th Edition

Course Name: Physiotherapy Law and Ethics

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Course Code: BPTC302

Course Type: Core (Practical)	Course Details: CC-13			L-T-P: 4 - 0 - 0	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		----	70	----	30

Course Learning Outcomes:

10. Utilize compound microscope to perform microscopic study of epithelial, connective, muscular and nervous tissue.
11. Identify axial and appendicular bones of human body.
12. Practice use of Hemocytometer for enumeration of white blood cell (WBC) and red blood corpuscles (RBC).
13. Estimate bleeding time, clotting time, hemoglobin content and erythrocyte sedimentation rate (ESR).

Module	Topics	Contact Hours
Module 1	Medical ethics versus medical law - Definition - Goal -Scope	3
Module 2	Introduction to Code of conduct	3
Module 3	Basic principles of medical ethics –Confidentiality	3
Module 4	Malpractice and negligence - Rational and irrational drug therapy	3
Module 5	Autonomy and informed consent - Right of patients	3
Module 6	Care of the terminally ill-Euthanasia	3
Module 7	Organ transplantation	3
Module 8	Medical diagnosis versus physiotherapy diagnosis.	3
Module 9	Medico legal aspects of medical records – Medico legal case and type- Records and document related to MLC - ownership of medical records - Confidentiality Privilege communication -	3
Module 10	Professional Indemnity insurance policy	3
Module 11	Development of standardized protocol to avoid near miss or sentinelevents	3

Module 12	Obtaining an informed consent.	3
Module 13	Biomedical ethical principles	3
Module 14	Code of ethics for physiotherapists	3
Module 15	Ethics documents for physiotherapists	3
Module 16	Laws affecting physiotherapy practice	3
	Total Number of Hours= 48	

Text Books:
Physical Therapy Ethics 2nd edition by Gabard & Martin, F.A Davis

Course Name: Pharmacology
Course Code: BPTC303

Course Type: Core (Theoretical)	Course Details: CC-14			L-T-P: 4 - 0 - 0	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		….	30	….	70

Course Learning Outcomes:

Module	Topics	Contact Hours
Module 1	Nature & Sources of drug. Routes of drug administration (general & Ocular). New drug delivery systems. Absorption & Bio availability of a drug. Distribution of a drug. Fate of a drug. Drug excretion & toxicity. Pharmacokinetics of drugs.	8
Module 2	Drug action→ site of drug action, structure activity relationship. Drug receptor. Mechanism of action of a drug. Dose response relationship. Adverse drugs reactions (ADR) in man, Manifestations of ADR. Treatment of Acute drug poisoning. Factors influencing drug metabolism & drug action. Classification of drugs.	6

Module 3	Drugs acting on CNS/PNS Anesthetics, alcohols, alkaloids, narcotics, analgesics, antipyretics, sedatives, stimulants & psychotherapeutics.	4
Module 4	Drugs acting on C.V.S Drugs acting on respiratory system. Drugs acting on G.l.System.	6
Module 5	Antibiotics & chemotherapeutic agents	4
Module 6	Hormones and drugs affecting endocrine functions.	4
Module 7	Immunonodulators	4
Module 8	Vitamin D, Calcium, Iron, Blood related diseases	4
Module 9	Heavy metals & antagonists.	4
Module 10	Drugs acting on Muscles, Muscles relaxants.	4
	Total Number of Hours	**48**

Text Books:-

5. Pharmacology for Physiotherapist by KV Ramesh, Jaypee Publishers.
6. Essentials of Medical Pharmacology Book by KD Tripathi

Reference Books:-

1. Pharmacology For Physiotherapy Students 3rd Edition 2017 by Uday kumar Padmaja, Jaypee Brothers Medical Publishers

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Course Name: Applied Biomechanics
Course Code: BPTC304

Course Type: Core (Theoretical)	Course Details: CC-15			L-T-P: 4 - 0 - 0	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		….	30	….	70

Course Learning Outcomes:

1) Describe the biological, mechanical, and neurological mechanisms by which muscles

produce movement
2) Identify and use engineering tools that are used to study movement
3) Write and solve equations of motion for simple models of human movement
4) Apply biomechanics principles to "real-world" clinical and biomechanical research.

Module	Topics	Contact Hours
Module 1	Biomechanics of Gait: Kinematics of Gait, Phases, Spatiotemporal Parameters of Gait, Determinants of Gait, Energy requirements, Kinetics of Gait, External and Internal Forces, Kinetics and Kinematics of the Trunk and Upper Extremities, Stair climbing gait, Effect of age, Gender, Assistive Devices, Disease States, Muscle pathology, Malalignments, Injuries and limb length discrepancies on Human Gait	6
Module 2	Posture: Static and Dynamic Posture, Major Goals and basic elements of Postural control, Kinetics and Kinematics of Posture, Inertial and Gravitational Forces, Ground Reaction Forces, Optimal or Ideal Posture, Biomechanics analysis of Posture in all planes, Effect of Age, Pregnancy, and Pathology on Posture	6
Module 3	General effects of injury and disease on joint functioning • Brief surgical anatomy (structural components, and alignment) • Joint range of motion, axis and plane of motion • Joint movements, mobility and stability, restrictions and limitations, end feels	6
Module 4	Abnormal deviations in joints in disease and injury of the following joint complexes: Shoulder joint complex Elbow joint complex	6
Module 5	General effects of injury and disease on joint functioning • Brief surgical anatomy (structural components, and alignment) • Joint range of motion, axis and plane of motion • Joint movements, mobility and stability, restrictions and limitations, end feels • Abnormal deviations in joints in disease and injury • Weight distribution (lower limb joints) Of the following joint complexes: _ Wrist and hand complex _ Hip joint complex _ Knee joint complex: _ Ankle-foot complex:	6

	_ Vertebral column	
Module 6	Abnormal Posture: 1. Definition and description. 2. Analysis of postures (anterior, lateral and posterior), alignment of joints in different postural deviations. 3. Abnormal postures – biomechanical analysis and effects. 4. Principles of Postural correction	6
Module 7	Pathological Gait: 1. Phases of gait – biomechanical analysis.	6
Module 8	Time and distance parameters – biomechanical significance. 3. Joint motion – chains of movement 4. Effects of pain, deformity, weakness in pathological gaits 5. Management of pathological gaits.	6
	Total Number of Hours	**48**

Text book:

3. Joint Structure and Function: A Comprehensive Analysis, Pamela K. Levangie Cynthia C. Norkin
4. Basics Of Biomechanics, January 2010, Bahl Ajay

Reference Book-

5. Basics Of Biomechanics, January 2010, Bahl Ajay
6. Joint structure & function, Cynthia norkins, FA Davis

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Course Name: Applied Biomechanics Practical
Course Code: BPTC305

Course Type: Core (Practical)	Course Details: CC-16			L-T-P: 0 - 0 - 4	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		60	----	40	----

Course Learning Outcomes:

12. Describe the biological, mechanical, and neurological mechanisms by which musclesproduce movement
13. Identify and use engineering tools that are used to study movement
14. Write and solve equations of motion for simple models of human movement
15. Apply biomechanics principles to "real-world" clinical and biomechanical research.

.

Module	Topics	Contact Hours
Module 1	General effects of injury and disease on joint functioning • Brief surgical anatomy (structural components, and alignment) • Joint range of motion, axis and plane of motion • Joint movements, mobility and stability, restrictions and limitations, end feels • Abnormal deviations in joints in disease and injury • Weight distribution (lower limb joints) Of the following joint complexes: _ Wrist and hand complex _ Hip joint complex _ Knee joint complex: _ Ankle-foot complex: _ Vertebral column	18
Module 2	Abnormal Posture: 1. Definition and description. 2. Analysis of postures (anterior, lateral and posterior), alignment of joints in different postural deviations. 3. Abnormal postures – biomechanical analysis and effects. 4. Principles of Postural correction	12
Module 3	Pathological Gait:	6

	1. Phases of gait – biomechanical analysis.	
Module 4	Time and distance parameters – biomechanical significance. 3. Joint motion – chains of movement 4. Effects of pain, deformity, weakness in pathological gaits 5. Management of pathological gaits.	6
Module 5	Abnormal deviations in joints in disease and injury of the following joint complexes: Shoulder joint complex Elbow joint complex	6
	Total Number of Hours	**48**

Text book:

3. Joint Structure and Function: A Comprehensive Analysis, Pamela K. Levangie Cynthia C. Norkin
4. Basics Of Biomechanics, January 2010, Bahl Ajay

Reference Book-

7. Basics Of Biomechanics, January 2010, Bahl Ajay
8. Joint structure & function, Cynthia norkins, FA Davis

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Semester –IV

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC401	Fundamental of Exercise Therapy	4-0-0	4	100

Module	Topics	Contact Lectures
Module 1	**Introduction to Exercise Therapy** - The aims of Exercise Therapy, The techniques of Exercise Therapy, Approach to patient's problems, Assessment of patient's condition – Measurements of Vital parameters, Starting Positions – Fundamental positions & derived Positions, Planning of Treatment	4
Module 2	Methods of Testing Functional tests Measurement of Joint range: ROM-Definition, Normal ROM for all peripheral joints & spine, Goniometer-parts, types, principles, uses, Limitations of goniometry, Techniques for measurement of ROM for all peripheral joints Tests for neuromuscular efficiency- Electrical tests, Manual Muscle Testing: Introduction to MMT, Principles & Aims, Indications & Limitations, Techniques of MMT for group & individual: Techniques of MMT for upper limb / Techniques of MMT for lower limb / Techniques of MMT for spine. Anthropometric Measurements: Muscle girth – biceps, triceps, forearm, quadriceps, calf Static power Test, Dynamic power Test, Endurance test, Speed test Tests for-ordination Tests for sensation Pulmonary Function tests Measurement of Limb Length: true limb length, apparent limb length, segmental limb length Measurement of the angle of Pelvic inclination	6
Module 3	Relaxation- Definitions: Muscle Tone, Postural tone, Voluntary Movement, Degrees of relaxation, Pathologicaltensioninmuscle,Stressmechanics,typesofstresses,Effectsofstresson the body mechanism, Indications of relaxation, Methods & techniques of relaxation- Principles & uses: General, Local, Jacobson's, Mitchel's, additional methods.	6

Module 4	Passive Movements- Causes of immobility, Classification of Passive movements, Specific definitions related to passive movements, Principles of giving passive movements, Indications, contraindications, effects of uses, Techniques of giving passive movements.	10
Module 5	Free exercise: Classification, principles, techniques, indications, contraindications, effects and uses	6
Module 6	Active Assisted Exercise: principles, techniques, indications, contraindications, effects and uses Assisted-Resisted Exercise: principles, techniques, indications, contraindications, effects and uses Resisted Exercise: Definition, principles, indications, contraindications, precautions & techniques, effects and uses	8
Module 7	Types of resisted exercises: Manual and Mechanical resistance exercise, Isometric exercise, Dynamic exercise: Concentric and Eccentric, Dynamic exercise: Constant versus variable resistance, Isokinetic exercise, Open-Chain and Closed-Chainexercise.	4
Module 8	History and Classification of Massage Technique Principles, Indications and Contraindications	4
	Total Number of Hours	**48**

Text Book:
1.THE PRINCIPLES OF EXERCISE THERAPY 4ED (2005) M.DEENA GARDINER
2.Textbook of Therapeutic Exercises by Narayanan S Lakshmi, Jaypee Brothers,
3. Therapeutic Exercise Foundation and Techniques- Krishna carolina, Jaypee publication
4.Practical Exercise Therapy by Margaret Hollis

Reference Book: Textbook Of Therapeutic Exercises, January 2005, S. Lakshmi Narayanan ,Jaypee

Course Code	**Course Name**	**L -T -P**	**Credits**	**Total Marks**
BPTC402	Fundamental Exercise therapy Practical	0-0-4	2	100

Module	**Topics**	**Contact Practicals D+P***
Module 1	Different test methods, Demonstrate relaxation techniques. Demonstrate to apply the technique of passive movements	2+2

	Demonstrate various techniques of Active movements Demonstrate massage technique application according to body parts	
Module 2	To practice the entire soft tissue manipulative techniques region wise – upper limb, lower limb, neck, back and face.	3+3
Module 3	To practice the measurement of ROM of joints – upper limb, lower limb & trunk.	2+2
Module 4	To practice the grading of muscle strength region wise – upper limb, lower limb and trunk.	3+3
Module 5	To study the position of joints, muscle work, and stability of various fundamental and derived positions.	4+4
Module 6	To study the different types of muscle contraction, muscle work, group action of muscles and coordinated movements.	3+3
Module 7	To practice the various types of suspension therapy and its application on various parts of body – region wise.	3+3
Module 8	To study & practice local & general relaxation techniques.	2+2
Module 9	To study the structure & function along with application of various equipment in a Gymnasium.	2+2
	Total Number of Hours	**48**

D- Demonstration + P - Practical

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC 403	Fundamental of Electro Therapy	4-0-0	4	100

Module	Topics	Contact Lectures
Module 1	Structure of atom, molecules, elements and compound	2
Module 2	Electricity:Definitionandtypes.Therapeuticuses.Basicphysicsofconstruction	4

Module 3	Importance of currents in treatment.	4
Module 4	Static Electricity: Production of electric charge. Characteristic of a charged body. Characteristics of lines of forces. Potential energy and factors on which it depends. Potential difference and EMF.	4
Module 5	Current Electricity: Units of Electricity: farad, Volt, Ampere, Coulomb, Watt Condensers: Definition, principle, Types- construction and working, capacity &uses. Magnetism: Definition. Properties of magnets. Electromagnetic induction. Transmission by contact. Magnetic field and magnetic forces. Magnetic effects of an electric field. Conductors, Insulators, Potential difference, Resistance and intensity Ohm's law and its application to DC and AC currents. Fuse: construction, working and application. Transmission of electrical energy through solids, liquids, gases and vacuum. Rectifying Devices-Thermionic valves, Semiconductors, Valves-Principle working-condenser-principle-Details of charging and discharging, etc. Transistors, measurement of current intensity, EMS and power-moving coil millimeter and voltmeter. Transistors, Amplifiers, transducer and Oscillator circuits. Display devices and indicators-analogue and digital. Transformer: Definition, Types, Principle, Construction, Eddy current, working uses Chokes: Principle, Construction and working, Uses	6
Module 7	Electrical supply: Brief outline of main supply of electric current. Dangers – short circuits, electric shocks. Precautions – safety devices, earthling, fuses etc. First aid & initial management of electric shock.	4
Module 8	Low Frequency Currents: Introduction to direct, alternating & modified currents. Production of direct current – Physiological and therapeutic effects of constant current, anodal and cathodal Galvanism, Ionization and their application in various conditions. Iontophoresis – Principles of clinical application, indication, contraindication, precaution, operational skills of equipment & patient preparation. Modified direct current – various pulses, duration and frequency and their effect on Nerve and Muscle tissue. Production of interrupted and surged current & their effects Modified direct current – Physiological and therapeutic effects,	4

	principles of clinical application, indications, contra indications, precautions, operational skills of equipment & patient preparation. High Voltage Pulsed Galvanic Stimulation, Diadynamic Currents	
Module 9	**Transcutaneous Electrical Nerve Stimulations (TENS):** Types of Low Frequency, pulse widths, frequencies & intensities used as TENS applications. Theories of pain relief by TENS. Principle of clinical application effects & uses, indications, contraindications, precautions, operational skills of equipment & patient preparation.	4
Module 10	**Electrogenic membranes response**-chemo responsive electrogenic systems. Neuromuscular junction-synapse-muscle electrogenic electro physiology of C.N.S.	6
Module 11	**Electrical Reactions and Electro – diagnostic tests:** Electrical Stimuli and normal behavior of Nerve and muscle tissue. Types of lesion and development of reaction of degeneration. Faradic – Intermittent direct current test. S.D. Curve and its application. Chronaxie, Rheobase, F.G.Testetc	6
Module 12	**Infra red rays** – Wavelength, frequency, types & sources of IRR generation, techniques of irradiation, physiological & therapeutic effects, indications, contraindications, precautions, operational skills of equipment & patient preparation. **Ultraviolet rays (UVR):** Wavelength, frequency, types & sources of UVR generation, techniques of irradiation, physiological & therapeutic effects, indications, contraindications, precautions, operational skills of equipment & patient preparation. Dosimetry of UVR. **Superficial heat -** Paraffin wax bath, moist heat, electrical heating pads, Contrast bath, Whirl pool bath, Fluid therapy Mechanism of production. Mode of heat transfer. Physiological & therapeutic effects. Indications, contraindications, precautions, operational skills of equipment & patient preparation. **Cryotherapy**: Principles, Physiological effects, uses of Cold packs, Ice massage, Commercial Cold Packs, Ice Towels, Cold compression Units, Evaporating Sprays.	4
	Total Number of Hours	**48**

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Text book:
1. Electrotherapy Simplified by Basant kumar nanda, Jaypee publication,
2. Claytons electrotherapy by ForsterA, CBS,
3.Fundamentals of Electrotherapy and Biomedical Physics by Ashishkakkad
4.Electrotherapy: evidence-based practice by Tim Watson
5.Practical Electrotherapy : A Guide to Safe Application:Fox and Sharp
6.Electrotherapy Explained: Principles and Practice:Low and Reed

Reference Book: Textbook Of Electrotherapy , Jagmohan Singh,Jaypee

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC404	Fundamental of Electro therapy Practical	0-0-4	2	100

Module	Topics	Contact Practicals D+P*
Module 1	To study the basic operation of electric supply to the equipment & safety devices.	2+2
Module 2	To experience sensory and motor stimulation of nerves and muscles by various types of low frequency currents on self.	2+2
Module 3	To locate and stimulate different motor points region wise, including the upper & lower limb, trunk	2+2
Module 4	Therapeutic application of different low frequency currents Faradic foot bath, Faradism under pressure, Iontophoresis.	2+2
Module 5	To study the reactions of degeneration of nerves, to plot strength duration curves.	2+2
Module 6	1. To find chronaxie and Rheobase. 2. To study a hydrocollator unit, its operations and therapeutic application of Hot packs –region wise.	3+3
Module 7	To study the various types of Infrared lamps and their application to body region wise.	2+2
Module 8	To study a paraffin wax bath unit, its operation and different methods of application – region wise.	2+2
Module 9	To study the different types of Ultra violet units, their operation, assessment of test dose and application of U.V.R. – region wise.	3+3
Module 10	To study a TENS Stimulator, its operation and application – region wise.	2+2

Module 11	To study various forms of therapeutic cold application region wise including – ice, cold packs, vapocoolant sprays, etc.	2+2
	Total Number of Hours	**48**

D - Demonstration + P - Practical

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC405	General and Applied Psychology	4-0-0	4	100

Module	Topics	Contact Lectures
Module 1	**General Psychology:** Definition of Psychology. Science of mind, consciousness and behavior, Scope and branches of Psychology, Methods of Introspection, observation and experimentation. **Hereditary and Environment** Relative importance of heredity and environment, Physical characteristics intelligence and personality. **Learning** Types of learning Trial and error, Classical Learning Instrumental learning, Insight for learning **Memory** Steps of memory, Measurement of memory, Causes of forgetting (diff. types only), Concept of STM & LTM **Perceptual Process** Nature of perceptual process, Structural and functional factors in perception, Illusion and Hallucination **Emotion** Emotion and feeling, Physiological changes, Theories of emotion (James-Lange and Eonnon-Bird) **Motivation** Motive need and Drive, Types of motive: Physiological, Psychological and Social **Intelligence**	12

	Definitions: theory and assessment of I.Q. **Personality:** Definition, Types and measurement.	
Module 2	**Child Psychology** Concept of child Psychology - Meaning, nature, and subject matter of child Psychology, Practical importance of studying child Psychology for Physiotherapist or rehab team member Methods of studying child development, Baby Biography, Case History, Behavioural abnormalities	12
Module 3	**Industrial Psychology:** Human Engineering, Importance of human engineering, Development in human engineering, problems in human engineering Decision making process and steps indecision making, Individual decision making, decision making in organization Stress and mental health, causes and reaction to stress, job stress and its management Work culture, morals and reward of work discipline Guidance and counseling- different types of counseling, meaning types and objectives of counselor.	12
Module 4	**Rehabilitation Psychology**: Purpose of studying, Interpersonal relationships, Familial & Social relationships, acceptance about the disability – its outcome in relation to different diagnostic categories psychological aspects of multiple handicapped, contribution of psychology in Total Rehab. Specific Rehabilitation Program	12
	Total Number of Hours	**48**

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC406	Quality patient care and safety	4-0-0	4	100

Module	Topics	Contact Lectures
Module 1	Quality assurance and management – Concepts of Quality of Care Quality Improvement Approaches Standards and Norms Quality Improvement Tools Introduction to NABH guidelines	12
Module 2	Basics of emergency care and life support skills- Basic life support (BLS) Vital signs and primary assessment	12

	Basic emergency care – first aid and triage Ventilations including use of bag-valve-masks (BVMs) Choking, rescue breathing methods One- and Two-rescuer PR Using an AED (Automated external defibrillator). Managing an emergency including moving patients	
Module 3	Bio medical waste management and environment safety Definition of Biomedical Waste Waste minimization BMW – Segregation, collection, transportation, treatment and disposal (including color coding) Liquid BMW, Radioactive waste, Metals / Chemicals / Drugwaste BMW Management & methods of disinfection Modern technology for handling BMW Use of Personal protective equipment (PPE) Monitoring & controlling of cross infection (Protective devices)	12
Module 4	Infection prevention and control – Evidence-based infection control principles and practices [such as sterilization, disinfection, effective hand hygiene and use of Personal protective equipment (PPE)], Prevention & control of common healthcare associated infections, Components of an effective infection control program, and Guidelines (NABH and JCI) for Hospital Infection Control	12
	Total Number of Hours	**48**

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Semester - V

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC501	Applied exercise therapy	4-0-0	4	100

Module	Topics	Contact Hours
Module 1	**Specific exercise regimens** Isotonic: de Lormes, Oxford, MacQueen, Circiut weight training Isometric: BRIME (Brief Resisted Isometric Exercise), Multiple Angle Isometrics Isokinetic regimens	4
Module 2	**Proprioceptive NeuromuscularFacilitation** Definitions &goals Basic neurophysiologic principles of PNF: Muscular activity, Diagonals patterns of movement: upper limb, lowerlimb Procedure: components of PNF Techniques of facilitation Mobility: Contract relax, Hold relax, Rhythmic initiation Strengthening: Slow reversals, repeated contractions, timing for emphasis, rhythmic stabilization Stability: Alternating isometric, rhythmic stabilization Skill: timing for emphasis, resisted progression Endurance: slow reversals, agonist reversal	4
Module 3	**Suspension Therapy** Definition, principles, equipments& accessories, Indications & contraindications, Benefits of suspension therapy Types of suspension therapy: axial, vertical, pendular Techniques of suspension therapy for upper limb Techniques of suspension therapy for lower limb	4
	Joints-definition-classification, structure of fibrous, cartilaginous joints, blood supply and nerve supply ofjoints. Muscles – origin, insertion, nerve supply andactions.	
Module 4	Functional Re-education Lying to sitting: Activities on the Mat/Bed, Movement and stability at floor level; Sitting activities and gait; Lower limb and Upper limb activities.	4

Module 5	**Aerobic Exercise** Definition and key terms; Physiological response to aerobic exercise, Examination and evaluation of aerobic capacity – Exercise Testing, Determinants of an Exercise Program, The Exercise Program, Normal and abnormal response to acute aerobic exercise, Physiological changes that occur with training, Application of Principles of an Aerobic conditioning program for patients – types and phases of aerobic training.	4
Module 6	**Stretching** Definition of terms related to stretching; Tissue response towards immobilization and elongation, Determinants of stretching exercise, Effects of stretching, Inhibition and relaxation procedures, Precautions and contraindications of stretching, Techniques of stretching.	4
Module 7	**Manual Therapy & Peripheral Joint Mobilization** Schools of Manual Therapy, Principles, Grades, Indications and Contraindications, Effects and Uses – Maitland, Kaltenborn, Mulligan Biomechanical basis for mobilization, Effects of joint mobilsation, Indications and contraindications, Grades of mobilization, Principles of mobilization, Techniques of mobilization for upper limb, lower limb, Precautions.	4
Module 8	**Balance**– Definition Physiology of balance: contributions of sensory systems, processing sensory information, generating motor output Components of balance (sensory, musculoskeletal, biomechanical) Causes of impaired balance, Examination & evaluation of impaired balance, Activities for treating impaired balance: mode, posture, movement, Precautions & contraindications, TypesBalance retraining.	4
Module 9	**Co-ordination Exercise** Anatomy & Physiology of cerebellum with its pathways Definitions: Co-ordination, Inco-ordination Causes for Inco-ordination, Test for co-ordination: equilibrium test, non-equilibrium test Principles of co-ordination exercise. Frenkel's Exercise: uses of Frenkel'sexercise technique of Frenkel's exercise, progression, home exercise.	4

Module 10	**Posture:** Definition, Active and Inactive Postures, Postural Mechanism, Patterns of Posture, Principles of re-education: corrective methods and techniques, Patient education. **Walking Aids:** Types: Crutches, Canes, Frames; Principles and training with walking aids	4
Module 11	**Basics in Manual Therapy & Applications with Clinical reasoning** **Examination of joint integrity** Contractile tissues Non contractile tissues **Mobility** - assessment of accessory movement & End feel **Assessment of articular & extra-articular soft tissue status** Myofascial assessment Acute & Chronic muscle hold Tightness Pain-original & referred **Basic principles, Indications & Contra-Indications of mobilization skills for joints & soft tissues.** Maitland Mulligan Mckenzie Muscle Energy Technique Myofascial stretching Cyriax Neuro Dynamic Testing	4
Module 12	**Hydrotherapy** Definitions, Goals and Indications, Precautions and Contraindications, Properties of water, Use of special equipment, techniques, Effects and uses, merits and demerits **Individual and Group Exercises** Advantages and Disadvantages, Organization of Group exercises, Recreational Activities and Sports **Introduction to Yoga** Asanas – Principles and elements; Pranayamas – Principles, Methods and Techniques	4
	Total Number of Hours 48	

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Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC502	Applied Exercise Therapy Practical	0-0-4	2	100

Module	Topics	Contact Hours
Module 1	To practice the entire soft tissue manipulative techniques region wise – upper limb, lower limb, neck, back and face.	6
Module 2	To practice the measurement of ROM of joints – upper limb, lower limb & trunk.	6
Module 3	To practice the grading of muscle strength region wise – upper limb, lower limb and trunk.	6
Module 4	To study the position of joints, muscle work, and stability of various fundamental and derived positions.	6
Module 5	To study the different types of muscle contraction, muscle work, group action of muscles and coordinated movements.	6
Module 6	To practice the various types of suspension therapy and its application on various parts of body – region wise.	6
Module 7	To study & practice local & general relaxation techniques.	6
Module 8	To study the structure & function along with application of various equipment in a Gymnasium.	6
	Total NumberofHours 48	

Suggested Readings:

1. Hollis, M. and Cook, P.F.
Practical Exercise Therapy Blackwell, Oxford 1999
2. Gardiner, Dena M. Principles of Exercise Therapy CBS, New Delhi 1999
3.Lippert, Lynn Clinical Kinesiology for Physical TherapyJaypee, New Delhi 1996
4. Paliarulo, M. A. Introduction to Physical Therapy Mosby, London 2001
5. Jones and Barker, Human Movement Explained Butter worth- Heine 2000
6. Thomson, Ann Tidy's Physiotherapy Varghese, Mumbai 1991
7.Hislop, H.J. and Montgomery, J. Daniels and Worthingham's Muscle Testing: Techniques ofManualExaminationW.B.Saunders, Philadelphia2002
8.Norkin Measurement of Joint Motion
9. Kisner, C. andKolby, L.A. Therapeutic Exercise Foundation and Technique Jaypee, New Delhi 1996
10. Holey, E. and Cook, E.Therapeutic Massage Harcourt, Singapore 1998

11. Bates, Andrea and Hanson, Norm Aquatic Exercise Therapy W.B.Saunders,Philedelphia1996
12 Kendal, F.P. Muscles Testing and Function Lippincott, New York 1993
13 Campion, M. R. Hydrotherapy: principles and Practice Butterworth, Oxford 2000
14 Perry, Jan F Kinesiology Workbook F A Davis,Philadelphia1996
15 Adler, S.S. PNF in Practice Springer, New York 2003

Course Code	Course Name	L -T –P	Credits	Total Marks
BPTC503	Applied Electro Therapy	4-0-0	4	100

Module	Topics	Contact Hours
Module 1	**Low frequency Currents** 1. **Basic types of current** a. Direct Current: types, physiological &therapeutic effects. b. Alternating Current 2. **Types of Current used in Therapeutics** a. Modified D.C i. Faradic Current ii. Galvanic Current b. Modified A.C i. Sinusoidal Current ii. Diadynamic Current. 3. **Faradic Current:** Therapeutic effects of Faradic Current, Precautions, Indications & Contra-Indications, Dangers. 4. **Galvanic Current:** Therapeutic effects of Galvanic Current, Indications & Contra-Indications, Dangers, Effect of interrupted galvanic current on normally innervated and denervated muscles and partially denervated muscles. 5. Sinusoidal Current &Diadynamic Current in Brief. 6. HVPGS – Parameters &its uses 7. **Ionization / Iontophoresis:** Techniques of Application of Iontophoresis, Indications, Selection of Current, Commonly used Ions (Drugs) for pain, hyperhydrosis, would healing. 8. Cathodal / Anodal galvanism. 9. Micro Current & Macro Current	8

	10. Types of Electrical Stimulators a. NMES- Construction component. b. Neuro muscular diagnostic stimulator- construction component. c. Components and working Principles 11. **TENS:**Types of Electrodes & Placement of Electrodes, Dosage parameters, Therapeutic effects, Indications & Contraindications.	
Module 2	**Electro-diagnosis** 1. FG Test 2. SD Curve: Methods of Plotting SD Curve, Apparatus selection, Characters of Normally innervated Muscle, Characters of Partially DenervatedMuscle, Characters of Completely denervated Muscle, Chronaxie&Rheobase. 3. Nerve conduction velocity studies 4. EMG: Construction of EMG equipment. 5. Bio-feed back. 6. **Electro-diagnosis may include ECG, EEG.**	10
Module 3	**Medium Frequency** 1. Interferential Therapy: Therapeutic effects, Indications & Contraindications. 2. Russian Current	10
Module 4	**Thermo &Actinotherapy (High Frequency Currents)** 1. Electro Magnetic Spectrum. 2.SWD: Therapeutic effects, Indications & Contraindications, Dangers, Dosage parameters. 3. Pulsed Electro Magnetic Energy: Therapeutic effectsUses of PEME. 4. Micro Wave Diathermy:Applicators, Dosage Parameters,Therapeutic effects, Indications & Contraindications, Dangers of MWD 5. Ultrasound: 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. 6. IRR: Therapeutic effects, Duration & frequency of treatment, Indication & Contraindication. 7. UVR: Therapeutic effects. Sensitizers & Filters. Test dosage calculation. Calculation of E1, E2, E3, E4 doses. Indications,	10

	contraindications. Dangers. Dosages for different therapeutic effects, Distance in UVR lamp 8. LASER: Methods of application of LASER. Dosage of LASER. Physiological & Therapeutic effects of LASER. Safety precautions of LASER. Classifications of LASER. Energy density & power density	
Module 5	**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. 2. Contrast Bath: Methods of application, Therapeutic uses, Indications & Contraindications. 3. Moist Heat Therapy: Hydro collator packs – in brief, Methods of applications, Therapeutic uses, Indications & Contraindications. 4. Cyclotherm: Principles of production, Therapeutic uses, Indications & Contraindications. 5. Fluidotherapy: Construction, Method of application, Therapeutic uses, Indications & Contraindications. 6. Whirl Pool Bath: Construction, Method of Application, Therapeutic Uses, and Indications& Contraindications. 7. Cryotherapy: Therapeutics effects, Techniques of Applications, Indications & Contraindications, Dangers, and Methods of application with dosages.	10
	Total Number of Hours	**48**

Course Code	**Course Name**	**L -T -P**	**Credits**	**Total Marks**
BPTC504	**Applied Electro Therapy Practical**	0-0-4	2	100

Module	**Topics**
Module 1	To study the basic operation of electric supply to the equipment & safety devices.
Module 2	To experience sensory and motor stimulation of nerves and muscles by various types of low frequency currents on self.

Module 3	To locate and stimulate different motor points region wise, including the upper & lower limb, trunk
Module 4	Therapeutic application of different low frequency currents Faradic foot bath, Faradism under pressure, Ionotophoresis.
Module 5	To study the reactions of degeneration of nerves, to plot strength duration curves.
Module 6	To find chronaxie and Rheobase.
Module 7	To study a hydrocollator unit, its operations and therapeutic application of Hot packs –region wise.
Module 8	To study the various types of Infrared lamps and their application to body region wise.
Module 9	To study a paraffin wax bath unit, its operation and different methods of application – region wise.
Module 10	To study the different types of Ultra violet units, their operation, and assessment of test dose and application of U.V.R. – region wise.
Module 11	To study a TENS Stimulator, its operation and application – region wise.
Module 12	To study various forms of therapeutic cold application region wise including – ice, cold packs, vapocoolant sprays, etc.

Text Books:

1 Froster, A. and Palastanga, N.Clayton's Electrotherapy: Theory and Practice AITBS, Delhi 1999
2 Jhon, Low and Ann,ReedElectrotherapyExplained:PrinciplesButterworthHeine,Oxford 2000
3 Nelson, R.M. andCurrier, D.P. Clinical Electrotherapy Appleton and Lange 1987
4 Chemeron, M.H. Physical Agents inRehabilitationW B Saunders,London 1999
5 Michlovitz, S L Thermal Agents inRehabilitationF A Davis,Philadelphia 1996

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC505	Functional Assessment and Applied Radiological Imaging	4-0-0	4	100

Module	Topics	Contact Hours
Module 1	Problem oriented Medical Record-History, Concept & Advantages Communication with patient-Principle and methods and types	2
Module 2	Physical approach on the basis of functional Assessment Musculo-skeletal system Maitland's Concept	6

	Cyriax Approach McKenzie Concept *Mulligan Concept* Neural Tension Test - normal & abnormal findings	
Module 3	Neuro-Muscular System (for Central Nervous System Problems) Bobath approach Motor Relearning Process	2
Module 4	Clinical decision-making *Diagnostic imaging and clinical decision making*	2
Module 5	Rationale of plan of Physiotherapeutic Management	6
Module 6	Special orthopedic tests commonly used in the clinical setting	6
Module 7	X-Ray, CT, MRI (Technique, Pros & Cons, Clinical Importance, Applied section), Basics	6
Module 8	Regional X-Ray, CT, MRI	6
Module 9	Ultrasound (Musculo skeletal), PET	6
Module 10	EMG, NCV	6
	Total Number of Hours	**48**

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC506	**Functional Assessment and Applied Radiological Imaging Practical**	0-0-4	2	100

SAME AS THEORY

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Semester VI

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC601	Orthopedics and Traumatology	4-0-0	4	100

Module	Topics	Contact Hours
Module 1	Introduction to Orthopedics Introduction to orthopedic terminology. Types of pathology commonly dealt with, clinical examination, common investigations X- rays & imaging techniques and outline of non – operative management. Principles of operative treatment List indications, contraindication and briefly outline principles of: Arthrodesis, Arthroplasty, Osteotomy, Bone grafting, Tendon – Transfers and Arthroscopy Sprains and Muscle Strains List common sites of sprains and muscle strains and describe the clinical manifestations and treatment. viz. Tennis Elbow, Golfer's Elbow, Dequervain's disease, Tenovaginitis, Trigger finger, Carpal Tunnel Syndrome and Plantar Fasciitis etc.	6
Module 2	Sprains and Muscle Strains List common sites of sprains and muscle strains and describe the clinical manifestations and treatment. viz. Tennis Elbow, Golfer's Elbow, Dequervain's disease, Tenovaginitis, Trigger finger, Carpal Tunnel Syndrome and Plantar Fascitis etc. Injuries Injuries related to common sports their classification and management.	6
Module 3	Fractures and Dislocations: General Principles, outline the following: i) Types of Fractures including patterns. Open and closed fractures and fracture – dislocations ii) Differences between dislocation & subluxation. iii) General & Local signs & symptoms of fractures & dislocation. iv) Principle of management of fractures & dislocations.	6

	v) Prevention & treatment of complications including: Fracture – disease, Volkmann's Ischemic Contracture, Sudeck's Atrophy, Carpal Tunnel Syndrome. Myositis Ossificans and Shoulder-Hand syndrome vi) Fracture healing.	
Module 4	Upper Limb Fractures & Dislocations a) Enumerate major long bone fractures and joint injuries. b) Briefly describe their clinical features, principles of management and complications. Lower Limb Fractures & Dislocations a) Enumerate major long bone fractures and joint injuries. b) Briefly describe their clinical features, principles of management and complication. Spinal Fractures and Dislocations: Outline the mechanism, clinical features, principles of management and complications of spinal injuries	6
Module 5	Recurrent Dislocations: Outline the mechanism, clinical features, principles of management and complications of recurrent dislocation of the shoulder and patella. 10.Amputations a) Classify amputations. List indication for surgery, b) Outline pre-operative, operative and prosthetic management. c) Outline prevention and treatment of complications.	4
Module 6	Bone & Joint Infections: Outline the etiology, clinical features, management and complications of septic arthritis osteomyelitis, Tuberculosis (including spinal T.B.). Bone Joint Tumors: Classify and outline the clinical features, management and complications of the following (benign / malignant bone and joint tumors, Osteomas, Osteosarcomas, Osteoclastomas, Ewing's sarcoma, Multiple myeloma	4
Module 7	Chronic Arthritis: Outline of pathology: clinical features, mechanism of deformities, management and complications of: Rheumatoid arthritis. Osteoarthritis of major joints and spine, Ankylosing spondylitis. Neck & Back Pain, Painful Arc Syndrome, Tendinitis, Fascitis& Spasmodic Torticollis, (Outline the above including clinical features and management)	4

Module 8	Spinal and Other Deformities: Classify spinal deformities and outline the salient clinical features, management and complications of Scoliosis, Kyphosis and Lordosis, Cervical Rib, Common acquired deformities of foot, knee, hip, shoulder, elbow and wrist including hand Poliomyelitis: Describe the pathology, microbiology, prevention, management and complications of polio. Outline the treatment of residual paralysis including use of orthosis, Principles of muscle transfers and corrective surgery	4
Module 9	Congenital Deformities: Outline the clinical features and management of Congenital Telepus Equino Varus (CTEV), Congenital Dislocation of the Hip, Flat foot, vertical talus, limb deficiency (radial club hand and femoral, tibial and fibula deficiencies) meningomyelocele, Arthrogryposis multiplex congenita and Osteogenesis imperfecta Peripheral Nerve Injuries: Outline the clinical features and management, including reconstructive surgery of: a) Radial, median and ulnar nerve lesions. b) Sciatic and lateral popliteal lesions. c) Brachial Plexus injuries including Erbs, Klumpke's and crutch palsy, Claw Hand	4
Module 10	Hand Injuries: Outline of clinical features, management and complications of: Skin and soft tissue injury, tendon injury, bone and joint injury. Leprosy: Outline of clinical features, management and complications of neuritis, muscle paralysis, tropic ulceration and hand & feet deformities.	4
	Total Number of Hours 48	

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC602	Orthopedics and Traumatology Practical	0-0-4	2	100

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BOOKS:-

1. Joshi, J. and Kotwal, P. Essential Of Orthopaedics and Applied Physiotherapy Elsevier, New Delhi 2004
2. Terke, Samual L. Orthopaedics: principles and their application Lippencott, New York 2000 2V
3. Magee, David J. Orthopaedic and Physical Assessment Saunders, Philadelphia 2002
4. Maheshwari, J Essential Orthopaedics
5. Solomon, Louis Apley's Systems of Orthopaedics and Fracture Arnold, London 2001
6. McRae, R. and Esser, Max Practical Fracture Treatment Churchill Living stone, London 2002
7. Treatment and Rehabilitation of Fractures by Hoppen field, Lippincott Williams and Wilkins

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC603	General Surgery, Obstetrics and Gynecology	4-0-0	4	100

Module	Topics	Contact Hours
Module 1	1. Principles of General Surgery and Anesthesia including blood transfusion and physiological response of the body to surgery 2. Pre and Post Operative complications and their management 3. Wounds: - Wound Infections, Sinuses and Ulcers. Burns- Different degrees. Complications of Burn specially post burn contractures, Tetanus, Gangrene and gas gangrene	8
8Module 2	1. Outline of Abdominal surgery, post-operative complications and management in- Appendectomy, Herniorrhaphy, Mastectomy, Thyroidectomy, Colostomy, Cholecystectomy, Ileostomy Role of Physiotherapy in General Surgery	8

Module 3	Cardio Thoracic Surgery Incisions for cardiothoracic surgery, General Pre and Post-Operative Physiotherapeutic Management patients of cardiothoracic surgery, various surgical procedures for chest and cardiac condition/disease	8
Module 4	Plastic Surgery 1. Burn- Degrees of burn, General management of burn, Reconstructive surgery following burn and complications of burn 2. Types of Skin Grafts and Flaps 3. Principles of Tendon transfer 4. Surgery of hand with emphasis on reconstructive surgery in Trauma and in Leprosy	8
Module 5	Obstetrics & Gynecology 1. Anatomy of Pelvic organs mechanism, physiology of pelvic floor, Sphincter muscles, Menstrual cycle, and its disorders, other hormonal disorders of females, Obesity and female hormones 2. Pregnancy and its stages, labour, stages of labour, delivery, Caesarian Section, Cancer of female reproductive organs, STD in females 3. Menopausal effects in emotion and musculo-skeletal system 4. Maternal physiology in pregnancy 5. Child birth complications, complication of multiple child birth, methods of birth control-Merits and Demerits 6. Hysterectomy	16
	Total Number of Hours	

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC604	General Surgery, Obstetrics and Gynecology Practical	0-0-4	2	100

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REFERENCE BOOKS:-
1 Howkins, John Shaw's Textbook of Gynecology Orient-Longman, Bangalore 1971
2 Datta, D.C. Textbook of Obstetrics NCBA, Calcutta 2000
3 Mudaliar, A.L. Clinical Obstetrics Orient-Long main, Bangalore 1972
4 Percival, Robert Manual of Obstetrics ELBS, London 1973

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC605	General Medicine and Pediatrics	4-0-0	4	100

Module	Topics	Contact Hours
Module 1	Each disease to be discussed under the following headings:- • Definition • Aetio-pathogenesis. • Pathology • Clinical Features • Diagnosis • Differential Diagnosis • Principles of Management including physiotherapeutic management 1. Introduction of Medicine 2. General principles of assessment and management including physiotherapeutic management. Elementary idea about use of laboratory and imaging techniques 3. Diseases of Respiratory System Approach to a patient with Respiratory Disease , Chronic Obstructive Pulmonary Disease. Bronchial Asthma, Pneumonia, Lung Abscess, Bronchiectasis, Pleural Effusion & Empyema Pneumothorax, Pulmonary tuberculosis, Respiratory Failure, Interstitial Lung Disease Pulmonary Embolism	10
Module 2	4. Diseases of GI system &Hepato-Biliary Disorders Peptic Ulcer Disease, Malabsorption Syndrome, Inflammatory Bowel Disease, Approach to a patients of G.I.S.Disease, Upper G.I.S. bleed,	6

	Jaundice , Viral Hepatitis, Cirrhosis of Liver Acute Pancreatitis 5. Diseases of Kidney Approach to a patient of Renal Disease, Glomerulo Nephritis, Acute Renal Failure , Chronic Renal Failure, Dialysis, Nephrotic Syndrome, Urinary Tract Infections	
Module 3	6. Haematological Disease Approach to a. patient with hematological disease, Anemia &its different types, Leukemia Hemophilia, Haemoglobinopathies, Purpura, Oncology- Lymphomas, Lung Carcinoma	4
Module 4	7. Endocrine & Metabolic Diseases Acromegaly, Gigantism & Dwarfism, Diabetes Insipidus, Hypothyroidism, Hyperthyroidism Adrenal hypo-function& hyper function, Diabetes Mellitus, Diabetic Neuropathy, Diabetic Foot Hypoglycemia, Vit-D, Calcium metabolism & Parathyroid Gland Disorders, Lipid Disorders 8. Nutritional Diseases Obesity, Protein Energy Malnutrition, Common Vitamin Deficiencies	4
Module 5	9. Connective Tissue Diseases Approach to a patient with Connective Tissue Disease, Rheumatoid Arthritis, Gout, Vasculitis 10. Infectious Diseases Malaria, Filaria, Tetanus, Kala-azar, Typhoid Fever, HIV&AIDS ,Diarrheal Diseases 11. Diseases due to Environmental factors & Poisons Heat Stroke , Radiation Injury, Snake Bite , General principles of management of poisoning Organo-Phosphorus Poisoning, Sedative and hypnotic poisoning	4
Module 6	Cardiology 1. Basic Anatomy of Heart, Coronary circulation. 2. Normal Cardiac contraction and relaxation mechanism 3. Acute Rheumatic Fever, Etiology, Clinical features and Assessment 4. Valvular Heart Diseases like Mitral	4

		Stenosis, Mitral Regurgitation, Aortic Stenosis, Aortic Regurgitation- Clinical features and assessment 5. Ischemic Heart Disease- Clinical features and assessment 6. Hypertension- Types and management 7. Congestive Heart Failure 8. Peripheral Vascular Disease & Deep Vein thrombosis 9. Common Cardiac Arrhythmias	
Module 7	Pediatrics	1. Growth and development of a child from birth to 12 yrs of age indicating physical and adaptive developments. 2. Maternal and neonatal factors contributing to high-risk pregnancy. 3. Neonatal and Maternal infections. 4. Maternal heart diseases, renal failure, tuberculosis, diabetes etc. 5. Community Health Program like PPP; Blindness; Deafness and immunization Schedule.	4
Module 8		6. Cerebral Palsy- Definition, Outline of ethology of prenatal, perinatal and postnatal causes. Classification, clinical features and assessment based on musculo skeleta1 system. Outline of associated defects like mental retardation, microcephaly, hearing and speech impairment, squint and convulsion. 7. Muscular Dystrophy- Various forms mode of inheritance, clinical manifestations and its management physiotherapeutic ally	4
Module 9	8. Spina Bifida, Meningomyelocele-Outline of development clinical manifestations, bladder bowel control, hydrocephalus 9. Stills Disease- classification, pathology in brief, physical findings, course and prognosis. Prevention and correction of deformity		4

	10. Acute CNS infection- Classification, clinical findings, sequel leading to mental retardation, blind ness, deafness speech defect, motor paralysis, bladder and bowel problems, seizure disorders feeding difficulties and pressure sores.	
Module 10	11. Normal diet for newborn and child, dietary calorie, fat, protein, minerals and vitamins requirements in normal child as well as in malnutrition child. 12. Lung Infections- Outline of clinical finding complications of bronchitis's lung abscess, bronchial asthma, cystic fibrosis) primary complex in infants and children 13. Acute pediatric distress syndrome, neonatological& pediatric surgical care. 14. Neonatal and pediatric cardiovascular problems.	4
	Total Number of Hours	48

REFERENCE BOOKS:-

1. Chemberlin, E.N. and Ogilvie, C. Symptoms and signs in Clinical Medicine Jhon Wright 1974
2. Swash, Michael Hutchison's Clinical Methods W B Saunders, London 2000
3. Ghai, O. P. Essential Pediatrics Interprint, New Delhi 1987
4. Haslett, C. Davidson's Principal and Practice of Medicine Churchill Livingstone, London 1999
5. Harrison's Principles of Internal Medicine

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Semester VII

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC701	Physiotherapy in orthopedic and sports conditions	4-0-0	4	100

Module	Topics	Contact Lectures
Module 1	1. PT assessment for Orthopedic conditions - SOAP format. Subjective - history taking, informed consent, personal, past, medical and socioeconomic history, chief complaints, history of present illness. Pain assessment- intensity, character, aggravating and relieving factors, site and location. Objective- on observation - body built swelling, muscle atrophy, deformities, posture and gait. On palpation- tenderness-grades, muscle spasm, swelling-methods of swelling assessment, bony prominences, soft tissue texture and integrity, warmth and vasomotor disturbances. On examination – ROM – active and passive, resisted isometric tests, limb length-apparent, true and segmental , girth measurement, muscle length testing-tightness, contractureandflexibility,manualmuscletesting,peripheralneurologicalexamination- dermatomes, myotomes and reflexes, special tests and functional tests. Prescription of home program. Documentation of case records, and follow up.	**4**
Module 2	2. Fractures - types, classification, signs and symptoms, complications. Fracture healing - factors affecting fracture healing. Principles of fracture management - reduction - open and closed, immobilization - sling, cast, brace, slab, traction - manual, mechanical, skin, skeletal, lumbar and Cervical traction, external fixation, functional cast bracing. PT management in complications - early and late - shock, compartment syndrome, VIC, fat embolism, delayed and mal union, RSD, myositis ossificans, AVN, pressure sores etc. Physiotherapy assessment in fracture cases. Aims of PT	**4**

	management in fracture cases - short and long term goals. Principles of PT management in fractures - Guidelines for fracture treatment during period of immobilization and guidelines for treatment after immobilization period.	
Module 3	3. Specific fractures and dislocations: PT assessment and management of upper limb fractures and dislocations. PT assessment and management of lower limb fractures and dislocations including pelvis. PT assessment and management spinal fractures. 4. Selection and application of physiotherapeutic techniques, manoeuvre's, modalities for preventive, curative and rehabilitative means in all conditions. 5. Principles of various schools of thought in manual therapy. (Briefly Maitland and Mckenzie).	**4**
Module 4	6. Degenerative and inflammatory conditions: Definition, signs and symptoms, clinical features, path physiology, radiological features, deformities, medical, surgical management. Describe the PT assessment and management and home program for the following conditions – Osteoarthritis - emphasis mainly on knee, hip and hand, Rheumatoid Arthritis, Ankylosing spondylitis, Gout, Perthes disease, Periarthritic shoulder.	**4**
Module 5	7. Infective conditions: Definition, signs and symptoms, clinical features, pathophysiology, radiological features, medical, surgical management. Describe PT assessment and management for following conditions – Osteomyelitis – acute and chronic, Septic arthritis, pyogenic arthritis, TB spine and major joints - knee and hip. 8. Define, review the postural abnormalities of spinal column, clinical features, deformities, medical and surgical management. Describe PT assessment and management and home program. 9. Deformities: Review in detail the causes, signs and symptoms, radiological features, medical and surgical management. Describe the PT. assessment and management of the following conditions: Congenital: CTEV, CDH, Torticollis, pes planus, pescavus and other common deformities. Acquired: scoliosis, kyphosis, coxavara, genu varum, valgum and recurvatum.	**4**
Module 6	10. Cerebral palsy: Definition, etiology, classification, clinical	**4**

	features, complications, deformities, medical and surgical management and home program with special emphasis on carrying techniques. PT management after surgical corrections. 11. Poliomyelitis: Definition, etiology, types, pathophysiology, clinical features, deformities, medical and surgical management. PT. assessment and management after surgical corrections and reconstructive surgeries - emphasis on tendon transfer and home program. 12. Leprosy: Definition, cause, clinical features, medical and surgical management. PT assessment, aims, and management after surgical procedures such as tendon transfer both pre and post operatively.	
Module 7	13. Amputations: Definition, levels, indications, types, PT assessment, aims, management pre and post operatively. PT management with emphasis on stump care and bandaging. Pre and post prosthetic training, checking out prosthesis, complications of amputations and its management. 14. Spinal conditions: Review the causes, signs and symptoms, investigations, radiological features, neurological signs. PT assessment, aims, and management and home program of the following conditions: Cervical spondylosis, Lumbar spondylosis, Spondylolisthesis, Spinal canal stenosis, Spondylolysis, Sacro-iliac joint dysfunction, Sacralisation, Lumbarisation, Intervertebral disc prolapse, Coccydynia, Spina bifida occulta.	**4**
Module 8	15. Effects of spinal traction, types of traction, modes of application, indications for spinal traction, contraindications, precautions, limitations of traction. 16. Osteoporosis- causes, predisposing factors, investigations and treatment. 17. Orthopaedic surgeries: Pre and post-operative PT assessment, goals, precautions and PT management of following surgeries such as : Arthrodesis, Osteotomy, Arthroplasty-partial and total - Excision arthroplasty, excision arthroplasty with implant, interposition arthroplasty and total replacement; Tendon transplant, Soft tissue release- tenotomy, myotomy, lengthening; Arthroscopy, Spinal stabilization, Re-attachment of limbs, External fixators, Synovectomy.	**4**
Module 9	18. Shoulder joint: Shoulder instabilities, TOS, RSD,	**4**

	Impingement syndrome - conservative and post-operative PT management. Total shoulder replacement and Hemi replacement. - Post operative PT management. AC joint injuries - rehabilitation. Rotator cuff tears-conservative and surgical repair. Subacromial decompression - Post operative Management. 19. Elbow and forearm: Excision of radial head - Post operative PT management. Total elbow arthroplasty- Post operative Management. 20. Wrist and Hand: Total wrist arthroplasty. Repair of ruptured extensor tendons. Carpal tunnel syndrome. Flexor and extensor tendon lacerations - Post operative Management.	
Module 10	21. Hip: Joint surgeries - hemi and total hip replacement - Post operative PT management Tendonitis and bursitis. - Management. 22. Knee: Lateral retinacular release, chondroplasty- Post operative management. Realignment of extensor mechanism. ACL and PCL reconstruction surgeries - Post operative rehabilitation. Meniscectomy and meniscal repair - Post operative management. Plica syndrome, patellar dysfunction and Hoffa's syndrome- conservative management. TKR-rehabilitation protocol. Patellar tendon ruptures and Patellectomy-rehabilitation. 23. Ankle and foot: Ankle instability. Ligamentous tears- Post operative management.	**4**
Module 11	24. Introduction to Bio-Engineering; Classification of Orthoses and prostheses; Biomechanical principles of orthotic and prosthetic application; Designing of upper extremity, lower extremity and spinal orthosis, indications and check out; Designing of upper extremity and lower extremity prostheses, indications and check out; Psychological aspects of orthotic and prosthetic application; prescription and designing of footwear and modifications; Designing and construction of adaptive devices.	**4**
Module 12	25. Sports Physiotherapy: Physical fitness. Stages of soft tissue healing. Treatment guidelines for soft tissue injuries- Acute, Sub acute and chronic stages. Repair of soft tissues- rupture of muscle, tendon and Ligamentous tears. Soft tissue injuries- prevention and rehabilitation of, Lateral ligament sprain of	**4**

	ankle. Rotator cuff injuries. Collateral and Cruciate injuries of knee. Meniscal injuries of knee. Supraspinatus and Bicipital tendonitis. Pre patellar and Sub-acromial bursitis. Tennis and Golfer's elbow. Hamstring strains, Quadriceps contusion, TA rupture. Dequervain's tenosynovitis. Trigger and Mallet finger. Plantar fasciitis. Wristsprains. 26. Applied Yoga in orthopedic conditions.	
	Total Number of Hours	**48**

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC702	Physiotherapy in orthopedic and sports conditions (Practical)	0-0-4	2	100

PRACTICAL - Practical shall be conducted for all the relevant topics discussed in theory in the following forms:

1. Bedside case presentations and case discussions
2. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

REFERENCE BOOKS:-

1.Maheshwari, J Essential Orthopedics
2 Solomon, Louis Apley's Systems of Orthopedics and Fracture Arnold, London 2001
3 Kolt, G.S and Mackler S. Physical Therapies in Sports and Exercise Livingston, London 2003 4 Starkey, and Ryan, Evaluation of Orthopedic and Athletic F A Davis, Philedelphia 2002
5 Mclatchie, and Lennox Soft Tissues: Trauma and sports Injury Butterworth Heine, Oxford 1993
6 Norris, C.M. Sports Injuries: Diagnosis and Management Butterworth Heine, Oxford 2001
7 Garrick, J.G. Sports Injuries: Diagnosis and Management W.B.Saunders, Philadelphia 1999
8 Guten, Gray N. Running Injuries W.B.Saunders, London 1997
9 James E.Z. Athletic Injuries and Rehabilitation
10 Fu, and Stone, Sport Injuries Lippincott, New York 2001
11 Anderson, M.K. Fundamentals of Sport Injuries and management Lippincott, Philedelphia 2002

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12. Essentials of Orthopedics for Physiotherapists, Ebenzar, Jaypee publishers

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC703	Physiotherapy in Surgical conditions	4-0-0	2	100

Module	Topics	Contact Lectures
Module 1	Physiotherapy in mother and child care – ante and post-natal management, early intervention and stimulation therapy in child care (movement therapy)	**4**
Module 2	Geriatrics – handling of old patients and their problems.	**4**
Module 3	Complication common to all operations	**4**
Module 4	Abdominal incisions	**4**
Module 5	Physiotherapy in pre and post-operative stages	**4**
Module 6	Operations on upper G.I.T.- esophagus, stomach, duodenum	**4**
Module 7	Operations on large and small intestine – Appendectomy, cholecystectomy, partial colectomy, ileostomy, hernia and herniotomy, herniorrhaphy, hernioplasty	**4**
Module 8	Physiotherapy in dentistry	**4**
Module 9	Burns and its treatment – physiotherapy in burns, skin grafts, and reconstructive surgeries. Management of wound ulcers- Care of ulcers and wounds - Care of surgical scars-U.V.R and other electro therapeutics for healing of wounds, prevention of Hyper-granulated Scars Keloids, Electrotherapeutics measures for relief of pain during mobilization of scar tissue.	**4**
Module 10	Physiotherapy intervention in the management of Medical, Surgical and Radiation Oncology Cases.	**4**
Module 11	Physiotherapy in dermatology -Documentation of assessment, treatment and follow up skin conditions. U.V.R therapy in various skin conditions; Vitiligo; Hair loss; Pigmentation; Infected wounds ulcers. Faradic foot bath for Hyperhidrosis. Massage maneuvers for cosmetic purpose of skin; use of specific oil as medium; Care of anesthetic hand and foot; Evaluation, planning and management of	**4**

	leprosy-prescription, fitting and training with prosthetic and orthotic devices.	
Module 12	ENT – sinusitis, non-suppurative and chronic suppurative otitis media, osteosclerosis, labyrinthitis, mastoidectomy, chronic rhinitis, laryngectomy, pharyngeal – laryngectomy, facial palsy.	**4**
	Total Number of Hours **48**	

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC704	Physiotherapy in Surgical conditions(Practical)	0-0-4	2	100

Same as theory.

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC705	Physiotherapy in Medical conditions	4-0-0	2	100

Module	Topics	Contact Lectures
Module 1	**A. General Medicine** Review of the Pathological and principles of management by Physiotherapy to the following conditions: 1. **Inflammation** – acute, chronic 2. **Oedema** – Traumatic, obstructive, Paralytic, Oedema due to poor muscle and laxity of the fascia 3. **Arthritis and Allied Conditions (in details):** a) Osteo – arthritis – generalized, Degenerative and traumatic, Spondylosis and disorders. b) Rheumatoid Arthritis, Still's disease, infective Arthritis. c) Spondylitis, Ankylosing Spondylitis. d) Monoarticular Rheumatism – Fibrositis, Myalgia, bursitis, Periarthritis etc. 4. **Common conditions of Skin** – Acne, Psoriasis, Alopecia, Leukoderma, Leprosy, Sexually transmitted diseases. 5. **Deficiency diseases** – Rickets, Diabetes, Obesity, Osteoporosis and other deficiency disorders related to Physiotherapy 6. **Psychiatric Disorders** – Psychosis, Psychoneurosis, Senile	14

	dementia.	
Module 2	**B. Respiratory Diseases** 1) Review of the mechanism of normal respiration. 2) Chest examination, including auscultation, percussion. 3) Knowledge of various investigative procedures (invasive & noninvasive) used in the diagnosis of various respiratory disorders. Review of pathological changes and principle of management by physiotherapy of the following conditions: 1) Bronchitis, Asthma, Lung abscess, Bronchiectasis, Emphysema, COPD. 2) Pleurisy and Empyema, Pneumonia 3) Bacterial Disease 4) Rheumatic fever, Carcinoma of respiratory tract 5) Paralysis of diaphragm & vocal cords 6) Chest wall deformities.	18
Module 3	**C. Cardiovascular Diseases** 1) Review of anatomy & physiology of the cardiovascular system. 2) Knowledge of various investigative procedures (invasive & noninvasive) used in the diagnosis of various cardiovascular disorders. 3) Review of pathological changes and principle of management by physiotherapy of the following conditions: Thrombosis, Embolism, Buerger's diseases, Arteriosclerosis, Thrombophlebitis, Phlebitis, Gangrene, Congestive Cardiac failure, Hypertension, Hypotension, Aneurysm	16
	Total Number of Hours	**48**

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC706	Physiotherapy in Medical conditions (Practical)	0-0-4	2	100

Same as theory.

Course Code	Course Name	L -T -P	Credits	Total Marks
BPTC707	Clinical Observer ship	0-0-4	0	0

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Semester VIII

Course Code: BPTC801
Course Name: Clinical Neurology and Neurosurgery and Psychiatry

Course Type: Core (THEORY)	Course Details: CC-41			L-T-P: 4 - 0 - 0	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		------	30	----	70

Module	Topics	Contact Lectures
Module 1	Disorders of function in the context of Pathophysiology, Anatomy in Neurology and Cortical Mapping. Classification of neurological involvement depending on level of lesion. Neurological assessment: Principles of clinical diagnosis, higher mental function, assessment of brain & spinal cord function, evaluation of cranial nerves and evaluation of autonomic nervous system. Investigations: principles, methods, views, normal/abnormal values/features, types of following investigative procedures- skull x-ray, CT, MRI, evoked potentials, lumbar puncture, CSF examination, EMG,NCV.	4
Module 2	Neuro-ophthalmology: Assessment of visual function – acuity, field, colour vision, Pupillary reflex, accommodation reflex, abnormalities of optic disc, disorders of optic nerve, tract, radiation, occipital pole, disorders of higher visual processing, disorders of pupil, disorders of eye movements, central disorders of eye movement. Deafness, vertigo, and imbalance: Physiology of hearing, disorders of hearing, examination & investigations of hearing, tests of vestibular function, vertigo, peripheral vestibular disorders, central vestibular vertigo.	4
Module 3	Lower cranial nerve paralysis – Etiology, clinical features, investigations, and management of following disorders - lesions in trigeminal nerve, trigeminal neuralgia, trigeminal sensory neuropathy, lesions in facial nerve, facial palsy, bell's palsy, hemi facial spasm,	4

	Glossopharyngeal neuralgia, lesions of Vagus nerve, lesions of spinal accessory nerve, lesions of hypoglossal nerve. Dysphagia – swallowing mechanisms, causes of dysphagia, symptoms, examination, and management of dysphagia. Cerebro-vascular diseases: Define stroke, TIA, RIA, stroke in evolution, multi infarct dementia and Lacunar infarct. Classification of stroke – Ischemic, hemorrhagic, venous infarcts. Risk factors, cause of ischemic stroke, causes of hemorrhagic stroke. Classification of hemorrhagic stroke, classification of stroke based on symptoms, stroke syndrome, investigations, differential diagnosis, medical and surgical management.	
Module 4	Head injury: Etiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications. Higher cortical, neuro psychological and neurobehavioral disorders: Causes of blackouts, physiological nature of Epilepsy, classification, clinical features, investigations, medical& surgical management of following disorders – Non-epileptic attacks of childhood, Epilepsy in childhood, Seizers, and Epilepsy syndromes in adult. Classification and clinical features of Dyssomnias, Parasomnias, Dementia, Obsessive-compulsive disorders. Neural basis of consciousness, causes &investigations of Coma, criteria for diagnosis of Brain death. Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, management of Perceptual disorders and Speech disorders.	2
Module 5	Movement disorders: Definition, etiology, risk factors, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders – Parkinson's disease, Dystonia, Chorea, Ballism, Athetosis, Tics, Myoclonus and Wilson's disease. Cerebellar and coordination disorders: Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, management of Congenital ataxia, Friedreich's ataxia, Ataxia telangiectasia, Metabolic ataxia, Hereditary cerebellar ataxia, Tabes dorsalis and Syphilis.	4
Module 6	Spinal cord disorders: Functions of tracts, definition, etiology, risk factors, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders – Spinal cord injury, Compression by IVD prolapse, Spinal epidural abscess, Transverse myelitis, Viral myelitis, Syringomyelia, Spina bifida, Sub	4

	acute combined degeneration of the cord, Hereditary spastic paraplegia, Radiation myelopathy, Progressive encephalomyelitis, Counimodular syndrome, Bladder & bowel dysfunction, and Sarcoidosis.	
Module 7	Brain tumors and spinal tumors: Classification, clinical features, investigations, medical and surgical management. Infections of brain and spinal cord: Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders – Meningitis, Encephalitis, Poliomyelitis and Post- polio syndrome. Complications of systemic infections on nervous system – Septic encephalopathy, AIDS, Rheumatic fever, Brucellosis, Tetanus, and Pertussis.	4
Module 8	Motor neuron diseases: - Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, and complications of following disorders - Amyotrophic lateral sclerosis, Spinal muscular atrophy, Hereditary bulbar palsy, Neuromyotonia and Post-irradiation lumbosacral polyradiculopathy. Multiple sclerosis - Etiology, pathophysiology, classification, clinical signs& symptoms, investigations, differential diagnosis, medical management, and complications.	4
Module 9	Disorders of neuromuscular junction – Etiology, classification, signs & symptoms, investigations, management, of following disorders Myasthenia gravis, Eaton-Lambert syndrome, and Botulism. Muscle diseases: Classification, investigations, imaging methods, Muscle biopsy, management of muscle diseases, genetic counselling. Classification, etiology, signs & symptoms of following disorders – Muscular dystrophy, Myotonic dystrophy, myopathy, Non-dystrophic myotonia.	4
Module 10	Polyneuropathy – Classification of Polyneuropathies, Hereditary motor sensory neuropathy, hereditary sensory and Autonomicneuropathies,Amyloidneuropathy,acuteidiopathic Polyneuropathies. Guillain-Barre syndrome – Causes, clinical features, management of GBS, Chronic Idiopathic Polyneuropathies, diagnosis of polyneuropathy, nerve biopsy. Focal peripheral neuropathy: Clinical diagnosis of focal neuropathy,	4

	neurotmesis, Axonotmesis, Neuropraxia. Etiology, risk factors, classification, neurological signs & symptoms, investigations, management, of following disorders – RSD, Nerve tumors, Brachial plexus palsy, Thoracic outlet syndrome, Lumbosacral plexus lesions, Phrenic & Intercostal nerve lesions, Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy, Musculocutaneous nerve palsy, Anterior & Posterior interosseous nerve palsy, Axillary nerve palsy, Long thoracic nerve palsy, Suprascapular nerve palsy, Sciatic nerve palsy, Tibial nerve palsy, Common peroneal nerve palsy, Femoral nerve palsy, Obturator nerve palsy, Pudentalnervepalsy.	
Module 11	Introduction, Indications and Complications of following Neuro surgeries: Craniotomy, Cranioplasty, Stereotactic surgery, Deep brain stimulation, Burr-hole, Shunting, Laminectomy, Hemilaminectomy, Rhizotomy, Microvascular decompression surgery, Endarterectomy, Embolization, Pituitary surgery, Ablative surgery - Thalamotomy and Pallidotomy, Coiling of aneurysm, Clipping of aneurysm, and Neuralimplantation.	4
Module-12	Paediatric neurology: Neural development, Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders - Cerebral palsy, Hydrocephalus, Arnold-chiari malformation, Basilar impression, Klippel-Feil syndrome, Achondroplacia, Cerebral malformations, Autism, Dandy walker syndrome and Down's syndrome.	4
Module-13	Toxic, metabolic and environmental disorders: Etiology, risk factors, classification, neurological signs & symptoms, investigations, management, of following disorders – Encephalopathy, Alcohol toxicity, Recreational drug abuse, Toxic gases & Asphyxia, Therapeutic & diagnostic agent toxicity, Metal toxicity, Pesticide poisoning, Environmental & physical insults, Pant & Fungal poisoning, Animal poisons, & Complications of organ transplantation.	2
	Total Number of Hours	**48**

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UG Learning Outcome Based Curriculum (LOCF) for Bachelor of Physiotherapy

Course Code: BPTC802
Course Name: Clinical Neurology and Neurosurgery and Psychiatry Practical

Course Type: Core (PRACTICAL)	Course Details: CC-42			L-T-P: 0 - 0 - 4	
Credit: 2	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		60	----------	40	----

SAME AS THEORY

REFERENCE BOOKS:-

1 Hislop, H.J. and Montgomery, J. Daniels and Worthingham's Muscle Testing: Techniques of Manual Examination W.B.Saunders, Philadelphia 2002
2 Bobath, Berta Adult Hemiplegia: Evaluation and treatment Butterworth, Oxford 1990
3 Shepherd, R.B. Physiotherapy in PaediatricsButterworthHeinemann, Oxford 1995
4 Downie, P.A. Cash's Textbook of Neurology for Physiotherapy Jaypee, New Deli 1993
5 Swaner, K.A. and LaVigne, J.M. Brunnstom's Movement Therapy in Hemi Lippincott, New York 1992
6 Burns, Y.R. and Macdonald J. Physiotherapy and the Growing Child Harcourt, Singapore 1998
7 Bromley, Ida Tetraplegia and Paraplegia Churchill-Livingston, London 1998
8 Voss, Dorothy Proprioceptive Neuromuscular Facilitation Lippincott, New York 1989
9 Adler, S.S. PNF in Practice Springer, New York 2003
10 Carr, J.H. and Shepherd, R.B. Stroke Rehabilitation ButterworthHeinemann, Singapore 2003

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Course Code: BPTC803
Course Name: Physiotherapy in Neurology and Neurosurgery and Psychiatry condition

Course Type: Core (THEORY)	Course Details: CC-43			L-T-P: 4 - 0 - 0	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		------	30	----	70

Module	Topics	Contact Lectures
Module 1	**Neurological Assessment:** Required materials for examination, Chief complaints, History taking – Present, Past, medical, familial, personal histories, Observation, Palpation, Higher mental function – Consciousness, Orientation, Wakefulness, memory, Speech, Reading, Language, Writing, Calculations, Perception, Left right confusion, Reasoning, and Judgment, Motor Examination – Muscle power, Muscle tone, Spasticity, Flaccidity, Reflexes – Developmental reflexes, deep tendon reflexes, Superficial reflexes, Sensory examination – Superficial, Deep and Cortical sensations, Special tests – Romberg's, Kernig's sign, Brudenzki sign, Tinels's sign, Slum test, Lehermitte's sign, Bells Phenomenon, Gower's sign, Sun set sign, Battle's sign, Glabellar tap sign, etc, Balance examination, coordination examination, Gait analysis – Kinetics & Kinematics (Quantitative & Qualitative analysis), Functional Analysis, Assessment tools & Scales – Modified Ashworth scale, Berg balance scale, FIM, Barthel index, Glasgow coma scale, Mini mental state examination, Rancho Los Amigos Scale for Head injury, APGAR score, ASIA scale, Reflex Grading. Differential diagnosis.	8

Module 2	**Neuro physiological Techniques** – Concepts, Principles, Techniques, Effects of following Neurophysiological techniques: NDT, PNF, Vojta therapy, Rood's Sensory motor Approach, Sensory Integration Approach, Brunnstorm movement therapy, Motor relearning program, Contemporary task oriented approach, Muscle re-education approach and Constraint induced movement therapy.	5
Module 3	**Paediatric Neurology:** Pediatric Examination, Developmental milestones, developmental reflexes, Neuro developmental screening tests. Evaluation & Management - History, Observation, Palpation, Milestone Examination, developmental reflex Examination, Higher mental function, Cranial nerve examination, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches & Modalities in Risk babies, Minimum brain damage, Developmental disorders, Cerebral palsy, Autism, Down's Syndrome, Hydrocephalus, Chorea, Spina bifida, and syringomyelia.	5
Module 4	Evaluation and Management of Brain and Spinal Cord Disorders : History, Observation, Palpation, Higher mental function, Cranial nerve examination, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches& Modalities in Cerebro vascular Accident, Meningitis, Encephalitis, Head Injury, Brain Tumors, Perceptual disorders, Amyotrophic lateral sclerosis, and Multiple sclerosis.	5
Module 5	Evaluation and Management of Cerebellar, Spinal Cord and Muscle Disorders : History, Observation, Palpation, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches& Modalities in Ataxia, Sensory Ataxia, Parkinson's disease, Muscular dystrophy (DMD), Myasthenia Gravis, Eaton-Lambert Syndrome, Spinal tumors, Spinal cord injury, Transverse myelitis, Bladder & Bowel Dysfunction, Spinal muscular atrophies, Poliomyelitis, Post-Polio Syndrome.	5

Module 6	**Evaluation and Management of Peripheral Nerve Injuries and Disorders :** History, Observation, Palpation, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches& Modalities in Hereditary motor sensory neuropathy, Guillain-Barre syndrome, Brachial plexus palsy, Thoracic outlet syndrome, Lumbosacral plexus lesions, Phrenic &intercostals nerve lesions, Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy, Musculocutaneous nerve palsy, Anterior & Posterior interosseous nerve palsy, Axillary nerve palsy, Long thoracic nerve palsy, Suprascapular nerve palsy, sciatic nerve palsy, Tibial nerve palsy, Common peroneal nerve palsy, Femoral nerve palsy, Obturator nerve palsy, and Pudental nerve palsy.	5
Module 7	**Assessment and management of Neurological gaits:** Quantitative and Qualitative (Kinetic & Kinematics) analysis, List of Problems, short & Long Term goals, Management of following Neurological Gaits - Hemiplegic gait, Parkinson gait, High step gait, Hyperkinetic gait, Hypokinetic gait, Waddling gait, Scissoring gait, Spastic gait, Choreaform Gait, Diplegic Gait, and Myopathic Gait.	5
Module 8	**Pre and post-surgical assessment and treatment following conditions -** Spinal disc herniation, Spinal stenosis, Spinal cord trauma, Head trauma, Brain tumors, Tumors of the spine, Spinal cord and peripheral nerves, Cerebral aneurysms, Subarachnoid hemorrhages, epilepsy, Parkinson's disease, Chorea, Hemiballism, Psychiatric disorders, Malformations of the nervous system, Carotid artery stenosis , Arteriovenous malformations, and Spina bifida.	5
Module 9	Applied Yoga in Neurological conditions.	5
	Total Number of Hours	**48**

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Course Code:BPTC804
Course Name: Physiotherapy in Neurology and Neurosurgery and Psychiatry condition (PRACTICAL)

Course Type: Core (PRACTICAL)	Course Details: CC-44			L-T-P: 0 - 0 - 4	
Credit: 2	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		60	----------	40	----

PRACTICAL: Practical shall be conducted for all the relevant topics discussed in theory in the following forms:
1. Bedside case presentations and case discussions
2. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

Total lecture hours- 48.

Suggested Readings:

1. Hislop, H.J. and Montgomery, J.DanielsandWorthingham'sMuscleTesting: Techniques of
Manual ExaminationW.B.Saunders,Philadelphia2002
2.Bobath, BertaAdultHemiplegia:Evaluation and treatmentButterworth, Oxford 1990
3. Shepherd, R.B.PhysiotherapyinPaediatricsButterworthHeinemann, Oxford1995
4.Downie, P.A.Cash's Textbook ofNeurologyforPhysiotherapyJaypee, New Deli 1993
5. Swaner, K.A. andLaVigne, J.M.Brunnstom'sMovementTherapy in HemiLippincott, New York 1992
6. Burns, Y.R. andMacdonaldJ.Physiotherapy and theGrowingChildHarcourt, Singapore 1998
7. Bromley, Ida Tetraplegia and ParaplegiaChurchill-Livingston,London1998
8. Voss, DorothyProprioceptiveNeuromuscularFacilitationLippincott, New York 1989
9. Adler, S.S. PNF in Practice Springer, New York 2003
10. Carr, J.H. andShepherd, R.B.StrokeRehabilitationButterworthHeinemann, Singapore2003
11. Carr, J.H. andShepherd, R.BNeurological Rehabilitation Butterworth, Oxford 1998
12. Kottke, F.J. andLehmanJ.F.Handbook of Physical,MedicineandRehabilitationW B Saunders, London 1990
13. Umphred, DracyANeurological Rehabilitation Mosby, London 2001

KAZI NAZRUL UNIVERSITY
School of Health Science and Technology
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UG Learning Outcome Based Curriculum (LOCF) for Bachelor of Physiotherapy

Course Code: BPTC805
Course Name: Disability Prevention and Rehabilitation

Course Type: Core (THEORY)	Course Details: CC-45			L-T-P: 4 - 0 - 0	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		------	30	----	70

Module	Topics	Contact Lectures
Module-1	Introduction Definition concerned in the phases of disability process, explanation of its aims & principles, Scope of rehabilitation, (Impairment, Disability, Handicap) Definition concerned with the causes of Impairment Functional limitation and Disability Disability Prevention. Limitation & Rehabilitation. Present Rehabilitation Services Legislations for rehabilitation services for the Disabled, P.W.D.Act / Compensations and benefits available for disabled	8
Module-2	Rehabilitation Team & its members, their role. Contribution of Social Worker towards rehabilitation Vocational evaluation & Goals for disabled, role of Vocational Counselor.	8
Module-3	**Principles of Communication & its problems: -** Speech Production Communication disorders secondary to Brain Damage. Aphasia & its treatment. Evaluating Language. Disarthria& its treatment	8

	Non-Aphasic language disorders	
Module-4	**Architectural barriers possible modifications in relation to different disabled conditions** – namely Hemiplegia, Paraplegia, Amputees, Cerebral Palsy etc. **Community Health:** Introduction to community Health, Definition of Community and Health, Health Determinants Community and Rehabilitation – Definition, Concepts and Team ,Community Health in relation to rural and urban health setup Community based rehabilitation Vs Institutional based rehabilitation – Merits and demerits Community Resources in rural and urban set up Rehabilitation – Team work, members, their duties and responsibilities	8
Module-5	**Prostheses and Orthoses** Definition and Basic Principles Designing and Construction of Upper & Lower extremity Orthosis& Spinal Orthosis. Upper Extremity prosthesis: Prescription, fitting and checking Lower. Extremity prosthesis: Prescription, fitting and checking Prescription and design of footwear- & its modification. Wheel Chairs. Design and construction of adoptive devices Classification of Aids & Appliances Ambulatory Aids & Assistive Devices Measurement and P.O.P. cast techniques. Simple splint techniques Low cost thermo-labile material for construction of Orthosis. Practical demonstration of orthoses /prostheses /mobility aids & assistive aids.	8
Module-6	Professional Ethics Implications of and confirmation to the rules of professional conduct	8
	Total Number of Hours	**48**

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Textbook:

1.Physical RehabilitationBook by Susan B. O'Sullivan
2.DeLisa's Physical Medicine and Rehabilitation: Principles and Practice, Two Volume ...
Book by Joel DeLisa
3.Essentials of Community based Rehabilitation by SatyaBhushan Nagar
4.Textbook of Preventive Practice and Community Physiotherapy by Chief Editor DrBharati Vijay Bellare and Sub Editors PavithraRajan and DrUnnati Nikhil Pandit, Jaypee Brothers Medical Publishers
5.Essentials Of Prosthetics & Orthotics With MCQs & Disability Assessment Guidelines by AK AGARWAL, Jaypee Brothers Medical Publishers

Course Code: BPTC806

Course Name: **Research Methodology and Biostatistics**

Course Type: Core (Theoretical)	Course Details: CC-46			L-T-P: 3 - 1 - 0	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		….	30	….	70

Module	Topics	Contact Lectures
Module-1	1. Introduction to Research methodology: Meaning of research, objectives of research, Motivation in research, Types of research & research approaches, Research methods vs methodology, Criteria for good research, Problems encountered by researchers in India.	5
Module-2	Research problem: Statement of research problem., Statement of purpose and objectives of research problem, Necessity of defining the problem	5

Module-3	Research design: Meaning of research design, Need for research design, Features for good design, Different research designs, Basic principles of research design	5
Module-4	Sampling Design: Criteria for selecting sampling procedure, Implications for sample design, steps in sampling design, characteristics of good sample design, Different types of sample design	5
Module-5	Measurement & scaling techniques: Measurement in research-Measurement scales, sources of error in measurement, Technique of developing measurement tools, Meaning of scaling, its classification. Important scaling techniques.	5
Module-6	Methods of data collection: collection of primary data, collection data through questionnaires & schedules, Difference between questionnaires & schedules.	5
Module-7	Sampling fundamentals, need for sampling & some fundamental definitions, important sampling distributions.	5
Module-8	Processing & analysis of data: Processing operations, problems in processing, Types of analysis, Statistics in research, Measures of central tendency, Dispersion, Asymmetry, relationship.	5
Module-9	Testing of hypothesis: What is hypothesis? Basic concepts concerning testing of hypothesis, Procedure of hypothesis testing, measuring the power of hypothesis test, Tests of hypothesis, limitations of the tests of hypothesis	4
Module-10	Computer technology: Introduction to Computers, computer application in research, computers & researcher.	4
	Total Number of Hours	**48**

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UG Learning Outcome Based Curriculum (LOCF) for Bachelor of Physiotherapy

Textbook:

1.Research Methodology And Biostatistics Application 2016 by Sharma, Elsevier
2.Essentials of Research Methodology for All Physiotherapy and Allied Health Sciences:by S. N SenthilRamalingam, A. Thangamani;Kumar
3.Biostatistics & Research Methodologyby G. NageswaraRao
4.ABC of Research Methodology and Applied Biostatisticsby MN Parikh and NithyaGogtay
5.Introduction to Biostatistics and Research Methods,Textbook by J. Richard and P. S. S. SundarRao

Course Code: BPTC807
Course Name: Clinical Posting

Course Type: Core (PRACTICAL)	Course Details: CC-47			L-T-P: 0 - 0 - 8	
Credit: 4	Full Marks: 100	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		60	----------	40	----

CLINICAL EDUCATION- Students will be posted in rotation in the following areas/wards. The students will be clinically trained to provide physiotherapy care for the patients under supervision. They will be trained on bedside approach, patient assessment, performing special tests, identifying indications for treatment, ruling out contraindications, decision on treatment parameters, dosage and use relevant outcome measures under supervision. Evidence-based practice will be part of training.

Module	Topics	Contact Practical
Module 1	Physiotherapy OPD	10
Module 2	Neurology, Neurosurgery & Neuro ICU	10
Module 3	General Surgery & CTS ICU	10
Module 4	Community-PHC	10
Module 5	Orthopedics	10
Module 6	General Medicine & MICU	10

Module 7	Developmental Pediatrics & Child Guidance Clinic	10
Module 8	OBG	10
Module 9	Geriatric – Old Age Homes	10
Module 10	Industrial Visits - Ergonomics	6
	Total Hours	96

Semester IX

IX	Internship	C	BPTC801	CC-48	0-0-12	6	12
	Dissertation	C	BPTC802	CC-49	0-0-12	6	