SCHOOL OF NURSING SCIENCES AND ALLIED HEALTH

DEPARTMENT FO PHYSIOTHERAPY

Vision Statement: To be recognized as one of the leading Physiotherapy institutes of higher learning by providing value-based education, facilitating research and health care services to rural and urban communities, keeping in view the global needs.

Mission Statements (Department Level):

- MS1: Develop competency in the field of Physiotherapy by Imparting and disseminating evidence based knowledge.
- MS 2: Fostering research and development in the emerging areas of Physiotherapy while adhering to the ethical standards.
- MS 3: Generating awareness of physiotherapy through outreach programmes.
- MS 4: To gain recognition via collaboration in the global arena by providing quality healthcare thus improving quality of Life.
- MS 5: Generating opportunities for faculties and students thus keeping pace with the advances related to physiotherapy.

Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

QUALIFICATION DESCRIPTORS (QDs)

Upon the completion of Academic Programme Bachelor of Physiotherapy, students will be able to:

QD-1: Systematic, extensive and coherent knowledge and skill in Physiotherapy and its applications including critical understanding of established theories, principles and concepts, knowledge of advanced and emerging issues in Physiotherapy, skills in musculoskeletal, neurological, cardio-respiratory Physiotherapy, recent advances and research in Physiotherapy evaluation and treatment procedures.

QD-2: Demonstrate Comprehensive knowledge and skills in areas related to manual therapy, exercise therapy techniques and equipment, electrotherapeutic modalities and advanced learning material.

QD-3: Use knowledge and skills required for identifying problems and issues, in collection of relevant quantitative and/or qualitative data, its analysis and evaluation using appropriate methodologies for formulating evidence-based solutions and inferences.

QD-4: Address self-learning needs related to evidence based practice in current and emerging areas of physiotherapy and rehabilitation, use research and professional material, apply knowledge to new concepts and unfamiliar areas and seek well defined solutions in real life situations.

QD-5: Demonstrate empirical and research-based knowledge and transferable skills in the field of physiotherapy for patient care and presenting oneself as an employable candidate in various healthcare settings including wellness, sports and fitness centres creating employment opportunities for professional learning needs based on research and development work.

Mapping Qualification Descriptors (QDs) with Mission Statements (MS)

	MS-1	**MS-2**	**MS-3**	**MS-4**	**MS-5**
QD-1	**3**	**2**	**2**	**2**	**1**
QD-2	**3**	**2**	**2**	**2**	**3**
QD-3	**3**	**3**	**2**	**3**	**3**
QD-4	**3**	**3**	**2**	**3**	**3**
QD-5	**3**	**3**	**2**	**3**	**3**

Write ‘3’ in the box for ‘High-level’ mapping, 2 for ‘Medium-level’ mapping, 1 for ‘Low-level’ mapping.

PROGRAM LEARNING OUTCOMES (PLOs) (12)

After completing this course, the students should be able to:

PLO-1: Physiotherapy Knowledge - To demonstrate and apply physiotherapy knowledge and skills for the physiotherapeutic management of various medical and surgical conditions.

PLO-2: Communication Skills- To demonstrate and apply appropriate behavioral skills with humanitarian approach for communication with patients, relatives, co-professionals and community.

PLO-3: Problem analysis with the development of solution- To demonstrate and apply the physiotherapy evaluation skills by co relating with the clinical subjects for diagnosis of the patient problem and design an appropriate physiotherapeutic treatment strategy.

PLO-4: Evidence-based practice- To demonstrate and apply physiotherapy knowledge and skills on the basis of empirical evidence.

PLO-5: Development of research acumen- To demonstrate ability of critical thinking, define problems, formulate hypotheses and design, execute and report the results of experiments with conclusions.

PLO-6: Individual or team work- Demonstrate the ability to work in an efficient manner individually as well as in diverse groups for providing best treatment strategies for the patients and community.

PLO-7: Digital literacy- To demonstrate and apply knowledge of basic computer applications for clinical and research purpose including data management, data storage and generate data bases.

PLO-8: Cross cultural integration- To acquire knowledge of attitudes, beliefs and socio-cultural values relevant to a particular society and nation with global perspectives to engage with diverse groups effectively.

PLO-9: Ethics- To demonstrate moral/ethical values in conduct, awareness of ethical issues related to patient care, work practices, refraining from malpractice, unethical Behaviour, falsification, plagiarism, misinterpretation of data, non-adherence to intellectual property rights, adhering to truthful, unbiased actions in all aspects of work without discrimination based on age, race, gender, sexual preference, disease, mental status, lifestyle, opinions or personal values.

PLO-10: Physiotherapy patient evaluation and management- To select appropriate clinical examination and investigation for common clinical conditions and analyze critically the findings along with planning appropriate rehabilitation goals and designing evidence-based management protocols.

PLO-11: Leadership skills- Students must demonstrate ability for task allocation, organization of task elements, setting direction, formulating an inspiring vision, team building, to achieve a vision, engaging, knowledge and respect individual values and opinions in order to foster harmonious working relationships with colleagues, peers, and patients.

PLO-12: Life-long learning- Students must demonstrate ability to acquire knowledge and skills through ongoing learning, participation in continuous education programs, engaging in self-paced, self- directed learning aimed at personal development, meeting social and cultural objectives, skill development, adapting to changing environment and workplace requirements and challenges.

PROGRAM SPECIFIC OUTCOMES (PSOs)

After completing this Course, the students should be able to …….
PSO-1 Apply the acquired fundamental knowledge for diagnosis and treatment of the patients.

PSO-2 Plan research and publish their work for the upliftment of the profession.

PSO-3 Work effectively in different setups

PSO-4 Demonstrate leadership qualities

Mapping of Program Learning Outcomes (PLOs)

With Qualification Descriptors (QDs)

	QD-1	QD-2	QD-3	QD-4	QD-5
PLO-1	**3**	**3**	**3**	**3**	**3**
PLO-2	**3**	**3**	**3**	**3**	**3**
PLO-3	**3**	**3**	**3**	**3**	**3**
PLO-4	**3**	**3**	**3**	**3**	**3**
PLO-5	**3**	**3**	**3**	**3**	**3**
PLO-6	**3**	**3**	**3**	**3**	**3**
PLO-7	**3**	**3**	**3**	**3**	**3**
PLO-8	**3**	**3**	**3**	**3**	**3**
PLO-9	**3**	**3**	**3**	**3**	**3**
PLO-10	**3**	**3**	**3**	**3**	**3**
PLO-11	**3**	**3**	**3**	**3**	**3**
PLO-12	**3**	**3**	**3**	**3**	**3**
PSO-1	**3**	**3**	**3**	**3**	**3**
PSO-2	**3**	**3**	**3**	**3**	**3**

PSO-3	**3**	**3**	**3**	**3**	**3**
PSO-4	**3**	**3**	**3**	**3**	**3**

Write ‘3’ in the box for ‘High-level’ mapping, 2 for ‘Medium-level’ mapping, 1 for ‘Low-level’ mapping.

BACHELOR'S OF PHYSIOTHERAPY

BYE-LAWS & SYLLABUS

DEPARTMENT OF PHYSIOTHERAPY

SCHOOL OF NURSING SCIENCES AND ALLIED HEALTH

JAMIA HAMDARD

(DEEMED TO BE UNIVERSITY)

BYE-LAWS

OBJECTIVES

To prepare highly skilled and efficient Physiotherapists who have a thorough knowledge of the theoretical and practical aspects of the field.

1. THE PROGRAMME

a. Name:	Bachelor of Physiotherapy (B.P.T)
b. Nature:	Regular and Full time.
c. Duration:	Four years course followed by 6 months compulsory internship
d. Pattern:	Annual System
e. Eligibility Criteria for Admission Educational:	A candidate seeking Admission to the B.P.T. Programme must have passed S.S.C. or intermediate or equivalent (recognized by Jamia Hamdard) under 10+2 system of education with Biology, Physics and Chemistry securing at least 50% marks in the aggregate.
Age:	17 years on 1st July in the year in which the admission is being sought.
f. Commencement:	July/ August of every year.
g. Mode of admission:	(as prescribed by the University) Eligibility same as for general candidates
h. Admission of Foreign Nationals/NRI/Company Sponsored Candidates	Selection Procedure as prescribed by Jamia Hamdard from time to time.
i. Total Seats:	as notified in the Jamia Hamdard prospectus.
j. Span Period:	9 years (excluding internship)

2. THE CURRICULUM

Total papers: 38+ 3 Qualifying papers
Total Research Projects:01
Clinical Hours : 928 clinical hours+80 research hours (excluding internship)

Mode of Curriculum delivery and execution includes classroom teaching, assignments, tests, lab work, project, case studies, and participation in relevant events.

3. THE COURSE STRUCTURE

BACHELOR OF PHYSIOTHERAPY

A. Hours distribution and marks distribution:

1st YEAR

Code No.	Subject	Hours	Marks	IA	EA	Credits
BPT161	Anatomy (Theory)	144	100	25	75	9
BPT162	Anatomy (Lab hours)	80	100	25	75	5
BPT 163	Physiology and biochemistry (Theory)	144	100	25	75	9
BPT 164	Physiology & Biochemistry (Lab hour)	80	100	25	75	5
BPT165	Sociology (theory)	64	100	25	75	4
BPT166	Basic Physics and Physical Principles of Exercise Therapy (Theory)	128	100	25	75	8
BPT167	Basic Physics and Physical Principles of Exercise Therapy (Lab hours)	112	100	25	75	7
BPT168	Basic Physics and Physical Principles of Electro Therapy (Theory)	128	100	25	75	8
BPT169	Basic Physics and Physical Principles of Electro Therapy (Lab hours)	112	100	25	75	7
BPT 170	Environmental studies*(theory)	48	100*	25	75	3
BPT 171	Computer Application*(lab hours)	32	100*	25	75	2
BPT 172	General Foundation Course*(theory)	48	100*	25	75	3
	Total	**1120**	**900+300***			**70**

*Qualifying subject. Marks not to be added in the total.

Total hours: 1120(theory hours: 736; lab hours: 384)

Total theory subjects:5 + 3*; total practical subjects:4

II YEAR

Code No.	Subject	Hours	Marks	IA	EA	Credits
BPT261	General Medicine (theory)	80 hrs	100	25	75	5
BPT262	General Surgery (theory)	80 hrs	100	25	75	5
BPT263	Pharmacology(theory)	80 hrs	100	25	75	5
BPT264	General Psychology(theory)	80 hrs	100	25	75	5
BPT265	Pathology and Microbiology(theory)	80 hrs	100	25	75	5
BPT266	Biomechanics and Kinesiology(theory)	144 hrs	100	25	75	9
BPT267	Biomechanics and Kinesiology(lab hours)	96	100	25	75	6
BPT268	Exercise therapy and Manual Therapy (theory)	144 hrs	100	25	75	9
BPT 269	Exercise Therapy and Manual Therapy(Lab hrs)	96 hrs	100	25	75	6
BPT 270	Electrotherapy (theory)	144 hrs	100	25	75	9
BPT 271	Electrotherapy (lab hrs)	96 hrs	100	25	75	6
	Total	**1120**	**1100**			**70**

total hours:1120(theory hours: 832,lab hours:288)

total theory subjects:08;practical subjets: 3

III YEAR

Code No.	Subject	Hours	Marks	IA	EA	Credits
BPT361	Orthopedics and sports medicine(theory)	80	100	25	75	5
BPT362	Radiology(theory)	48	100	25	75	3
BPT363	Neurology and Neurosurgery(theory)	80	100	25	75	5
BPT364	Physiotherapy in General Medicine and General Surgery(theory)	80	100	25	75	5
BPT365	Physiotherapy in General Medicine and General Surgery(lab hours)	48	100	25	75	3
BPT366	Orthopedic Physiotherapy(theory)	96	100	25	75	6
BPT367	Orthopedic Physiotherapy (lab hours)	64	100	25	75	4
BPT368	Neurophysiotherapy(theory)	96	100	25	75	6
BPT 369	Neurophysiotherapy (lab hours)	64	100	25	75	4
BPT 370	Clinical Training	464	100	100		29
	Total	**1120**	**900**			**70**

Total hours:1120(theory hours:480, lab hours: 176, clinical training: 464)

Total theory subjects:7;practical subjects:2

IV YEAR

Code N.	Subject	Hours	Marks	IA	EA	Credits
BPT461	Community medicine and Rehabilitation (Theory)	48 hrs	100	25	75	3
BPT462	Research Methodology and Biostatistics(theory)	96	100	25	75	6
BPT463	Cardiopulmonary Physiotherapy (theory)	96hrs	100	25	75	6
BPT464	Cardiopulmonary Physiotherapy (lab hrs)	64 hrs	100	25	75	4
BPT465	Sports Physiotherapy (Theory)	96 hrs	100	25	75	6
BPT466	Sports Physiotherapy (lab hrs)	64 hrs	100	25	75	4
BPT467	Prosthetics and orthotics (theory)	64 hrs	100	25	75	4
BPT468	Organization and Administration: law and Ethics(theory)	48 hrs	100	25	75	3
BPT 469	Research Project	80 hrs	100		100	5
BPT 470	Clinical Training	464 hrs	100	100		29
	Total	**1120**	**900**			**70**

Total hours: 1120(theory hours:448, lab hrs:128, research:80 hrs, Clinical training:464 hrs)

Total theory subjects:6;practical subjects:2

GRAND TOTAL MARKS OF I, II, III, IV YEARS:4300 MARKS

ATTENDANCE

I to IV Year
Attendance & Clinical Postings

a. All students must attend every lecture / lab hours held in each subject. However, to account for late joining or other such contingencies the attendance requirement for appearing in the examinations shall be minimum of 75% of the classes actually held from the date of admission. Each student is also required to participate in educational trips/ tour of the class.

b. In order to maintain the attendance record of a particular subject, a roll call will be taken by the teacher in every scheduled lecture and practical classes.

c. The teacher in -charge will consolidate the attendance record for theory & practical separately for each academic year. Attendance on account of participation in the prescribed functions of NCC, NSS, Inter - University Sports, Educational tours / Fieldwork, shall be credited to the aggregate, provided the attendance record is duly signed by the Officer in-charge, is sent to the Dean of the School within two weeks of the function / activity, etc.

d. The statement of attendance of students shall be displayed on the School notice board twice in each academic session. Copies of the same shall be kept in the Office of the Dean of the School/ of the concerned
Department for record. Notice displayed on notice board shall be deemed to be a proper notification and no
individual notice to students will be necessary.

e. If a student is found to be continuously absent from the classes without information for a period of thirty days, the teacher in-charge shall report it to the Head of Department. The Head will report it to the the Dean for necessary action.

f. .A student with less than 75% attendance in theory and practical of each subject in an academic session shall be detained from appearing in the Annual Examination of the subject (s) in which the attendance is short. However, the Dean of the School may consider for the condonation of attendance upto 5% on account of sickness or any other extenuating circumstances, provided the application condonation of attendance, duly certified by a Registered Practitioner /supported by documentary evidence has been submitted within seven days from recovery.

g. A student must have 85% of compulsory attendance for clinical training.

Internship

a. All students must attend their postings in institutions/hospitals/centers and can avail one leave per month. ATotal of Six(06) leaves can be taken during the entire Internship period. In Case a candidate takes more than 6 leaves during entire internship period his or her internship will be extended beyond 6 months in accordance with extra leaves taken beyond 6 months to meet the requirement and his/her degree certificate will be withheld till then.
b. In charge of the department/institution under whom the candidate is posted during the internship will send attendance after completion of every posting to the head of the department at Jamia Hamdard

c. Head of the Dept will consolidate the attendance of 6 months and will send it to the examination branch after the completion of the internship for award of degree.

6. INTERNAL ASSESSMENT

a. There will be three tests for internal assessments and best 2 out of 3 will be considered for marks calculation Tests will carry a weightage of 15marks theory/practical ,5marks for attendance and 5 for assignment . The total weightage of the internal exams will be 25% of total marks in each subject in the Final / annual exams.

b. Missing an examination without prior permission of competent authority will be counted an attempt. The marks of the internal assessment as well as attendance will be notified quarterly and the examination answer sheets will be shown to the students and kept in record after receiving their signatures. In exceptionally genuine and deserving cases, additional internal assessment test may be held at the discretion of the competent authority.

c. Research Project in the fourth year will have only annual examination.

d. Clinical training in third and fourth year will have two internal assessments in the form of case presentations/examinations. Addition for all the two will be considered for final marks calculation.

7. ANNUAL AND SUPPLEMENTARY EXAMINATIONS

I. Annual examinations of theory and practical shall be conducted as per schedule given in the Academic Calendar of Jamia Hamdard as outlined below:

II. Mode of Examination

Theory exams	: Written only
Practical exams	: Written, Demonstration and Viva Voce
Research Project	: Presentation & Viva(fourth year).
III.Duration	:Theory exams : 3 hours
Practical exams	: Upto one hour per candidate
IV.Examiner::Theory exams	: 01(from the panel)
Practical exams	: 02 (1 internal and 1 external) from the Panel*

(*panel to be prepared by the Department and approved by the competent authority)

V. Moderation of Theory Papers	For papers set by external examiners only. Change cannot be more than30% by the teacher nominated by the Head.

8. MINIMUM PASS MARKS

The minimum pass marks in each subject (theory and practical separately) shall be 50% of the aggregate of Internal Assessment marks and Final Examination marks.

9. PROMOTION SCHEME

In order to pass a paper, a student has to secure at least 50% marks in that paper. A student has to clear theory and practicals separately.

(A) From 1st year to 2nd year:

A candidate will be promoted from 1st year to 2nd year provided he/she has passed in at least 05 papers out of 12 prescribed in the first year in annual/supplementary examinations. If a candidate fails to satisfy the criteria mentioned above, he/she shall be detained in the 1st year .

A candidate failing in any subject will not be required to reappear in the internal assessment. His/her old internal assessment marks will be considered.

(B) From 2nd year to 3rd Year:

A candidate will be promoted from 2nd year to 3rd year provided he/she has passed in at least 05 papers out of 11 papers prescribed in the second year in annual/supplementary examinations. If a candidate fails to satisfy the criteria mentioned above, he/she shall be detained in the 2nd year .

A candidate failing in any subject will not be required to reappear in the internal assessment. His/her old internal assessment marks will be considered.

(C) From 3rd year to 4th year:

A candidate will be promoted from 3rd year to 4th year provided he/she has passed in at least 04 papers out of 10 papers prescribed in the third year in annual/supplementary examinations. If a candidate fails to satisfy the criteria mentioned above, he/she shall be detained in the 3rd year .

A candidate failing in any subject will not be required to reappear in the internal assessment. His/her old internal assessment marks will be considered.

(D) Fourth or Final year :

After having passed all subjects of all the four years the candidate will be eligible to start the internship.

A candidate failing in any subject will not be required to reappear in the internal assessment. His/her old internal assessment marks will be considered.

Note: A candidate will be permitted to apply for re-evaluation if he /she wishes so.

There will be supplementary examinations within 45 days of declaration of the result of the annual examination.

After having passed all the four years and completion of compulsory Internship, the students shall be eligible for the award of Bachelor of Physiotherapy (BPT) degree from Jamia Hamdard

10. INTERNSHIP

a. The candidate seeking entry to the internship period shall satisfy the following conditions:

i. He/She must have passed examinations in all subjects of all four years.

ii.During the internship period candidate shall have to undergo a full time Supervised P.T clinical practice for not less than six months in Institutions Hospitals/Centres recognized by Jamia Hamdard.

b. The candidate's performance during Internship will be assessed by the clinical supervisor and if found
unsatisfactory, the Internship will be extended for an equal period of time during which the performance was found to be unsatisfactory.

11. AWARD OF DEGREE

a. The candidate shall be awarded a Degree Certificate only on successful completion of the course including six months internship.

b. The entire course of study in Physiotherapy for all four years must be completed within nine years from the date of first admission, excluding the period of internship.

12. SPAN PERIOD

The entire course exclusive of internship should be completed within a period of 9 years from the date of
first admission to the program.

13. PAPER FORMAT

Max marks: 75
Duration: 3 hours

Section A: Multiple choice questions	1 x 15=15 marks (one mark questions)
Section B: Attempt any 3 questions out of 4	3 x 10 =30 marks (each question carries 10 marks)
Section C: Essay type answers Attempt any 2 out of 3	2 x 15 = 30 marks (each question carries 15 marks)

BACHELOR OF PHYSIOTHERAPY

1ST YEAR

Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY FIRST YEAR**

Course Code: BPT 161 Title of the Course: **ANATOMY (THEORY)**

L-T-P:144-0-0 Credits:9

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs)

After completing this Course, the students should be able to:

CO-1: Identify the axis and planes of different movements in human body and should be able to tell common anatomical terminology (Cognitive level: Understand)

CO-2: Identify the structures and classification of various connective tissues, bones, joints and muscles in the human body and correlate the structure with the functions. (Cognitive level: Understand)

CO-3: Discuss about the structural and functional importance of muscles, joints, long and short nerves and different spaces in upper limb and lower limb, trunk and pelvis including knowledge of greater vessels, muscles, structural and functional importance of different viscera. (Cognitive level: Understand)

CO-4: Identify and describe various parts of nervous system. (Cognitive level: Understand)

CO-5: To identify the microscopic structures of various tissues and organs in the human body and correlate the structure with the functions. (Cognitive level: Understand)

CO-6: To understand the basic principles of embryology including genetic inheritance and stages involved in development of the organs and systems from the time of conceptions till birth. (Cognitive level: Understand)

CO-7: To understand the bones, joints, muscles, vascular and nerve supply of upper limb, lower limb, abdomen, head and neck. (Cognitive level: Understand)

C0-8: To know about basic anatomical knowledge of boundaries and contents of thoracic cavity. (Cognitive level: Understand)

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11	PLO 12	PSO 1	PSO 2	PSO 3	PSO 4

CLO1	3	2	2	2	1	1	1	1	2	1	2	3	2	1	1	1
CLO2	3	2	2	2	1	1	1	1	2	1	2	3	2	1	1	1
CLO3	3	2	2	2	1	1	1	1	2	1	2	3	2	1	1	1
CLO4	3	2	2	2	1	1	1	1	2	1	2	3	2	1	1	1
CLO5	3	1	1	1	1	1	1	1	1	3	2	3	2	1	1	1
CLO6	3	1	1	1	1	1	1	1	1	3	2	3	2	1	1	1
CLO7	3	1	1	1	1	1	1	1	1	3	2	3	2	1	1	1
CLO8	3	1	1	1	1	1	1	1	1	3	2	3	2	1	1	1

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

Unit 1: General Anatomy **10 hours**

- Subdivisions of anatomy: anatomical position & descriptive terms
- Skin, superficial fascia including contents, deep fascia including its modifications, appendages of skin
- Muscles; classification, parts, origin, tendon, aponeurosis, bursa, synovial sheath & ligaments.
- Bone including ossification
- Blood vessels
- Lymphatic system
- Nervous system in general
- Joints in general and classification

Unit 2: The topics covered under the different regions are as follows: Head & Neck
20 hours

- Face
- Neck-posterior triangle, back of neck and sub occipital triangle
- Orbit and its contents
- Ant. Triangle and cervical fascia
- Thyroid and infra-temporal regions
- Temporo-mandibular joint and muscles of mastication
- Pre-vertebral region and root of neck
- Lymph nodes of head and neck and blood vessels of neck
- Sympathetic trunk
- Oral cavity and tongue
- Pharynx and palate
- Nasal cavity and paranasal sinuses
- Larynx
- Ear
- Cranial nerves

- Joint of head and neck
- Bones-skull bones, mandible, cervical vertebrae, hyoid.

Unit 3: Upper limb **15 hours**

- Introduction & pectoral region
- Mammary gland
- Axilla: boundaries, contents, brachial plexus, axillary vessels & lymph nodes
- Back
- Shoulder region
- Shoulder joint, acromio-clavicular and sterno-clavicular joint
- Flexor and extensors compartments of arms
- Cubital fossa
- Flexor compartments of forearm and palm
- Extensor compartments of forearm
- Elbow and radio-ulnar joints
- Lymphatic's and venous drainage of upper limb
- Dermatomes and nerve injuries
- Bones-clavicle, scapula, humerus, radius, ulna, skeleton of hand

Unit 4: Thorax **15 hours**

- Thoracic wall, intercostal spaces
- Blood supply of thoracic wall
- Pleura and lungs
- Trachea, bronchi, mediastinum
- Diaphragm and respiratory movements
- Pericardium and heart
- Coronary circulation
- Autonomic nervous system
- Joints thorax
- Bones-sternum, ribs, thoracic vertebrae

Unit 5: Lower limb **15 hours**

- Introduction & front of thigh, femoral triangle, boundaries & its contents, femoral hernia
- Medial side of thigh and adductor canal
- Gluteal region, muscles, nerves and vessels
- Popliteal fossa, boundaries and contents
- Back of the thigh, hamstring muscles
- Hip joint
- Front of leg &dorsum of foot
- Lateral &medial side of leg
- Back of leg
- Sole

- Knee joint
- Ankle joint
- Tibio-fibular joint and small joints of foot
- Venous drainage &lymphatic drainage
- Nerves injuries
- Arches of foot
- Bones-hip bone, femur,patella, tibia, fibula and bones of foot

Unit 6: Abdomen and pelvis **15 hours**

- Anterior abdominal wall
- Rectus sheath
- Stomach
- Spleen and coeliac trunk
- Small and large intestines
- Duodenum
- Pancreas
- Livers and extra-hepatic biliary apparatus
- Kidney, ureter and suprarenal
- Posterior abdominal wall
- Perineum abdominal wall
- Perineum- superficial and deep perineal pouches
- Pelvis-urinary bladder
- Female genital organs; ovary, fallopian tube, uterus and vagina
- Rectum and anal canal
- Prostate, vas deference seminal vesicles
- Male urethra
- Blood vessel, nerves and muscles of pelvis
- Bones-lumber vertebrae, sacrum, male and female pelvis

Unit 7: Neuroanatomy **20 hours**

- Introduction, subdivision of nervous system and meninges
- Spinal cord; external and internal features, Spinal nerves and its nuclei, ascending and descending tracts, blood supply, lesions and their effects.
- Medulla oblongata; external and internal features, motor and sensory decussating, nuclei of cranial nerves, floor of the fourth ventricle, inferorbcerebral peduncle, blood supply and lesions
- Pons; external and internal features, sections through upper and lower pons, nuclei of cranial nerves; middle cerebellar peduncle; blood suppy and lesions.
- Cerebellum; subdivision, connections, white matter and nuclear masses, blood supply, functions and effects of lesions.

- Thalamic complex; dorsal thalamus, metathalamus, epithalamus, subthalamus, connections, functions, blood supply and lesions.
- Hypothalamus; nuclei, connections, functions, blood supply, third ventricle and applied anatomy.
- Cerebral hemispheres; functional areas, basal ganglion white matter, internal capsule, blood supply, lesions and lateral; ventricle.
- Cerebrospinal fluid; production, circulation, absorption, functions and applied anatomy
- Autonomic nervous system; sympathetic and parasympathetic components.
- Ascending and descending pathways.

Unit 8: Surface anatomy **10 hours**

Important bony landmarks of the body, important vessels and nerves and projection of the outline of heart, its border, surfaces and valves, lungs, their borders, fissures and hila, pleura, and various abdominal and pelvic organs.

Unit 9: Radiological anatomy **4 hours**

Identification of normal anatomical features in commonly used ski grams (plain & contrast).

Unit 10: Embryology **5 hours**

General embryology

Introduction

- Oogenesis, ovarian cycle, uterine cycle.
- Spermatogenesis, spermatogenesis, sex determination, principles of family planning

First two weeks of development:

- Fertilization, cleavage & blastocyst formation
- Implantation, formation of decidua
- Formation of embryoblast and trophoblast, bilaminar germ disc.
- Amniotic sac; yolk sac, extra-embryonic mesoderm & extra-embryonic coelome; connecting stalk, chorion; formation of pro-chordal plate.

Third week of development

- Gastrulation; trilaminar germ disc, formation of intra-embryonic mesoderm, notochord, establishment of body axis.
- Trophoblast, secondary yolk sac, intra-embryonic coelom.

Third to eighth week of development: embryonic period

- Derivatives of ectoderm, endoderm and mesoderm
- Formation of somites, neural tube, folding of the embryo, establishment of the body form, formation of gut and its subdivisions.

Third month to birth: fetus and fetal membranes

- Development of fetus
- Placenta; formation, functions, features, types, circulation, placental barrier abnormalities
- Umbilical cord; amnion, amniotic fluid, its functions, amniocentesis

Unit 11: Histology **15 hours**

General histology

Introduction: cell & microscope

Microscope and basic principles of microscopy, commonly used stains, basophilic and acidophilic staining reactions and their significance, commonly encountered artifacts.

Details structure of cell and its components and their functional mechanisms.

Epithelial tissue:

Microscopic characteristics of simple and stratified epithelium, functions & distribution glands: mucous, serous and mixed

Connective tissue:

Classification: cells, fibers and their structural features and functions. Intercellular substances, amorphous ground substance, types of connective tissue (loose areolar tissue, dense connective tissue) and their distribution.

Cartilage:

Specialized connective tissue, different types of cartilages and their functions, ossification, regeneration and repair

Bone:

Structural features of compact and cancellous bone, their distribution and functions, ossification, regeneration and repair

Muscular tissue:

Structural and functional characteristics of skeletal, cardiac and smooth muscle.

Lymphoid tissue:

Structural and functional characteristics of lymph nodes, spleen, tonsil and thymus.

Blood vessels:

Conducting and distributing arties, arterioles, types of capillaries, their structural features and distribution, structural characteristics of large and small veins, lymphatic’s and sinusoids.

Nervous tissue:

Structural characteristics of neuron, types of neurons and their structural and functional features and distribution, neuroglia: types, structure and functions, ganglia, peripheral nerves, myelination, degeneration and regeneration in peripheral nerves.

Reference Books:

1.RJS Smout & McDowell (1948), *Anatomy and physiology for students of physiotherapy and occupational therapy, by Smout and McDowall* (Edwad Arnold)

2. Primary castes anatomy by Basmajian (Williams and Willkins Co. Batlimore).

3, An Introduction of fundamental Anatomy by David Sinclair.

4. Slater-Hammel A. WELLS, KATHERINE F.," Kinesiology: The Mechanical and Anatomic Fundamentals of Human Motion"(Book Review). Physical Educator. 1950 May 1;7(2):64.

5. B D Chaurasia (2019). *Human Anatomy (*All 3 volumes), 8th Edition, CBS Publishers & Distributors Pvt Ltd, India, 640 pages.

6. Limbs of Dr. Kadasana-All 3 volumes.

7. Agur AM, Dalley AF. Grant's atlas of anatomy. Lippincott Williams & Wilkins; 2009.

8. L Don Lehmkuhl, Signe Brunnstrom, Laura K. Smith (1983), *Brunnstrom's Clinical kinesiology*, 4th Edition . 453 pages

9. Adamstone FB. Human Embryology (Prenatal Development of Form and Function). WJ Hamilton, JD Boyd, and HW Mossman. Baltimore, Md.: Williams and Wilkins, 1945. Pp. viii+ 366.(Illustrated.) $7.00. Science. 1946 Sep 6;104(2697):234-.

10. RASCH PJ, BURKE RK. Kinesiology and applied anatomy. American Journal of Physical Medicine & Rehabilitation. 1972 Feb 1;51(1):41.

11. Applied Anatomy and Kinesiolgy by W. Bower and H. Shose
(Lae and Febigar).

12. The Extermities by QuiningWasbel.

13. Bhuiyan PS, Rajgopal L. Shyamkishore K. Inderbir Singhs Textbook of Human Neuroanatomy. 2017 10th Edition

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the

average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: BPT 162 Title of the Course: **ANATOMY PRACTICAL**

L-T-P: 0-0-80 Credits: 5

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

Detailed Syllabus:

Surface Anatomy: Identification and Description of surface land marks on Human Specimen

Muscles, Bones, Ligaments, Joints of head, face, trunk, lower and upper extremities on a dissected human specimen.

Gross and Microscopic Anatomy of the Central and Peripheral Nervous System.

Gross anatomy of Respiratory, Digestive, Endocrine, Urinary and Reproductive Systems on a dissected human body.

Reading x-rays.

Reference Books:

1.RJS Smout & McDowell (1948), *Anatomy and physiology for students of physiotherapy and occupational therapy, by Smout and McDowall* (Edwad Arnold)

2. Primary castes anatomy by Basmajian (Williams and Willkins Co. Batlimore).

3, An Introduction of fundamental Anatomy by David Sinclair.

4. Slater-Hammel A. WELLS, KATHERINE F.," Kinesiology: The Mechanical and Anatomic Fundamentals of Human Motion"(Book Review). Physical Educator. 1950 May 1;7(2):64.

5. B D Chaurasia (2019). *Human Anatomy (*All 3 volumes), 8th Edition, CBS Publishers & Distributors Pvt Ltd, India, 640 pages.

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(Lae and Febigar).

12. Extermities by QuiningWasbel.

13. *Bhuiyan PS, Rajgopal L. Shyamkishore K. Inderbir Singhs Textbook of Human Neuroanatomy. 2017 10th Edition*

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Course Code: BPT 163 Title of the Course: **PHYSIOLOGY AND BIOCHEMISTRY (THEORY)**

L-T-P Credits: 144-0-0 Credits: 9

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs)

After completing this Course, the students should be able to …….

CO-1: Understand the cell physiology in detail including the transport mechanism of human body and blood and body fluid distribution and composition. (Cognitive level: Understand)

CO-2: Understand interaction and integration of different organ systems in health and diseases special nerve-muscle physiology. (Cognitive level: Understand)

CO-3: Understand the functional mechanisms of cardiovascular system and describe the physiology of respiratory, digestive and endocrine system etc. (Cognitive level: Understand)

CO-4: Understand the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body. (Cognitive level: Understand)

CO-5: To explain clearly concepts and principles of biochemistry and cell biology, including correlations of these with cellular and molecular processes involved in health and disease. (Cognitive level: Understand)

CO-6: Differentiate and know the importance of different pathways concerned with carbohydrate, lipid and protein metabolism along with their application in different physical and clinical conditions after the completion of the course. (Cognitive level: Understand)

CO-7: Understand the importance of nutrition and calorific values of different types of food products, able to explain the energy expenditure in various types of physical activities, understand the role of vitamins and minerals in health and diseases after the completion of a course . (Cognitive level: Understand)

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
CLO1	3	3	1	1	1	1	1	3	3	3	1	3	2	1	1	1
CLO2	3	3	1	1	1	1	1	3	3	3	1	3	2	1	1	1
CLO3	3	3	1	1	1	1	1	3	3	3	1	3	2	1	1	1
CLO4	3	3	1	1	1	1	1	3	3	3	1	3	2	1	1	1
CLO5	3	3	1	1	1	1	1	3	3	3	1	3	2	1	1	1
CLO6	3	3	1	1	1	1	1	3	3	3	1	3	2	1	1	1
CLO7	3	3	1	1	1	1	1	3	3	3	1	3	2	1	1	1

‘3’ is for ‘High-level’ mapping, 2 for ‘Mediu1m-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

PHYSIOLOGY **112 Hours**

Objectives

1. Functions of organ systems in normal subjects
2. Various regulatory mechanisms and their integration in maintenance of homeostasis
3. Altered physiology on exposure to stress, during disease process to diagnose and manage it relevant to other specialties.
4. The comparison of normal and abnormal data; interpret the same to assess heath status.
5. Reproductive physiology as relevant to national family welfare program
6. Basic laboratory investigations relevant for a rural setup
7. Concept of professionalism
8. The approaches to the patient with humanity and compassion.

Unit 1: General physiology **3 hours**

- Principles of homeostasis
- Structure of cell membrane
- Transport mechanisms

Unit 2: Blood **5 hours**

- Composition and functions
- RBC-formation, functions and anemia’s
- WBC-formation, function and leukemia’s
- Hemoglobin-synthesis and functions
- Blood groups- basic of blood grouping, clinical importance, blood banking and transfusion
- Homeostasis

Unit 3: Muscle and nerve physiology **11 hours**

- Structure and functions of neuron and neuralgia
- Molecular basic of resting membrane and action potential
- Transmission of nerve impulse
- Structure and transmission across neuromuscular junction
- Types and structure of muscle fiber
- Molecular basis of muscle contraction

Unit 4: Renal system **8 hours**

- Structure and function of nephron
- Urine formation involving processes of filtration, tubular absorption, secretion and concentration.
- Structure and function of Juxta glomerular apparatus
- Innervations of bladder, micturition, abnormalities of micturition
- Body fluid and electrolyte balance

Unit 5: Digestive system **10 hours**

- Basic structure of digestive system
- Functions of
    - Salivary secretion
    - Gastric secretion
    - Pancreatic secretion
    - Intestinal secretion
    - Bile
    - Gastro-intestinal movements
    - Gastro-intestinal hormones=source, regulation and functions.

Unit 6: Endocrinology **10 hours**

- Physiological actions and effect of altered secretion of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas and hypothalamus

Unit 7: Reproductive system **10 hours**

- Functions of testis & ovary and related hormones
- Spermatogenesis & factors influencing it
- Menstrual cycle-hormonal, uterine and ovarian changes
- Physiological basis for pubertal changes
- Contraceptive methods (male and female methods)
- Pregnancy and lactation

Unit 8: Cardiovascular system **12 hours**

- Properties of cardiac muscle
- Conducting system of heart, cardiac cycle
- Regulation of heart rate and blood pressure and cardiac output, normal ECG and shock
- Peripheral resistance and venous return

Unit 9: Respiratory System **12 hours**

- Functional anatomy, volumes and capacities
- Mechanism of normal respiration
- Regulation of respiration
- Transport of respiratory gases
- PFT
- Physiological changes with altitude and acclimatization
- Respiratory dysfunction- Obstructive/Restrictive pulmonary disorders

Unit 10: Central nervous system **18 hours**

- Organization of nervous system
- Functions and properties of synapse, reflex, receptors
- Functions of cortex, basal ganglia, thalamus, hypothalamus, cerebellum and limbic system, descending and ascending tracts
- Pain and referred pain
- Autonomic Nervous System

Unit 11: Special senses **7 hours**

- Functional anatomy of eye
- Physiology of image formation, color vision, refractive errors visual reflexes- pupillary and light reflex
- Functional anatomy ear
- Mechanism of hearing
- Perception of smell and taste sensation
- Vestibular apparatus

Skin and body temperature regulation (2 hrs.)

- Mechanism of temperature regulation

Physiology of sports , exercise , yoga and meditation(4 hrs)

- Cardiorespiratory and metabolic adjustments.
- Physiological effects of yoga and meditation.

BIOCHEMISTRY **32 Hours**

Unit 1: Cell biochemistry **2 hours**

- Cell organelles, cell membrane; structure and function

Unit 2: Carbohydrates **6 hours**

- Classification, dietary sugar
- Glycolysis, TCA cycle, fate of dietary glucose
- CHO metabolism
- Hormonal Regulation of Blood Sugar Levels-Important Metabolic Disorders of Glycogen, Lactose Intolerance, Diabetes Mellitus.

Unit 3: Lipids **4 hours**

- Composition, classification, EFA
- Cholesterol, Lipoproteins, Function Of Lipoproteins – Lipoproteinemia, Atherosclerosis
- Fate of dietary lipid, ketosis

Unit 4: Amino acids **1 hour**

- Classification, EEA, transamination

Unit 5: Proteins **4 hours**

- Classification, dietary proteins
- Structure, denaturation, fate of dietary proteins
- Removal of CO_2 and ammonia urea cycle
- Neuro-Transmitters

Unit 6: Tissue proteins **1 hour**

- Plasma proteins, muscles proteins

Unit 7 : Enzymes **2 hours**

- Definition-Co-Enzymes-Classification-Factors Affecting enzyme action
- General Metabolism Of Enzymes [In Brief]
- Inhibition & Types Of Inhibitors ;
- Iso-Enzymes
- Clinical & Therapeutic Use Of Enzymes

Unit 8: Bioenergetics **2 hours**

Energy release from food and Energy transfer in body

- Oxidative phoshorylation
- ETC

Unit 9: Nutrition **3 hours**

- Balanced diet, calorific value
- Energy requirement
- Basal Metabolic Rate-Definition-Normal Values-Factors Affecting BMR
- Energy Requirement-With-Age/Sex/ Thermogenesis/-Specific Dynamic Action Of Food,-Energy Expenditure For Various Activities
- Nitrogen Balance & Its Significance-Protein Energy Malnutrition-Kwashiorkor & Marasmus

Unit 10: Vitamins **2 hours**

- Water soluble and fat soluble vitamins
- Individual Vitamins-Sources-Co-Enzyme Forms- Function-Reaction Related To Metabolism

Unit 11: Minerals Metabolism **2 hours**

- Calcium, Phosphate, Iron
- Magnesium, Flouride, Zinc, Copper, Selenium, Molybdenum, Iodine-Sources, RDA, Absorption -Transport-Excretion Function & Disorder

Unit 12: Hormones **1 hour**

- Classification, Biochemical Roll

Unit 13: Nucleic acids **1 hour**

RNA and DNA; Definition-Structure & Function-Types-Genetic Code; Catabolism Of Purine - Gout

Unit 14: Molecular biology **1 hour**

- Translation, transcription, genetic code, genetic disorders

Reference Books:

1. Ramakrishnan S. Textbook of medical biochemistry. Orient Blackswan; 2004.

2. Human Physiology: 1. Chaudhary 2. Bijlani

3. Sembulingam K, Sembulingam P. Essentials of medical physiology. JP Medical Ltd; 2012 Sep 30.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, learning by doing, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: BPT 164 Title of the Course: **PHYSIOLOGY AND BIOCHEMISTRY PRCTICAL**

L-T-P Credits : 0-0-80 Credits: 4

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs) (5 TO 8)

After completing this Course, the students should be able to …….

CO-1: Demonstrate the principle and working of various instruments used in Human Physiology. (Cognitive level: Apply)

CO-2: Identify microscopical features of various types of cells and tissues. (Cognitive level: Apply)

CO-3: Perform haematological tests and also record BP, heart rate & pulse etc. (Cognitive level:Apply)

CO-4: Have knowledge about coordinated working pattern of different organs of each system. (Cognitive level: Apply)

CO-5: Analyse, determine and estimate normal and abnormal constituents of urine sample. (Cognitive level: Apply)

CO-6: Analyse, determine and estimate normal and abnormal constituents of Blood sample. (Cognitive level: Apply)

CO-7: To identify and detect the biomolecule lipids and plasma proteins. (Cognitive level: Apply)

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
CLO1	1	1	3	3	3	3	1	1	3	3	1	3	2	1	1	1
CLO2	1	1	3	3	3	3	1	1	3	3	1	3	2	1	1	1
CLO3	3	1	3	3	3	3	1	1	3	3	1	3	2	1	1	1

CLO4	1	1	3	3	3	3	1	1	3	3	1	3	2	1	1	1
CLO5	1	1	3	3	3	3	1	1	3	1	1	3	2	1	1	1
CLO6	1	1	3	3	3	3	1	1	3	1	1	3	2	1	1	1
CLO7	1	1	3	3	3	3	1	1	3	1	1	3	2	1	1	1

'3' is for 'High-level' mapping, 2 for 'Medium-level'mapping, 1 for 'Low-level'mapping.

Detailed Syllabus:

Unit 1: Physiology Practical **60 hours**

1)Hematology

- RBC count
- WBC count
- Differential WBC count
- Eosinophil count
- Clotting and bleeding time
- Blood grouping and cross matching
- Interpret peripheral smear, identify abnormality and anemia.
- Calculate various blood indices.

2)Mosso's finger Ergography

3)Stethography

- Effect of deglutination
- Volume hyperventilation

4)Clinical Examination

- Respiration/CVS/higher Function/Memory/Time/Orientation/Reflexes/Motor and Sensory System/Abdomen
- Cranial Nerves

5)Blood pressure-effects of change in posture and exercise

6)Electrocardiography (Demonstration)

7)Vitalograph

8)Reflexes

Unit 2: Biochemistry Practical **20 hours**

1. Normal and abnormal urine, CSF
2. Routine blood investigations normal values

3. LFT, KFT, TFT, Lipid profile
4. Pancreas, muscles, heart and liver
5. Normal and abnormal urine, CSF
6. Plasma glucose GTT, G.t curve
7. Plasma protein
8. Plasma creatinine
9. Demo experiments enzymes assays
10. Na, K, Ca
11. Spotting

Reference Books:

1. Ramakrishnan S. Textbook of medical biochemistry. Orient Blackswan; 2004.

2. Human Physiology: 1. Chaudhary 2. Bijlani

3. Sembulingam K, Sembulingam P. Essentials of medical physiology. JP Medical Ltd; 2012 Sep 30.

Teaching-Learning Strategies in brief

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Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: BPT 165 Title of the Course: **SOCIOLOGY (THEORY)**

L-T-P Credits: 64-0-0 Credits: 4

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs)

After completing this Course, the students should be able to …….

CO-1: Understand the discipline and basic concept in sociology and social structure. (Cognitive level: Understand)

CO-2: Understand social issues and are empowered to face social problems. (Cognitive level: Understand)

CO-3: Understand an Introduction of Social Structure & Social Change. (Cognitive level: Understand)

CO-4: Understood basic knowledge of Social Structure & Change of Society and major Segment in Social life. (Cognitive level: Understand)

CO-5: Understand the concept of stress and its relationship to health, sickness and one's profession. (Cognitive level: Understand)

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
CLO1	3	3	1	1	2	3	2	3	3	3	3	3	2	1	1	1
CLO2	1	3	3	1	1	3	1	3	3	3	3	3	2	1	1	1
CLO3	1	3	3	1	1	3	1	3	3	3	3	3	2	1	1	1
CLO4	1	3	3	1	1	3	1	3	3	3	3	3	2	1	1	1
CL05	3	3	3	3	1	3	1	3	3	3	3	3	2	1	1	1

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

Unit 1: 5 Hours

Introduction of the basic concepts of sociology & social process. Social institutions (in relation to the individual , family & community), socio-cultural factors as determinants of health & the behaviour in health & sickness will also be introduced which will allow the student to relate the above to therapeutic situations in Physiotherapy.

Introduction

Definitions of sociology, sociology as a science of society, uses of the study of sociology, application of knowledge of sociology in physiotherapy and occupational therapy.

Sociology and Health

Social factors affecting health status, social consciousness and perception of illness, social consciousness and meaning of illness, decision making in taking treatment. Institutions of health, their role in the improvement of the health of the people.

Unit 2: **17 hours**

Socialization

Meaning of socialization, influence of social factor on personality, socialization in hospitals, socialization in the rehabilitation of patients.

Social Groups

Concept of social groups, influence of formal and informal groups on health and sickness, the role of primary groups and secondary groups in the hospitals and rehabilitation settings.

Family

Influence of family on human personality, discussion of chores in the functions of a family on the individual's health, family and nutrition, the effects of sickness on family, and psychosomatic disease.

Community

Concept of community, role of rural and urban communities in public health, role of community in determining beliefs, practices and home remedies in treatment.

Culture

Components of culture, impact of culture on human behavior, cultural meaning of sickness, response of sickness and choice of treatment (role of culture as social consciousness in moulding the perception of reality), culture induced symptoms and disease, sub-culture of medical workers.

Unit 3: **9 hours**

1. Caste System

Features of the modern caste system and its trends.

2. Social Change

Meaning of social change, factors of social change, human adaptation and social change, social change and stress, social change and deviance, social change and health programs, the role of social planning in the improvement of health and in rehabilitation.

3. Social Control

Meaning of social control, role of norms, folkways, customs, morals, religion law and other means of social control in the regulation of human behavior, social deviance and disease.

4. Roles

Role taking and making, concepts of role, multiple roles, role set, role conflicts, role loss and transition, roles and health.

Unit 4: **16 hours**

1. Organization

Goals and functions, organization as systems, organizational impact -individual, family, community, social structure, power and control in organizations, feminist perspectives on organizations.

2. Sex, gender and feminism

Social construction of sex and gender, sex / gender roles, feminist critiques of sociology.

3. Work

Work, culture and work, theories of work, unemployment, women and work.

4. Leisure

Leisure, conceptual and methodological

Unit 5: **17 hours**

1. Social Problems of the Disabled

Consequences of the following social problems in relation to sickness and disability, remedies to prevent the following problems:

Population explosion, Poverty and unemployment, Beggary, Juvenile delinquency, Prostitution, Alcoholism, Problems of women in employment,

2. Sociology of the health profession

Various perspectives, power and autonomy in professions, women and professions.

3. Social Security

Social security and social legislation in relation to the disabled.

4. Social Worker
The role of a medical social worker

Reference Books:

1. Bhushan V, Sachdeva DR. Fundamentals of Sociology. Pearson Education India; 2012.

Teaching-Learning Strategies in brief

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Course Code: BPT 166 Title of the Course: **BASIC PHYSICS AND PHYSICAL PRINCIPLES OF EXERCISE THERAPY**

L-T-P Credits: 128-0-0 Credits: 8

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs)

After completing this Course, the students should be able to …….

CO-1: Understand Mechanical Principles applied in Physiotherapy like force, Torque, Centre of Gravity, etc. (Cognitive level: Understand)

CO-2: Describe different types of levers in the human body and pulleys and strings used in Physiotherapy. (Cognitive level: Apply)

CO-3: Describe various principles of Hydrotherapy. (Cognitive level: Apply)

CO-4: Explain normal and abnormal pelvic tilts and corrective exercises. (Cognitive level: Apply)

CO-5: Understand Group action of muscles and starting and derived positions. (Cognitive level: understand)

CO-6: Understand techniques of giving active movements for various joints and muscle groups. (Cognitive level: Apply)

CO-7: Understand Passive Movement techniques, passive stretching and self-stretching techniques of various muscles in the body. (Cognitive level: Apply)

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

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CLO3	3	2	3	3	1	2	2	1	3	3	2	3	2	1	1	1
CLO4	3	3	3	3	3	3	2	1	3	3	3	3	2	1	1	1
CLO5	3	3	3	3	3	3	2	1	3	3	3	3	2	1	1	1
CLO6	3	3	3	3	3	3	2	1	3	3	3	3	2	1	1	1
CLO7	3	3	3	3	3	3	2	1	3	3	3	3	2	1	1	1

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

Unit 1: Musculoskeletal and Mechanical Basis of Movement 22 Hours

- Force and force Systems
- Motion and its Laws
- Pendulum
- Friction
- Work, Energy and Power
- Stress and Strain
- Planes and Axes
- Bones and their Classification
- Joints and their Classification
- Classification of Movement
- Degrees of Freedom
- Structure of Muscle and its Classification
- Muscle Tension
- Muscle Fibre
- Group Action of Muscles
- Torque & angle of pull with free body diagrams

Unit 2: Gravity and Equilibrium **8 Hours**

- Definition
- Effects of Gravity
- Centre of gravity
- Line of Gravity and their Alterations
- Application of gravity in Human Body and Movement.
- Equilibrium
    - Definition
    - Types
    - Effects
    - Supporting Base
    - Role in Human Movement.

Unit 3: Simple Machines **10 Hours**

- Levers and their Functions and classification
- Pulleys and their Functions and classification
- Inclined Planes and their Functions and classification.

Unit 4: Muscle Action **6 Hours**

- Muscle work: Isotonic (concentric, eccentric), Isometric (static), Isokinetic
- Mechanical efficiency of the muscles.
- Factors affecting mechanical efficiency of muscle.

Unit 5: Fundamental and Derived Positions **15 Hours**

- Positions and their muscle work.
- Effects and uses.
- Specify the importance and derived positions for each one:
    - standing
    - kneeling
    - sitting
    - lying
    - hanging

- Pelvic Tilt

Normal pelvic tilts, alterations from normal, anterior tilt (forward) posterior tilt (backward), Lateral tilt. Muscles responsible for alterations and pelvic rotation. Identification of normal pelvic tilt, pelvic rotation and altered tilts and their corrective measures.

Unit 6: Movements **27 Hours**

- Surface Anatomy of the individual joints
- Classification of Movement: Active, Passive, Active Assisted, Resisted
- Physiological Effects of exercise.
- Rhythm of movement, Timing of movement, Duration of movement.

Principle of application, types, indications and contra - indications of the following and demonstrate thetechnique for each:

i) Passive movements: Relaxed passive, mobilizing passive (forced P.M. manipulations, serial manipulations)

ii)Active movements: Voluntary (free, active assisted, assisted resisted, resisted)

iii) Progressive Resisted Exercises –Various means of providing resistance; Various progressive resisted programs, Mac queens set system, Mac Queen's power system. Delorme's boot, Dumbbells, Sand bags in pulleys, powder board , Progressive Resisted Exercises of various muscles (10 Hours)

Unit 7: **10 hours**

A.Basic principles of General fitness.

- Basic Principles of training
- Warm up exercises.
- Aerobic exercises.
- Cool down exercises.

B.Therapeutic Gymnasium

- Set-up of gymnasium & its importance.
- Various equipments in the gymnasium.
- Operational skills & uses of the equipments.

Unit 8: Relaxation **8 Hours**

- Introduction
- Types (Local and General)
- Indications of local and general relaxation with description of muscle fatigue and spasm.
- Prerequisites of relaxation methods.
- Detailed study of local and general techniques of relaxation.

Unit 9: Passive stretching **12 Hours**

- Definitions of stretching and flexibility.
- Various flexibility tests (Thomas, Ely's, Ober's etc)
- Indications and contra-indications
- Therapeutic effects.
- Techniques of passive stretching.
- Methods of stretching for major muscles of the body.

Unit 10: Miscellaneous **10 Hours**

- Elasticity
    - Stress, Strain, Hooke's Law, Springs and their properties
- Hydrostatics and Hydrodynamics
    - Principles, Application
- Traction: Principles and Application

Reference Books:

1. Hollis M, Cook PF, editors. Practical exercise therapy. Wiley-Blackwell; 1999 Aug 3.
2. Perveen W. The Principles of Exercise Therapy M Dena Gardiner Delhi, India CBS Publishers & Distributor. 2017;4(3):73-4.
3. Levangie PK, Norkin CC. Joint structure and function: a comprehensive analysis. FA Davis; 2011 Mar 9.
4. Kisner C, Allen Colby L. Exercise Therapy.2007.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: BPT 167 Title of the Course: **BASIC PHYSICS AND FUNDAMENTALS OF EXERCISE THERAPY (LAB HOURS)**

L-T-P : 0-0-112 Credits: 7

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs)

After completing this Course, the students should be able to …….

CO-1: Demonstrate Mechanical Principles applied in Physiotherapy like force, Torque, Centre of Gravity, etc. (Cognitive Level: understand)

CO-2: Describe different types of levers in the human body and pulleys and strings used in Physiotherapy. (Cognitive Level: understand)

CO-3: Describe various principles of Hydrotherapy. (Cognitive Level: understand)

CO-4: Explain normal and abnormal pelvic tilts and corrective exercises. (Cognitive Level: understand)

CO-5: Understand Group action of muscles and starting and derived positions (Cognitive Level: understand)

CO-6: Understand techniques of giving active movements for various joints and muscle groups. (Cognitive Level: understand)

CO-7: Understand Passive Movement techniques, passive stretching and self-stretching techniques of various muscles in the body. (Cognitive level: Understand)

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
CLO1	3	1	2	3	2	1	1	1	1	1	1	3	2	1	1	1
CLO2	3	1	2	3	2	2	1	1	1	3	1	3	2	1	1	1
CLO3	3	3	3	3	2	3	1	3	3	3	3	3	2	1	1	1
CLO4	3	3	3	3	3	3	1	3	3	3	3	3	2	1	1	1
CLO5	3	1	2	3	3	3	1	3	3	3	3	3	2	1	1	1
CLO6	3	2	3	3	3	3	1	3	3	3	3	3	2	1	1	1
CLO7	3	1	3	3	3	3	1	3	3	3	3	3	2	1	1	1

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

1. Mechanical Principles applied in Physiotherapy like force, Torque, Centre of Gravity, etc.

2. Demonstration of different types of levers in the human body.

3. Demonstration of different types of pulleys and strings used in Physiotherapy.

4.Demonstration of Archimedes' Principle of floatation and Bernoulli's Theorem in Hydrotherapy.

5.Demonstration of normal and abnormal pelvic tilts and corrective exercises.

6.Demonstration of Group action of muscles

7.Demonstration of starting and derived positions

8.Demonstration of techniques of giving active movements for various joints and muscle groups

9.Demonstration of Passive Movement techniques for the whole body

10.Demonstration of passive stretching and self-stretching techniques of various muscles in the body.

11.Application of PRE principle, Strengthening exercises for different muscles and muscle groups

12.Clinical Observation

Reference Books:

1. Hollis M, Cook PF, editors. Practical exercise therapy. Wiley-Blackwell; 1999 Aug 3.
2. Perveen W. The Principles of Exercise Therapy M Dena Gardiner Delhi, India CBS Publishers & Distributor. 2017;4(3):73-4.
3. Levangie PK, Norkin CC. Joint structure and function: a comprehensive analysis. FA Davis; 2011 Mar 9.
4. Kisner C, Allen Colby L. Exercise Therapy.2007.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning by doing, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: BPT 168 Title of the Course: **BASIC PHYSICS AND PRINCIPLES OF ELECTROTHERAPY (THEORY)**

L-T-P: 128-0-0 Credits: 8

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs)

After completing this Course, the students should be able to …….

CO-1: To explain the physical rationale for the use of physical agent and electrotherapeutic modalities. (Cognitive level: Understand)

CO-2: Develop an understanding of the physical principles of electromagnetic radiation and effects of current electricity. (Cognitive level: Understand)

CO-3: Develop an understanding of electrophysiology of nerve and muscle. (Cognitive level: Understand)

CO-4: Develop an understanding of therapeutic effects of heat and cold etc. (Cognitive level: Understand)

CO-5: Practically apply Paraffin wax bath, Hydrocollator hot packs, Fluido-therapy, Whirlpool, Contrast Bath, Cryotherapy, ultraviolet radiation, TENS and laser on patients. (Cognitive level: Apply)

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
CLO1	3	2	3	2	1	3	1	1	3	3	2	3	2	1	1	1
CLO2	3	2	3	2	1	3	1	1	3	3	2	3	2	1	1	1
CLO3	3	2	3	2	1	3	1	1	3	3	2	3	2	1	1	1
CLO4	3	2	3	2	1	3	1	1	3	3	2	3	2	1	1	1
CLO5	3	3	3	1	1	3	1	2	3	3	3	3	2	1	1	1

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

Unit 1: Physical principles **46 Hours**

a. Physical Properties of matter - adhesion, surface tension, viscosity, density and elasticity.

b. Structure of atom, molecules, elements and compound

c. Introduction to therapeutic currents - Definition, types and characteristic features

d. 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 Electromotive Force (EMF).

e. Current Electricity: Units of Electricity: farad, Volt, Ampere, Coulomb, Watt , Conductors, Insulators, Potentialdifference, Resistance and intensity

f. Condensers: Definition, principle, Types: construction and working, capacity and uses.

g. Magnetism: Definition.Magnetic field line, magnetic flux, magnetic flux density, E.M.F.. Properties of magnets. Electromagnetron effects of electrical current. Electromagnetic induction. Magnetic field and magnetic forces. Magnetic effects of an electric field, Risk factors on prolonged exposure to E.M. field.

h. Ohm's law and its application to DC and AC currents.

i Fuse: construction, working and use

j. Rectifying Devices-Thermionic valves, Semiconductors, Transistors, Amplifiers, transducer and Oscillator circuits.

k. Display devices and indicators-analogue and digital.

l. Transformer: Definition, Types, Principle, Construction, Eddy current, Functions

m. Chokes: Principle, Construction and working, Uses

n. Amplifiers: Definition, principle, Uses and Application

Unit 2: Electrical Supply and Electric shock **10 Hours**

- Brief outline of main supply of electric current
- Electric Shock
    - Dangers-short circuit,
    - Precaution-safety devices, three- pin, earthing, fuses, etc.
    - First aid and initial management of electric shock

Unit 3: Efects of Current Electricity (6 Hrs)

a. Chemical effects-lons and electrolytes, lonisation, Production of an EMF by chemical actions.

Unit 4: Electrophysiology of Nerve and Muscle (8 Hrs)

Electrical activities in Human body, Muscles, Nerves.

Thermal regulation and its mechanism in in human body.

Unit 5: Electro magnetic Radiation **14 Hours**

Electromagnetic spectrum.: Physical Principles and their Relevance to Physiotherapy Practice .

LASER:

- Physical properties
- Production
- effects and uses
- indications and contraindications
- Dosimetry
- methods of application
- dangers and production.

Unit 6: Therapeutic Effects Heat and Cold therapy **22 Hours**

- Introduction
- Physical principles and Physiological effects of heat and cold on body tissues
- Specific heat, Modes of Heat transfer, Latent heat, Conductors and non conductors, Energy conversions, Thermometer and Thermography.
- Thermal agents: PWB, Hydrocollator, Fluidotherapy, Whirlpool, Contrast Bath.
- Cryotherapy: Effects and uses, indications and contraindications, methods of application, dangers and precautions

Unit 7: Electrotherapeutic Modalities **22 Hours**

a . Ultra Violet Radiations:

- Principle and classification
- Physiological and therapeutic effects and uses
- Indication, contraindication
- Dangers and Precautions
- Techniques

b. Transcutaneous Electrical Nerve Stimulation:

- Principles
- Theories of pain and its control
- Effects and uses of TENS.

- Indications and contraindications
- Dosimetry
- Dangers and precautions
- Techniques

Reference Books:

1. Sarah Bazin (1995), *Clayton's Electrotherapy*, 10th Edition, W.B. Saunders

2. John Low & Ann Reed (1994), *Physical Principles Explained,* I Edition, Butterworth-Heinemann.

3. Michelle H. Cameron, *Physical Agents in Rehabilitation: An Evidence based Approach to Practice,* 5th Edition, Elsevier.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning by doing, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: BPT 169 Title of the Course: **BASIC PHYSICS AND PHYSICAL PRINCIPLES OF ELECTROTHERAPY (LAB HOURS)**

L-T-P :0-0-112 Credits:7

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

Detailed Syllabus:

1. Diode and Triode valves, Transistors, Ammeter, Voltmeter, Galvanometer, Rheostat, Resistance Box, Transformer, etc.

2. Demonstration of Electrotherapy units .

3. Practical application of PWB, Hydrocollator, Fluidotherapy, Whirlpool, Contrast Bath, Cryotherapy

4. Hydrocollator unit, its operation and therapeutic application of Hot packs-regionwise.

5. Paraffin wax bath unit, its operation and different method of application- regionwise.

6. Various forms of therapeutic cold application region wise including ice, cold packs, vasocoolant sprays, etc.

7. Clinical observation

Reference Books:

1. Sarah Bazin (1995), *Clayton's Electrotherapy*, 10th Edition, W.B. Saunders

2. John Low & Ann Reed (1994), *Physical Principles Explained*, I Edition, Butterworth-Heinemann.

3. Michelle H. Cameron, *Physical Agents in Rehabilitation: An Evidence based Approach to Practice*, 5th Edition, Elsevier

Teaching-Learning Strategies in brief (4 to 5 sentences)

The teaching learning strategies followed are board and chalk teaching, learning by doing, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief (4 to 5 sentences)

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: BPT 170 Title of the Course: **ENVIRONMENTAL STUDIES**

L-T-P : 48-0-0 Credits: 3

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs)

After completing this Course, the students should be able to …….

CO-1: Recognize the physical, chemical, and biological components of the earth's systems and show how they function. (Cognitive level: Understand)
CO-2: Understand the transnational character of environmental problems and ways of addressing them, including interactions across local to global scales. (Cognitive level: Understand)
CO-3: Apply systems concepts and methodologies to analyse and understand interactions between social and environmental processes. (Cognitive level: Understand)

CO-4: Concepts and methods from ecological and physical sciences and their application in environmental problem solving. (Cognitive level: Understand)

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
CLO1	1	1			1	1	3	1			1	3	1	1	1	1
CLO2		1			2	3	3	3			3	3	1	1	1	1
CLO3		1	3		3	2	3	2		1	3	3	1	1	1	1
CLO4		1	3	1	3	3	3	2	1		1	3	1	1	1	1

'3' is for 'High-level' mapping, 2 for 'Medium-level'mapping, 1 for 'Low-level'mapping.

Detailed Syllabus:

Unit 1: **10 Hours**

1. The Multidisciplinary Nature of Environmental Studies
   - Definition, scope and importance
   - Need for public awareness
2. Natural Resources:
   - Renewable and non-renewable resources:
   - Natural resources and associated problems.

A. Forest resources
B. Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
C. Water resources: Use Andover-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems.
D. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
E. Food resources: world food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies
F. Energy resources: growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Cast studies.
G. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
    a. Role of an individual in conservation of natural resources.
    b. Equitable use of resources for sustainable lifestyles

Unit 2: **14 Hours**

1. Ecosystems
    A. Concept of an ecosystem
    B. Structure and function of an ecosystem
    C. Producers, consumers and decomposers
    D. Energy flow in the ecosystem
    E. Ecological succession
    F. Food chains, food webs and ecological pyramids
    G. Introduction, types, characteristic features, structure and function of the following ecosystem
        - Forest ecosystem
        - Grassland ecosystem
        - Desert ecosystem
        - Aquatic deco systems (ponds, streams, lakes, rivers, oceans, estuaries)

2. Biodiversity and Its Conservation
- Introduction – definition: genetic, species and ecosystem diversity.
- Biogeographical classification of India
- Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values
- Biodiversity at global, National and local levels
- India as a mega-diversity nation
- Hot spots of biodiversity

- Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts
- Endangered and endemic species of India
- Conservation of biodiversity: In situ and Ex-situ conservation of biodiversity

3. Environmental Pollution
   - Definition
   - Causes, effects and control measures of :

A. Air pollution
B. Water pollution
C. Soil pollution
D. Marine pollution
E. Noise pollution
F. Thermal pollution
G. Nuclear hazards
   a) Solid waste Management: causes, effects and control measures of urban and industrial wastes
   b) Role of an individual in prevention of pollution
   c) Pollution case studies
   d) Disaster management: floods, earthquake, cyclone and landslides

Unit 3: **19 Hours**

1. Social Issues and the Environment
   - From Unsustainable to Sustainable development
   - Urban problems related to energy
   - Water conservation, rain water harvesting, watershed management
   - Resettlement and rehabilitation of people; its problems and concerns, case studies
   - Environmental ethics: Issues and possible solutions
   - Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies
   - Wasteland reclamation
   - Consumerism and waste products
   - Environment Protection Act.
   - Air (Prevention and Control of Pollution) Act.
   - Water (Prevention and control of Pollution) Act
   - Wildlife Protection Act
   - Forest Conservation Act
   - Issues involved in enforcement of environmental legislation
   - Public awareness

2. Human population and the Environment
   - Population growth, variation among nations
   - Population explosion – Family Welfare Program
   - Environment and human health
   - Human Rights
   - Value Education
   - HIV/AIDS
   - Women and Child Welfare
   - Role of Information Technology in Environment and human health
   - Case Studies

Unit 4: Field Work **5 Hours**

- Visit to a local area to document environmental assets-river/forest/grassland/hill/mountain
- Visit to a local polluted site – Urban/Rural/Industrial/Agricultural
- Study of common plants, insects, birds
- Study of simple ecosystems-pond, river, hill slopes etc. (Field work equal to 5 lecture hours)

Reference Books:

1. Environmental Science by NCERT

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning by doing, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the

average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: BPT 171 Title of the Course: **COMPUTER APPLICATIONS**

L-T-P : 0-0-32 Credits:2

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs)

After completing this Course, the students should be able to …….

CO-1: Use the computer for basic academic and research purposes. (Cognitive level:Create)
CO-2: Able to understand the basic programming unit and execution of instruction. (Cognitive level: Create)
CO-3: Able to understand the hardware's or parts of computer. (Cognitive level: Understand)

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
CLO1	2	1	3	3	3	1	3	3	3	3	3	3	1	3	1	1
CLO2	1	1	1	1	1	1	3	1	3		3	3				1
CLO3	1	1	1	1			3				3	3		3		

'3' is for 'High-level' mapping, 2 for 'Medium-level'mapping, 1 for 'Low-level'mapping.

Detailed Syllabus:

Unit 1: **8 Hours**

- Various components of personal computer.
- Operational skills of common computer applications, including work processing and spread sheet software

Unit 2: **8 Hours**

- Basic knowledge of utility of multimedia.
- Skills of web surfing for literature research relevant to the field of Physiotherapy.

Unit 3: **8 Hours**

- Power Point Presentations
- Assignments in Microsoft Word
- Microsoft Excel

Unit 4: **8 Hours**

Introduction to Basic Principles of Programming

Reference Books:

1. Fundamentals of Computer science - M. AfsharAlam
2. Mansfield, Ron: the Compact Guide to Microsoft office: BPB Publication, Delhi
3. O'Brian, J.A: Management Information System, Tata McGraw Hill, New Delhi

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning by doing, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: BPT 172 Title of the Course: **GENERAL FOUNDATION COURSE**

L-T-P: 48-0-0 Credits :3

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs)

After completing this Course, the students should be able to …….
CO-1: Will help the students to recall the concepts of Physics, chemistry and biology to set a foundation for higher studies. (Cognitive level: Understand)

CO-2: To understand the basics of English grammar for better understanding of the BPT course subjects. (Cognitive level: Apply).

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
CLO1	3	1	3	3	1	1	1	2	1	1	1	3	1	1	1	1
CLO2	3	3	3	3	1	1	3	3		3	1	3	1	1	1	1

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

Unit 1: Chemistry **10 Hours**

1. Electrochemical cells
2. Galvanic Cells
3. Conductance of Electrolytic Solutions
4. Electrolytic cells
5. Batteries

Unit 2: Biology **20 Hours**

1. Human Reproduction
   - The male reproductive systems
   - The female reproductive systems

- Gametogenesis
- Menstrual cycle
- Fertilization and implantation
- Pregnancy and embryonic development
- Parturition and lactation

2. Reproductive health
   - Definition
   - Population explosion
   - Birth control
   - Medical Termination of pregnancy
   - Sexually Transmitted diseases
   - Infertility
3. Human health and diseases
   - Common diseases in humans
   - Innate immunity
   - Active and passive immunity
   - Vaccination and immunisation
   - Allergies
   - Autoimmunity
   - Immune system in body
   - AIDS
   - Cancer
   - Drugs and alcohol abuse
   - Effect of drugs / Alcohol Abuse
   - Prevention and control

Unit 3: Physics: **10 Hours**

- Coulomb's law

-Forces between Multiple charges

- Capacitors and capacitance
  - Definition
  - The parallel plate capacitor
  - The effect of dieclectric on capacitance
  - Combination of capacitors
  - Energy stored in capacitors
- Ohm's law
- Drift of electrons and origin of resistivity
- Combination of resistors – series and parallel

Unit 4: English **8 Hours**

Noun, pronouns, Adjectives verbs, prepositions, conjunctions, letter writing/essay writing

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning by doing, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

BACHELOR OF PHYSIOTHERAPY

2ND YEAR

Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 261

Title of the Course: **GENERAL MEDICINE**

L-T-P: 80-0-0 Credits: 5

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

GENERAL MEDICINE (THEORY)

CO1: To understand the Aetiology, Pathophysiology, Signs & Symptoms & Management of the various Endocrinal, Metabolic, Geriatric & Nutrition Deficiency conditions, Rheumatological, Cardiovascular, Respiratory & Neurological Conditions.

CO2: To acquire skill of clinical examination of Musculoskeletal, Pulmonary, Cardiovascular & Neurological System.

CO3: To interpret auscultation findings with special emphasis to pulmonary system, Chest X-ray, Blood gas analysis, PFT findings, and Blood studies done for medical conditions.

CO4: To describe the principles of Management at the Medical Intensive Care Unit

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	2	2	3	3	3	3	3	3	3	1	2	1	2
CO2	2	3	3	3	3	3	3	3	3	2	3	2	1	2	1	2
CO3	2	3	3	3	3	3	3	3	3	3	3	2	1	2	1	2
CO4	3	3	2	3	3	3	3	3	3	3	3	3	1	2	1	2

Detailed Syllabus

Section – I {35Hrs}

1. Genetic, Immunological, Environmental, Climatic Factors in Disease.
2. Diseases due to Infection
   Major Manifestations of Infection, Principles of Management
   Diseases due to: Viruses, Chlamydeous, Rickettsiae, Bacteria,
   Spirochetes, Fungi, Protozoa, Helminthes, Arthropods, STD.
3. Diseases of the alimentary tract and pancreas including: stomach and duodenum, large and small intestine and pancreas, Gastro-intestinal haemorrhage, inflammatory bowel disease.
4. Diseases of the teeth
5. Diseases of the Liver and Biliary System including: jaundice, portal hypertension, ascites , renal failure, hepatic encephalopathy , fulminant hepatic failure , acute and chronic parenchymal disease , tumors of the liver , liver transplantation, gall stones, cholecystitis
6. Nutritional factors in disease.
7. Disturbances in water, electrolyte and acid – base balance. Physiology of water and electrolytes, major manifestations of electrolyte and acid – base disorders, hypernatremia, hyponatremia, hyperkalaemia, hypokalaemia, sodium and water excess, calcium, phosphate and magnesium disorders, metabolic acidosis and alkalosis, respiratory acidosis and alkalosis, mixed acid – base disorders.
8. Diseases of Kidney and Genito- urinary system including: Acute glomerulonephritis syndrome, nephrotic syndrome, recurrent haematuria, renal failure, glomerular diseases, infections if the kidney and urinary tract, obstruction of the urinary tract, urinary tract calculi and nephrocalcinosis, congenital abnormalities of the kidney, drug – induced kidney disorders and tumors
9. Diseases of the endocrinal system and metabolism including: Hypothalamus, pituitary, thyroid, parathyroid, adrenal diseases, Sexual disorders, Diabetes Mellitus
10. Diseases of the Blood: Disorders of the erythrocytes & leucocytes, Blood transfusion, Haemostasis Disorders of the venous thrombosis
11. Oncology (clinical presentation and principles of management)
12. Principles of Geriatric Medicine Demography of aging, normal old age, Atypical presentation of disease, Acute confusion, urinary incontinence, immobility, falls.
13. Acute poisoning Assessment of severity, general principles, general features and management and prevention.

Section – II CARDIAC DISEASE {10Hrs}

1. Disorders of heart rate, rhythm, and conduction.
2. Ischemic (Coronary) heart disease, Myocardial Infarction.
3. Vascular disease
4. Diseases of the heart valves.
5. Congenital Heart Disease.
6. Diseases of the myocardium.
7. Diseases of the pericardium.

Section – III PULMONARY DISEASE {12Hrs}

1. Obstructive pulmonary disease.
2. Infections
3. Tumors of the Bronchus and lungs.
4. Interstitial pulmonary diseases.
5. Diseases of the nasopharynx, larynx, trachea.
6. Diseases of the pleura, diaphragm, chest wall.

Section – IV SKIN {8Hrs}

1. Signs & symptoms of skin disease.
2. Skin damage from environmental hazards.
3. Infections, infestations, insect bites, & stings.
4. Immunologically mediated skin disorders.
5. Skin disorders in AIDS, immunodeficiency & venereal disease.
6. Brief description of eczematous dermatomes, psoriasis, lichen planus, acne, rosacea, and similar disease, malignant disease of skin, disorders of keratinization, skin problems in infancy, old age, pregnancy & the skin, metabolic disorders & reticulo histiocytic proliferative disorders, disorders of hair & nails, systemic disease, disorders of pigmentation, principles of management of skin diseases.

SECTION V – PEDIATRICS {15Hrs}

1. Normal fetal development & child birth, including assessment of neonate
2. Development of Normal child – Neuromotor, physical; growth, cognitive, intellectual, social etc.
3. Examination & assessment of a pediatric patient
4. Congenital & acquired musculoskeletal disorders
5. Congenital &Acquired Cardio-pulmonary disorders
6. Congenital & acquired neurological disorders
7. Hereditary disorder
8. Nutritional vitamins Deficiency & developmental disorders
9. Burns injuries & accident
10. Common surgical interventions

Section V PSYCHIATRY (10 hours)

1. Brief description of epidemiology and etiological factors.
2. Classification of psychiatric disorders.
3. Clinical interview (MSE)
4. Brief description of psychological and physical treatments used.
5. Brief description of clinical syndromes (organic psychiatric disorders, substance abuse, schizophrenia, affective disorders, neurotic, stress related and somatoform disorders, eating disorders, sleeping disorders, sexual dysfunction, puerperal mantal disorders personality disorders, factitious disorders)
6. Psychiatric problems in a general hospital, community psychiatry, legal aspects of psychiatry.

BOOKS RECOMMENDED

1. Principles & Practical Medicine – Davidson
2. Medicine for students – Golwalla
3. Principle of Internal Medicine - Harrisson
4 Textbook of paediatrics- O.P.Ghai

BOOKS RECOMMENDED

1. *Principles & Practical Medicine – Davidson*
2. *Medicine for students – Golwalla*
3. *Principle of Internal Medicine – Harrisson*

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessional are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 262

Title of the Course: **GENERAL SURGERY (THEORY)**

L-T-P: 80-0-0 Credits: 5

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

GENERAL SURGERY (THEORY)

The student will be able to:

CO1:List the indications for surgery, etiology, clinical features and surgical methods for various conditions.

CO2:Plan a better rehabilitation care for patients pre and post surgically

CO3:clinical decision making ability and management expertise

CO4: diagnose condition from history taking, clinical evaluation and investigation in antenatal and postnatal care.

CO5: To understand various injuries with its treatment Protocol

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	2	3	3	3	3	3	2	3	3	1	2	1	2
CO2	2	3	3	3	3	2	3	3	3	3	3	2	1	2	1	2
CO3	3	3	2	2	2	2	2	2	2	2	3	3	1	2	1	2
CO4	3	3	3	3	3	2	2	3	2	2	3	3	1	2	1	2
CO5	3	3	2	3	3	2	3	3	3	3	3	3	1	2	1	2

DETAILED SYLLABUS

Section - I {20 Hrs.}

1. General scheme of case taking: history, physical examination, investigations, progress, follow – up, termination.
2. Healing and wound management.
3. Accident and emergency surgery, warfare injuries.
4. Resuscitation & support (acute & long term).
5. Wound infections.
6. Immunology and organ transplantation.
7. Tumors, cysts, ulcers, sinuses.
8. Burns.
9. Arterial & venous disorders.
10. Lymphatic and lymph nodes

Section – II SURGERIES OF THE THORAX, HEART AND PERICARDIUM {20 Hrs.}

1. Investigation methods.
2. Cardio – respiratory resuscitation
3. Thymus.
4. Chest injuries and Diseases of the chest wall.
5. Diseases of the pleura.
6. Trachea.
7. Diseases of the Bronchi and Lung
8. Post –operative pulmonary complications.
9. Diaphragm
10. Mediastinal tumors.
11. Cardiac surgeries: extra cardiac, closed intracardiac, open cardiac operations
12. Pericardium.
13. Congenital Heart Diseases
14. Acquired Heart Disease
15. Aortic aneurysm
16. Cardio thoracic trauma.
17. Skeletal cardiomyoplasty.
18. Cardiac transplantation.
19. Heart lung transplantation.
20. Mechanical circulatory support.

Section – III GYNAECOLOGY AND OBSTETRICS {15 Hrs.}

1. History taking
2. Terminologies used.
3. Classification of Diseases.
4. Birth control
5. Reproduction.
6. Placenta and placental membranes.
7. Foetus.
8. Physiological changes during pregnancy.

9. Endocrinology in relation to reproduction.
10. Foetus – in - utero.
11. Foetal skull and maternal pelvis.
12. Antenatal care.
13. Antenatal assessment of foetal well - being.
14. Normal labour, normal puerperium.
15. Complications of pregnancy and labour.
16. Special considerations: previous history of C- section, Rh negative, elderly primigravida grand multipara, bad obstetric history, and obesity.
17. Term, new born infant, low birth weight baby.
18. Diseases of the foetus and new born.
19. Pharmacotherapeutics, induction of labour, operative obstetrics.
20. Special topics: foetal distress, intrapartum foetal monitoring, shock in obstetrics, acute renal failure, blood coagulation disorders, high – risk pregnancy, immunology in obstetrics
21. Aids to diagnosis in obstetrics.

Section-IV EYE (10 Hours)

1. Brief description of anatomy and physiology of the eye.
2. Ophthalmic optics and brief description of examination.
3. Diseases of the eye and adnexa of the eye.
4. Disorders of motility of the eye.
5. Ocular manifestations of diseases of the nervous system.
6. Brief description of immunopathology of the eye.
7. Preventive ophthalmology.

Section – V E.N.T. {15 Hrs.}

Ear (7 hrs)

1. Brief description of anatomy and physiology, peripheral receptors & central neural pathways of auditory and vestibular system.
2. Audiology and acoustics.
3. Brief description of assessment of hearing (TFT's & Audiometry)
4. Hearing loss.
5. Hearing Aid & cochlear Implants
6. Rhinoplasty
7. Assessment of vestibular functions.
8. Disorders of vestibular system.
9. Diseases of the external and middle ear.
10. Otosclerosis.
11. Facial nerve and its disorders.
12. Brief description of Meniere's disease, acoustic neuroma, otalgia, tinnitus & Vertigo
13. Tumors of external ear, middle ear, and mastoid, Lateral skull base.

Nose and Para nasal Sinuses (3 hrs)

1. Brief description of anatomy and physiology.
2. Classification of diseases and disorders
3. Rhinitis (acute, chronic, allergic, other forms of non – allergic rhinitis)
4. Trauma to the face (Maxillofacial)
5. Sinusitis & its complications

Throat (5 hrs)

1. Thyroid Gland & its Disorder.
2. Head and Neck oncology
3. Brief description of diseases of the oral cavity, salivary glands, pharynx larynx, trachea, oesophagus & Cervical Lymph nodes
4. Brief description of the techniques used for examination
5. Brief description of clinical examination including telescopy
6. Indications and types of operative surgery (Tracheostomy, Tonsillectomy & adenoidectomy, micro laryngoscopy, mastoidectomy & tympanoplasty)
7. Instrumentation-Diagnostic and Therapeutic.

BOOKS RECOMMENDED

Text book of surgery ,S.Das
Logan Turner's Disease of ENT
Disease of ENT-John Jacob Ballenger

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

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Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 263

Title of the Course: **PHARMACOLOGY (THEORY)**

L-T-P: 80-0-0 Credits: 5

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

PHARMACOLOGY (THEORY)

CO1: To understand the various routes of drugs administration, pharmacodynamics and pharmacokinetics of drugs.

CO2: . To understand the various drugs used for the treatment of ANS, PNS and CNS conditions with their mechanism of action and adverse effects.

CO3: To understand the various drugs used for the treatment of endocrine system with their mechanism of action and adverse effects.

CO4: To understand the various drugs used for the treatment of GIT problems with their mechanism of action and adverse effects

CO5: To understand the various antibiotic drugs with their mechanism of action and adverse effects

CO6: To understand the various drugs used for the treatment of ailment of cardio vascular system, bronchial asthma, skin lesions with their mechanism of action and adverse effects.

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
CO1	2	2	3	2	2	2	2	3	2	3	3	2	1	2	1	2
CO2	3	2	2	2	3	3	2	2	2	3	2	3	1	2	1	2
CO3	3	2	3	2	2	2	2	2	2	3	2	3	1	2	1	2
CO4	2	2	2	2	3	3	2	3	2	2	2	2	1	2	1	2
CO5	3	2	3	3	2	2	3	2	2	2	2	3	1	2	1	2
CO6	2	3	2	2	3	3	2	2	3	3	2	2	1	2	1	2

Section – I General Pharmacological Principles (13 Hours)

1. Definitions and Routes of Drug Administration
2. Pharmacokinetics: transportation across membranes, absorption, distribution, biotransformation, excretion, kinetics of elimination
3. Pharmacodynamics: principles and mechanisms of drug action, combined effects of drugs, drug dosage, factors modifying drug action.
4. Adverse Drug Effects

Section – II (67 Hours)

1. Drugs acting on Central Nervous System: anesthetics, alcohols, alkaloids, narcotics, neuroleptics hypnotics, anticonvulsants, sedatives, stimulants, antianxiety
2. Drugs acting on peripheral nervous system: Skeletal muscle relaxants, local anesthetics
3. Drugs acting on the Autonomic Nervous System: cholinergic & anticholinergic drugs, adrenergic & antiadrenergic drugs.
4. Drugs acting on cardiac vascular system.
5. Drugs acting on the respiratory system
6. Drugs acting on the Kidney.
7. Drugs affecting Blood and Blood formation
8. Gastrointestinal Drugs
9. Antimicrobial Drugs
10. Drugs acting on Skin and Mucous membrane
11. Antiseptics, Disinfectants, and Ectoparasiticides
12. Chelating agents
13. Chemotherapeutic agents.
14. Hormones and drugs affecting endocrine functions
15. Vitamins
16. Metabolic and other inorganic compounds.
17. Immunologic agents.
18. Diagnostic agents.

BOOKS RECOMMENDED:

1. *Pharmacology* by Gaddum
2. *Medical Pharmacology* by Drill
3. *The pharmacology Principle of Medical Practise* by Krantx&Carr
4. *The pharmacological basis of therapeutics* by Goodman, L.S. Gilman A

5. *Pharmacology and Pharmacotherapeutics* - By Satoskar and Bhandarkar
6. *Medical Pharmacology* - Goth Anders

Teaching-Learning Strategies in brief

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Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 264

Title of the Course: **GENERAL PSYCHOLOGY (THEORY)**

L-T-P: 80-0-0 Credits: 5

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

GENERAL PSYCHOLOGY (THEORY)

CO1: Understand the role of family and community in the development of behaviours.

CO2: Develop a holistic outlook toward the structure of society and community resources, understand the significance of social interactions in the process of rehabilitation.

CO3: Identify the subtle influence of culture in the development of human personality, the role of beliefs and values as determinants of individual and group behaviours.

CO4: Psychosocial assessment of patients in various developmental stages.

CO5: Concept of stress and its relationship to health, sickness and one's profession.

CO6: Ego defense mechanisms and learn counselling techniques to help those in need, Reasons for non-compliance among patients and improving compliance behavior.

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
CO1	2	2	3	2	2	2	2	3	2	3	3	2	1	2	1	2
CO2	3	2	2	2	3	3	2	2	2	3	2	3	1	2	1	2
CO3	3	2	3	2	2	2	2	2	2	3	2	3	1	2	1	2
CO4	2	2	2	2	3	3	2	3	2	2	2	2	1	2	1	2
CO5	3	2	3	3	2	2	3	2	2	2	2	3	1	2	1	2
CO6	2	3	2	2	3	3	2	2	3	3	2	2	1	2	1	2

DETAILED SYLLABUS

1. Definition, application and methods in psychology. {2 Hrs.}
2. Biology of Behavior. {2 Hrs.}
3. Sensory processes and perception. {2 Hrs.}
4. Principles of learning.
   Classical and Instrumental Conditioning, Cognitive learning. {5 Hrs.}
5. Memory.

Theories, long and short – term memories, forgetting, amnesia. {6 Hrs.}

6. Thinking and Language.
   Concepts, thinking process, problem- solving and decision making,

   creative thinking and language communication. {6 Hrs.}

7. Motivation.
   Theories, Biological and Social motives, frustration and conflict of motives, motives to know and be effective. {6 Hrs.}

8. Emotion and Stress. {6 Hrs.}
   Expression and perception of emotions, physiology and application of emotion.

9. Social perceptions, influences, and relationships. {5 Hrs.}
10. Attitudes.
    Nature and measurement of attitudes.

    Attitude theories {6 Hrs.}

    Factors in attitude change

    Behavior and attitudes

11. Development – A Lifespan Perspective (infancy, childhood, adolescence, adult, old age) {10 Hrs.}

12. Brief description of Psychological assessment and testing. {5 Hrs.}
13. Personality
    Defining and thinking about personality {8Hrs.}

    Theories and issues and controversies and research

14. Abnormal Psychology. {5Hrs.}
15. Therapy for Psychological distress. {5 Hrs.}

BOOKS RECOMMENDED

Morgan C.T., King R. A., Weijz J. R .,Schopler J.
Introduction to Psychology, 7th edn. (Tata McGraw-Hill Publishing Co. Ltd.)
Papalia D. E., Olds S. W.
Human Development, 5th. (Tata McGraw Hill Publishing Co. Ltd
Munn N.L.*Introduction to Psychology*-(Premium Oxford, I.B.P. Publishing Co.)
Parameshwaran E. G. &Ravichandra K. - *Experimental Psychology* : A *Laboratory Manual* (1st edn.) (Seema Publications, Delhi) Munn Julia (ed.)

Laboratory Psychology : A Beginner's Guide (Psychology Press Ltd., East Sussex, U.K.)
Psychology for Physiotherapist 2nd ,ThangamaniRamalingam A DibyendunarayanBid.

Teaching-Learning Strategies in brief

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Assessment methods and weightages in brief

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Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 265

Title of the Course: **PATHOLOGY AND MICROBIOLOGY (THEORY)**

L-T-P: 80-0-0 Credits: 5

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

PATHOLOGY and MICROBIOLOGY (THEORY)

At the end of the course, the student will be able to

CO1: Acquire the knowledge of concepts of cell injury and changes Produced thereby indifferent tissues and organs; Capacity of the body in healing Process.

CO2: Recall the Etio-pathological effects and the Clinico pathological Correlation of common infection. They can also understand the importance and procedure of sterilization for hospitals, lab, ICU, OT and during surgery, to manage biomedical waste products and to understand the nosocomial infection and their prevention and non-infectious diseases

CO3: Acquire the knowledge of concepts of Neoplasia with reference to the Etiology, gross and microscopic features diagnosis and prognosis in different tissues and organs of the body. They are able to characterize, understand the pathogenicity of disease.

CO4: Correlate normal and altered. morphology of different organ systems in different diseases needed for understanding disease process and their clinical significance (with special emphasis on neuro- musculoskeletal and cardio-respiratory system). They can understand the epidemiology of disease, diagnosis, treatment and prevention of disease

CO5: Acquire knowledge of common immunological disorders and their resultant effects on the human body. They will be able to perform, demonstrate, implement and apply the concept of microbiology in better understanding with relevance to human disease.

CO6: Understand in brief, about the Hematological diseases and their resultant effects on the human body.

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
CO1	2	2	3	2	2	3	2	2	2	2	2	2	1	2	1	2
CO2	3	2	2	3	3	3	3	2	3	2	3	3	1	2	1	2
CO3	2	3	2	2	3	3	3	2	2	2	2	2	1	2	1	2
CO4	3	2	2	3	2	2	2	3	2	2	2	3	1	2	1	2
CO5	2	3	2	3	2	2	3	2	2	2	2	2	1	2	1	2
CO6	3	2	3	2	3	2	3	2	3	2	3	3	1	2	1	2

DETAILED SYLLABUS

Section – I PATHOLOGY (60 Hours)

1. Introduction to Pathology (**4 Hours**)
   a. Definitions
   b. Branches
   c. Pathology as a Science
   d. Correlation between Pathology and Physiotherapy
2. Cell Injuries, Death and Adaptation (**3 Hours**)
   a. Definitions and Causes
   b. Mechanisms
   c. Morphology of Cell Injury
   d. Apoptosis
3. Cellular Adaptations to Growth and Injury (**3 Hours**)
   a. Acute and Chronic Inflammation
   b. General Features of Inflammation
   c. Vascular Changes and Cellular Events-Acute Inflammation.
   d. Chemical Mediators of Inflammation.
   e. Definitions, Causes and Histological Features-Chronic Inflammation.
4. Tissue and Cell Repair (**4 Hours**)
   a. Normal Cell Growth
   b. Repair by Connective tissue
   c. Wound Healing
   d. Fracture Healing
   e. Pathological Aspects of repair
5. Hemodynamic Disorders (**4 Hours**)
   a. Edema, Hyperemia and Congestion, Hemorrhage, Hemostasis and Thrombosis, Embolism, Infarction, Shock.

6. Disorders of Immune System (**4 Hours**)
   a. Cells of the Immune System
   b. Immune Mechanisms of Tissue Injury
   c. Autoimmune Disease: Mechanism, RA, SLE, Myasthenia Gravis.
   d. Immunodeficiency Diseases: Differences between Primary and Secondary Immunity, AIDS.
7. Neoplasms (**3 Hours**)
   a. Definitions and Nomenclature.
   b. Characteristics.

c. Carcinogenesis, Carcinogenic agents
d. Biology of Tumor Growth, Tumor Immunity.

8. Environmental Disorders (**3 Hours**)
   a. Injury by Chemical Agents
   b. Injury by Physical Agents
9. Infectious Diseases (**4 Hours**)
   a. Categories of Infectious Agents
   b. Host barriers to Infection
   c. Immune Evasion by Microbes
10. Nutritional Disorders (**4 Hours**)
   a. Nutritional Deficiencies
   b. Obesity
   c. Diet and Systemic Disease
11. Vascular System (**4 Hours**)
   a. Vascular Wall Cells and their Response to Injury
   b. Arterial Diseases: Arteriosclerosis, Hypertension and Hypertensive
   c. Vascular disease, Buerger's disease, Aneurysm. Venous Disease:
   d. Varicose Veins, Phlebothrombosis, Thrombophlebitis.
   e. Lymphatic Diseases: Lymphangitis, Lymphoedema.
12. Cardiac System (**3 Hours**)
   a. Principles of Cardiac Dysfunction
   b. Types of Heart Disease: Ischemic Heart Disease,
   c. Hypertensive Heart Disease, Valvular Heart Disease,
   d. Myocardial Heart Disease, Pericardial Heart Disease,
   e. Congenital Heart Disease.
13. Hematopoietic and Lymphoid System (**3 Hours**)
   a. Anemia, Polycythemia, Leukopenia, Leukemia, Deficiencies of Factor VIII and IX, Splenomegaly.
14. Respiratory System (**2 Hours**)
   a. Atelectasis, Obstructive Lung disease, Restrictive Lung Disease,
   b. Vascular Lung Diseases, Pulmonary Infections: Pneumonia,
   c. Tuberculosis, Lung Abscess, leural Disorders: Pneumothorax,
   d. Hemothorax.
15. Gastrointestinal System (**2 Hours**)
   a. Gastritis, Gastric Ulcerations, Ischemic Bowel Disease, Appendicitis,
   b. GI Tract Infections, Cohn's Disease, Jaundice, Hepatic Failure, {2 Hrs.}
   c. Cirrhosis, Hepatitis, Cholelithiasis, Cholecystitis, Diabetes Mellitus,
   d. Pancreases.
16. Urinary and Reproductive System (**2 Hours**)
   a. Nephritis, Kidney Stones.
   b. Male Genital Tract: Specific Inflammation. {2Hrs.}
   c. Female Genital Tract: Pelvic Inflammatory Disease, Menopause and
   d. Post-Menopausal Changes, Endometritis, Carcinoma of the Mammary Glands.
17. Endocrine System (**2 Hours**)
   a. Hyperpituitarism, Hypopituitarism, hyperthyroidism, Hypothyroidism.
18. Musculoskeletal System (**2 Hours**)
   a. Osteoporosis, Osteomyelitis, Osteoarthritis, Gout, Osteoma
   b. Osteosarcoma, Chondroma, Chondrosarcoma
   c. Osteochondrosarcoma, Muscular Dystrophy
19. Integumentary System (**2 Hours**)

a. Psoriasis, SLE, Acne Vulgaris.

20. Nervous System (**2 Hours**)
    a. Hydrocephalus, Meningitis, Hematoma, Multiple Sclerosis,
    b. Alzheimer's Disease, Parkinsonism, G.B. Syndrome.

BOOKS RECOMMENDED

1.Basic Patho – Kumar
4.Textbook Of Pathology By Boyd

Section – I MICROBIOLOGY (20 Hours)

1. Immunology (**5 Hours**)
    a. Brief description of immune system, Immunity, Immune Responses, Immunodeficiency Diseases, & Hypersensitivity disorders
2. Bacteriology (**5 Hours**)
    a. Morphology, Nutritional Requirements, Metabolism, Growth,
    b. Classification and Identification of Bacteria
    c. Staphylococcus, Streptococcus, Pneumococcus, Neisseria, Mycobacteria, Clostridium, salmonnela, vibrio-colera,E-coli, Sigella, Tetanus
3. Virology (**5 Hours**)
    a. General Characteristics and Classification Of Virus
    b. Virus-Host Interaction
    c. DNA and RNA Viruses, HIV
4. Miscellaneous (**5 Hours**)
    a. Brief description of medical mycological classification, candilla, Ring Worm, Cryptoccus
    b. Parasitology(malaria, amebiosis, ascaris)
    c. Bacteriology of Water, Milk and Air.
    d. Hospital Infection
    e. Diagnostic Microbiology

BOOKS RECOMMENDED

1. Textbook Of Microbio - P.Chakraboty
2. Textbook OfMicrobio–Anantnarayan

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 266

Title of the Course: **BIOMECHANICS AND KINESIOLOGY (THEORY)**

L-T-P: 144-0-0 Credits: 9

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

BIOMECHANICS and KINESIOLOGY (THEORY)

CO1: On successful completion of this programme, students should be able to describe the understanding of basics of mechanics, muscle structure and contraction, factors effecting muscle contraction and recruitment

CO2: Describe mechanics of chest wall during various movements and the pathomechanics associated with various chest conditions and deformities

CO3: Define normal mechanics and pathomechanics of TMJ associated with various conditions

CO4: Analyse normal mechanics of posture and gait in various planes and axis

CO5: Analyse the pathomechanics associated with abnormal posture and gait.

CO6: Describe biomechanics of shoulder, elbow, wrist, hip, knee, ankle joint, Vertebral column.

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	3	3	3	3	2	3	3	3	1	2	1	1
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CO4	3	3	2	2	3	3	3	3	3	3	3	3	1	2	1	1
CO5	3	3	2	2	3	2	3	3	3	3	2	3	1	2	1	1
CO6	3	3	3	2	2	3	2	3	2	3	2	3	1	2	1	1

DETAILED SYLLABUS

SECTION – I (6 Hours)

1.Review of the fundamentals of biomechanics

A. Joint Structure and Function.

a. Basic principles of joint design and a human joint.

b. Tissues present in human joint including dense fibrous tissue, bone, cartilage and connective tissue.

c. Classification of joints.

d. Joint function, Kinematics chains and range of motion.
e. General effects of injury and disease.
f. Recall anatomy and study the biomechanics of the spine, shoulder girdle, joints of the upper extremity, pelvic girdle and the joints of the lower extremity.

B. Kinesiology:
1. Origin of human movement and its significances
2. Analysis of movement – kinetics and kinematics

SECTION 2 (5 Hours)

Muscle Structure and Function 5Hrs

a. Mobility and stability functions of muscle
b. Elements of muscles structure and its properties.
c. Factors affecting muscle tension.
d. Types of muscle contraction and muscles work.
e. Classification of muscles and their functions.
f. Group action of muscles, coordinated movement.

SECTION 3 (20 Hours)

Postures and Gait

a. Posture: Definition, factors responsible for posture, relationship of gravity on posture Postural in balance: factors responsible for in balance in static and dynamic positions including ergonomics, abnormal postures.
b. Description of normal gait, determinants of gait, spatio temporal features, and its analysis. Running and stair climbing gait.
c. Gait deviations: Types, causative factors and analysis.
d. Pathological gaits.

SECTION 4

Regional Structure and Function

a. The vertebral column 10Hrs
b. Shoulder complex 20Hrs
c. Elbow complex 10Hrs
d. Wrist and Hand complex 20Hrs
e. Hip complex 15Hrs
f. Knee complex 20Hrs
g. Ankle and Foot complex. 20Hrs

Teaching-Learning Strategies in brief

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Assessment methods and weightages in brief

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Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 267

Title of the Course: **BIOMECHANICS AND KINESIOLOGY (LAB HOURS)**

L-T-P: 0-0-96 Credits: 6

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

BIOMECHANICS and KINESIOLOGY (THEORY)

CO1:On successful completion of this programme, students should be able to describe the understanding of basics of mechanics, muscle structure and contraction, factors effecting muscle contraction and recruitment

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CO3:Define normal mechanics and patho mechanics of TMJ associated with various conditions

CO4:Analyse normal mechanics of posture and gait in various planes and axis

CO5:Analyse the patho mechanics associated with abnormal posture and gait.

CO6: Describe biomechanics of shoulder, elbow, wrist, hip, knee, ankle joint ,Vertebral column.

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
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CO4	3	3	2	2	3	3	3	3	3	3	3	3	1	2	1	1
CO5	3	3	2	2	3	2	3	3	3	3	2	3	1	2	1	1
CO6	3	3	3	2	2	3	2	3	2	3	2	3	1	2	1	1

DETAILED SYLLABUS

1. Study the effects of forces on objects.
2. Determination of the C.G. of an object
3. Identification of axes and planes of motion at the joints of spine, shoulder girdle, joints of upper extremity, pelvic girdle and joints of lower extremity.
4. Study the effects of different types of muscle contraction, muscle work group action of muscles and coordinated movement.
5. Analysis of normal posture respect to L.O.G. and the optimal position of joints in Antero-posterior and lateral views.

6. Analysis of normal gait and measurement of spatio- temporal features.

Recommended Books

1. Joint Structure and Function- Norkin
2. Biomechanics of Human Motion- Leveau

Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 268

Title of the Course: **EXERCISE THERAPY AND MANUAL THERAPY (THEORY)**

L-T-P: 144-0-0 Credits: 9

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

Course Outcomes (COs)

CO1: To use & describe advanced therapeutic exercises used for devising rehabilitation protocol for various conditions.

CO2: To know the benefits of hydrotherapy, balance and coordination exercise.

CO3. To be able to perform various types of stretching of upper limb & lower limb, massage techniques, yoga balance and coordination exercises.

CO4. To acquire the skills of application of various techniques to improve pulmonary function as well as to regain maximum strength of muscles, its therapeutic uses and merits-demerits of the same.

CO5: Describe the pattern of normal and abnormal movements of various joints and activities.

CO6: Analyze normal human posture (static and dynamic) and various normal musculoskeletal movements during gait, ADL, and describe the movements of the thorax during breathing.

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
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CO4	3	3	3	3	3	3	3	3	2	3	2	3	1	2	1	1
CO5	3	3	2	2	3	2	3	3	3	3	2	3	1	2	1	1
CO6	3	3	3	2	2	3	2	3	2	3	2	3	1	2	1	1

DETAILED SYLLABUS

1. Basic concepts in manual therapy.8.47Hrs
   - Definition of manual therapy, mobilization and manipulation.
   - History of manual therapy.
   - Neurophysiological effects of manual therapy
   - Biomechanical principles in manual therapy.

2. Introduction to Manual Therapy Techniques: 8.47Hrs
   - Maitland concepts and techniques
   - Mulligan concepts and techniques
   - McKenzie concepts and techniques
   - Cyriax concepts and techniques
   - Butler concepts and techniques
   - Muscle Energy Technique

3. Massage:8.47Hrs
   - Definition and History of massage
   - Massage manipulations.
   - Physiological and therapeutic effects of various massage manipulations on various systems of body.
   - Indications and contra indications of Massage.
   - Pre-requisites of massage application (Such as position of the patient, inspection of treatment part, draping etc.).
   - Regional Massage: Massage for Upper extremity, Lower extremity, Face.

4. Peripheral Joint mobilization:8.47Hrs
   - Definition and principles.
   - Indications and contra indications.
   - Causes of joint range limitation.
   - Therapeutic uses of passive joint mobilization.
   - Various approaches of joint mobilization.
   - Passive mobilization techniques for various joints of the body.

5. Motor Learning:8.47Hrs
   - Introduction to learning and difference between learning and performance.
   - Factors affecting motor learning with a special focus on Feedback and its types.
   - Theories of motor learning and their practical implications.
   - Introduction to different strategies used to enhance motor learning.

6. Motor control:8.47Hrs
   - Introduction.
   - Factors responsible for motor control.
   - Theories and their implications.
   - Introduction to various treatment techniques based on different models of motor control.

7. Yoga:8.47Hrs
   - Introduction.
   - Principles of Yoga.
   - Basic Yogic postures & their effects.

8. Chest physiotherapy:8.47Hrs
   - Overview of anatomy of thorax
   - Breathing exercises
   - Postural drainage, its indications and contraindications.
   - Respiratory muscle training.

Exercise Therapy topics.....

1. Muscle Grading: 8.47Hrs
   - Principles and application of manual muscle testing
   - Grading of muscles of the upper limb, lower limb, Back, Abdominals and Neck.

2. Goniometry:8.47Hrs
   - Introduction.
   - Description of various types of goniometers,
   - Principles and application of goniometry.
   - Study of normal ranges of motion of various joints of the body.
   - Measurement of ROM of the individual joints of the body in different planes using a goniometer.

3. Posture:8.47Hrs
   - Introduction.
   - Types of posture.
   - Postural mechanisms.
   - Postural Abnormalities in saggital and coronal planes.
   - Assessment of posture.
   - Introduction to postural correction measures.

4. Gait:8.47Hrs
   - Introduction.
   - Phases of gait and their sub-phases.
   - Determinants and variables of gait.
   - Abnormal gaits.
   - Introduction to various methods used for gait analysis.
   - Introduction to gait training.

5. Balance:8.47Hrs
   - Definition.
   - Types of balance.
   - Factors responsible for maintenance of balance.
   - Balance dysfunction and its causes.
   - Methods used in evaluating static and dynamic balance in detail with a special mention to the most commonly used scales.
   - Introduction to various balance training strategies.

6. Neuromuscular Co-ordination:8.47Hrs
   - Definition
   - Mechanism of Neuromuscular co-ordination.
   - Causes of incoordination with emphasis on cerebellar and basal ganglia dysfunctions.
   - Assessment of co-ordination dysfunction
   - Brief idea about training of coordination particularly the Frenkel exercises regimen.
   - Neuromuscular re-education with emphasis on PNF (Principles, Procedures and Techniques).

7. Crutch Walking.8.47Hrs
   - Introduction to walking aids.
   - Classifications and components of crutches.
   - Characteristics of a good crutch..
   - Preparing a patient for crutch walking (strengthening of crutch walking muscles, Measurement of crutches)
   - Types of crutch walking on even ground and stairs.

8. Hydrotherapy:8.47Hrs
   - Review of Hydrostatics and hydrodynamics.
   - Indications and contra-indications for hydrotherapy.
   - Therapeutic uses of hydrotherapy.
   - Guidelines for preparation of patients and therapist.

- Brief explanation about the design, Construction, types, safety features, cleaning the pool, water heating systems, and Hygiene of the pool.

9. Bed Rest Complications: 8.47Hrs
- Indications of prolonged bed rest.
- Complications after a period of prolonged immobilization related to Neurological, Musculoskeletal, Cardiovascular and gastrointestinal systems.
- Prevention and treatment of the complications.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

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Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 269

Title of the Course: **EXERCISE THERAPY AND MANUAL THERAPY (LAB HOURS)**

L-T-P: 0-0-96 Credits: 6

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

Course Outcomes (COs)

CO1: To use & describe advanced therapeutic exercises used for devising rehabilitation protocol for various conditions.

CO2: To know the benefits of hydrotherapy, balance and coordination exercise.

CO3. To be able to perform various types of stretching of upper limb & lower limb, massage techniques, yoga balance and coordination exercises.

CO4. To acquire the skills of application of various techniques to improve pulmonary function as well as to regain maximum strength of muscles, its therapeutic uses and merits-demerits of the same.

CO5: Describe the pattern of normal and abnormal movements of various joints and activities.

CO6: Analyze normal human posture (static and dynamic) and various normal musculoskeletal movements during gait, ADL, and describe the movements of the thorax during breathing.

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
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CO4	3	3	3	3	3	3	3	3	2	3	2	3	1	2	1	1
CO5	3	3	2	2	3	2	3	3	3	3	2	3	1	2	1	1
CO6	3	3	3	2	2	3	2	3	2	3	2	3	1	2	1	1

Manual Therapy Topics

The course involves hands on demonstrations of manual therapy techniques:48Hrs

1. Maitland technique
2. Mulligan technique
3. McKenzie technique
4. Cyriax technique
5. Buttler technique
6. Muscle energy technique

The course also involves practical sessions of :

1. Various massage manipulations and practical demonstration of regional massage.
2. Flexibility tests and passive stretching of individual muscles and muscle groups.
3. Passive mobilization of various joints of the body.
4. Demonstration of various asanas and pranayams.
5. Demonstration of positions used for postural drainage with different manipulations.

Exercise Therapy topics..... 48Hrs

6. Demonstration of muscle grading.
7. Goniometry of various joints of body.
8. Assessment of posture.
9. Assessment of balance and demonstration of some balance training strategies
10. Assessment of coordination and demonstration of Frenkel Exercises.
11. Orientation to therapeutic gymnasium.
12. Demonstration of various walking aids. Various types of crutch walking and crutch measurement.
13. Positioning of the patient and different techniques of relaxation.

Recommended Books:MANUAL THERAPY

1. Massage, Manipulation & Traction---Sydney Litch
2. Massage by Hollis
3. Measurement of Physical Function. Cynthia Norkins
4. Therapeutic Exercise by Carolyn Kisner
5. Principles of Exercise Therapy-Dena Gardiner
6. Physical Therapy of the Cervical and Thoracic Spine by Grant
7. Grieve's Modern Manual Therapy
8. Science and Practice of Mannual therapy by EyalLyderma
9. Orthopaedic Physical Therapy, by Robert Donatelli
10. Motor control by Shummway Cook**.**

Recommended Books:EXERCISE THERAPY

1.Principles of Exercise Therapy-Dena Gardiner
2.Measurement of Physical Function. Cynthia Norkins
3.Therapeutic Exercise by Carolyn Kisner
4.Exercise therapy by Hollis
5.Physical rehabilitation by O Sullivan

Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 270

Title of the Course: **ELECTROTHERAPY (THEORY)**

L-T-P: 144-0-0 Credits:9

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

ELECTROTHERAPY (THEORY)

CO1: Able to demonstrate the techniques of application of various electrotherapy modalities.

CO2: Able to select the appropriate modalities in different conditions

CO3: Able to select the appropriate dosages of different Electrotherapy modalities to achieve the different goals

CO4: Demonstrate the indication and contraindications of various modalities

CO5: Demonstrate the treatment time, intensity according to the Acute, subacute & chronic conditions.

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
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CO3	3	3	2	3	3	3	3	3	3	3	3	3	1	2	1	1
CO4	3	2	3	3	3	3	3	3	3	3	3	2	1	2	1	1
CO5	3	2	3	3	3	2	3	3	3	3	3	3	1	2	1	1

DETAILED SYLLABUS

SECTION I – ELECTROPHYSIOLOGY

Electrophysiology of nerve and muscle: Electrical characteristic of muscle and nerve cell, Physiology of electrically induced muscle contraction, Motor unit, Types of muscle cells, Pattern of muscle fibre recruitment with manual and electrically induced contraction

Electrical concepts: Effects of changes in current parameters and their effects on treatment protocol : (a)Alternating versus direct current (b)Tissue impedance (c)Current Density(d) Current Frequency (e)Current Intensity (f)Current Duration(g)Polarity(h)Electrode Placement

Therapeutic Use Of Electrically Induced Muscle Contraction: (a)Muscle Re-education(b)Muscle Pump contraction(c)Retardation of muscle atrophy(d)Muscle Strengthening(e)Increasing Range of Motion(f)The effect of no contractile stimulation on oedema

Physiology Of Pain :(a) Introduction (b) Types and various classification of pain(c) Peripheral and central aspect of pain transmission and modulation of pain transmission (d)Role of different physical and electrotherapeutic modalities in pain management.

SECTION II – ELECTROTHERAPEUTICS

1. **Low Frequency Currents**: Basic principles, application techniques, parameters (Dosimetry), Indications, dangers, precautions and contraindications, therapeutic effects of all types of low frequency currents
    a. Transcutaneous Electrical Nerve Stimulation
    b. Faradic Foot Bath
    c. Faradism Under Pressure
    d. Ultra Reiz
    e. High Voltage Pulsed Galvanic Current
2. **Medium Frequency Currents**: Basic principles, application techniques, parameters (Dosimetry), therapeutic effects, Indications, dangers, precautions and contraindications, of all types of medium frequency currents:
    a. Interferential Therapy Current
    b. Russian Current
3. **High frequency Currents**: Basic principles, application, techniques, Dosimetry, therapeutic effects, Indications, dangers, precautions and contraindications, of all types of High frequency energies:
    a. Short Wave Diathermy
    b. Microwave Diathermy

c. Ultrasound Therapy

d. Infrared Therapy

4. Guidelines for using therapeutic modalities in injury management-

a. Initial acute injury phase

b. Inflammatory response phase

c. Fibroblastic repair phase

d. Maturation remodelling phase

e. Treatment parameters of stimulation of denervated muscle

f. Important consideration in treating injury

g. Indications and contraindications

SECTION III – ELECTRODIAGNOSTIC AND ADVANCED ELECTROTHERAPEUTICS

1. Basic principle, application techniques, procedure, interpretation of findings, indications, precautions, dangers, and contraindication of the following:
    a. Motor Point Assessment And Finding
    b. Faradic And Galvanic Currents In Electrotherapeutics And Electro Diagnosis.
    c. SD Curve, Rheobase And Chronaxie
    d. Nerve Conduction Velocity Test-Sensory And Motor
    e. Diagnostic Electromyography
    f. Isokinetic Dynamometer
2. Basic principle, application techniques, procedure, interpretation of findings, indication, precaution, dangers, and contraindication of the following:
    a. Functional Electrical Stimulation
    b. Neuromuscular Electrical Stimulation
    c. Shock Wave Therapy
    d. Long Wave Diathermy
    e. EMG Biofeedback
    f. Combination Therapy
    g. Iontophoresis
    h. Phonophoresis

SECTION IV – ADVANCED ELECTROTHERAPY (20 Hours)

1. Computerization of modalities
2. Combination of different modalities.
3. Progression of parameters.
4. Selection and combination of parameters.
5. Combination therapy
    a. Principles
    b. Uses and indications of ultrasound with electrotherapy.

c. Uses and indications of laser with electro therapy
d. Uses and indications of ultrasound with laser and electro therapy.
e. Uses and indications of microwave with traction.

6. Shock wave therapy
7. Long wave diathermy

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

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Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 271

Title of the Course: **ELECTROTHERAPY (LAB HOURS)**

L-T-P: 96-0-6 Credits: 6

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

ELECTROTHERAPY (LAB HOURS)

CO1: Able to demonstrate the techniques of application of various electrotherapy modalities.

CO2: Able to select the appropriate modalities in different conditions

CO3: Able to select the appropriate dosages of different Electrotherapy modalities to achieve the different goals

CO4: Demonstrate the indication and contraindications of various modalities

CO5: Demonstrate the treatment time, intensity according to the Acute, subacute & chronic conditions.

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
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CO3	3	3	2	3	3	3	3	3	3	3	3	3	1	2	1	1
CO4	3	2	3	3	3	3	3	3	3	3	3	2	1	2	1	1
CO5	3	2	3	3	3	2	3	3	3	3	3	3	1	2	1	1

DETAILED SYLLABUS

1. Basic operation of electric supply to the equipment and safety device.
2. Sensory and motor stimulation of nerves and muscles by various types of low frequency currents on self.
3. Locate and stimulate different motor points region wise, including the upper and lower limb, trunk & face.
4. Therapeutic application different low frequency currents faradic foot bath, faradism under pressure,
   iontophorsis.
5. Reaction of degeneration of nerves. Plot strength duration curves. Chronaxie and Rheobase.
6. TENS Stimulator, its operation and application - regionwise.
7. SWD,MWD,LASER methods of applications ,safety ,precautions.
8. Short wave diathermy unit, its operation and different methods of application - regionwise.
9. Microwave diathermy unit, its operation and different methods of application - regionwise.
10. Ultrasound unit, its operation and methods of application - regionwise.
11. LASER unit, its operation and methods of application - regionwise.
12. Various forms of therapeutic cold application region wise including ice , coldpacks,vapocoolantsprays, etc.
13. Intermittent pneumatic therapy unit its operation and different methods of application - regionwise.

Recommended Books

1. Clayton's Electrotherapy
2. Clinical Electrotherapy- Nelson and Currier
3. Electrotherapy Explained- Low and Reed

BACHELOR OF PHYSIOTHERAPY

3rd YEAR

Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY THIRD YEAR**

Course Code: BPT 361

Title of the Course: **ORTHOPEDICS AND SPORTS MEDICINE (THEORY)**

L-T-P: 80- 0-0 Credits 5

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs)

After completing this Course, the students should be able to ……

CO-1: Develop an understanding of various orthopedic conditions which commonly cause disability and their medical and surgical management. (Cognitive level: Understand)

CO-2: Develop an understanding of orthopedic diseases including tumours, fractures, sports injuries and nerve injuries. (Cognitive level: Understand)

CO-3: Develop an understanding of terminologies, assessment and examination, surgical techniques of various orthopaedic conditions. (Cognitive level: Apply)

CO-4: Develop an understanding of Regional Orthopedics including common sports injuries. (Cognitive level: Apply)

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
CLO1	2	1	2	3	3	3	2	1	3	2	2	3	3	3	1	2
CLO2	2	1	2	3	3	3	2	1	3	2	2	3	3	3	1	2
CLO3	2	1	2	3	3	3	2	1	3	2	2	3	3	3	1	2
CLO4	2	1	2	3	3	3	2	1	3	2	2	3	3	3	1	2

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

Unit 1: Introduction & Traumatology **12 Hours**

A. Introduction to Orthopaedics

a) Introduction to Orthopaedic terminologies

b) Clinical History and Examination

c) Approach to the patient and bedside manners

B. Trauma

a) Definition, Classification, Clinical Features, Differential Diagnosis, Investigations, Complications, Medical and Surgical Management of 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

iv. Principles of management – Conservative and Surgical

v. Prevention and treatment of complications including – Volkmann's Ischaemic contracture, Sudeck's Atrophy, Carpal Tunnel syndrome. Myositis Ossificans and shoulder-hand syndrome.

vi. Functional Bracing

vii. Soft Tissue Injuries

viii. Upper limb Trauma – bony injuries, joint injuries and soft tissue injuries.

ix. Lower limb Trauma – bony injuries, joint injuries and soft tissue injuries.

x. Spinal Trauma – bony injuries, joint injuries and soft tissue injuries

xi. Crush Injuries

xii. Vascular Injuries

C. Peripheral Nerve Injuries

a) Classification of Nerve Injuries

b) Clinical features and physiotherapy management, including reconstructive surgery for Radial, median and ulnar nerve lesions, femoral nerve, Sciatic and lateral popliteal lesions.

c) Brachial Plexus injuries including Erb's, Klumpke's and Crutch Palsy.

D. Neuromuscular Disorders

a) Poliomyelitis

b) Myopathies

c) Cerebral Palsy

Unit 2: General Orthopaedics **20 Hours**

Outline the clinical

A. Congenital Deformities – Outline the clinical features and management of Torticollis Thoracic Inlet Syndrome, Limb Deficiency, Scoliosis, Kyphosis, Sprengel's Shoulder, CTEV, Foot deformities, Arthrogryposis Multiplex Congenita, Spina Bifida etc.
B. Acquired Deformities: Deformities of spine, knee, shoulder, hip, hand, foot etc.
C. Developmental Disorders of Bone – Cartilage Dysplasia and Bony Dysplasia, Developmental dysplasia of the hip etc.
D. Diseases of the joints: Osteoarthritis, Rheumatoid Arthritis, Ankylosing Spondylitis, Reiter's Disease, Gout etc.
E. Common Bone and Joint Tumors –Types of Bone Tumors, Pathology of Bone Tumors, Complications, Conservative and Surgical Management.

Unit 3: Regional Orthopaedics including Common Sports Injuries **30 Hours**

Outline the Definition, Classification, Clinical Features, Pathogenesis, Investigations, Differential Diagnosis, Complications and Management of the following conditions:

a) Shoulder - Tendinitis, Periarthritis, Rotator Cuff Injury, Impingement Syndrome, Adhesive Capsulitis, etc.
b) Elbow - Tennis Elbow, Golfer's Elbow, Pulled Elbow, Olecranon Bursitis etc.
c) Wrist and Hand - Dequervain's Tenosynovitis, Trigger Thumb and Finger, Carpal Tunnel Syndrome, Dupuytren's Contracture, Ganglion etc.
d) Cervical - Brachial Neuralgia, Cervical Spondylitis, PIVD, etc.
e) Thoracic and Lumbar Spine – Thoracic outlet Syndrome, Scheurmann's Disease, Spondylolisthesis, Lumbosacral Strain, Lumbar Canal Stenosis, Spondylitis, PIVD, etc
f) Hip - Slipped Upper Femoral Epiphysis, Avascular Necrosis, etc.
g) Knee – Patellofemoral Pain Syndrome, Bursitis, Osgood Schlatter's Disease, Internal Derangement, Anterior Knee Pain, Chondromalacia Patellae, etc.
h) Foot and Ankle – Anterior Foot Pain, Plantar Fascitis, Heel Pain, Bursitis, Metatarsalgia, Tarsal Tunnel Syndrome, etc

Unit 4: Special Surgical Techniques and Amputation **18 Hours**

1. Special Surgical Techniques
   a) Osteotomy, Arthrodesis
   b) Arthroplasty and joint replacements
   c) Tendon transplant, tendon repair, soft tissue release.
   d) Nerve Suturing
   e) Limb Lengthening Techniques and Reattachment of limbs
   f) Spinal stabilization, Discectomy, Spinal fusion.
   g) Spinal surgeries in Cerebral Palsy & Poliomyelitis

2. Amputation
   a) Classify Amputations, indications, levels of amputation.
   b) Outline pre-operative, operative and prosthetic management.
   c) Outline prevention and treatment of complications

Reference Books:

1.

2. Hamblen D.L. Simpson A. H. R.W. and Adams J.C. (12th Edition) Adam's Outline of Fractures including joint injuries, Churchill Livingstone Elsevier.

3. Hamblen D.L. Simpson A. H. R.W. and Adams J.C. (14th Edition) Adam's Outline of Fractures including joint injuries, Churchill Livingstone Elsevier.

4. Turek

5. Campbell

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: BPT 362 Title of the Course: **RADIOLOGY (THEORY)**

L-T-P 48-0-0 Credits- 3

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs) (5 TO 8)

After completing this Course, the students should be able to …….

CO-1: Understand the principles of radiology and identification of anatomical structures and pathologies on radiographs. (Cognitive level: Understand)

CO-2: Develop an understanding of radiology reports to enable correlation of finding with the images. (Cognitive level: Apply)

CO-3: Develop an understanding of recent advances in diagnostic imaging. (Cognitive level: Apply)

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
CLO1	2	1	1	2		2	1		3	3	1	1	3	2	2	1
CLO2	2	1	2	2	1	2	1		3	3	1	1	3	2	2	1
CLO3	2	1	2	2	2	2	1	1	3	3	1	3	3	2	2	1

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

Unit 1: Introduction and Radiographs of Upper limb

- Introduction
- Principles of radiography, identification of gross anatomical features in plain radiographs.

- Radiographs of :

Upper Limb

Shoulder region

X-ray - Plain Film

MRI - Magnetic Resonance Imaging

MRI of the shoulder with its excellent soft tissue discrimination offers the best non-invasive way to study the shoulder. MRI gives us direct imaging of the rotator cuff, muscles and tendons of the glenohumeral joint in multiplanar projections

Pathologies

Osteonecrosis, Osteoarthritis, Ant. Dislocation, Posterior Dislocation, Rotator Cuff Tear, fractures & dislocations

Elbow & forearm

X-ray - Plain Film - AP view, Lat view

Forearm : AP view, Lat view

Pathologies:

Fractures & dislocations

Wrist - X-ray - Plain Film

MRI - Magnetic Resonance Imaging

MRI has added a new dimension in the diagnoses of Carpal Tunnel Syndrome at the wrist. The transaxial picture at the level of the hook of the hamate provides an optimum view, enabling evaluation of the tendons and the study of their relationship. The sine qua non of Carpal Tunnel Syndrome is to see edema of the median nerve.

Pathologies

Madelung's Deformity, Trapezium Fracture, Failure of Segmentation, Hypertrophic Osteoarthropathy, Hamate Fracture, Torn Scapholunate Lig.

Hand:

X-ray - Plain Film

MRI - Magnetic Resonance Imaging

Pathologies

Gamekeeper's fracture, Scleroderma

Unit 2: Radiographs of Spine

X-ray - Plain Film

MRI and CT, Pathologies : Rheumatoid Arthritis (RA), Odontoid Fx, PIVD, Cervical Ribs,spondylosis, spondylolesthesis, spinal fractures and dislocations , potts spine,ankylosing spondilytis

Unit 3: Radiographs of Lower Limb

Pelvis & hip

X-ray - Plain Film

Pathologies

Osteomalacia, Fractures of head and neck of femur ,AVN, Paget's Disease, Rickets, Posterior Dislocation, Posterior Dislocation, Osteonecrosis, Septic Arthritis, Transforaminal Fracture, Osteonecrosis

Knee region:

Chondrocalcinosis, Fracture, Bone Cyst, Condylar Fx, Baker's Cyst, Osteoarthritis

Ankle region & Foot: Septic arthritis, Osteomyelitis, Stress fracture, Osteochondritis Dissecans, pott's fracture,

iii) Abdomen

Plain Radiograph, AP, Lat.

iv) Thorax

Plain Radiograph: male, female

Rib fractures, flail rib, lung and pleural diseases, cardiac diseases,

v) Head, Face & Neck

Plain Radiograph skull, AP, Lat.

Plain Radiograph Neck, AP,

Unit 4: Recent Advances In Diagnostic Imaging

1. Computed tomography: Basic principle-data accumulation-image reconstruction storing the image-viewing the image-evaluation of image - equipment for tomography-

table-gantry-x-ray generator-different generations--image quality-patient exposure artefacts.

2. Magnetic resonance imaging. Magnetic resonance imaging- basic principle-

Instrumentation-Magnetic field gradient coils-Spin echo imaging sequence-multi slice -

imaging-multi echo imaging-contrast-multi planar imaging-inversion recovery pulse sequence-signal to noise ratio-fast imaging techniques-safety considerations.

3. Digital radiographic imaging:

History and development; Theory and Principle Digital fluoroscopy system-Digitized image- digital subtraction techniques- digital image processing- future Equipment developments- Clinical application - PACS (Picture Archival and Communication System)-Digital Image quality-: Laser film printers.

Reference Books:

1. Armstrong P, Wastie ML, editors. A concise textbook of radiology. Aronold; 2001.
2. Sutton D. Textbook of radiology and medical imaging. 1987.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning by doing, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: BPT 363

Title of the Course: **NEUROLOGY AND NEUROSURGERY (THEORY)**

L-T-P 80-0-0 Credits 5

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs)

After completing this Course, the students should be able to …….

CO-1: Develop an understanding of neuroanatomy and neurophysiology (Cognitive level: Understand)

CO-2: Develop an understanding of various neurological conditions. (Cognitive level: Understand)

CO-3: Understand indications, precautions and contraindications with respect to clinical presentations. (Apply)

CO-4: Assess, evaluate and plan management of neurological patients. (Cognitive level: Create)

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
CLO1	2	1	1	2	2	1	2	2	3	2	1	3	3	2	1	1
CLO2	3	1	2	2	2	1	2	2	3	3	1	3	3	2	1	1
CLO3	3	1	3	3	3	2	2	2	3	3	1	3	3	2	1	1
CLO4	3	3	3	3	3	2	2	2	3	3	1	3	3	2	1	1

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

Unit 1: **13 Hours**

1. Neuroanatomy

Review the Basic Anatomy of the Brain and Spinal Cord including

- Blood supply of the Brain and Spinal Cord
- Anatomy of the Visual Pathway
- Connections of the Cerebellum and Extrapyramidal System
- Relationship of the Spinal Nerves to the Spinal Cord Segments
- Long tracts of the Spinal Cord
- The Brachial and Lumbar Plexuses and Cranial Nerves.

2. Neurophysiology

Neurophysiological basis of:

- Tone and Disorders of Tone and Posture
- Bladder Control
- Muscle Contraction
- Movement and Pain

3. Assessment and Evaluative Procedures for the Neurological Patient.

4. Principles of Management of a Neurological Patient and Principles of Diagnosis

Unit 2: **20 Hours**

Briefly outline the Etiogenesis, Clinical Features and Management of the following Neurological Disorders:

1. Genetic Disorders
- Cri-du-Chat Syndrome
- Prader-Willi Syndrome
- Arthrogryposis Multiplex Congenita
- Osteogenesis Imperfecta
- Cystic Fibrosis
- Phenylketonuria
2. Cerebrovascular Accidents
    - General Classification
    - Thrombotic, Embolic, Haemorrhagic & Inflammatory Strokes
    - Gross Localisation and Sequelae.
3. Trauma
    - Localisation
    - First Aid and Management of Sequelae of Head Injury and Spinal Cord Injury.
4. Diseases of the Spinal Cord

- Craniovertebral Junction Anomalies
- Syringomyelia
- Cervical and Lumbar Disc Lesions
- Tumours and Spinal Arachnoiditis
- Cauda Equina

5. Demyelinating Diseases (Central and Peripheral)

- Guillain-Barre Syndrome
- Acute Disseminated Encephalomyelitis
- Transverse Myelitis
- Multiple Sclerosis.

6. Disorders of Higher Cortical Function
7. Disorders of Cerebellar Function
8. Pyramidal and Extra-Pyramidal Disorders- Parkinson's disease, Chorea, Athetosis, Dystonia, Hemiballismus, Spasmodic Torticollis

Unit 3: **15 Hours**

Briefly outline the Etiogenesis, Clinical Features and Management of the following Neurological Disorders:

1. Developmental and Degenerative Syndromes – Cerebral Palsy, Kernicterus, Hereditary Ataxias, Motor Neuron Disease, Peroneal Muscular Atrophy,Hydrocepahlus
2. Infections – Pyogenic Meningitis Sequelae, tuberculous Infection of Central Nervous System and Poliomyelitis.
3. Diseases of the Muscle – Classification, Signs, Symptoms, Progression and Management, Progressive Muscular Dystrophy, Polymyositis, Myasthenia Gravis, Floppy Infant Syndrome
4. Peripheral Nerve Disorders – Peripheral nerve injuries, Entrapment neuropathies and Peripheral neuropathies, Traumatic/ Compression or Entrapment Neuropathy, Polyneuritis, GB syndrome, Diabetic Polyneuropathy and Spinal Radiculopathies. Special emphasis on Brachial and Lumbo-sacral Plexuses and Major Nerves – Radial, Ulnar, Median, Femoral and Sciatic nerve

Unit 4: **10 Hours**

1. Epilepsy – Definition, Classification and Management.
2. Intracranial Tumours – Broad Classifications, Signs and Symptoms, Management

3. Cranial Nerve – Types of Disorders, Clinical Manifestation & Management.
4. Tetanus-Pathophysiology, Clinical Features and Management

5. Nutritional disorders- Broad Classifications, Signs and Symptoms, Management, Wernicke-Korsakoff Syndrome, nutritional polyneuropathy, Vitamin B12 Deficiency etc.

Unit 5: Neurosurgery **22 Hours**

Review of the Pathological Changes & Principles of Pre & Postoperative Management by Physiotherapy of the following Conditions:

1. Common Surgeries of the Cranium & Brain.
2. Common Surgeries of the Vertebral Column & Spinal Cord.
3. Common Surgeries of the Peripheral Nerves.
4. Surgical Interventions in Traumatic Head Injuries.
5. Shunts
6. SOL Resection
7. Surgical Treatment of Spasticity

Reference Books:

1. Brain's Diseases of the Nervous System- J Walton
2. Neurology – Adams
3. Lindsay KW, Bone I, Fuller G. Neurology and neurosurgery illustrated e-book. Elsevier Health Sciences; 2010 Sep 9.Ghai OP, Vinod PK, Arvind B. Essential text book of paediatrics. CBS Publishers & Distributors, 7thEdition. 2000;358.Chamberlain, E.N.,Symptoms and Signs in Clinical Medicine ,John Wright, Bristol 1974
4. Swash, Michael, Hutchison's Clinical Method W B Saunders, London 2000
5. Bannister, R.,Brain and Bannister Clinical Neurology ,Oxford university press, oxford 2002
6. Brain.Aids to the Examination of the Peripheral Nervous System, 4th Revised ed,London,Saunders(W.B.)2000 (ISBN-10: 0702025127 ,ISBN-13: 9780702025129)
7. Geraint Fuller, Neurological Examination Made Easy, 4th Revised ed, London, Churchill Livingstone,2008 (ISBN-10: 0443069646,ISBN-13: 9780443069642)
8. Allan Ropper,Daryl R Gress. Neurological and Neurosurgical Intensive Care, 4th Revised ed Philadelphia,Lippincott Williams and Wilkins, 2003(ISBN-10: 0781731968 ISBN-13: 9780781731966)
9. Roger Barker, S Barasi,. Neuroscience at a Glance, 2nd Revised ed, Oxford ,Blackwell Publishing Ltd 2003(ISBN-10: 1405111240, ISBN-13: 9781405111249)
10. Michael Donaghy, Brain's Diseases of the Nervous System,11th ed,Oxford university press,2001(ISBN-10: 0192626183 ,ISBN-13: 9780192626189)
11. Nicki R. Colledge, Brian R. Walker, Stuart H. Ralston. Davidson's Principles and Practice of Medicine. 21th ed Churchill Livingstone, 2010(ISBN: 9780702030857)
12. Kenneth W. Lindsay, Ian Bone,Geraint Fuller. Neurology and Neurosurgery Illustrated, 5ed, Churchill Livingstone,2010(ISBN:9780443069574).

13. Kumar.Neurosurgery review.1st ed,New Delhi, Jaypee Brothers Medical Publishers(P) Ltd.2009.(ISBN:978-81-8448-652-0).
14. Hadi Manji, Sean Connolly, Neil Dorward, Neil Kitchen, Amrish Mehta, Adrian Wills. Oxford Handbook of Neurology. Oxford university press,2006(ISBN: 978-0-19-850973-8)
15. Roger Bannister, Brain and Bannister's Clinical Neurology.7th ed,Oxford University press,1999(ISBN: 9780195647068)

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: BPT 364 Title of the Course: **PHYSIOTHERAPY IN GENERAL MEDICINE AND GENERAL SURGERY (THEORY)**

L-T-P 80-0-0 Credits 5

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs)

After completing this Course, the students should be able to …….

CO-1: Develop an understanding of various General medicine and general surgical conditions. (Cognitive level: Understand)

CO-2: Assess, examine and plan preoperative and postoperative physiotherapy management of various general medical and general surgical conditions. (Cognitive level: Evaluate).

CO-3: Assess, diagnose and plan physiotherapy management for various general medicine and surgical conditions. (Cognitive level: Apply)

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11	PLO 12	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
CLO1	2	3	2	2	2	3	2	3	3	3	2	3	3	2	2	1
CLO2	3	3	3	3	3	3	3	3	3	3	2	3	3	2	2	1
CLO3	3	3	3	3	3	1	3	1	3	3	1	3	3	2	2	1

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

Unit 1: Assessment and Techniques of Treatment 10 Hours

1. Assessment of the patients(including cardio pulmonary assessment), medical history, past treatment, breathing pattern and pain.
2. Identify problems: Pain, increased secretions, defective posture and decreased exercise tolerance.
3. Treatment techniques: Breathing exercise, huffing and coughing, mobilizing exercise, posture correction and Graduated exercise programme.

Unit 2: Physiotherapy Management in General Medical Conditions 25 Hours

Review of the pathophysiology and principles of Physiotherapeutic management in the following

conditions:

1. Metabolic and Deficiency Diseases: Diabetes Mellitus, Osteoporosis, Obesity etc.
2. Oncology
    - Classification and Characteristics of common tumours
    - Carcinoma breast.
    - Carcinoma head and neck.
    - Complications of Tumors
    - Physiotherapeutic Management
3. Common condition of Skin - Acne, Psoriasis, Alopecia, Leucoderma, Leprosy.
4. AIDS
5. Oedema
    - Definition, types, factors controlling tissue fluid circulation, cause of edema,
    - Physiotherapy assessment and management of edema
6. Inflammation
    - Signs of inflammation, stages
    - Acute, chronic and suppurative
    - Physiotherapy management
7. Gangrene
    - Types and their physiotherapy management
8. Psychiatric Disorders
    - Introduction: Definition, defence mechanism, symptomatology, types & causes of mental disorders, psychosomatic disorders.
    - Disorders:-

    a. Psychosis – Schizophrenia (including paranoid), Manic Depressive psychosis
    b. Obsessive-compulsive Disorders
    c. Dementia – types & principles of management.
    d. Depressive disorders
    e. Anxiety Disorders
    f. Neurosis
    g. Alzheimer's Disease

    - Therapies –

    a. Psychotherapy–Group therapy, Psychodrama, behaviour modification, family therapy, play therapy, psychoanalysis, hypnosis.
9. Geriatric Medicine
    - Normal aging – definition, the anatomical, physiological and cognitive changes related to aging
    - The examination & assessment of a geriatric patient.
    - Common Problems with Elderly-Its assessment and Management
    - Falls in Elderly
    - Physiotherapy Management

Unit 3: Physiotherapy in General Surgical Conditions **25 Hours**

1. Review of the pathophysiology and principles of pre and postoperative Physiotherapeutic Management.
2. Introduction to principles of surgery and its procedure. Physiotherapy management of the following:
   - Types of Incisions
   - Anaesthesia and its complications
   - Hernia –its types and management
   - General abdominal surgeries including GIT, liver, spleen, kidney, bladder, etc-
   - Nephrectomy, Appendectomy, Mastectomy, Colostomy, Cystectomy, Prostatectomy, Hysterectomy, Cholecystectomy
3. ENT – physiotherapy management in maxillary sinusitis, otitis media, otitis externa, rhinitis etc.
4. Wounds - Classification – Acute Wounds, Chronic Wounds, Normal wound healing , Abnormal wound healing, Examination, Evaluation, Diagnosis ,Prognosis and Physiotherapy Intervention 2 Hours
5. Ulcers – Types and management
6. Pressure Sores – grading, prevention and management
7. Scars & their Management.
8. Burns and Plastic Surgery
   - Skin anatomy and burn wound pathology
   - Classification of burn injury
   - Complication of burn injury
   - Burn wound healing
   - Medical and surgical management of burn
   - Assessment and Physiotherapy management
9. Skin Grafting & Flaps – Indications, Types & procedures.
10. Common reconstructive surgical procedures for the management of wounds, ulcers, burns and consequent contractures and deformities.

Unit 4: Physiotherapy Management in Gynaecology and Specific Surgical Conditions 10 Hours

1. Gynaecological disorders and management – Salpingitis, parametritis, retro-uterus, Uterine Prolapse, Pelvic Inflammatory Diseases, Urinary Incontinence
2. Physiological changes during pregnancy.

a) Common operation of reproductive system, including surgical intervention for child delivery.
b) Pre- natal, antenatal and post-natal Physiotherapy management.

Unit 5: Organ Transplant Surgeries 10 Hours

1. Organ transplant surgeries
   Heart, Liver, Kidney, Bone Marrow etc.
2. Incision Types, Procedures, Indications ,Complications
3. Pre and Post op assessment and its Physiotherapy Management

Reference Books:

1. Polden M, ScienceDirect (Online service). Physiotherapy in obstetrics and gynaecology. Mantle J, Haslam J, Barton S, editors. Edinburgh, Scotland: Butterworth-Heinemann; 2004 Apr.
2. Thomson AM, Skinner AT, Piercy J. Tidy's physiotherapy. Butterworth-Heinemann; 1991 Jan.Therapeutic Exercise -Kisner C. & Colby L A
3. Walker BR, Colledge NR. Davidson's principles and practice of medicine e-book. Elsevier Health Sciences; 2013 Dec 6.
4. Ahuja N. Concise Textbook of Psychiatry. Indian Journal of Psychiatry. 2002 Apr 1;44(2):193.
5. Frownfelter D, Dean E, Stout M, Kruger R, Anthony J. Cardiovascular and Pulmonary Physical Therapy E-Book: Evidence to Practice. Elsevier health sciences; 2022 Jan 19.
6. Mehta PJ. PJ Mehta's Practical Medicine. Dr Shilpa Pradip Mehta; 2005.
7. Cash JE, Downie PA. Cash’s textbook of General medical and surgical conditions for physiotherapist. Jaypee Brother
8. Paz JC, West MP. Acute care handbook for physical therapists e-book. Elsevier Health Sciences; 2019 Oct 12.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: BPT 365 Title of the Course: **PHYSIOTHERAPY IN GENERAL MEDICINE AND GENERAL SURGERY (LAB HOURS)**

L-T-P 0-0-48 Credits: 3

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

Detailed Syllabus:

The students will be shown patients of relevant diseases and disorders for:

1. History taking of the conditions of patients.
2. Assessment of medical and cardiopulmonary functions
3. Clinical diagnosis of the presentations.
4. Investigations and tests of different clinical presentations
5. Physiotherapy management of the various diseases & surgeries

Reference Books:

9. Polden M, ScienceDirect (Online service). Physiotherapy in obstetrics and gynaecology. Mantle J, Haslam J, Barton S, editors. Edinburgh, Scotland: Butterworth-Heinemann; 2004 Apr.
10. Thomson AM, Skinner AT, Piercy J. Tidy's physiotherapy. Butterworth-Heinemann; 1991 Jan.Therapeutic Exercise -Kisner C. & Colby L A
11. Walker BR, Colledge NR. Davidson's principles and practice of medicine e-book. Elsevier Health Sciences; 2013 Dec 6.
12. Ahuja N. Concise Textbook of Psychiatry. Indian Journal of Psychiatry. 2002 Apr 1;44(2):193.
13. Frownfelter D, Dean E, Stout M, Kruger R, Anthony J. Cardiovascular and Pulmonary Physical Therapy E-Book: Evidence to Practice. Elsevier health sciences; 2022 Jan 19.
14. Mehta PJ. PJ Mehta's Practical Medicine. Dr Shilpa Pradip Mehta; 2005.
15. Cash JE, Downie PA. Cash’s textbook of General medical and surgical conditions for physiotherapist. Jaypee Brother
16. Paz JC, West MP. Acute care handbook for physical therapists e-book. Elsevier Health Sciences; 2019 Oct 12.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning by doing, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Course Code: BPT 366 Title of the Course: **ORTHOPEDIC PHYSIOTHERAPY (THEORY)**

L-T-P 96-0-0 Credits: 6

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs)

After completing this Course, the students should be able to …….

CO-1: Develop an understanding of various orthopaedic conditions. (Cognitive level: Understand)

CO-2: Assess and set treatment goals for various orthopaedic conditions. (Cognitive level: Apply)

CO-3: Plan physiotherapy management of various joint disorders, bone and joint tumours, amputation, traumas, peripheral nerve injuries and neuromuscular disorders. (Cognitive level: Apply).

CO-4: Assess, diagnose, plan and conduct a safe and effective treatment of patients with various orthopaedic conditions. (Cognitive level: Apply)

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
CLO1	3	1	2	2	2	1	2	1	3	3	1	3	3	2	2	1
CLO2	3	3	3	3	3	3	3	2	3	3	2	3	3	2	2	1
CLO3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	1
CLO4	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	1

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

Unit 1

1. Introduction
   a) Assessment of the Patient
   b) Setting of Treatment Goals and Plans
2. Traumatology
   a) General Physiotherapy approach towards trauma.

b) Principles of physiotherapeutic treatment and complication management of fractures and dislocations.
    i. Assessment, preoperative and postoperative and physiotherapeutic management.
c) Upper limb Trauma – bony injuries, joint injuries and soft tissue injuries.
d) Lower limb Trauma – bony injuries, joint injuries and soft tissue injuries.
e) Spinal Trauma – bony injuries, joint injuries and soft tissue injuries
f) Crush Injuries
g) Vascular Injuries

3. Peripheral Nerve Injuries
    d) Classification of Nerve Injuries
    e) Clinical features and physiotherapy management, including reconstructive surgery for Radial, median and ulnar nerve lesions, femoral nerve, Sciatic and lateral popliteal lesions.
    f) Brachial Plexus injuries including Erb's, Klumpke's and Crutch Palsy.
4. Neuromuscular Disorders
    d) Poliomyelitis
    e) Myopathies
    f) Cerebral Palsy

Unit 2: General Orthopaedics

1. Signs, symptoms, common sites, assessment and physiotherapeutic management of the following:
    a) Congenital deformities: Torticollis Thoracic Inlet Syndrome, Scoliosis, Kyphosis, Sprengel's Shoulder, CTEV, Foot deformities, Developmental dysplasia of the hip, Spina Bifida etc.
    b) Acquired Deformities: Deformities of spine, knee, shoulder, hip, hand, foot etc.
    c) Bone & joint infections: osteomyelitis, tuberculosis, septic arthritis etc.
    d) Diseases of the joints: Osteoarthritis, Rheumatoid Arthritis, Ankylosing Spondylitis, Reiter's Disease, Gout etc.

3. Common Bone and Joint Tumors
    a) Types of Bone Tumors
    b) Pathology of Bone Tumors
    c) Complications
    d) Surgical Management and Principles of Post operative Physiotherapy
    e) Pain management and rehabilitation

Unit 3: Regional Orthopaedics

1. Review of the Condition, Assessment, Management and Treatment Goals and plans for the following Conditions

i) Shoulder - Tendinitis, Periarthritis, Rotator Cuff Injury, Impingement Syndrome, Adhesive Capsulitis, etc.
j) Elbow - Tennis Elbow, Golfer's Elbow, Pulled Elbow, Olecranon Bursitis etc.
k) Wrist and Hand - Dequervain's Tenosynovitis, Trigger Thumb and Finger, Carpal Tunnel Syndrome, Dupuytren's Contracture, Ganglion etc.
l) Cervical - Brachial Neuralgia, Cervical Spondylitis, PIVD, etc.
m) Thoracic and Lumbar Spine – Thoracic outlet Syndrome, Scheurmann's Disease, Spondylolisthesis, Lumbosacral Strain, Lumbar Canal Stenosis, Spondylitis, PIVD, etc
n) Hip - Slipped Upper Femoral Epiphysis, Avascular Necrosis, etc.
o) Knee – Patellofemoral Pain Syndrome, Bursitis, Osgood Schlatter's Disease, Internal Derangement, Anterior Knee Pain, Chondromalacia Patellae, etc.
p) Foot and Ankle – Anterior Foot Pain, Plantar Fascitis, Heel Pain, Bursitis, Metatarsalgia, Tarsal Tunnel Syndrome, etc

Unit 4:

3. Amputation
   d) Assessment, Management and Treatment Goals of Amputation of Upper and Lower Extremity.
   e) Levels of Amputation, Stump Care, Pre and Post Prosthetic Management, Prosthetic Checkout, Complications and their Management, etc.
   f) Assessment and Management of Gait Deviations in Lower Extremity Amputation.

4. Orthopaedic surgery – Assessment, preoperative and postoperative and physiotherapeutic management of the following:
   h) Osteotomy, Arthrodesis
   i) Arthroplasty and joint replacements
   j) Tendon transplant, soft tissue release.
   k) Limb Lengthening Techniques and Reattachment of limbs
   l) Spinal stabilization
   m) Spinal surgeries in Cerebral Palsy & Poliomyelitis

Reference Books:

1. Authors (year), *Title of the Book*, Edition, Publishers, Place of Publication, Page Nos.

2.

3.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

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Course Code: BPT 367 Title of the Course: **ORTHOPEDICS PHYSIOTHERAPY (LAB HOURS)**

L-T-P 0-0-64 Credits: 4

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

Detailed Syllabus:

Unit 1: The students will be shown patients of relevant diseases and disorders for:

1. History taking of the conditions of patients.
2. Assessment
3. Clinical diagnosis of the presentations.
4. Investigations and tests of different clinical presentations.
5. Physiotherapy management of the various disorders & surgeries.

Reference Books:

1. Authors (year), *Title of the Book*, Edition, Publishers, Place of Publication, Page Nos.
2.
3.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning by doing, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

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Course Code: BPT 368 Title of the Course: **NEUROPHYSIOTHERAPY (THEORY)**

L-T-P: 96-0-0 Credits :6

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

COURSE LEARNING OUTCOMES (CLOs)

After completing this Course, the students should be able to …….

CO-1: Develop an underrating of various neurological conditions along with their assessment and treatment strategies. (Cognitive level: Apply)

CO-2: Plan physiotherapy management for various neurological conditions (Cognitive level: Apply).

CO-3: Apply various special treatment techniques such as Bobath, Proprioceptive Neuromuscular Facilitation (PNF), Motor Relearnong Programme, Rood Approach. (Cognitive level: Apply).

CO-4: Assess, diagnose and plan management for patients suffering from neurological conditions. (Cognitive level: Evaluate).

Mapping of Course Learning Outcomes (CLOs) with Program Learning Outcomes (PLOs) and Program Specific Outcomes (PSOs)

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**	**PLO 7**	**PLO 8**	**PLO 9**	**PLO 10**	**PLO 11**	**PLO 12**	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**
CLO1	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	1
CLO2	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	1
CLO3	3	1	3	3	1	3	3	2	3	3	3	3	3	2	2	1
CLO4	3	3	3	3	1	3	3	2	3	3	3	3	3	2	2	1

‘3’ is for ‘High-level’ mapping, 2 for ‘Medium-level’mapping, 1 for ‘Low-level’mapping.

Detailed Syllabus:

Unit 1: Components of Neurological Assessment with emphasis on: 6 Hours

- Assessment of higher functions.
- Sensory assessment (Superficial, Deep and combined cortical sensations)
- Cranial nerve Assessment.
- Tonal Assessment.

- Reflex Examination.
- Assessment of gait in various neurological populations.
- Functional Evaluation (Introduction to various functional measures).
- Paediatric neurologic assessment-Weight, Height, Circumference measurement related to age in child, Developmental milestones, Neonatal Reflexes, Factors influencing growth and development, Physical examination of the child, growth pattern.

Unit 2: Introduction to Treatment Procedures **4 Hours**

- Sensory re-education.
- Motor re- education.
- Assistive Technology in Neurological rehabilitation.
- Current trends in Neurological Rehabilitation.

Unit 3: Cerebellar Dysfunction **3 Hours**

- Review of anatomy and physiology of cerebellum.
- Causes and Clinical picture of cerebellar problems.
- Evaluation of cerebellar dysfunction.
- Training of balance, coordination and gait problems in cerebellar problems.
- Cerebellar ataxia-Relevant anatomy, Evaluative procedures and assessment, Physiotherapy : aims and objectives, principles of management,

Unit 4: Balance Disorders **3 Hours**

- Definition.
- Types of balance.
- Factors responsible for maintenance of balance with emphasis on the role of sensory input systems.
- Balance dysfunction and its causes.
- Methods used in evaluating static and dynamic balance in detail with a special mention to the most commonly used scales.
- Balance training strategies and vestibular rehabilitation.

Unit 5: Poliomyelitis **3 Hours**

- Introduction. And Etiopathology.
- Clinical picture of poliomyelitis in acute, recovery and residual stages.
- Post-Polio Residual Paralysis.
- Assessment and management of poliomyelitis, orthotic aids commonly used in the management of polio.
- Introduction to surgeries in polio and their physiotherapy management.

Unit 6: Peripheral Nerve Lesions **4 Hours**

- Anatomy of a peripheral nerve.
- Introduction to myelination of nerve fibres and to the process of nerve degeneration and regeneration.
- Classification, causes and clinical picture of peripheral nerve injuries.

- Radial nerve, median nerve, ulnar nerve etc. entrapments and injuries.
- Physical therapy assessment and management of peripheral nerve injuries.

Unit 7: Polyneuropathies **5 Hours**

- Review of the anatomy and physiology of peripheral nerves.
- Aetiological classification with emphasis on GB syndrome, diabetic neuropathy and Charcot-Marie tooth neuropathy.
- Neuropathies of facial nerve.
- Pathological changes occurring in peripheral neuropathies.
- Physical therapy assessment and management.

Unit 8: Muscular dystrophy **5 Hours**

- Definition and types of muscle dystrophy.
- Detailed study of Duchenne, Becker's, Facioscapulohumeral and limb girdle dystrophies.
- Clinical presentation and stages of DMD.
- Assessment and management with emphasis of treatment of contractures and deformities, strengthening of muscles and respiratory problems in DMD.
- Various types of orthoses used and wheel chair management in DMD.

Unit 9: Motor Neuron Disease **3 Hours**

- Introduction, Aetiology and types (Amyotropic lateral sclerosis, Progressive muscular atrophy, Progressive bulbar palsy).
- Impairments in motor neuron diseases and prognosis of various types and differential diagnosis.
- Physical therapy assessment and management.

Unit 10: Cerebral palsy **5 Hours**

- Introduction.
- Normal developmental process and milestones.
- Classification and clinical presentation of various categories of cerebral palsy.
- Assessment of the impairments including various developmental milestones.
- Management of impairments with emphasis on special treatment approaches like NDT and Rood's Approach.

Unit 11: Parkinson's disease **3 Hours**

- Introduction.
- Etiology and pathophysiology.
- Clinical presentation and disease course.
- Parkinson Plus Syndrome
- Assessment of impairments in detail and introduction to commonly used scales in Parkinson's disease.
- Management and its recent trends.

Unit 12: Spinal cord injuries **7 Hours**

- Classification and causes of spinal cord lesions with focus on cord syndromes.
- Designation of neurological level of injury and clinical manifestations and functional expectations with different levels of injury.
- Physical therapy examination of various systems of the body.
- Management with special consideration to mat program, transfers and wheel chair management.

Unit 13: Stroke **8 Hours**

- Introduction and review of cerebral blood flow.
- Aetiology and various vascular syndromes (Middle, Anterior, Posterior and vertebra-basilar artery syndromes).
- Recovery after stroke and factors affecting it.
- Assessment with the study of various measurement scales used in stroke.
- Rehabilitation of stroke patients with a special attention to treatment of abnormal gait, postural control, upper and lower extremity function, balance and cognitive and perceptual deficits.
- Current trends in management.

Unit 14: Multiple Sclerosis **3 Hours**

- Definition with an introduction to difference in myelination between peripheral and central nervous system.
- Etiology and pathophysiology.
- Clinical features and clinical types of multiple sclerosis.
- Assessment, diagnostic criteria and prognosis and various measurement scales used in multiple sclerosis.
- Rehabilitation management with emphasis on treatment of balance and coordination, spasticity, fatigue.

Unit 15: Traumatic Brain Injury **4 Hours**

- Introduction and classification.
- Factors affecting the recovery.
- Direct and indirect impairments after TBI with special consideration to abnormal tone, and abnormal posturing.
- Clinical rating scales (GCS, RLA, RDR).
- Physical therapy assessment and management with emphasis on ICU Management and currents treatment trends.

Unit 16: Syringomyelia **4 Hours**

- Etiology and pathology

- Signs and Symptoms
- Diagnosis and assessment
- Physiotherapy management

Unit 17: Meningitis and Encephalitis **5 Hours**

- Etiopathogenesis,Causes
- Classification-Bacterial,Tubercular,Viral
- Clinical features
- Assessment and diagnosis
- Principles of treatment

Unit 18: Myopathies **4 Hours**

- Etiopathogenesis
- Signs and symptoms; sequel of disease
- Classification-Inflammatory, Toxic and Metabolic, Endocrine,
- Diagnosis and patient assessment
- Principles of physiotherapy management

Unit 19: Vestibular Disorders **4 Hours**

- Anatomy, Physiology of Vestibular System
- Vestibular System Dysfunction
- Diagnosis involving Vestibular System
- Physical Therapy Examination-Tests Specific to various pathologies
- Physiotherapy Intervention-Special Emphasis on specific Techniques
- Contraindications to Vestibular Rehabilitation

Unit 20: Spinal and Brain Tumours **4 Hours**

- Classification
- Pathology
- Clinical Features
- Diagnosis and Assessment
- Physiotherapy Treatment

Unit 21: Transverse Myelitis **2 Hours**

- Pathology, Causes
- Clinical Features
- Assessment and Physiotherapy Treatment

Unit 22: Tabes Dorsalis **2 Hours**

- Etiology
- Pathogenesis
- Symptoms: in the pre ataxic, ataxic and paralytic stage
- Physiotherapy Assessment and management

Unit 23: Special considerations **5 Hours**

- Bobath, PNF, MRP,Brunnstrom and Rood approach.
- Issues in Motor Control, Motor Learning.

Reference Books:

1. Proprioceptive Neuro Muscular Facilitation- By Herman Kabat.
2. O'Sullivan SB, Schmitz TJ, Physical Rehabilitation. F.A. Davis Company; Seventh edition (January 25, 2019)
3. Physical medicine & Rehabilitation -Braddom.
4. Illingworth RS. Normal Development. Churchill Livingstone : distributed by Longman; 6th edition (January 1, 1975)
5. Cash JE. Cash's textbook of neurology for physiotherapists. Lippincott Williams & Wilkins; 1986.Neurology by Victor Adams
6. Umphred, Dracy A ,Neurological Rehabilitation Mosby, London 2001
7. Kottke, F.J. and Lehman J.F,Handbook of Physical, Medicine and Rehabilitation B Saunders, London 1990
8. Carr, J.H. and Shepherd, R.B ,Neurological Rehabilitation Butterworth, Oxford 1998
9. Carr, J.H. and Shepherd, R.B.,Stroke Rehabilitation Butterworth Heinemann, Singapore 2003
10. Adler, S.S. PNF in Practice Springer, New York 2003
11. Voss, Dorothy, Proprioceptive Neuromuscular Facilitation Lippincott, New York 1989
12. Burns, Y.R. and Macdonald J.,Physiotherapy and the Growing Child Harcourt, Singapore 1998
13. Swaner, K.A. and LaVigne, J.M.,Brunnstom's Movement Therapy in Hemi Lippincott, New York 1992

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning by doing, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

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Course Code: BPT 369 Title of the Course: **NEUROPHYSIOTHERAPY (LAB HOURS)**

L-T-P: 0-0-64 Credits: 4

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

Detailed Syllabus:

Unit 1: The students will be shown patients of relevant diseases and disorders for:

1. Basic history taking to determining whether the brain spinal cord or peripheral nerve is involved.
2. Assessment of higher mental function such as orientation, memory, attention, speech and language.
3. Assessment of cranial nerves.
4. Assessment of motor power.
5. Assessment of sensory function touch, pain and position.
6. Assessment of tone- spasticity, rigidity and hypotonic.
7. Assessment of cerebellar function.
8. Assessment of higher cortical function.
9. Assessment of gait abnormalities.
10. Practical demonstration of various balance training strategies.
11. Treatment methods used in polio, Motor neuron disease, Muscle dystrophies, Peripheral nerve injuries and Polyneuropathies.
12. Practical Demonstration of Vestibular Rehabilitation and Tests used to Assess Vestibular Disorders
13. Practical Demonstration of MAT programme, Transfer techniques, Wheel chair pressure relieving Techniques, Wheel chair ambulation
14. Practical Demonstration of Gait Training using Walkers, Crutches, Sticks.

The students will be shown patients and taught practical application of various treatment methods with the emphasis on recent trends in management of patients with:

1. Cerebral palsy
2. Parkinson's disease
3. Spinal cord injuries
4. Stroke
5. Traumatic brain injury
6. Multiple sclerosis

The students will be given an idea of practical application of various special treatment techniques.

- Bobath,
- Proprioceptive Neuromuscular Facilitation (PNF)

- Motor Relearning Programme (MRP)
- Rood approach

Reference Books:

1. Proprioceptive Neuro Muscular Facilitation- By Herman Kabat.
2. O'Sullivan SB, Schmitz TJ, Physical Rehabilitation. F.A. Davis Company; Seventh edition (January 25, 2019)
3. Physical medicine & Rehabilitation -Braddom.
4. Illingworth RS. Normal Development. Churchill Livingstone : distributed by Longman; 6th edition (January 1, 1975)
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6. Umphred, Dracy A ,Neurological Rehabilitation Mosby, London 2001
7. Kottke, F.J. and Lehman J.F,Handbook of Physical, Medicine and Rehabilitation B Saunders, London 1990
8. Carr, J.H. and Shepherd, R.B ,Neurological Rehabilitation Butterworth, Oxford 1998
9. Carr, J.H. and Shepherd, R.B.,Stroke Rehabilitation Butterworth Heinemann, Singapore 2003
10. Adler, S.S. PNF in Practice Springer, New York 2003
11. Voss, Dorothy, Proprioceptive Neuromuscular Facilitation Lippincott, New York 1989
12. Burns, Y.R. and Macdonald J.,Physiotherapy and the Growing Child Harcourt, Singapore 1998
13. Swaner, K.A. and LaVigne, J.M.,Brunnstom's Movement Therapy in Hemi Lippincott, New York 1992

Teaching-Learning Strategies in brief

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Course Code: BPT 370 Title of the Course: **CLINICAL TRAINING**

L-T-P 0-0-464 Credits: 29

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

Students will engage in clinical practice in Physiotherapy department in the Physiotherapy setting to enhance their skills and apply contemporary knowledge gained during the teaching sessions.

BACHELOR OF PHYSIOTHERAPY

4TH YEAR

Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 461

Title of the Course: **COMMUNITY MEDICINE AND REHABILITATION (THEORY)**

L-T-P: 48-0-0 Credits: 3

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

Course Outcomes (COs)

After completing this Course, the students should be able to:

CO1: TO understand the concept of rural and urban community.

CO2: To understand the team approach in community rehabilitation and disability.

CO3: Identification of residual potentials in patients with partial or total disability (temporary or permanent). Formulation of appropriate goals (long & short term) in treatment & rehabilitation.

CO4: Acquire the knowledge in preventive and curative measures that are required to be practiced in community and at all levels of health care system

CO5: To understand health education and disease preventive measures.

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	3	2	3	3	3	2	3	3	1	2	1	1
CO2	3	3	3	3	3	3	2	3	3	3	3	3	1	2	1	1
CO3	3	3	3	2	3	3	3	3	3	3	3	3	1	2	1	1
CO4	2	3	3	3	3	3	3	3	3	3	3	2	1	2	1	1
CO5	3	2	3	3	3	3	3	3	2	3	3	3	1	2	1	1

Detailed Syllabus

Section I – Conceptual Framework of Community Medicine and Rehabilitation (9 Hours)

- Definitions and various models or rehabilitation.
- Concepts of Healthcare and illness
- Healthcare system
- Screening of a Health condition
- Epidemiology of disability with emphases on locomotor disability, its implications on the individual, family, society, economy and the state.
- Describe the following communicable diseases with reference to reservoir, mode of transmission, route of entry and level of prevention. (Poliomyelitis, Meningitis & Encephalitis, Tuberculosis, Filariasis, Leprosy, Tetanus, Measles)
- Description of the Epidemiology of Rheumatic heart disease, cancer, chronic degenerative disease and cerebrovascular accidents.
- Preventive Medicine And Public Health Practice: Maternal health and hygiene, Child health and hygiene

Section II – Nutritional Deficiencies and Occupational Disorders (6 Hours)

1. Outline the influence of nutritional factors such as Protein Energy Malnutrition, Anaemia, Vitamin and mineral deficiency on disability.
2. Preventive aspects of disability and organizational skills to manage it.
3. Occupational health, occupational stress and work management, occupational ergonomics and returning the worker to productivity and methods of prevention of occupational diseases and hazards.
4. Disaster management

Section III – Support Structure For Persons With Disabilities (29 Hours)

1. Education of the persons with disabilities.
2. Vocational Rehabilitation.
3. Community Based Rehabilitation and Out -Reach programs to rehabilitate persons with disabilities living in rural areas

a. Define community based and institution based rehabilitation. Describe the advantage and disadvantage of institution and community based rehabilitation.

4. Statutory provisions, schemes of assistance to persons with disability.
5. Role of the Voluntary Sector in rehabilitation of the Persons with Disabilities.
6. Legislative support for Rehabilitation

a. Outline the Employees State insurance scheme and its various benefits

b. Describe the social security measures for protection from occupational hazards, accidents, diseases, and the workman's compensation act

7. Strategies for awareness, public education, and information

a. List the principles of health education, methods of communication and role of health education in rehabilitation services.

8. Basic principles of administration and finance including personnel management and budget preparation and procurement etc.
9. Role of technology and manpower for rehabilitation.
10. Outline selected National Health Programs
11. Public Health Law and Concept of Social Security
12. International health and role of international agencies

Section – IV Description of Roles of Members of The Rehabilitation Team (2Hrs)

1. Physician
2. Occupational Therapist and Physiotherapist
3. Clinical Psychologists
4. Social worker
5. Prosthetic and Orthotic Engineers
6. Audiologists and Speech Therapists
7. Hearing aid and ear mould technicians
8. Orientation and Mobility instructors
9. Teachers for various categories of children with disabilities.
10. Vocational instructors, Counsellors and Placement Officers
11. Multi-purpose rehabilitation workers
12. The family

Section – V Rehabilitation in Special Cases (2 Hrs)

1. Visual, speech, communication and hearing impairment.
2. Physically challenged
3. Mentally challenged
4. Psychiatry and de-addiction syndromes
5. Behaviour and learning problems
6. Role of Telerehabilitation and assistive technology.
7. Geriatric rehabilitation
8. Paediatric rehabilitation

RECOMMENDED BOOKS:

1. Park's Textbook of Preventive and Social Medicine – Banarsidas Bhanot Publishers - K Park
2. Textbook of Rehabilitation – Jaypee Publishers – S Sunder.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

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Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 462

Title of the Course: **RESEARCH METHODOLOGY AND BIOSTATISTICS (THEORY)**

L-T-P: 96-0-0 Credits: 6

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

Course Outcomes (COs)

After completing this Course, the students should be able to:

CO1: Understand the importance of research in the relative field. Understand the basic concepts and methods of research.

CO2: Interpret differences in data distributions via visual displays. Calculate standard normal scores and resulting probabilities

CO3: Calculate and interpret confidence intervals for population means and proportions. Interpret and explain a p-value.

CO4: Perform a two-sample t-test and interpret the results; calculate a 95% confidence interval for the difference in population means.

CO5: Select an appropriate test for comparing two populations on a continuous measure, when the two sample t-test is not appropriate. Understand and interpret results from Analysis of Variance (ANOVA), a technique use to compare means amongst more than two independent populations.

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	3	3	3	2	3	3	3	3	1	3	2	1
CO2	3	3	3	3	3	3	3	3	2	3	3	3	1	3	2	1
CO3	3	3	3	3	3	3	3	3	3	2	3	2	1	3	2	1
CO4	3	3	3	3	3	3	3	3	3	3	3	3	1	3	2	1
CO5	3	3	3	3	3	3	3	3	3	2	3	2	1	3	2	1

Research Methodology (56 Hours)

I- Research in Physiotherapy (10 Hours)

Introduction and need of research in Physiotherapy

Definition, Concept, Characteristics, Purpose, Approaches of research

Barriers in Physiotherapy research, Web source Of Physiotherapy research

II-Research Fundamentals (10 Hours)

- Measurement scales
- Methods of data collection
- Pilot study, types of Error in research
- Variables-Definition and types
- Reliability and Validity- Definition, types and threats to internal and external validity of measurements.
- Drawing tables graphs, Master chart

III –Writing research proposal, Critiquing published research Articles (15 Hours)

- Defining problems,
- Review of Literature and level of evidence
- Formulating research question, Hypothesis, Operational definition
- Sampling techniques
- Inclusion and exclusion criteria
- Data collection and analysis
- Result, Interpretation, discussion
- Ethical issues in Research, Elements of Informed Consent

IV-Research design- (15 Hours)

- Principles of design
- Design, Instrumentation and analysis of qualitative research
- Design, Instrumentation and analysis of quantitative research
- Design, Instrumentation and analysis of quasi experimental research
- Design Model utilized in Physiotherapy research.

V-Scientific writing and Publication (6 hours)

- Role of author, Guide and Co-authors'
- Structure, style and content-
- Style manuals (APA, MLA, Vancouver); Citation styles, footnotes, references, evaluation of researches, impact factor, indexed journal.

BIOSTATISTICS (40 hours)

Unit I(10Hours)

Biostatistics – Definition and Scope - Collection of Data - Sampling methods - Variable: Discrete and continuous. Presentation of Data: Classification and tabulation. Diagrams and graphs: Bar, pie, Histogram, line graph - Concept of statistical population and sample characteristics of frequency distribution, power analysis for determining sample size

Unit II (10 Hours)

Measures of Central tendency: Mean, Median, Mode & Weighted Arithmetic Mean - Measures of Dispersion: Range, Quartile deviation, Mean deviation & Standard deviation - Correlation and Regression,

UNIT III (20 hours)

Test of significance:

- Testing hypothesis, Techniques, using statistics, some basic maths, symbols in statistics
- Matching the research design to the statistical test
- Non-parametric tests for same - & matched – subjects design
- Parametric tests for same - & matched – subjects design
- Non – parametric tests for different – (unrelated) subjects design
- Parametric tests for different – (unrelated) subjects design
- Non – parametric & parametric tests for correlation designs
- Estimation
- Analysis of variance

References:

1. Mahajan, B. K. Methods In Biostatistics. Jaypee Brothers Publishers.
2. Hicks, C. Research For Physiotherapists: Project Design and Analysis. Churchill Livingstone.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of

25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 463

Title of the Course: **CARDIOPULMONARY PHYSIOTHERAPY (THEORY)**

L-T-P: 96-0-0 Credits: 6

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

Course Outcomes (COs)

After completing this Course, the students should be able to:

Cardiopulmonary Physiotherapy

CO1: Interpretation of different invasive and non-invasive diagnostic investigation to make proper assessment in various respiratory and cardiovascular dysfunction

CO2: Develops the skills to execute different Physiotherapy techniques used in treatment of Cardio-respiratory dysfunctions

CO3: To select strategies for cure, care & prevention; adopt restorative & rehabilitative measures for maximum possible functional independence of a patient at home, work place & in community.

CO4: Be able to execute the effective Physiotherapeutic measures with appropriate clinical reasoning to improve pulmonary function.

CO5: To design & execute effective tailored cardiopulmonary rehabilitation programme.

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3	2
CO2	3	3	3	3	2	3	3	3	2	3	3	2	2	2	3	2
CO3	2	2	3	2	3	3	2	2	3	2	2	3	2	2	3	2
CO4	3	3	3	3	2	2	2	3	2	3	3	2	2	2	3	2
CO5	3	3	2	3	2	3	3	3	3	2	2	3	2	2	3	2

Detailed Syllabus

SECTION A – ANATOMY & PHYSIOLOGY OF CARDIOVASCULAR AND RESPIRATORY SYSTEMS (5 hrs)

1.Review of the Anatomy and Physiology of the Cardiovascular and Respiratory systems.

SECTION B: EVALUATION OF CARDIOVASCULAR AND RESPIRATORY SYSTEM (14 hrs)

2. Assessment: Describe physical assessment in Cardio respiratory dysfunction:
a) Inspection:
i) Posture (recumbent, erect, orthopneic)
ii) Breathing pattern (rate, rhythm, use of accessory muscles)
iii) Chest movement (Intercostals and diaphragmatic components)
iv) Chest deformity (Barrel chest, pigeon chest),
v) Spinal deformity(scoliosis, kyphosis, kyphoscoliosis)
vi) Sputum (colour, type, volume, consistency)
vii) Cough (types, productive/non-productive, and presence of a normal cough reflex).
b) Palpation:
i) Tactile and vocal fremitus
ii) Mobility of thoracic spine and rib cage.
c) Percussion:
i) Dullness and hyper resonance.
d) Auscultation:
i) Normal and abnormal breath sounds.

3. Measurement:
a) Chest expansion at different levels
b) Exercise tolerance assessment (six minute walk test)
c) Post - operative range of motion.
d) Post-operative muscle strength

SECTION C – CONCEPTS AND TECHNIQUES IN CARDIOPULMONARY PHYSIOTHERAPY (23 hrs)

1. Cardiopulmonary Physiotherapy treatment Procedures:
a) Indication, goals and procedure of breathing exercises.
b) Breathing exercises: Diaphragmatic breathing exercises, Deep breathing exercises, localised basal expansion, apical expansion, specific segmental exercise.
c) Chest mobilisation exercises.
d) Relaxation positions for the breathless patient - high side lying, forwarded lean sitting, relaxed sitting, forward lean standing, relaxed standing.
e) Airway Clearance Techniques:
   i) Postural Drainage Therapy
   ii) Forced Expiratory Techniques including huffing and coughing
   iii) Percussion, Vibration and Shaking

iv) Endotracheal Suctioning

v) Active Cycle of Breathing Technique

vi) Autogenic Drainage

f) Airway clearance technology: use of equipments like acapella and flutter.

2) Principles of humidification therapy and methods of correcting humidity deficits.(5 hrs)
Principles of operation of pass - over humidifiers and bubble -diffusion humidifiers.

3) Principles of Aerosol Therapy:

a. Describe the physical properties of aerosols and their deposition in the alveoli.

b. Describe the principles of operation of nebulizers.

SECTION D: CONCEPTS IN ICU CARE (24 hrs)

1. Mechanical Ventilation:
Modes, Physiological Effects, Indications, Contraindications, Benefits, Complications, weaning from Ventilator.

2.Principles of Intensive Care Physiotherapy:

a) Knowledge of the following equipment: Endotracheal tubes, tracheostomy tubes, Humidifiers, ventilators, High frequency ventilators, differential ventilators, CPAP masks, suction pump, Electrocardiogram.

b) Pressure monitors - arterial, central venous, pulmonary artery and pulmonary Wedge pressure, temperature monitors.

c) Assess: special instructions pertaining to any operation performed, respiration, level of Consciousness. Blood pressure, pulse, temperature, sputum expectorated (colour and quantity), drugs , drains, presence of pacemaker or intra aortic balloon pump. Understanding the ECG and blood gas results. Describe chest radiograph with respect to expansion of lungs, size of heart, and presence of secretions and placement of chest tubes.

3. Pulmonary Function tests, Arterial Blood gas analyses.

SECTION E – PHYSIOTHERAPY MANAGEMENT IN OBSTRUCTIVE AND RESTRICTIVE LUNG DISEASES AND CHEST INFECTIONS(10 hrs)

1. Review of conditions included under obstructive and restrictive lung diseases.
2. Review of conditions included under chest infections including upper and lower respiratory tract infections, bronchitis, pneumonia, pleurisy.
3. Assessment of symptoms and identification of problems.
4. Cardiopulmonary Physiotherapy management including exercise based Pulmonary Rehabilitation.

SECTION G – PHYSIOTHERAPY MANAGEMENT AND REHABILITATION AFTER MYOCARDIAL INFARCTION(5 hrs)

1. Review of myocardial infarction: causes, symptoms, ECG changes.
2. Role of the physiotherapist in a coronary care unit.
3. Assessment of patient with myocardial infarction and principles of formulation of an exercise programme for Cardiac Rehabilitation.

SECTION H- PHYSIOTHERAPY MANAGEMENT AFTER CARDIAC AND PULMONARY SURGERIES(15 hrs)

1. Pre-operative management of cardiac surgeries like CABG , valve surgeries, cardiac transplant ,pacemaker implantation, LVAD and pulmonary surgeries like lung transplant, segmentectomy, lobectomy, pneumonectomy.
2. Post- operative management after cardiac and pulmonary surgeries.
3. Exercise based Cardiac and Pulmonary Rehabilitation.

Recommended Books

1. Cash`s Text Book For Physiotherapists In Chest, Heart & Vascular Diseases
2. Chest Physical Therapy & Pulmonary Rehabilitation-D. Frownfelter & E. Dean
3. Physiotherapy for Respiratory and Cardiac Problems-Webber B & Pryor
4. Resource Manual for Cardiac Rehabilitation and Secondary Prevention – AACVPR
5. Guidelines for Pulmonary Rehabilitation – AACVPR

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

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Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 464

Title of the Course: **CARDIOPULMONARY PHYSIOTHERAPY (LAB HOURS)**

L-T-P: 64-0-0 Credits: 4

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

Course Description: This course involves a description of the assessment of patients with cardiopulmonary conditions, training of the various techniques involved in Cardiopulmonary Physiotherapy, and orientation to ICU/critical care. It also involves a description of the Physiotherapy treatment of patients with Medical and Surgical Cardiopulmonary disorders and conditions.

1. The students will be shown patients of relevant diseases and disorders for:
    a. History taking of the conditions of patients.
    b. Assessment
2. The student shall be practically taught and given hands-on training for the various techniques and procedures involved in Cardiopulmonary Physiotherapy.
3. The student shall be oriented to the ICU environment and will be taught the use of various tools and equipments in the ICU.
4. The students will be shown patients of relevant diseases and disorders for:

a) Clinical diagnosis of the presentations.
b) Investigations and tests of different clinical presentations.
c) Physiotherapy management of the various disorders & surgeries.

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	3	3	3	3	3	3	3	3	2	2	3	2
CO2	3	3	3	3	2	3	3	3	2	3	3	2	2	2	3	2
CO3	2	2	3	2	3	3	2	2	3	2	2	3	2	2	3	2
CO4	3	3	3	3	2	2	2	3	2	3	3	2	2	2	3	2
CO5	3	3	2	3	2	3	3	3	3	2	2	3	2	2	3	2

Recommended Books

1. Cash`s Text Book For Physiotherapists In Chest, Heart & Vascular Diseases
2. Chest Physical Therapy & Pulmonary Rehabilitation-D. Frownfelter & E. Dean
3. Physiotherapy for Respiratory and Cardiac Problems-Webber B & Pryor
4. Resource Manual for Cardiac Rehabilitation and Secondary Prevention – AACVPR
5. Guidelines for Pulmonary Rehabilitation – AACVPR

Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 465

Title of the Course: **SPORTS PHYSIOTHERAPY (THEORY)**

L-T-P: 96-0-0 Credits: 6

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

Course Outcomes (COs)

After completing this Course, the students should be able to:

CO1: To identify, evaluate, analyze and discuss primary and secondary dysfunction and their management related to common sporting injuries

CO2: Apply theoretical basis of physiological effects and evidence ba

CO3: Apply evidence-based effective, safe management guidelines for sports injuries.

CO4: Acquire Ethical Skills by demonstrating safe and effective performance of physical handling techniques for off field and on field sports injuries.

CO5: Understanding patients' clinical condition, need for privacy, resources available and environment for effective evaluation and management.

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	3	3	3	2	3	3	3	3	3	2	3	2
CO2	3	3	3	3	3	3	3	3	2	3	3	3	3	2	3	2
CO3	3	3	3	3	3	3	3	3	3	2	3	3	3	2	3	2
CO4	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2
CO5	3	3	3	3	3	3	3	3	2	3	3	3	3	2	3	2

Section I: Sports Assessment, Evaluation and Rehabilitation **30 Hrs**

A. On field and off field evaluation including pre participation evaluation. (2)

B. Introduction to Exercise testing. (2)

a. Preliminary Requirements

b. Indications, Contraindications and methodology.

C. Regional Evaluation - Shoulder, Elbow, Wrist, Fingers, (3)

Hip, Groin, Thigh, Knee, Lower Leg, Ankle, (3)

Chest, abdomen and spine (3)

D. Basic principles of Training in sports. (1)

E. Rehabilitation Goals in Sports Medicine. (1)

F. Mechanism, prevention, physiotherapy and medical management of Sports Injuries

i. Head and Spinal injury (5)

ii. Upper limb injury (5)

iii. Lower limb injury (5)

Section II **10 Hrs**

A. Measurement of fitness components and sports skills (7)

a. Measurement of muscular strength

b. Measurement of muscular endurance

c. Measurement of flexibility

d. Determination of exercise endurance

B. Physiological effects of exercise on body systems (3)

a. Muscular system

b. Endocrine system

c. Cardio-respiratory system

d. Nervous system

Section III: **22 Hrs**

a. Introduction to Body Composition Analysis (2)

b. Introduction to Anthropometry (2)

c. Emergency care of a sports person. (2)

d. Therapeutic Exercises in Sports (2)

e. Open and Closed Kinetic Chain Exercises (2)

f. Isokinetics in sports (2)

g. Aquatic Therapy (2)

h. PNF in sports (2)

i. Re - establishing Proprioception and Kinesthesia (2)

j. Plyometrics (2)

k. Functional Rehabilitation (2)

Section IV: Introduction to Exercise physiology **14 Hrs**

A. Energy transfer during exercise (4)
    a. Adenosine Triphosphate-Phosphocreatine system
    b. Lactic acid system
    c. Aerobic system
    d. Maximal Oxygen uptake
    e. Oxygen debt
B. Energy generation capacity during exercise:
1. Measurement and evaluation of anaerobic energy systems (4)
    a. The immediate energy system
    b. Performance tests of anaerobic power and capacity
    c. The short term energy systems
2. Measurement and evaluation of aerobic energy systems (4)
    a. Direct calorimetry
    b. Indirect calorimetry
        - Closed circuit spirometry
        - Open circuit spirometry
    c. Respiratory Quotient
    d. Respiratory exchange ratio
C. The maximal oxygen uptake (VO_{2max}) (2)

Section V: Introduction to Sports Techniques **8 Hrs**

a. Bandaging (2)
b. Taping (3)
c. Sports Massage (3)

Section VI: Miscellaneous **12 Hrs**

a. Introduction to Doping in Sports (1)
b. Ergogenic Aids in Sports (2)
c. Introduction to protective gear used for spine, upper limb, and lower limb. (2)
d. The athlete with a disability. (2)
e. Medical problems in athlete. (3)
f. Female athlete (2)

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessionals are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 466

Title of the Course: **SPORTS PHYSIOTHERAPY (LAB HOURS)**

L-T-P: 64-0-0 Credits: 4

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

Course Outcomes (COs)

After completing this Course, the students should be able to:

CO1: To identify, evaluate, analyze and discuss primary and secondary dysfunction and their management related to common sporting injuries

CO2: Apply theoretical basis of physiological effects and evidence ba

CO3: Apply evidence-based effective, safe management guidelines for sports injuries.

CO4: Acquire Ethical Skills by demonstrating safe and effective performance of physical handling techniques for off field and on field sports injuries.

CO5: Understanding patients' clinical condition, need for privacy, resources available and environment for effective evaluation and management.

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	3	3	3	2	3	3	3	3	3	2	3	2
CO2	3	3	3	3	3	3	3	3	2	3	3	3	3	2	3	2
CO3	3	3	3	3	3	3	3	3	3	2	3	3	3	2	3	2
CO4	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2
CO5	3	3	3	3	3	3	3	3	2	3	3	3	3	2	3	2

DETAILED SYLLABUS:
The students will be shown patients of relevant diseases and disorders for:

1. History taking of the conditions of patients.
2. Assessment - on field and off field
3. Assessment and Physiotherapy and medical management of Sports Injuries
    i. Spinal injury,
    ii. Upper limb injury
    iii. Lower limb injury

4. Emergency care
5. Investigations ,tests and diagnosis of the clinical presentations
6. Techniques of Body Composition Analysis
7. PNF Techniques in Sports
8. Plyometrics, Aquatic, Isokinetic, OKC and CKC exercises – Practical Application
9. Functional Rehabilitation.
10. Bandaging & Taping
11. Sports Massage - Techniques

RECOMMENDED BOOKS :

1. Prentice, William E., Rehabilitation Techniques in Sports Medicine, St. Louis: McGraw Hill Publishing Company.
2. Gray, Gary W., Lower Extremity Functional Profile, 1st Edition, Adrian, MI: Wynn Marketing.
3. Prentice, W. "Therapeutic Modalities for Allied Health Professionals" McGraw Hill.
4. Norkin & White: Measurement of Joint Motion - A Guide to Goniometry - F.A.Davis.
5. Dvir: Isokinetics: Muscle Testing, Interpretation and Clinical Applications, W.B. Saunders.
6. Reed: Sports Injuries - Assessment and Rehabilitation, W.B. Saunders.
7. Lillegard, Butcher & Rucker: Handbook of Sports Medicine: A symptom - Oriented Approach,
8. Butterworth & Heinemann Baker: The Hughston Clinic Sports Medicine Book, Williams & Wilkins
9. Sinha A.G.: Principle and Practices of Therapeutic Massage - Jaypee Brothers, New Delhi
10. Basmajian John V.: Therapeutic Exercise, Williams & Wilkins.
11. William E. Prentice: Rehabilitation Techniques - Mosby.
12. Werner Kuprian: Physical Therapy for Sports, W.B. Saunders.
13. Andrea Bates and Norm Hanson: Aquatic Exercise Therapy, W.B. Saunders.
14. Hartley: Practical Joint Assessment, A Sports Medicine Manual, upper and lower quadrants,

C.V. Mosby.
15. Kennedy: Mosby's Sports Therapy Taping Guide.
16. Malone: Orthopeadic and Sports Physical Therapy, C.V. Mosby.
17. Albert: Eccentric Muscle Training in Sports and Orthopeadics, W.B. Saunders.
18. Voss et al - Proprioceptive Neuromuscular Facilitation - Patterns & Techniques- Williams & Wilkins

Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 467

Title of the Course: **PROSTHETICS AND ORTHOTICS (THEORY)**

L-T-P: 64-0-0 Credits: 4

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

Course Outcomes (COs)

CO1: To understand the structure of Upper, lower limb and trunk orthosis and prosthesis.

CO2: To acquire knowledge about biomechanical principles of application of different aids and appliances used for ambulation, protection and prevention

CO3: To Acquire knowledge about Examination, prescription and Physiotherapy training of various orthosis and prosthesis

CO4: To Apply biomechanical principles for the prescription and use of variety of orthosis and prosthesis.

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	3	2	3	3	3	2	3	3	2	2	2	1
CO2	3	3	3	3	3	3	2	3	3	3	3	3	2	2	2	1
CO3	3	3	3	2	3	3	3	3	3	3	3	3	2	2	2	1
CO4	2	3	3	3	3	3	3	3	3	3	3	2	2	2	2	1
CO5	3	2	3	3	3	3	3	3	2	3	3	3	2	2	2	1

DETAILED SYLLABUS

Section - A

ORTHOTICS 24 hours

- Principles involved in prescribing orthotic devices for different parts of the body
- Outline the purpose of each type and list major indications and contraindications
- Demonstrate methods of training in their use, assessment (check out), fitting
- Fabrication of simple splints

TYPES OF ORTHOSES

1) Upper Limb Orthoses
   - Shoulder
   - Elbow
   - Wrist & Hand
2) Trunk Orthoses
   - Cervical Orthoses
   - Dorso-lumbar Orthoses
   - Thoraco-lumbar Orthoses
   - Sacral Orthoses
   - Corsets
   - Orthoses for Spinal Deformities
3) Lower limb orthoses
   - Shoes
   - Foot orthoses
   - Ankle-foot orthoses
   - Knee-Ankle-foot orthosis
   - Hip-knee-ankle –foot orthoses
   - Trunk-hip-knee-ankle-foot orthoses
   - Orthotic options for patients with paraplegia
4) Trunk orthoses
   - Corset
   - Rigid orthoses
   - Cervical orthoses
   - Scoliosis orthoses
5) Orthotic maintenance
   - Shoes
   - Shells, bands & straps
   - Uprights
   - Joints& locks

6) Physical therapy management
    - Pre-orthotic examination
    - Orthotic prescription
    - Orthotic examination
    - Facilitating orthotic acceptance
    - Orthotic training
    - Final examination & follow –up care
7) Functional capacities
    - Paraplegia
    - Hemiplegia

Section - B

PROSTHETICS 24 hours

- Prescription checklist.
- Artificial limbs and their functions.
- Methods of training.
- Indications, contraindications, assessment, uses and fitting-upper and lower extremity.

TYPES OF PROSTHESIS

1) Partial foot Prostheses
2) Transtibial Prostheses
    - Foot – Ankle assembly
3) Transfemoral (Above – Knee) Prostheses
    - Knee Unit
    - Axis System
    - Friction Mechanism
    - Extension Aid
    - Stabilizers
    - Socket
    - Fit and Alignment
    - Suspension
4) Disarticulation prostheses
    - Knee disarticulation prostheses
    - Hip disarticulation prostheses
5) Socks, sheaths and liners
6) Prosthetic maintenance
    - Socket and suspension
    - Knee Unit

- Foot-Ankle Assembly
- Exterior Finish

7) Physical Therapy Management
    - Pre-Prescription Considerations
    - Physical Examination
    - Psychosocial Considerations
    - Prosthetic Prescription
    - Temporary Prosthesis
    - Prosthetic Examination
    - Facilitating Prosthetic Acceptance
    - Prosthetic Training
    - Final Examination and Follow-Up Care
8) Functional Capacities

Recommended Books:

1. Susan B Sullivan, Physical Rehabilitation,5th Edition,
2. Orthotics & Prosthetics In Rehabilitation, Michelle M Lusardi,Caroline C Neilson
3. Prosthetics And Orthotics (Davies)
4. Mackee Pat, Orthotics In Rehabilitation, Jaypee, New Delhi 1998
5. Atlas Of Limb Prosthetics American Academy Of Orthopaedic Surgeon Mosby
6. Atlas Of Orthotics – American Academy Of Orthopaedic Surgeon Mosby

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Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 468

Title of the Course: **ORGANIZATION AND ADMINISTRATION: LAW AND ETHICS (THEORY)**

L-T-P: 48-0-0 Credits: 3

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

Course Outcomes (COs)

CO1: To understand the role of administration and management.

CO2: To understand principles of hospital management, time management and financial management.

CO3: To understand the Ethical Principles of Physiotherapy Profession

CO4: To understand the medico-legal issues in physiotherapy

CO5: To be able to manage a patient more lawfully in clinical and hospital setting and maintain records.

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
CO1	2	2	3	3	2	2	2	2	2	2	2	2	1	2	1	3
CO2	2	3	2	2	2	2	2	2	2	2	2	2	1	2	1	3
CO3	2	2	2	3	2	3	2	2	2	2	2	2	1	2	1	3
CO4	3	2	2	3	2	2	2	2	2	2	2	3	1	2	1	3
CO5	3	2	2	2	2	2	2	2	2	2	2	3	1	2	1	3

DETAILED SYLLABUS

Section I

1. General Administration & Management
   a. Planning & Organization: Planning Cycle, Principles of Organizational Charts, Resource and Quality management, Planning change
   b. Hospital Management: Hospital Organisation, Staffing, information, Communication and coordination with Physiotherapy. Services of hospital Cost of service, Monitoring and Evaluation.
   c. Self-Management
      i. Preparing for first job
      ii. Time Management
      iii. Career development

Section II

1. Administration of the department
   a. Describe methods of administration in a Physiotherapy department
   b. Records: their purpose e.g., Attendance, statistics, inventory, stock.
   c. Maintenance of records
2. Methods of community and institutional based Departments (CBR & IBR)
3. Referrals - purpose and types of referral
4. Demonstrate administration of the following:
   a. Store keeping materials, inventory records, purchase ordering petty cash accounting.
   b. General maintenance and care of equipments of equipment, furniture, buildings, costing of splints/ aids/equipment/ articles/ made in Physiotherapy.
5. Describe and demonstrate:
   a. Types of correspondence
   b. Methods of filing.

Section III

1. Discuss budgeting- including items for an annual budget.
2. Discuss considerations for constructions of a new Physiotherapy department, and modification of an old department including: Space required Allotment of space, e.g., suitability for access, plumbing requirements & circulation of air.
3. Plan assessment forms e.g., Pre-vocational ADL hand function & higher functions for initial evaluation and progress recording.
4. Outline method of writing Physiotherapy department annual reports. Calculate monthly and annual statistics. Make plans for future requirements e.g., Consider staff patient ratio, equipment and staff requirements.
5. Plan to organize picnic or sports program for patients.
6. Outline safety precautions in Physiotherapy department.

Section IV

1. Physiotherapy Ethics
   a. History & Philosophy of Physiotherapy
   b. Rules Of Professional Conduct & Code of Ethics.
   c. Major Ethical Principles Applied to Moral Issues in Health Care
   d. Relationship With Patient, Co-Professionals and Other Professionals.
   e. Provision Of Services and Advertising
   f. Sale Of Goods.
   g. Professional And Government Licensing Bodies, Accreditation and Education Standards.
   h. Laws And Legal Concepts

i. Law - Protection from Malpractice Claim
j. Consumer Protection Act, Liability and Documentation. Outline Legal Aspects Related To Rehabilitation: Medico Legal Cases, Workman's' Compensation Act & Insurance Facilities & Other Financial Benefits Available For The Disabled.
k. Role And Functions of WCPT And DCPTOT.

References:

1. Percival, T. *Medical ethics*. Cambridge University Press.
2. Dunn, M., & Hope, T. *Medical ethics: a very short introduction*. Oxford University Press.
3. Blackburn, S. *Ethics: A very short introduction* (Vol. 80). Oxford University Press.

Teaching-Learning Strategies in brief

The teaching learning strategies followed are board and chalk teaching, learning through discussion among peer group, learning through case studies, experiential learning, reflective learning, open ended questions by teacher, open ended questions from students.

Assessment methods and weightages in brief

Assessment is divided into internal assessment and external assessment. Internal assessment is conducted throughout the year. Internal assessment is divided into 3 parts and is for a total of 25 marks of which 5 marks are for attendance, 5 marks are for assignment and 15 marks are for sessional. Three sessional are conducted of which the average of the best two sessional is calculated. External assessment if for 75 marks conducted at the end of the session.

Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 469

Title of the Course: **RESEARCH PROJECT**

L-T-P: 0-80-0 Credits: 5

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

Course Outcomes (COs)

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	3	2	3	3	3	2	3	3	1	2	1	2
CO2	3	3	3	3	3	3	2	3	3	3	3	3	1	2	1	2
CO3	3	3	3	2	3	3	3	3	3	3	3	3	1	2	1	2
CO4	2	3	3	3	3	3	3	3	3	3	3	2	1	2	1	2
CO5	3	2	3	3	3	3	3	3	2	3	3	3	1	2	1	2

1. The student will select a topic in his/her area of interest and the Research Project will be done under the supervision of the Faculty Members.
2. Presentation of the same will be held.
3. The research project could be in the form of case study, review of literature, RCT etc.

Name of the Academic Program: **BACHELOR OF PHYSIOTHERAPY**

Course Code: BPT 470

Title of the Course: **CLINICAL TRAINING**

L-T-P: 0-0-0 (464) Credits: (29)

(L=Lecture hours, T=Tutorial hours, P=Practical hours)

Course Outcomes (COs)

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PSO1	PSO2	PSO3	PSO4
CO1	3	3	3	3	3	2	3	3	3	2	3	3	2	2	3	3
CO2	3	3	3	3	3	3	2	3	3	3	3	3	2	2	3	3
CO3	3	3	3	2	3	3	3	3	3	3	3	3	2	2	3	3
CO4	2	3	3	3	3	3	3	3	3	3	3	2	2	2	3	3
CO5	3	2	3	3	3	3	3	3	2	3	3	3	2	2	3	3

Students will engage in clinical practice in Physiotherapy departments in the Physiotherapy setting to enhance their clinical skills and apply contemporary knowledge gained during teaching sessions.