# Mahatma Gandhi Physiotherapy College

## Syllabus

## Bachelor of Physiotherapy (BPT)

## 5 years

## (4 Years + 1 Year Internship)

**Program Code: BPT26**

**Duration: 4 Years + 1 Year Internship**

**(BPT)**

**2026-2027**

**Recommended by the BOS in Physiotherapy at its meeting held on 8.04.2026 , the Faculty of Allied and Healthcare Professions at its meeting held on 28.7.2026 and approved by Academic Council at its meeting held on 03.08.2026.**

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# Notice

1. The university reserves the right to make changes in the syllabus /books/ guidelines, fee structure or any other information at any time without prior notice the decision of the university shall be binding on all.

2. The jurisdiction of all court cases shall be Jaipur Bench of Hon'ble Rajasthan High Court only.

3. This syllabus is aligned with the NCAHP Curriculum dated 24.04.2025 and Corrigenda issued on 27/01/2026,2/07/2026 and 20/07/2026. Any subsequent amendments, revisions or corrigenda issued by the NCAHP shall automatically apply to the Rules, Regulations and Syllabus of MGUMST, Jaipur, and implemented accordingly.

**References:**


- https://ncahp.abdm.gov.in/Curriculum/Physiotherapy.pdf
- https://ncahp.abdm.gov.in/Curriculum/CurriculumCorrigendum/Physiotherapy%20Corrig endum-1.pdf
- https://ncahp.abdm.gov.in/Curriculum/CurriculumCorrigendum/Corrigendum 2PHYSIOT HERAPY.pdf
- https://ncahp.abdm.gov.in/Curriculum/CurriculumCorrigendum/Corrigendum 3Physiother apy.pdf
- https://ncahp.abdm.gov.in/Resources/ImpLetters/LetterNEETDeferred02Mar2026.pdf

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# List of Abbreviations

| Abbreviation | Expansion |
|---|---|
| **AGPA** | Annual Grade Point Average |
| **BPT** | Bachelor of Physiotherapy |
| **CGPA** | Cumulative Grade Point Average |
| **Ci** | Number of credits of the $i^{th}$ course (grading formula) |
| **CIA** | Continuous Internal Assessment |
| **CPG** | Clinical Practice Guideline |
| **DOPS** | Directly Observed Procedural Skills |
| **EBP** | Evidence-Based Practice |
| **Gi** | Grade point secured in the $i^{th}$ course (grading formula) |
| **ICF** | International Classification of Functioning, Disability and Health |
| **LAQ** | Long Answer Question |
| **MCQ** | Multiple Choice Question |
| **NCAHP** | National Commission for Allied and Healthcare Professions |
| **NCL** | Non-Creamy Layer |
| **NEET** | National Eligibility-cum-Entrance Test |
| **NOC** | No Objection Certificate |
| **NTA** | National Testing Agency |
| **NUES** | Non-University Examination System |
| **OMR** | Optical Mark Recognition (answer sheet) |
| **OSCE** | Objective Structured Clinical Examination |
| **OSPE** | Objective Structured Practical Examination |
| **PO** | Program Outcome |
| **PwD** | Persons with Disabilities |
| **RP** | Research Project |
| **RPwD** | Rights of Persons with Disabilities (Act, 2016) |
| **SAQ** | Short Answer Question |
| **Si** | AGPA of the $i^{th}$ year (grading formula) |
| **VSAQ** | Very Short Answer Question |
| **WHO** | World Health Organization |

# Rules and Regulations of Bachelor of Physiotherapy (BPT)

BPT26

## 1. TITLE OF THE PROGRAM:

Bachelor of Physiotherapy (BPT)

## 2. DURATION OF THE PROGRAM: (4 years + 1 year rotatory internship)

**2.1. Annual Pattern:** 4 years [38 weeks per year x 6 days per week x 7 hrs. per day minimum) academic training, excluding internal and University examination, extracurricular activities, Public Holidays and Vacations.

**2.2. Internship program:** 01-year full time rotatory internship program. Candidates should complete the Bachelor of Physiotherapy degree course within a period of ten years from the date of joining the course

## 3. MEDIUM OF INSTRUCTION:

English shall be the medium of instruction for all the subjects of study and for examination of the course.

## 4. ELIGIBILITY FOR ADMISSION:

**4.1.** Candidates must have passed Senior Secondary (10+2) or equivalent with Physics, Chemistry & Biology (or Botany & Zoology) with 50% aggregate with English pass. However, in respect of the candidates belonging to Scheduled Castes, Scheduled Tribes, or Other Background Classes (NCL), the minimum marks obtained in Physics, Chemistry, and Biology are taken together in the qualifying examination shall be 40% marks instead of 50% marks for Unreserved and General-EWS Candidates. In respect of PwBP/PwD candidates the minimum marks in qualifying examination in Physics, Chemistry, and Biology (or Botany & Zoology) taken together shall be 40% instead of 50%. English pass required for all categories.

**4.2.** The candidate must have appeared in the National Eligibility Entrance Test (NEET) conducted by National Testing Agency (NTA) for the academic year. However, there shall be no minimum qualifying marks or cut-off percentile requirement for application for the admission.

**4.3.** Admission on the basis of NEET Merit/Marks (with no cut-off marks or cut-off percentile for application) of the academic year.

**4.4.** Candidates who have studied abroad and have passed the equivalent qualification as determined by the Association of Indian Universities and Equivalence Committee of the NCAHP, and must fulfil the criteria as per points 1-3 above.

**4.5.** For He/she has completed 17 years of age at the time of admission or will complete that age on or before 31 December of the year of his/her admission to the first year of Undergraduate Allied and Healthcare Course.

**4.6.** He/she has to furnish at the time of submission of application form, a certificate of Physical fitness from an Authorized Medical Attendant to ascertain that the candidate does not have any physical disability as per the guideline mentioned below.

**4.7.** As per the Eligibility criteria described in Table 1, candidates can take admission on disability quota for BPT program.

i. Guidelines regarding admission of students with "Specified Disabilities" under the Rights of Persons with Disabilities Act, 2016 with respect to admission in BPT Course

a. **Note:** The "Certificate of Disability" shall be issued in accordance with the Rights of Persons with Disabilities Rules, 2017 notified in the Gazette of India by the Ministry of Social Justice and Empowerment [Department of Empowerment of Persons with Disabilities (Divyangjan)] on 15th June 2017.

b. The extent of "specified disability" in a person shall be assessed in accordance with the "Guidelines for the purpose of assessing the extent of specified disability in a person included under the Rights of Persons with Disabilities Act, 2016 (49 of 2016)" notified in the Gazette of India by the Ministry of Social Justice and Empowerment [Department of Empowerment of Persons with Disabilities (Divyangjan)] on 4th January 2018.

c. The minimum degree of disability should be 40% (Benchmark Disability) in order to be eligible for availing reservation for persons with specified disability.

d. The term 'Persons with Disabilities' (PwD) is to be used instead of the term 'Physically Handicapped' (PH).

e. Quota/ reservation policy as per the State Government norms to be followed by the State Council as applicable during allotment of seats

f. Candidates who fail to attend the Medical Examination on the notified date(s) will forfeit the claim for admission and placement in the waiting list except permitted by the competent authority under special circumstances.

**Table 1: Eligibility criteria for 'Persons with Disabilities' (PwD) for admission to BPT**

| **Sr. No.** | **Disability Type** | **Benchmark Disabilities** | **Specified Disability** | **Eligible for Physiotherapy Course, Not Eligible for PH Quota** | **Eligible for Physiotherapy Course, Not Eligible for PH Quota** | **Not Eligible for Physiotherapy** |
|---|---|---|---|---|---|---|
| 1. | Physical Disabilities | A. Locomotor Disability including Condition (a-f) | a. Leprosy* cured person<br>b. Cerebral Palsy**<br>c. Dwarfism<br>d. Muscular Dystrophy<br>e. Acid attack victim<br>f. Others*** such as Amputation, Poliomyelitis, etc. | Less than 40% disability | 1. Lower Limb: 40-50% disability<br>2. Spine: 40-50% disability<br>3. Limbs &/Spine: 40-50% disability | More than 50% for Lower Limb<br>Involvement of both Upper Limbs<br>Involvement of dominant Upper Limb<br>Involvement of Nondominant Upper Limb<br>More than 50% for Spine<br>More than 50% for Combined for Limbs and spine |
| | | * Attention should be paid to loss of sensations in fingers and hands, amputation, as well as involvement of eyes and corresponding recommendations be looked at.<br>** Attention should be paid to impairment of vision, hearing, cognitive function etc. and corresponding recommendations be looked at. | | | | |

| | | | | | | |
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| | | *** Both hands intact, with intact sensations, sufficient strength and range of motion are essential to be considered eligible for BPT course. | | | | |
| | | B. Visual Impairment (*) | a. Blindness<br>b. Low vision | Less than 40% disability (i.e. Category '0(10%)', 'i(20%)' & 'ii(10%) | | Equal to or More than 40% Disability Category till and above |
| | | C. Hearing Impairment @ | a. Deaf<br>b. Hard of hearing | Less than 40% Disability | | Equal to or more than 40% Disability |
| | | (*) Persons with Visual impairment / visual disability of more than 40% may be made eligible to pursue BPT Course and may be given reservation, subject to the condition that the visual disability is brought to a level of less than the benchmark of 40% with advanced low vision aids such as telescopes / magnifier etc.<br>@ Persons with hearing disability of more than 40% may be made eligible to pursue BPT.<br>Course and may be given reservation, subject to the condition that the hearing disability is brought to a level of less than the benchmark of 40% with the aid of assistive devices.<br>In addition to this, the individual should have a speech discrimination score of more than 60%. | | | | |
| | | D. Speech & language disability$ | a. Organic/ neurological causes | Less than 40% Disability | | Equal to or more than 40% Disability |
| | | $ Persons with Speech Intelligibility Affected (SIA) shall be eligible to pursue BPT Courses, provided Speech Intelligibility Affected (SIA) score shall not exceed 3 (three), which is 40% or below.<br>Persons with Aphasia shall be eligible to pursue BPT Courses, provided Aphasia Quotient (AQ) is 40% or below | | | | |
| 2 | Intellectual Disability | | a. Specific learning disability (Perceptual disability, Dyslexia, Dyscalculia, Dyspraxia & | # Currently there is no Quantification scale available to assess the severity of SpLD, therefore the cut-off of 40% is arbitrary and more evidence is needed. | | |
| | | | | Less than 40% Disability | Equal to or more than 40% disability and equal to or less than | More than 50% or severe nature or significant cognitive/ |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | Developmental aphasia)# | | 50%. But selection will be based on the learning competency evaluated with the help of the remediation/ assisted technology/ aids/ infrastructural changes by the Expert Panel. | intellectual disability. |
| | | | b). Autism spectrum disorders | Absence or Mild Disability, Asperger syndrome (disability of upto 60% as per ISAA) where the individual is fit for BPT course by an expert panel | Currently not recommended due to lack of objective method to establish presence and extent of mental illness. However, the benefit of reservation/quota may be considered in future after developing better methods of disability assessment. | More than 60% disability or presence of cognitive /intellectual disability and / or if the person is unfit for pursuing BPT course by an expert panel. |
| 3 | Mental Behaviour | | Mental illness | Absence or Mild Disability : less than 40% (under IDEAS) | Currently not recommended due to lack of objective method to establish presence and | Equal to or more than 40% disability or if the person is unfit to perform his/her duties. |

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| | | | | | extent of mental illness. However, the benefit of reservation/quota may be considered in future after developing better methods of disability assessment. | Standards may be drafted for the definition of "fitness to practice medicine", as are used by several institutions of countries other than India. |
| 4 | Disability caused due to | a. Chronic Neurological Conditions | i. Multiple Sclerosis<br>ii. Parkinsonism | Less than 40% Disability | 40-50% disability | More than 50% |
| | | b. Blood Disorder | i. Hemophilia<br>ii. Thalassemia<br>iii. Sickle cell disease | Less than 40% Disability | 40-50% disability | More than 50% |
| 5 | Multiple disabilities including deaf blindness | | More than one of the above specified disabilities | Must consider all above while deciding in individual cases recommendations with respect to presence of any of the above, namely, Visual, Hearing, Speech & Language disability, Intellectual Disability, and Mental Illness as a component of Multiple Disability.<br>Combining Formula as notified by the related Gazette Notification issued by the Govt. of India<br>A + [b(90-a)/90]<br>(where a= higher value of disability % and b=lower value of disability % as calculated for different disabilities) is recommended for computing the disability arising when more than one disabling condition is present in a given individual. This formula may be used in cases with multiple disabilities, and recommendations regarding admission and/or reservation made as per the specific disabilities present in a given individual. | | |

## 5. ADMISSION PROCESS:

**5.1.** The candidate must have appeared in the National Eligibility Entrance Test (NEET) conducted by National Testing Agency (NTA) for the academic year. However, there shall be no minimum qualifying marks or cut-off percentile requirement for application for the admission.

**5.2.** Admission on the basis of NEET Merit/Marks (with no cut-off marks or cut-off percentile for application) of the academic year of the admission. *

***Under-Graduate programme's mandatory requirement of appearance in NEET (UG)- 2026 examination, be deferred till next academic year 2027-28. [Ref: File No. Z-1011/2026/NCAHP(AHS)/FTS No' 126]***

### 5.3 Re-admission after break of study

**5.3.1.** Candidates having a break of study of five years and above from the date of admission and more than two spells of break will not be considered for readmission

**5.3.2.** The five years period of break of study shall be calculated from the date of first admission of the candidate to the course for the subsequent spells of break of study

**5.3.3.** Candidates having a break of study shall be considered for re admission provided that they are not subjected to any disciplinary action and no charges are pending or contemplated against them.

**5.3.4.** All re admissions of candidates are subject to the approval of a duly empowered committee of the university constituted by the Vice Chancellor.

**5.3.5.** The candidates having a break of study of up to five years shall apply for readmission to the appropriate authority of the University. The candidates shall be granted exemption in the subjects they have already passed.

### 5.4 Maximum duration of the program:

**5.4.1** Candidates should complete the Bachelor of Physiotherapy degree course within a period of **ten years** from the date of joining the course.

### 5.4.2 Discharge from the program –

a. “If a student admitted to a course of study in an University and for any reason not able to complete the course or qualify for the degree by passing the examinations prescribed within a period of ten years prescribed in the Regulations for the concerned course, he/she will be discharged from the said course, his/her name will be taken off the roles of the University and

he/ she will not be permitted to attend classes or appear for any examination conducted by the University thereafter."

b. "In respect of courses where internship is prescribed and if a student is for any reason not able to complete the internship within two years duration, such cases will be placed before a committee to be constituted by the State Council for making appropriate decisions on a case-to-case basis, based on individual merits.

c. "Notwithstanding anything contained in the foregoing, the students who fall in the category clause I above and who are in the final year of the respective courses be given one more last and final chance to appear for the University Examination with a condition that if they do not pass the examination even in their last chance, they shall be discharged from the course. The Controller of Examinations will admit such candidates to the University examinations only after their producing an undertaking (as per format given in students' manual) to this effect."

**6. RESERVATION POLICY:**

Reservation policy for admission in under graduate programs shall be as per the State/Centre Government norms.

**7. ENROLMENT &/ or REGISTRATION:**

Every candidate who is admitted to Bachelors of Physiotherapy Degree Program in Mahatma Gandhi Physiotherapy College shall be required to get himself/herself enrolled with the Mahatma Gandhi University of Medical Sciences & Technology (MGUMST) after paying the prescribed eligibility and enrolment fees.

A candidate shall deposit the enrolment fee along with the tuition fee at the time of admission to the course. Any candidate who fails to submit the duly filled enrolment form to the college Principal, along with the original documents including the migration certificate required for enrolment, within the prescribed period shall be required to pay the applicable late fee. No student will be allowed to appear in the university examination without enrolment.

Migration/transfers of candidates up to second year is allowed between government college to government college. For private colleges Migration/transfers shall be done as per the norms of the University.

**8. INTRODUCTION:**

**8.1. Objectives/Aims of the Program:**

The need for quality in treatment is a critical component of Physiotherapy and requires knowledge and understanding of the basic sciences as well as the interaction between the techniques and procedures used in Physiotherapy. In an era of greater complexity of technology and techniques, the role of the physiotherapist (PT) and his/her level of responsibility is continually evolving and expanding. Given the complexity of modern Physiotherapy, the recognition of the profession of PT and development of dedicated education programs specific to that profession must be addressed. Education programs should provide the PT with the scientific theoretical foundation of the profession and enable them, as practitioners, to be able to synthesize, evaluate and apply their knowledge in a clinical setting.

The aims of the recommended curriculum are to produce PTs who are

i. Technically and clinically competent for independent decision making;

ii. Competent to assess a patient;

iii. Aware of patient conditions and treatment along with the importance of quality assurance;

iv. Understand the theoretical basis for evidence-based practice;

v. Effective members of the multidisciplinary team;

vi. Prepared to participate in or initiate research into practice;

**8.2. Program Outcomes:**

As an independent practitioner, entry level Physiotherapy graduate will be able to:

PO1 - Discipline-Specific Knowledge & Skills

PO2 - Independent Clinical Practice

PO3 - Communication

PO4 - Member of a multidisciplinary health team

PO5 - Ethics and accountability at all levels (clinical, professional, personal and social)

PO6 - Commitment to professional excellence

PO7 - Leadership and mentorship

PO8 - Social accountability and responsibility

PO9 - Lifelong learning

PO10 - Scientific attitude and scholarship (only at higher level-MPT and PhD)

i. Demonstrate competencies to provide quality care to the individuals and populations to optimize their movement, function, and quality of life.

ii. Demonstrate competency to examine, assess, evaluate, treat and prescribe physiotherapeutic management of various disease, disorders and trauma conditions.

iii. Promote health and implement strategies informed by best available research evidence to prevent and minimize impairments, activity limitations and participation restrictions caused due to various disorders.

iv. Demonstrate the commitment to provide ethical care through high standards of professional practice.

v. Demonstrate abilities to communicate effectively to augment therapeutic and professional relationships.

vi. Demonstrate competency to prescribe and comprehend various diagnostic imaging, electrophysiological, hematological and bio- chemistry investigations for proper diagnosis, treatment or referral to other healthcare professionals

vii. Demonstrate competencies to integrate best available research evidence in to clinical decision making and practice

viii. Exhibits commitment towards continuous learning and scholarly activities.

ix. Demonstrate abilities to work effectively with Healthcare team in providing patient centered care.

x. Demonstrate abilities to manage self, time, resources and priorities to ensure safe, effective, and sustainable services.

xi. Demonstrate competencies in quality assurance relevant to Physiotherapy practice.

### 8.3. Program Specific Outcomes:

At the completion of this course, the student should be:

i. Able to acquire the cognitive, affective and psychomotor skills deemed essential for completion of this program and to perform as a competent physiotherapist who will be able to examine, evaluate, diagnose, plan, execute and document Physiotherapy treatment independently or along with the multidisciplinary team.

ii. Evaluate patients for impairments and functional limitations and be able to execute all routine physiotherapeutic procedures as per the evaluation.

iii. Able to operate and maintain Physiotherapy equipment used in treatment of patients, Physiotherapy treatment planning (both electrotherapy and exercise therapy) & procedures independently.

iv. Able to provide patient education about promotion of health, prevention of disease and disorders and various physiotherapeutic interventions to the patient and care givers.

v. Able to demonstrate all competencies to achieve the program outcomes.

### 8.4. Graduate Attributes:

i. The graduate will be a competent, skilled and reflective Physiotherapy practitioner who can work in a variety of settings with patients and clients of all ages and along the continuum of care, from wellness and prevention to management of dysfunction while remaining safe and effective and abiding by legal, ethical and professional standards of practice.

ii. The graduate will utilize critical inquiry and evidence-based practice to make clinical decisions essential for autonomous practice.

iii. The graduate will participate actively in professional and community organizations. The graduate will be a committed supporter of the advancement and promotion of community health.

iv. The graduate will demonstrate lifelong commitment to learning and professional development.

v. The graduate will adopt and adapt innovations, technology, research and critical thinking to keep pace with scientific advancements in Physiotherapy and associated fields.

vi. The graduate will function as active member in trans-disciplinary and multidisciplinary applications

vii. Coursework entitles independent Physiotherapy assessment and treatment in any healthcare delivery centers in India by the graduates

viii. Course work will skill the graduate's physical/ functional diagnosis, treatment planning and management, administration of Physiotherapy treatment and for patient support.

ix. Graduates can find employment opportunities in hospitals/nursing homes/sports teams/fitness centers/Community Rehabilitation /Health planning boards/health promotions services in both private and public sectors as well as in independent Physiotherapy clinics.

x. Physiotherapy graduates are encouraged to pursue further qualification to attain senior positions in the professional field and also to keep abreast with the recent advances, new technology and research. The professional should opt for continuous professional education credits offered by national and international institutes.

**8.5. Skills Based Outcomes and Monitorable Indications for Bachelor of Physiotherapy:**

**8.5.1. Competency Statements:**

i. Consults with the client to obtain information about his/her health, associated history, previous health interventions, and associated outcomes.

ii. Collect assessment data relevant to the client's needs and Physiotherapy practice.

iii. Be able to conduct the patient evaluation and assessment as per condition.

iv. Analyzing Assessment findings & establishing Physiotherapy diagnosis and prognosis.

v. Develops and recommends an intervention strategy.

vi. Be able to prepare the patient (physically and emotionally) and as well as the equipment to be used as per treatment plan

vii. Implements intervention.

viii. Be able to accurately explain the treatment plans and able to demonstrate and teach self exercises

ix. Advise patients on nutrition, exercises, rest, relaxation and other issues.

x. Evaluates the effectiveness of interventions.

xi. Be able to complete accurate treatment documentation.

xii. Develops, builds, and maintains rapport, trust, and ethical professional relationships through effective communication.

xiii. Establishes and maintains inter-professional relationships, which foster effective client centered collaboration.

xiv. Understand the principles of continuous quality improvement.

xv. Be able to carry out the daily/weekly Quality Control (QC) checks.

xvi. Be able to review the literature.

xvii. Be able to suggest implementation of research findings.

xviii. Be able to suggest/ initiate topics for Physiotherapy research

xix. Be able to interpret, apply and disseminate information as a member of the Physiotherapy team.

**8.5.2. Guidelines for the implementation of the training procedure Discipline wise:**

**8.5.2.1. Musculoskeletal Physiotherapy:** Goal- The aim of teaching the undergraduate student in musculoskeletal Physiotherapy is to impart such knowledge and skills that may enable them to assess and give Physiotherapy treatment to orthopaedic related problems. He/she shall acquire competence to deal with orthopaedic related problems. The details are as under:-

i. Orthopaedic Assessment of patients

ii. Physiotherapy treatment of post-operative fractures

iii. Physiotherapy treatment of orthopaedic conditions

iv. Assessment and Physiotherapy management of arthroplasty

v. Assessment and Physiotherapy management of various degenerative conditions

vi. Rehabilitation of amputee

vii. Rehabilitation of poliomyelitis

viii. Assessment and Physiotherapy management of congenital deformities.

**8.5.2.2. Neurological Physiotherapy:** Goal- The aim of teaching the undergraduate student in neurological Physiotherapy is to impart such knowledge and skills that may enable them to do Physiotherapy assessment, functional assessment and give Physiotherapy treatment to neurological related conditions. He/she shall acquire competence to deal with neurological related problems. The details are as under: -

i. Neurological Assessment of patient

ii. Motor and sensory assessment

iii. Balance and coordination assessment

iv. Examination of cranial nerves

v. Examination of higher function

vi. transfers and ambulation of patient with spinal injuries

vii. Physiotherapy management of various neurological conditions

**8.5.2.3. Cardiopulmonary Physiotherapy:** Goal- The aim of teaching the undergraduate student in Cardio-pulmonary Physiotherapy is to impart such knowledge and skills that may enable them to do

Physiotherapy assessment and give Physiotherapy treatment to cardiopulmonary related conditions. He/she shall acquire competence to deal with Cardio-pulmonary related problems. The details are as under:

i. Bed side case discussion and presentation

ii. Cardiopulmonary assessment of patient

iii. ICU monitoring

iv. Cardiac rehabilitation

v. Pulmonary rehabilitation

vi. Pre and post-operative treatment in cardiothoracic conditions

vii. Various Physiotherapy techniques used in cardiothoracic conditions

viii. Chest Physiotherapy for neonates and children

**8.5.2.4. Sports Physiotherapy:** Goal - The aim of teaching the undergraduate student in sports Physiotherapy is to impart such knowledge and skills that may enable them to assess and give Physiotherapy treatment and rehabilitate the sports related conditions. He/she may acquire such competency that they can assess and treat sports injury at the field and out-patient department. The details are as under; -

i. Pre participation evaluation for risk factor identification.

ii. Assessment and Physiotherapy management of acute sports injuries.

iii. Assessment and Physiotherapy management of overuse sports injuries.

iv. Testing of fitness components such as power, endurance, flexibility, balance.

v. Bandaging and tapping application. Disability evaluation and its rehabilitation

vi. Principles of orthotics and prosthetics

vii. Management of various intellectual disabilities and its rehabilitation including vocational training

viii. Rehabilitation of various speech and hearing impairments, vocational and social rehabilitation.

ix. Knowledge of assisted devices

x. Handling sport injury emergencies.

**8.5.2.5. Community Physiotherapy:** Goal- the aim of undergraduate students in community physiotherapy is to impart such knowledge and skills that may enable them to assess and physiotherapy treatment to common community related conditions and recognize the importance of

community involvement. He/she shall acquire competence to deal effectively with an individual and community in the context of primary health care.

**8.5.2.6. Obstetrics and gynecological Physiotherapy:** Goal - The aim of teaching the undergraduate student in Obstetrics and gynecological Physiotherapy is to impart such knowledge and skills that may enable them to assess and give Physiotherapy treatment to Obstetrics and gynecological related conditions He/she shall acquire competence to deal with Obstetrics and gynecological related conditions. The details are as under: -

i. Assessment and Physiotherapy management of antenatal and postnatal cases.

ii. Physiotherapy management in cases of prolapse uterus

iii. Physiotherapy management in cases of menstrual disorders and other gynecological disorders.

iv. Physiotherapy management in urinary incontinence

v. Physiotherapy management in pelvic inflammatory disease.

**8.5.2.7. Medicine/ Surgery/Oncology/ Pediatrics/ Emergency Medicine and trauma/ Dermatology/ Burns and Plastic surgery:**

Goal- The aim of teaching the undergraduate student in various disciplines is to impart such knowledge and skills that may enable them to assess and give Physiotherapy treatment in various conditions. He/she shall acquire competence to deal in Medicine/Surgery/Oncology/ Pediatrics/ Emergency Medicine and trauma/Dermatology/ Burns and Plastic surgery disciplines. The details are as under;-

i. Monitoring of vital signs

ii. Assessment and Physiotherapy management of common cardiothoracic conditions.

iii. Assessment and Physiotherapy management of common respiratory conditions.

iv. ICU monitoring

v. Assessment and Physiotherapy management of pre and post common surgical conditions.

vi. Assessment and Physiotherapy management of diseases commonly encounter in neonates and children

vii. Screening of developmental disorders

viii. Assessment and Rehabilitation of various speech and hearing impairments in children.

ix. Chest Physiotherapy in neonates and children.

x. Assessment and Physiotherapy management of burn cases.

xi. Assessment and Physiotherapy management of cancer patients.

xii. Assessment and Physiotherapy management of common integumentary conditions.

**8.5.3. The Intended Course Outcome with Competency Levels, Learning Methods and Assessment methods are depicted in Table below:**

**Table 2: Intended Course Outcome with Competency Levels, Learning Methods and Assessment Methods**

| Course | Intended Learning Outcome | Teaching Learning Methods | Assessment Methods |
|---|---|---|---|
| Competency level | K – Knows [Describe, Define]<br>KH – Knows How [ Explain, Analyse, Identify, Recognise]<br>S- Shows [Demonstrate]<br>SH – Shows How [Demonstrate]<br>P- Performs Independently [Perform] | Lecture<br>Tutorial<br>Demonstration using models including digital<br>Flipped class<br>Dissection<br>panel discussion<br>field Visit<br>case study<br>Debate<br>Practical [Lab Work<br>Video Demonstration<br>Role Play<br>Hands On<br>Virtual Reality Simulation<br>Case Discussion | MCQs<br>Assignments<br>Short Essays<br>Long essay<br>Spotters<br>Viva Voice<br>Presentations<br>Debate |

**Table 3: Intended Program Outcomes and Broader Competencies for Physiotherapists in diverse roles**

| Role/Domain | Intended Program Outcomes | Broader Competencies |
|---|---|---|
| I. Clinical / Physiotherapy Practitioner | Demonstrate competencies to provide quality care to individuals and populations to optimise their movement, function, and quality of life.<br><br>Promote health and implement strategies informed by best available research evidence to prevent and minimise impairments, activity limitations and participation restrictions caused due to various disorders. | 1. Plan and implement culture-specific Physiotherapy assessment to identify impairments, activity limitations, and participatory restrictions.<br>2. Examine, assess, evaluate and treat various disorders, diseases and trauma conditions for physio- therapeutic interventions.<br>3. Prescribe physiotherapeutic modalities, therapeutic exercises, assistive devices, aid, appliances, support systems and home modifications.<br>4. Prescribe and comprehend various diagnostic imaging, electro- physiological, hematological and biochemistry investigations for proper diagnosis and physiotherapeutic treatment.<br>5. Design, implement, evaluate, and monitor patient-centered physio- therapy care based on the available evidence.<br>6. Involves patients, care givers, and related healthcare providers in holistic clinical decision making.<br>7. Evaluate the Physiotherapy intervention and modify as required.<br>8. Considers local and cultural aspects in clinical decision making and plan of care. |
| II. Ethical and professional practitioner | Demonstrate the commitment to provide ethical care through high standards of professional practice. | 1. Incorporates legal and ethical standards into Physiotherapy practice.<br>2. Demonstrate the knowledge of national, international, and professional association's policies and ethical standards.<br>3. Comply with legal standards and regulatory requirements as prescribed by relevant organisations. |

| | | |
|---|---|---|
| III. Communicator | Demonstrate abilities to communicate effectively to augment therapeutic and professional relationships | 1. Communicate effectively with colleagues, patients, Healthcare providers and other stakeholders.<br>2. Demonstrate ability to document Physiotherapy assessment, plan of care, protocol modification, and evaluation as per the prescribed standards. |
| IV. Evidence-based practitioner and lifelong learner | Demonstrate competencies to integrate best available research evidence into clinical decision making and practice.<br><br>Exhibits commitment towards continuous<br>learning and scholarly activities. | 1. Demonstrates competencies in acquiring, appraising, and applying research evidence.<br>2. Identifies the need for continuing professional development. |
| V. Inter-professional teamwork | Demonstrate abilities to work effectively with Healthcare team in providing patient<br>centred care | 1. Contribute to effective team-work through comprehensive, collaborative, consultative, culturally responsive, and patient centred models of practice.<br>2. Demonstrate competencies for appropriate referral to other medical and Healthcare professionals |
| VI. Leader and Manager | Demonstrate abilities to manage self, time, resources and priorities to ensure safe, effective, and sustainable services. | |
| VII. Quality assurance | Demonstrate competencies in quality assurance relevant to physiotherapy practice | 1. Demonstrate knowledge in quality policies, procedures, process, and standards. |

**9. ATTENDANCE:**

**9.1.** A candidate has to secure minimum

a. 75% attendance in theory subjects.

b. 85% in Skills training (practical) for qualifying to appear for the final examination.

**9.2.** No relaxation, whatsoever, will be permissible to this rule under any ground including indisposition etc.

**9.3.** The Head of the Institution/University may declare a maximum of 30 days of vacation (summer, winter leaves) in an academic year to the students. The period(s) of vacation can be decided by the Head of the Institution/University.

## 10. MINIMUM INSTRUCTION/ TEACHING DAYS:

**10.1.** Minimum Available hour per week = 38 weeks [6 days x 7 Hours = 42 hours]

**10.2.** Minimum Duration of year = 220 days

**10.3.** Maximum Vacation per year- 30 days.

**10.4.** Minimum teaching hours per year = 1560

**10.5.** Calculation of credit for student (As per National Credit Framework)

One credit course in a year:

i. Theory = 15 Hours

ii. Practical / Clinical = 30 Hours

iii. Field work = 45 Hours

**10.6.** Teaching/Learning Methods: The teaching methods will adopt competency-based learning for the students. Apart from classroom teaching (contact hours), self-learning will be facilitated to make a graduate lifelong learner. Additionally, technology, hybrid or virtual learning, use of advanced learning tools, mannequins, simulators, and videos can be utilized for enhancing learning experience.

## 11. PROGRAMME STRUCTURE (YEAR I, II, III, IV, & V):

**Table 4: Year Wise Program Structure**

| Year | Core Theory Component | Practical Component | Total Number of Course/ Papers |
|---|---|---|---|
| Year 1 | 9 | 5 | 14 |
| Year 2 | 8 | 6 | 14 |
| Year 3 | 7 | 7 | 14 |
| Year 4 | 8 | 7 | 15 |

**BPT 1st Year**

| S. No | Subject Code | Subject Name | Theory hours | Practical hours | Total Hours | Credits Theory | Credits Practical | Credits Total |
|---|---|---|---|---|---|---|---|---|
| 1 | BPT - 101 | Human Anatomy (HA) | 180 | 120 | 300 | 12 | 4 | 16 |
| 2 | BPT - 102 | Human Physiology (HP) | 180 | 120 | 300 | 12 | 4 | 16 |
| 3 | BPT - 103 | Biochemistry (BC) | 90 | | 90 | 6 | | 6 |
| 4 | BPT - 104 | Fundamentals of Exercise Modalities (FoEM) | 120 | 60 | 180 | 8 | 2 | 10 |
| 5 | BPT - 105 | Fundamentals of Electro Physical Agents (FoEA) | 120 | 60 | 180 | 8 | 2 | 10 |
| 6 | BPT - 106 | Psychology & Sociology (PD) | 120 | | 120 | 8 | | 8 |
| 7 | BPT - 107 | Fundamentals of Healthcare delivery System in India (FoHS) | 120 | | 120 | 8 | | 8 |
| 8 | BPT - 108 | English (EG) | 60 | | 60 | 4 | | 4 |
| 9 | BPT - 109 | Information Technology (IT) | 60 | | 60 | 4 | | 4 |
| 10 | BPT - 110 | Clinical Orientation (COr) | | 150 | 150 | | 5 | 5 |
| **Grand Total** | | | **1050** | **510** | **1560** | **70** | **17** | **87** |

## BPT 2nd Year

| S. No | Subject Code | Subject | Theory hours | Practical hours | Total Hours | Credits Theory | Credits Practical | Credits Total |
|---|---|---|---|---|---|---|---|---|
| 1 | BPT - 201 | Pathology & Microbiology (PM) | 120 | | 120 | 8 | | 8 |
| 2 | BPT - 202 | Pharmacology (PC) | 90 | | 90 | 6 | | 6 |
| 3 | BPT - 203 | Public Health & Health Promotion (PH) | 120 | | 120 | 8 | | 8 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 4 | BPT - 204 | Emergency Care and life support Skills (ECLS) | 90 | 30 | 120 | 6 | 1 | 7 |
| 5 | BPT - 205 | Exercise therapy (ExT) | 150 | 120 | 270 | 10 | 4 | 14 |
| 6 | BPT - 206 | Electrotherapy (ET) | 150 | 120 | 270 | 10 | 4 | 14 |
| 7 | BPT - 207 | Biomechanics & Kinesiology (BK) | 120 | 60 | 180 | 8 | 2 | 10 |
| 8 | BPT - 208 | Yoga and Systems of Medicine (YoG) | 120 | 60 | 180 | 8 | 2 | 10 |
| 9 | BPT - 209 | Clinical Observation (COb) | | 210 | 210 | | 7 | 7 |
| **Grand Total** | | | **960** | **600** | **1560** | **64** | **20** | **84** |

## BPT 3rd Year

| S. No | Subject Code | Subject | Theory hours | Practical hours | Total Hours | Credits Theory | Credits Practical | Credits Total |
|---|---|---|---|---|---|---|---|---|
| 1 | BPT - 301 | General Medicine and Pediatrics (GMP) | 90 | 30 | 120 | 6 | 1 | 7 |
| 2 | BPT - 302 | General Surgery (GS) | 90 | 30 | 120 | 6 | 1 | 7 |
| 3 | BPT - 303 | Orthopedics (OR) | 90 | 30 | 120 | 6 | 1 | 7 |
| 4 | BPT - 304 | Physiotherapy in Adult and Pediatric Medical and Surgical Conditions (PTMS) | 180 | 120 | 300 | 12 | 4 | 16 |
| 5 | BPT - 305 | Physiotherapy in Adult and Pediatric Orthopedics Conditions (PTO) | 180 | 120 | 300 | 12 | 4 | 16 |
| 6 | BPT - 306 | Physical & functional Diagnosis & Prescription (PFDP) | 120 | 60 | 180 | 8 | 2 | 10 |
| 7 | BPT - 307 | Research Methodology, Biostatistics and Evidence Based Practice (RMB) | 120 | | 120 | 8 | | 8 |
| 8 | BPT - 307 | Clinical Education (CEd) | | 300 | 300 | | 10 | 10 |
| **Grand Total** | | | **870** | **690** | **1560** | **58** | **23** | **81** |

## BPT 4th Year

| S. No | Subject Code | Subject | Theory hours | Practical hours | Total Hours | Credits Theory | Credits Practical | Credits Total |
|---|---|---|---|---|---|---|---|---|
| 1 | BPT - 401 | Neurology, Psychiatry and Neurosurgery (NPNS) | 90 | 30 | 120 | 6 | 1 | 7 |
| 2 | BPT - 402 | Physiotherapy in Adult and Pediatric Neurological and Neurosurgical conditions (PTN) | 150 | 60 | 210 | 10 | 2 | 12 |
| 3 | BPT - 403 | Cardiothoracic diseases and surgeries (CTD) | 90 | 30 | 120 | 6 | 1 | 7 |
| 4 | BPT - 404 | Physiotherapy in Adult and Pediatric Cardiothoracic conditions and Surgical Conditions (PTCT) | 150 | 60 | 210 | 10 | 2 | 12 |
| 5 | BPT - 405 | Sports Physiotherapy & Exercise Prescription (PTS) | 150 | 60 | 210 | 10 | 2 | 12 |
| 6 | BPT - 406 | PT Ethics, Medico Legal aspects, Management & Administration (PTLM) | 90 | | 90 | 6 | | 6 |
| 7 | BPT - 407 | Community Physiotherapy & Rehabilitation (CPTR) | 90 | 30 | 120 | 6 | 1 | 7 |
| 8 | BPT - 408 | Project Work Orientation [NUES] (PW) | 90 | 0 | 90 | 6 | 0 | 6 |
| 9 | BPT - 409 | CLINICAL ROTATION (CR) | | 390 | 390 | | 13 | 13 |
| **Grand Total** | | | **900** | **660** | **1560** | **60** | **22** | **82** |

## 12. CONDUCT OF CONTINUOUS ASSESSMENT/ INTERNAL ASSESSMENT

**12.1.** The Continuous Internal Assessment (CIA) forms the Formative Assessment component of the evaluation system while the end year examination as explained along with the formative assessment will become the summative assessment

**12.2.** Assessments should be completed by the academic staff, based on the compilation of the student's theoretical & clinical performance throughout the training program. To achieve this, all assessment forms and feedback should be included and evaluated. The passing marks for every subject shall be 50% marks in theory and 50% in practical. The candidate has to pass both theory and practical separately. If a candidate fails in practical or theory exam only s/he must have to appear in both theory and practical exam again

**12.3.** Each paper shall have 20% Internal Assessment and 80% marks for University/External Examination. The internal assessment weightage will be based on following criteria depicted in Table

**Table 5: The internal assessment weightage criteria**

| | **% of the total marks of the internal assessment** |
|---|---|
| i) Written/Assignment/Project Work, attendance etc.<br>The Board of Studies of the concerned university may have their own rubrics for internal assessment (40%) components such as assignments, project work, attendance, and related<br>academic activities. | 40 % |
| ii) Two Mid-term Tests | 60 % (Best of two mid-term tests) |

## 13. DISSERTATION/ INTERNSHIP/ PROJECT/ CLINICAL POSTINGS:

**13.1.** All students of Bachelor of Physiotherapy must undergo a compulsory rotatory internship for a period of one year approved by the college after passing all examinations in all subjects.

**13.2.** Teaching institutes shall be responsible for ensuring the internship of the students in the hospital of the institute or affiliated /approved hospitals.

**13.3.** During the period of internships, stipend amount must be paid to the students by the institute as prescribed by the State Council.

**13.4.** Up to 4 months of the internship duration can be completed as an internship in an institute approved by the State Council.

**13.5.** Completion of Basic Life Support (BLS) program is mandatory for every student during the one year of internship. The concerned institute shall be responsible for organizing the BLS program to be guided by certified instructors for their students.

**13.6.** Two months of rural posting and preferably in a government setting like a CHC/ PHC/ Rural Rehabilitation Centers, shall be coordinated by the State Council for each student as a part of the Internship.

**13.7.** At the end of the Internship, a log book as prescribed in the Curriculum, duly signed by the Principal of the concerned Institute, must be preserved in the Institute.

**BPT. INTERNSHIP GUIDELINES:**

**A. Internship Goals and Objectives:** Internship shall be part of the curriculum of the bachelor of Physiotherapy and shall be called "Rotatory clinical internship"

i. Goals: The goal of the internship programme is to train the Physiotherapy graduate in such a manner that they will be able to assess, diagnose and treat the patients independently.

ii. Objectives- At the end of internship programme the Physiotherapy graduate should have following competencies.

a. Can assess, diagnose, prevent and treat the patients of Physiotherapy independently

b. Opportunity to develop confidence and increase skill in simulation and treatment delivery

c. Effective communicator with patients, families, colleagues and the community.

d. Ability to upgrade themselves with recent advances, treatment procedure and research in the field of Physiotherapy.

B. It is mandatory for the Institution conducting BPT Programme to have its own Physiotherapy clinic fully furnished with all the necessary equipment as per the curriculum of the Programme.

C. Institutions shall have to satisfy themselves that satisfactory infrastructure facilities of Physiotherapy exist in the Institute /Hospital where the internship training has to be undertaken. Following parameters / guidelines have been suggested:

i. The hospitals must have a separate Physiotherapy department with qualified and registered Physiotherapy professionals (with the respective Physiotherapy Council/ Commission).

ii. The Institutes & the Hospitals should have the Physiotherapy section with all the necessary infrastructure facilities.

iii. Senior Physiotherapists with sufficient clinical experience should manage the Physiotherapy departments in the Institutes/Hospitals.

D. Institute Director / principal can at his discretion grant NOC to the students to do the Internship at the place of his choice provided, the concerned Hospital fully satisfies the above criteria. For the purpose of granting NOC, the candidate shall have to submit to the Institution the status of Physiotherapy Services available at the place where he intends to do his Internship.

E. Eligibility of starting internship; BPT students declared to have passed all the examinations (University & internals) both Theory and Practical's for all subjects of all 4 years. Candidates seeking entry to the internship period must have passed all examinations in all subjects (i.e. He/She must have secured total credits of the Programme).

F. Provisional Registration- Before starting the internship, it will be the responsibility of the teaching institute to report the name, and details of the candidates starting the internship and students should take provisional registration from the commission/council.

G. The title during placement of internship would be Physiotherapy intern/ BPT. Intern.

H. Intern shall be responsible for proper use of equipment of the Institute/Hospital where they are posted. He/She shall be liable to pay for damage caused to the equipment resulting from improper use by him/her.

I. During the internship candidates shall have to work full time average 7 hours per day (each working day) 6 days /week for 12 Calendar months.

i. Total duration- One year or twelve months; Seven hours a day for six days a week amounting to min 2016 hours. 12 months = 1 year = 2016 hours [Minimum Hours] (7 X 6 X 48)

ii. Each candidate is allowed a maximum of 12 holidays during the entire Internship Programme and in case of any exigencies during which the candidate remains absent for a

period more than 12 days, he/she will have to work for the extra days during which the candidate has remained absent.

iii. During the period of internship, the student shall be posted in rotation in the OPD & IPD facilities of the clinical departments of the hospitals of the institution/university.

iv. Duration of 12 months inclusive of posting in rural setup/CBR/similar setup.

v. Time distribution: The internship time period provides the students the opportunity to continue to develop confidence and increased skill in simulation and treatment delivery. Students will demonstrate competence in beginning, intermediate, and advanced procedures in both areas. Students will participate in advanced and specialized treatment procedures. The student will complete the clinical training by practicing all the skills learned in classroom and clinical instruction. The students are expected to work for minimum 7 hours per day as shown in Table 6.

**Table 6: Duration of Department wise Rotatory posting during BPT. Internship**

| Sl. No. | Department / areas | Duration |
|---|---|---|
| 1 | Musculoskeletal / Orthopaedic Physiotherapy | 45 days |
| 2 | Neurological Physiotherapy | 45 days |
| 3 | Community Physiotherapy/ Rural posting | 2 months |
| 4 | Cardiology ICU/NICU | 1 month |
| 5 | Pulmonology/TB Hospital/ Medicine | 1 month |
| 6 | Sports Physiotherapy | 1 month |
| 7 | Obstetrics and gynecological Physiotherapy | 1 month |
| 8 | Pediatric | 1 month |
| 9 | Surgery/ Oncology | 1 month |
| 10 | Burns and Plastic Surgery | 1 month |

J. At the end of the Internship, a log book as prescribed in the Curriculum, duly signed by the Principal of the concerned Institute, must be preserved in the Institute.

K. Assessment: The interns/candidate shall maintain the record of work, which will be verified and certified by the Head of the Department under whom he/she works. Apart from scrutiny of the record of work, the Head of the Department shall undertake assessment and evaluation of training in attendance, discipline, knowledge, skills and attitude for the duration of training. The assessment report of the candidate shall be sent to the Parent institution.

i. Based on the record of work and date of evaluation the Director/Principal shall issue Certificate of Satisfactory Completion of training following which the University shall award the Bachelor of Physiotherapy Degree or declare the candidate eligible for the same.

ii. In the event of an unsatisfactory report, the said intern shall have to repeat the internship for the period to be decided by the Head of the Institution concerned.

iii. Intern will abide by all the rules & regulations of Institution/Hospital where they are posted.

L. Internship duration can be extended by the Principal / Director on the grounds:

i. Remaining absent in excess of the permitted 6 days leave period, which is due: An intern will compensate by working extra for each day's leave taken.

ii. Unsatisfactory performance during the period: If there are unsatisfactory reports in terms of performance of the intern, submitted by the Department In-charge, the said intern shall have to repeat the internship for a period at least two months further.

iii. Case of indiscipline at any level: A Discipline and Action Committee will be formed in the college / Institution convened by Internship coordinator/HOD PT & headed by Director/Principal. In case of any lack of discipline, breach of trust or indulgence in any criminal activity on the part of the interns when reported by the concerned departments of Hospitals/Institutions where the interns have been posted, the defaulting Intern shall be called back immediately and subjected to disciplinary proceedings by the Disciplinary Action Committee.

iv. Punishments:

a) Suspension of Internship for a period of 3-4 weeks for the reasons to be recorded. Following this disciplinary suspension, internship can be resumed only after submission of an appropriate undertaking/ guarantee/surety. Period of suspension shall be considered as Break in Internship. Disciplinary Action Committee shall decide the period of suspension and resumption of Internship for a specified period.

b) Rustication & Termination: In case of a serious complaint of indiscipline or breach of trust against intern or any criminal activity done by intern according to the law of the country, he/she may be rusticated along with termination of Internship. Hon'ble Court of Law can resume the Internship in this case only on the abrogation of criminal charges against him.

M. Role of Hospital Administration in BPT. Internship:

**Authority has to ensure that:**

i. The faculty Intern/ student ratio shall be maximum 1:10

ii. The departments shall be headed by the senior most physiotherapist (registered with the council/committee) according to the hierarchy prescribed by the commission, in clinical settings. The internship shall be coordinated by the faculty of the institution for adequate clinical training and teaching as per the curriculum.

iii. The Physiotherapy faculty in the hospital shall be responsible for the clinical training and teaching of the student in OPD & IPD's and ICU's. Each student will maintain the log book for daily clinical activities / learnings as per the clinical schedule assigned to him/her in accordance with the curriculum, and present the case reports for discussion in the clinical discussion meetings once every week at the place of their clinical postings. The presentation by the students shall be moderated by the institutional faculty and in-charge physiotherapist. Each intern must present at least twelve case presentations/ peer group review, from clinical departments he/ she is posted in.

iv. The internship completion certificate must be signed by the supervising physiotherapist/ HOD Physiotherapy and counter signed by the principal of the institute. The certificate must display/ mention all the clinical departments where the student had been placed in, along with the number of days (with dates) of his/her postings in respective clinical departments/ facilities. This certificate shall be a mandatory requirement for registration of the applicant for the practice of the profession.

v. The clinical facilities/ hospitals shall be inspected by the Commission for allocating the number of clinical trainees / interns in each hospital/ facility.

vi. Grant of Leave to the intern- The student shall be allowed maximum one leave per month only apart from one day weekly off during internship. In case of any medical or other exigency, the student has to compensate for the number of days he/she has been absent due to such reason for the period beyond 12 leaves.

N. Assessment of BPT Internship:

**Continuous Assessment and Documentation:**

i. Initial Assessment Documentation: An intern must document the following information: Initial assessment documented based on SOAP format.

a. Subjective examination (symptomatic)

b. Objective examination (measurable, observable)

c. Action/Analysis (interpretation of current condition/intervention provided)

d. Plan of action

e. Written or verbal feedback of the client or other relevant carers

f. Discharge plan

g. Agreement of treatment plan by patient or "person responsible"

ii. Progress Documentation: Progress documentation may include the following information:

a. Any individual intervention should be documented in SOAP format (including response to intervention/s using outcome measures)

b. Oral consent obtained and documented when there is a significant change in treatment/ treatment options/ status of patient's health.

c. Written consent obtained for designated invasive procedures

d. Change in status or events that may affect discharge plans/goals

e. Documented consultation with key clinical team members

iii. Twelve case presentation is mandatory during the one-year internship

**Project work/ Case Presentations: Course objective:**

a. The candidate shall submit a project under the supervision of a Physiotherapy faculty during internship. The project may be a case study or recent technique or literature reviews etc. To make the student have a research mind and to facilitate higher studies.

b. Twelve case presentations are mandatory during the one-year internship. The student will be doing specific case studies allotted by their teacher/guide. The subject is for Case Presentations and evaluations. Minimum 5- 10 cases are to be documented for discussion.

**Examination:** There will be no university examination.

i. Students will be assessed on the basis of Viva on his/her project work and the awards secured by them will be sent to University, criteria domain for which is depicted in Table 7 and 8.

ii. The interns shall maintain the record of work which is to be verified and certified by the Physiotherapy faculty under whom he/she works. Based on the record of work and project, The Internship completion shall be reported in the form of grades by the HOD/ principal while issuing "Certificate of Satisfactory Completion" of internship following which University shall award the BPT degree. All internees will be assessed based on their satisfactory attendance, performance in the postings/ and the presentation of the logbook and project. The credits and hours of internship will be mentioned in the transcript.

**Table 7: Criteria of Evaluation of Students during BPT. Internship**

| Sl. No. | Description | Satisfactory/ Unsatisfactory |
|---|---|---|
| 1 | Attendance | |
| 2 | Discipline and general behavior in the Department | |
| 3 | Approach to patients | |
| 4 | Inquisitiveness regarding the subject | |
| 5 | Knowledge about evaluation of conditions | |
| 6 | Knowledge about various therapeutic modalities | |
| 7 | Knowledge about actual application of therapeutic skills | |

**Table 8: Domain Criteria and Weightage for Evaluation of Students during BPT. Internship**

| Domains | % of total marks of the internal assessment |
|---|---|
| Attendance | 10% |
| Log Book | 30% |
| Project | 60% |

## 14. SCHEME OF EXAMINATION:

14.1 First Year B. P. T. Examination [Annual Pattern]

**Table 9: First Year BPT. Examination Scheme**

| S. No | Subject | Internal Assessment Marks | | University Examination Marks | | | Total Marks | Theory hours | Practical hours | Total Hours | Credits Theory | Credits Practical | Credits Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Theory | Practical | Theory | Viva | Practical | | | | | | | |
| 1 | BPT -101 Human Anatomy (HA) | 20 | 20 | 80 | 20 | 60 | 200 | 180 | 120 | 300 | 12 | 4 | 16 |
| 2 | BPT-102 Human Physiology (HP) | 20 | 20 | 80 | 20 | 60 | 200 | 180 | 120 | 300 | 12 | 4 | 16 |
| 3 | BPT - 103 Biochemistry (BC) | 10 | | 40 | | | 50 | 90 | | 90 | 6 | | 6 |
| 4 | BPT - 104 Fundamentals of Exercise Modalities (FoEM) | 20 | 20 | 80 | 20 | 60 | 200 | 120 | 60 | 180 | 8 | 2 | 10 |
| 5 | BPT-105 Fundamentals of Electro Physical Agents (FoEA) | 20 | 20 | 80 | 20 | 60 | 200 | 120 | 60 | 180 | 8 | 2 | 10 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | BPT – 106 Psychology & Sociology (PD) | 20 | | 80 | | | 100 | 120 | | 120 | 8 | | 8 |
| 7 | BPT – 107 Fundamentals of Healthcare delivery System in India (FoHS) | 20 | | 80 | | | 100 | 120 | | 120 | 8 | | 8 |
| 8 | BPT – 108 English (EG) | 50 | | [NUES] | | | | 60 | | 60 | 4 | | 4 |
| 9 | BPT – 109 Information Technology (IT) | 50 | | [NUES] | | | | 60 | | 60 | 4 | | 4 |
| 10 | BPT – 110 Clinical Orientation (COr) | | | | 50 | | 50 | | 150 | 150 | | 5 | 5 |
| | **Grand Total** | **230** | **80** | **520** | **130** | **240** | **1100** | **1050** | **510** | **1560** | **70** | **17** | **87** |

**N.B. –** Setting Question Paper will be done as per the subjects in Annual Pattern

### 14.2 Second Year B. P. T. Examination [Annual Pattern]

**Table 10: Second Year BPT. Examination Scheme**

| S. No | Subject | Internal Assessment Marks | | University Examination Marks | | | Total Marks | Theory hours | Practical hours | Total Hours | Credits Theory | Credits Practical | Credits Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Theory | Practical | Theory | Viva | Practical | | | | | | | |
| 1 | BPT - 201 Pathology & Microbiology (PM) | 20 | | 80 | | | 100 | 120 | | 120 | 8 | | 8 |
| 2 | BPT – 202 Pharmacology (PC) | 20 | | 80 | | | 100 | 90 | | 90 | 6 | | 6 |
| 3 | BPT-203 Public Health & Health Promotion (PH) | 20 | | 80 | | | 100 | 120 | | 120 | 8 | | 8 |
| 4 | BPT-204 Emergency Care and life support Skills (ECLS) | 20 | | 80 | | | 100 | 90 | 30 | 120 | 6 | 1 | 7 |
| 5 | BPT - 205 | 20 | 20 | 80 | 20 | 60 | 200 | 150 | 120 | 270 | 10 | 4 | 14 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Exercise therapy (ExT) | | | | | | | | | | | | |
| 6 | BPT - 206 Electrotherapy (ET) | 20 | 20 | 80 | 20 | 60 | 200 | 150 | 120 | 270 | 10 | 4 | 14 |
| 7 | BPT- 207 Biomechanics & Kinesiology (BK) | 20 | | 80 | | | 100 | 120 | 60 | 180 | 8 | 2 | 10 |
| 8 | BPT - 208 Yoga and Systems of Medicine (YoG) | 20 | 20 | 80 | 20 | 60 | 200 | 120 | 60 | 180 | 8 | 2 | 10 |
| 9 | BPT - 209 Clinical Observation (COb) | | 70 | | | | | 70 | 210 | 210 | | 7 | 7 |
| | **Grand Total** | **160** | **130** | **640** | **60** | **180** | **1100** | **1030** | **600** | **1560** | **64** | **20** | **84** |

**N.B. –** Setting Question Paper will be done as per the subjects in Annual Pattern

### 14.3 Third Year B. P. T. Examination [Annual Pattern]

**Table 11: Third Year BPT. Examination Scheme**

| S. No | Subject | Internal Assessment Marks | | University Examination Marks | | | Total Marks | Theory hours | Practical hours | Total Hours | Credits Theory | Credits Practical | Credits Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Theory | Practical | Theory | Viva | Practical | | | | | | | |
| 1 | BPT -301 General Medicine and Pediatrics (GMP) | 20 | | 80 | | | 100 | 90 | 30 | 120 | 6 | 1 | 7 |
| 2 | BPT -302 General Surgery (GS) | 20 | | 80 | | | 100 | 90 | 30 | 120 | 6 | 1 | 7 |
| 3 | BPT -303 Orthopedics (OR) | 20 | | 80 | | | 100 | 90 | 30 | 120 | 6 | 1 | 7 |
| 4 | BPT -304 Physiotherapy in Adult and Pediatric Medical and Surgical Conditions (PTMS) | 20 | 20 | 80 | 20 | 60 | 200 | 180 | 120 | 300 | 12 | 4 | 16 |
| 5 | BPT -305 Physiotherapy in Adult and Pediatric Orthopedics | 20 | 20 | 80 | 20 | 60 | 200 | 180 | 120 | 300 | 12 | 4 | 16 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Conditions (PTO) | | | | | | | | | | | | |
| 6 | BPT -306 Physical & functional Diagnosis & Prescription (PFDP) | 20 | 20 | 80 | 20 | 60 | 200 | 120 | 60 | 180 | 8 | 2 | 10 |
| 7 | BPT -307 Research Methodology, Biostatistics and Evidence Based Practice (RMB) | 20 | | 80 | | | 100 | 120 | | 120 | 8 | | 8 |
| 8 | BPT -308 Clinical Education (CEd) | | 100 | | | | | | 300 | 300 | | 10 | 10 |
| | **Grand Total** | **140** | **160** | **560** | **60** | **180** | **1100** | **870** | **690** | **1560** | **58** | **23** | **81** |

**N.B. –** Setting Question Paper will be done as per the subjects in Annual Pattern

### 14.4 Fourth Year B. P. T. Examination [Annual Pattern]

**Table 12: Fourth Year BPT. Examination Scheme**

| S. No | Subject | Internal Assessment Marks | | University Examination Marks | | | Total Marks | Theory hours | Practical hours | Total Hours | Credits Theory | Credits Practical | Credits Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Theory | Practical | Theory | Viva | Practical | | | | | | | |
| 1 | BPT -401 Neurology, Psychiatry and Neurosurgery (NPNS) | 20 | | 80 | | | 100 | 90 | 30 | 120 | 6 | 1 | 7 |
| 2 | BPT -402 Physiotherapy in Adult and Pediatric Neurological and Neurosurgical conditions (PTN) | 20 | 20 | 80 | 20 | 60 | 200 | 150 | 60 | 210 | 10 | 2 | 12 |
| 3 | BPT -403 Cardiothoracic diseases and surgeries (CTD) | 20 | | 80 | | | 100 | 90 | 30 | 120 | 6 | 1 | 7 |
| 4 | BPT -404 Physiotherapy in Adult and Pediatric Cardioth | 20 | 20 | 80 | 20 | 60 | 200 | 150 | 60 | 210 | 10 | 2 | 12 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | oracic conditions and Surgical Conditions (PTCT) | | | | | | | | | | | | |
| 5 | BPT -405 Sports Physiotherapy & Exercise Prescription (PTS) | 20 | 20 | 80 | 20 | 60 | 200 | 150 | 60 | 210 | 10 | 2 | 12 |
| 6 | BPT -406 PT Ethics, Medico Legal aspects, Management & Administration (PTLM) | 20 | | 80 | | | 100 | 90 | | 90 | 6 | | 6 |
| 7 | BPT -407 Community Physiotherapy & Rehabilitation (CPTR) | 20 | 20 | 80 | 20 | 60 | 200 | 90 | 30 | 120 | 6 | 1 | 7 |
| 8 | Project Work Orientation [NUES] (PW) BPT-408 | | | | | | 0 | 90 | 0 | 90 | 6 | 0 | 6 |
| 9 | CLINICAL ROTATION (CR) BPT-409 | 150 | | | | | 150 | | 390 | 390 | | 13 | 13 |
| **Grand Total** | | **290** | **80** | **560** | **80** | **240** | **1250** | **900** | **660** | **1560** | **60** | **22** | **82** |

**N.B. –** Setting Question Paper will be done as per the subjects in Annual Pattern

## 15. CONDUCT OF UNIVERSITY EXAMINATION:

University examinations will be conducted at the end of each academic year. However, two Examination in an academic year is essential and has to be conducted by the university, one Annual/supplementary examination in an academic year.

### 15.1 Appointment of Examiners and Paper Setter (Qualification of Paper Setters and Examiners):

i. MPT possessing -

- Assistant Professor and above
- Tutor/Demonstrator with at least 3 years of working experience (Academic)
- Physiotherapist with an experience of at least 3 years in a Medical College [@]

ii. Practical examination should be conducted by a pair of examiners (one internal from the same university and one external from another university) only and not by single examiner / examiners of the same university.

iii. Designing a question paper should take into consideration all levels of knowledge domain e.g. Bloom's taxonomy of cognitive domain. Use appropriate verbs for the questions at each level to assess higher levels of learning and applied knowledge of the subject.

iv. Use a combination of various types of questions e.g. structured essays (Long Answer Questions - LAQ), Short Answers Questions (SAQ) and objective type questions (e.g. Multiple Choice Questions - MCQ). Marks for each part should be indicated separately. MCQs, if used, should not have more than 20% weightage. The question paper should be evenly distributed to cover all the sections appropriately from competencies.

### 15.2 Eligibility to appear for the examination:

i. Regular periodic examinations shall be conducted throughout the course. There shall be no less than two internal assessment examinations, their weightage is as shown in Table 13.

**Table 13: Weightage of the Internal and External Exams**

| Year | Internal exam 20% weightage | Final 80% weightage |
|---|---|---|
| I$^{st}$ Year | Internal 1 | University exam 1 |
| | Internal 2 | |
| 2$^{nd}$ Year | Internal 1 | University exam 1 |
| | Internal 2 | |
| 3$^{rd}$ Year | Internal 1 | University exam 1 |
| | Internal 2 | |
| 4$^{th}$ Year | Internal 1 | University exam 1 |
| | Internal 2 | |

ii. Learners must secure at least 50% marks in theory and practical separately assigned for internal assessment in a particular subject in order to be eligible for appearing at the final University examination of that subject.

iii. The results of Internal Assessment should be displayed on the notice board within a 1-2 week of the test. Summative assessment consists of university examinations.

**15.3 Theory Examinations:** Bloom's Taxonomy helps Physiotherapy educators create learning goals that cover a range of skills, from basic recall to critical thinking and problem-solving. The six hierarchical levels representing cognitive skills are depicted with their weighted percentage for effective learning experience for a BPT. graduate in Table below.

**Table 14: Weightage of Levels of Taxonomy for effective learning experience for BPT Graduates**

| Level | Total |
|---|---|
| Knowledge | 20% |
| Comprehension | 20% |
| Application | 20% |
| Analysis | 20% |
| Synthesis | 20% |
| Evaluation | 20% |

**Theory paper Proposed Question Paper Style**

i. Duration: 3 Hours

ii. Total Marks: 80

iii. Format:

**a. Section-I ( Evaluated by External Examiner)** [@] **40 Marks**

Que. 1 Long Answer 2 x 10 = 20 (Any 2 out of 3)

Que. 2 Short Answer 2 x 05 = 10 (Any 2 out of 3)

Que. 3 Very Short Answer 5 x 02 = 10 (Any 5 out of 6)

**b. Section-II ( Evaluated by Internal Examiner)** [@] **40 Marks**

Que. 4 Long Answer 1 x 15 = 15 (Any 1 out of 2)

Que.5 Short Answer 3 x 05 = 15 (Any 3 out of 4)

Que. 6 MCQ 1X 10 = 10

**15.4 Practical Examinations and Viva Voice:**

i. Include assessment in psychomotor and effective domain. Assessment of clinical and procedural skills should be based on direct observations by the examiners.

ii. Assessment tools like case presentations, Objective Structured Clinical Examination (OSCE) and/or Objective Structured Practical Examination (OSPE) and Directly Observed Procedural Skills (DOPS) should be employed, where applicable.

iii. Practical/clinical examinations will be conducted in the laboratories and /or hospital wards/ OPD. Viva/oral examination should assess approach to patient management, emergencies, attitudinal, ethical and professional values.

**Practical Examination (University)**

i. Total Marks: 80

ii. Format: On the basis of

a. OSPE / OSCE,

b. Viva,

c. Case presentation.

**15.5 Results:**

**Credit:** A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work/field work per week.

**Credits** will be assigned on the basis of the lectures (L) / tutorials (T) / Clinical Training (CR) / laboratory work (P) / Research Project (RP) and other forms of learning in a 15-20 week schedule

i. L - One credit for one hour lecture per week (1 credit course = 15 hours)

ii. P/T - One credit for every two hours of laboratory or practical or clinical (1 credit course = 30 hours)

iii. CR - One credit for every three hours of field work posting (1 credit course = 45 hours)

iv. RP - One credit for every two hours of Research Project per week – Max Credit 20-· 25 (1 credit course = 30 hours)

v. Credit Point: It is the product of grade point and number of credits for a course.

vi. Grade Point: It is a numerical weight allotted to each letter grade on a 10-point scale.

vii. Letter Grade: It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P and F.

**Credits** may be calculated subject-wise, including theory and practical both combined.

**Marks equivalence table Grades and Grade Points:**

**Table 15: Equivalence Table for Marks, Grades and Grade Points**

| Letter Grade | Grade Point | Range of Marks* |
|---|---|---|
| O (Outstanding) | 10 | 85 % and above |
| A+ (Excellent) | 9 | 80 - 84.99 % |
| A (Very Good) | 8 | 75 - 79.99 % |
| B+ (Good) | 7 | 70 - 74.99 % |
| B (Average) | 6 | 60 - 69.99 % |
| C (Average) | 5 | 55 - 59.99 % |
| P (Pass) | 4 | 50 - 54.90 % |
| F (Fail) | 0 | < 50 % |
| Absent | 0 | 0 |

A student getting 'F' or lower grade in any course in this discipline will be treated as having failed in that course and the weights of 'F' and lower Grades will not be counted in AGPA or CGPA.

Annual Grade Point Average (AGPA): It is a measure of performance of work done in a year. It is the ratio of total credit points secured by a student in various courses registered in a year and the total course credits taken during that year. It shall be expressed up to two decimal places.

**Cumulative Grade Point Average (CGPA):** It is a measure of overall cumulative performance of a student's overall years. The CGPA is the ratio of total credit points secured by a student in various courses in all year and the sum of the total credits of all courses in all the year. It is expressed up to two decimal places.

**Computation of AGPA and CGPA:** The following procedure should be used to compute the Annual Grade Point Average (AGPA) and Cumulative Grade Point Average (CGPA):

i. The AGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student, i.e.

$$AGPA\ (Si) = \sum(Ci \times Gi) / \sum Ci$$

where Ci is the number of credits of the ith course and Gi is the grade point scored by the student in the ith course. Format for Transcripts and Illustration of Computation of AGPA based on Total credits of a year.

ii. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the years of a program, i.e.

$$CGPA = \sum(Ci \times Si) / \sum Ci$$

where Si is the AGPA of the ith years and Ci is the total number of credits in that year. Format for Transcripts and Illustration of Computation of CGPA based on AGPA and Credit of respective years.

iii. The AGPA shall be rounded off to 2 decimal points and reported in the transcripts.

**Table 16: Illustration for Computation of (AGPA) Annual Grade Point Average**

| **Course** | **Credit (Ci)** | **Grade Letter** | **Grade point (Gi)** | **Credit Point = Credit (Ci) x Grade point (Gi)** |
|---|---|---|---|---|
| Course 1 | 3 | A | 8 | 24 |
| Course 2 | 4 | B+ | 7 | 28 |
| Course 3 | 3 | B | 6 | 18 |
| Course 4 | 3 | O | 10 | 30 |
| Course 5 | 3 | C | 5 | 15 |
| Course 6 | 4 | B | 6 | 24 |
| **Total** | **20** | | | **139** |
| **AGPA (Si) = Credit points / Total credit** | | **139/20 = 6.95** | | |

iv. The CGPA shall be calculated after deriving year wise AGPA and rounded off to 2 decimal points and reported in the transcripts.

**Table 17: Illustration for Computation of Cumulative Grade Point Average (CGPA)**

| **Year** | **Total Credit** | **AGPA** | **AGPA x Credit** | **Credit Point** |
|---|---|---|---|---|
| Year 1 | 55 | 6.9 | 55 x 6.9 | 379.5 |
| Year 2 | 56 | 7.8 | 56 x 7.8 | 436.8 |
| Year 3 | 42 | 5.6 | 42 x 5.6 | 235.2 |
| Year 4 | 45 | 6 | 45 x 6 | 270 |
| **Total** | **198** | | | **1321.5** |
| **CGPA = credit points / total credit** | | **1321.5/198 = 6.67** | | |
| INTERNSHIP | | | | |
| TOTAL | | | | |

The NUES (Non-University Examination Subjects) examinations are to be conducted at the college/institution level as suggested by the Board of Studies of the concerned university. Earned credits may be calculated based on grades secured in college/institutional examinations. Passing criteria remain a minimum of 50% for university and non-university exam subjects.

The Board of Studies of the concerned university may develop structured rubrics for assessment of student performance in clinical setups.

**15.6 Supplementary Examination:**

University examinations will be conducted at the end of each academic year. However, two Examination in an academic year is essential and has to be conducted by the university, one Annual/supplementary examination in an academic year. As per the regulations by the University.

**15.7 Revaluation/Scrutiny:**

As per the regulations prescribed for review of answer papers by the University.

**15.8 Promotion to the Next Year:**

i. A Candidate shall be declared to have passed the examination if he/she obtained not less than 50% of the marks in theory and practical papers separately
ii. Students can be permitted to next year only if the number of failed subjects is two or less than two and students must clear all the subjects before appearing for the final examination of next year.
iii. Only after passing all the subjects of all the four years, he/she will be allowed to undergo internship

**16. AWARD OF DEGREE:**

The degree shall be awarded by the University only after receipt of Course completion certificate and NO dues from the Head of Institution. (Dean/Principal of the college).

**A successful candidate**

i. Who secures 75% and above in the aggregate marks shall be declared to have secured 'FIRST CLASS WITH DISTINCTION' provided he/she passes the whole examination in the FIRST ATTEMPT;
ii. Who secures above 60% and less than 75% in the aggregate marks and completes the course within the stipulated course period shall be declared to have passed the examinations in the 'FIRST CLASS, provide he/she passes the whole examination in the FIRST ATTEMPT';
iii. Who secures above 50% and less than 60% in the aggregate marks and completes the course within the stipulated course period shall be declared to have passed the examinations in the 'SECOND CLASS'; and
iv. All other successful candidates shall be declared to have PASSED the examinations

**17. AUTHORITY TO ISSUE TRANSCRIPT:**

The Controller of Examination of the University shall be the authority for issuing a transcript after receiving the described fee from the candidate.

**18. LOGBOOKS AND CLINICAL RECORDS:**

**18.1. Maintenance:** A logbook must be maintained by the candidate, detailing academic competency, clinical competency, skills obtained, and related activities.

**18.2. Clinical Competencies:** The logbook should include details of clinical competencies with pre-specified number of minimum records for:

i. Patient Case logs/ records

ii. Procedures

iii. Presentations

**18.3. Program Structure:** The logbook should outline the program's content, structure, and timetable.

**19. ANY SPECIFIC POINT/ RULE/ REGULATION RELATED TO COLLEGE/ INSTITUTE:**

## 20. COURSE WISE SYLLABUS WITH RECOMMENDED TEXT BOOKS:

### 1st Year BPT Syllabus

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Human Anatomy (HA) | BPT 101 | 1 | Theory | 12 | 180 |

### A. Course Outcomes (CO)

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Describe common anatomical terms (K) | 3 | 1 | 2 | - | - | 1 | - | - | 1 | - |
| **CO2:** Describe the basic embryological development of structures (K) | 3 | 1 | 1 | - | - | 1 | - | - | 1 | - |
| **CO3:** Discuss the classifications of bones, their general features, structure, functions and the mechanism of displacement and common sites of fractures (KH) | 3 | 2 | 2 | - | - | 2 | - | - | 1 | - |
| **CO4:** Identify the skeletal muscles, their origin, insertion, nerve supply, actions, and main relations (KH) | 3 | 2 | 2 | - | - | 2 | - | - | 1 | - |
| **CO5:** Describe Muscle Groups, their actions, nerve supply and effects of nerve injury (K) | 3 | 2 | 2 | - | - | 1 | - | - | 1 | - |
| **CO6:** Discuss the joints of the body, their movements, and the muscles responsible for the movements (KH) | 3 | 2 | 2 | - | - | 2 | - | - | 1 | - |
| **CO7:** Identify the borders of the named anatomical regions along with their associated fascia, ligaments, tendons, or cartilages (KH) | 3 | 2 | 2 | - | - | 2 | - | - | 1 | - |
| **CO8:** Recognize anatomical structures and describe the topographic anatomy of the regions of abdomen, pelvis, perineum, thorax, and extremities (KH) | 3 | 2 | 2 |  | - | 2 | - | - | 1 | - |
| **CO9:** Describe the anatomy of the components of organ systems of the body based on the anatomical region. | 3 | 2 | 2 | - | - | 1 | - | - | 1 | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| (Thorax, abdomen, pelvis, and perineum) (K) | | | | | | | | | | |
| **CO10:** Describe the components nervous system, including the cerebrum, brainstem, cerebellum, spinal cord, peripheral nerves, sensory motor, and autonomic nervous system (K) | 3 | 2 | 2 | - | - | 2 | - | - | 1 | - |
| **CO11:** Identify clinically relevant injuries, lesions and anatomical malformations including musculoskeletal and nervous system (KH) | 3 | 3 | 2 | 1 | - | 2 | - | - | 2 | - |

**B. Course Content**

**Unit: 1**

HA 1.1. Define Scope of Anatomy

HA 1.2. Discuss the Anatomical Position and anatomical Terminology common anatomical terminologies (Groove, tuberosity, trochanters etc.)

HA 1.3. Identify Anatomical positions of body, axes, and planes

**Bone:**

HA 1.4. Discuss Composition, Functions, Classification based on Morphology,

HA 1.5. Describe Development and Structure; Formation / Development of Bones esp. Long Bones; Parts of Long Bones

HA 1.6. Discuss the Blood Supply of Bones

**Cartilage:**

HA 1.7. Describe Types and Features of cartilage

**Joints:**

HA 1.8. Define and state types of joints.

HA 1.9. Discuss the features of fibrous, Cartilaginous & Synovial joints, sub-types of synovial joints

HA 1.10. Explain the movements of joints, factors permitting and limiting these movement

HA 1.11. Discuss blood supply of joints; applied aspects.

**Muscles:**

HA 1.12. Discuss Comparative Feature of Skeletal, Smooth and Cardiac Muscles, parts & structure of Skeletal Muscle including fascicular architecture

HA 1.13. Describe Blood supply and nerve supply of Skeletal Muscle; Motor Unit

HA 1.14. Discuss the Types of Skeletal Muscles based on their action i.e. Agonists, Antagonists, Fixators, Synergists, Origin & Insertion, Tendon; Isometric & Isotonic contractions; Applied Aspects

**Connective Tissue:**

HA 1.15. Explain Composition i.e. Cellular & Non-Cellular components;

HA 1.16. Types and functions of connective tissue;

HA 1.17. Types and functions of Ligaments;

HA 1.18. Applied Aspects.

**General Embryology:**

HA 1.19. Describe Ovum, Spermatozoa, fertilization and formation of the Germ layers and their derivations. Development of skin, Fascia, blood vessels, lymphatic, (outline only details not required).

HA 1.20. Discuss Development of bones, axial and appendicular skeleton and muscles, Neural tube, brain vessels and spinal cord, Development of brain and brain stem structures

**Integumentary System:**

HA 1.21. Discuss the Structure of skin and its appendages

**Unit 2: Upper Extremity**

**Musculo-Skeletal Anatomy of Upper Extremity**

HA 2.1. Identify Osteology: Clavicles, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, and Phalanges.

HA 2.2. Identify Soft parts: Breast, pectoral region, axilla, front of arm, back of arm, cubital fossa, front of fore arm, back of fore arm, palm, dorsum of hand, muscles, nerves, blood vessels and lymphatic drainage of upper extremity.

HA 2.3. Explain Shoulder girdle, shoulder joint, elbow joints, radio ulnar joint, wrist joint and joints of the hand.

HA 2.4. Discuss Arches of hand, skin of the palm and dorsum of hand.

**Unit 3: Thorax:**

**Cardio-vascular system**

HA 3.1. Describe Mediastinum: Divisions and contents Pericardium

HA 3.2. Describe Thoracic Wall: position, shape and parts of the heart; conducting System

HA 3.3. Describe blood supply and nerve supply of the heart; names of the blood vessels and their distribution in the body – region wise.

**Respiratory system**

HA 3.4. Outline the respiratory passages, Pleura and lungs: position, parts, relations, blood supply and nerve supply; Lungs – emphasize on bronchopulmonary segments.

HA 3.5. Describe Diaphragm: Origin, insertion, nerve supply and action, openings in the diaphragm.

HA 3.6. Describe Intercostal muscles and Accessory muscles of respiration: Origin, insertion, nerve supply and action.

**UNIT 4: Lower Extremity: Musculo-Skeletal Anatomy of Lower Extremity**

HA 4.1. Identify Osteology: Hip bone, femur, tibia, fibula, patella, tarsals, metatarsals and phalanges.

HA 4.2. Identify Soft parts: Gluteal region, Anterior, posterior, medial and lateral aspects of the thigh (Femoral triangle, femoral canal and inguinal canal), medial side of the thigh (Adductor canal), lateral side of the thigh, popliteal fossa, anterior and posterior compartment of leg, sole of the foot, lymphatic drainage of lower limb, venous drainage of the lower limb, arterial supply of the lower limb, arches of foot, skin of foot.

HA 4.3. Discuss Joints of the lower limb: Hip Joint, Knee joint, Ankle and joint, joints of the foot.

**Unit 5: Musculoskeletal anatomy of trunk & pelvis:**

HA 5.1. Identify Osteology: Cervical, thoracic, lumbar, sacral and coccygeal vertebrae and ribs.

HA 5.2. Discuss Soft tissue: Pre and Para vertebral muscles, intercostal muscles, anterior abdominal wall muscles, Inter-vertebral disc.

HA 5.3. Describe Pelvic girdle and muscles of the pelvic floor.

**Unit 6: Abdomen:**

HA 6.1. Describe Peritoneum: Parietal peritoneum, visceral peritoneum, folds of peritoneum, functions of peritoneum.

HA 6.2. Describe large blood vessels of the gut.

HA 6.3. Identify Location, size, shape, features, blood supply, nerve supply and functions of the following: stomach, liver, spleen, pancreas, kidney, urinary bladder, intestines, and gall bladder.

HA 6.4. Describe Pelvis: Position, shape, size, features, blood supply and nerve supply of the male and female reproductive system.

**Unit 7: Endocrine glands:**

HA 7.1. Describe Position, shape, size, function, blood supply and nerve supply of the following glands: Hypothalamus and pituitary gland, thyroid glands, parathyroid glands, Adrenal glands, pancreatic islets, ovaries and testes, pineal glands, thymus.

**Unit 8: Musculoskeletal Anatomy of Head and Neck:**

HA 8.1. Identify Osteology: Mandible and bones of the skull.

HA 8.2. Identify Soft parts: Muscles of the face and neck and their nerve and blood supply-extra ocular muscles, triangles of the neck.

**Unit 9: Neuro Anatomy**

HA 9.1. Discuss Organization of Central Nervous system - Spinal nerves and autonomic nervous system mainly pertaining to cardiovascular, respiratory and urogenital system ( Cranial nerves, Peripheral nervous system, Peripheral nerve, Neuromuscular junction, Sensory end organs, Central Nervous System, Spinal segments and areas, Brain Stem, Cerebellum, Inferior colliculi, Superior Colliculi, Thalamus, Hypothalamus, Corpus striatum, Cerebral hemisphere, Lateral ventricles,Blood supply to brain, Basal Ganglia, The pyramidal system, Pons, medulla, extra pyramidal systems, Anatomical integration)

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Human Anatomy (HA) | BPT 101 (P) | 1 | Practical | 4 | 120 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1.** Identify the bones of the upper limb, lower limb, and spine, and locate their surface markings on articulated/disarticulated specimens and 3D models. | 3 | 2 | 1 | - | - | 1 | - | - | 1 | - |
| **CO2.** Locate and identify the muscles of the extremities, trunk, and face on dissected specimens or 3D models, relating them to their bony attachments. | 3 | 2 | 1 | - | - | 1 | - | - | 1 | - |
| **CO3.** Identify the joints of the extremities, trunk, and face along with associated ligaments, fascia, and surface markings on specimens/models. | 3 | 2 | 1 | - | - | 1 | - | - | 1 | - |
| **CO4.** Trace the course and relationships of major peripheral nerves and plexus formations on dissected specimens or 3D models. | 3 | 2 | 1 | - | - | 1 | - | - | 1 | - |
| **CO5.** Identify the gross structure of the heart, lungs, brain, and spinal cord on dissected specimens or 3D models. | 3 | 2 | 1 | - | - | 1 | - | - | 1 | - |

**B. Course Content**

HA (P) 10.1 Identify the parts of bones (Upper limb, lower limb and spine)

HA (P) 10.2 Identify the muscles of extremities, trunk and face on a dissected human body/3 D models.

HA (P) 10.3 Identify the joints of extremities, trunk and face on a dissected human body/3 D models.

HA (P) 10.4 Identify the course and relationships of major peripheral nerves including plexuses formation

HA (P) 10.5 Identify the surface markings of joints, fascia, ligaments and muscles of extremities, trunk and face on a model

HA (P) 10.6 Identify the grass structure of heart, lungs, brain and spinal cord on a dissected

HA (P) 10.7 Human body/3 D models

**Recommended Text Books for HA**


1. Snell RS. Clinical anatomy: an illustrated review with questions and explanations. Lippincott Williams & Wilkins; 2004..

2. Inderbir Singh, Text book of Anatomy with color Atlas – Vol. 1, 2, 3. Jaypee Brothers

3. Chaurasia BD. Human anatomy Volume- I, II & III, CBS Publisher; 2004.

4. Singh I. Textbook of human neuroanatomy. Jaypee Brothers Publishers; 2006.

5. Kadasne'S T.B. of Anatomy Vol.1 Upper and Lower Extremities2009

6. Singh V. Textbook of clinical neuroanatomy. Elsevier Health Sciences; 2014.

7. Dutta AK. Essentials of human anatomy, head and neck.

8. Gray's Anatomy: Descriptive and Applied. Longman

9. Snell RS. Neuroanatomy.

9. Singh V. Textbook of clinical neuroanatomy.

10. Romanes GJ. Cunningham's manual of practical anatomy

11. Mcminn’s Last’s Anatomy – Regional and applied, Churchill Livingstone.

12. Mcminn, et al - A Colour Atlas of Human Anatomy, Mosby.

13. Snell – Clinical Anatomy- Lippincott.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Human Physiology (HP) | BPT 102 | 1 | Theory | 12 | 180 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Describe the key physiological terms. (K) | 3 | 1 | 1 | - | - | 1 | - | - | 2 | - |
| **CO2:** Discuss the structure and functions of cell and tissue (KH) | 3 | 1 | 1 | - | - | 1 | - | - | 2 | - |
| **CO3:** Discuss the mechanism of homeostasis. (KH) | 3 | 1 | 1 | - | - | 1 | - | - | 2 | - |
| **CO4:** Describe the structure and transport functions of cell membrane (carrier-mediated active transport systems, ion pumps and channels, origin of membrane potential and the basis of membrane excitability). (K) | 3 | 1 | 1 | - | - | 1 | - | - | 2 | - |
| **CO5:** Explain the physiology of skeletal muscle contraction. (KH) | 3 | 1 | 1 | - | - | 1 | - | - | 2 | - |
| **CO6:** Explain the functions of cardio-vascular, respiratory, musculoskeletal and nervous systems including regulatory mechanism. (KH) | 3 | 1 | 1 | - | - | 1 | - | - | 2 | - |
| **CO7:** Describe the functions of digestive, renal and reproductive systems. (K) | 3 | 1 | 1 | - | - | 1 | - | - | 2 | - |
| **CO8:** Demonstrate competencies in performing common physiological and anthropological measurements. (SH) | 3 | 1 | 1 | - | - | 1 | - | - | 2 | - |
| **CO9:** Discuss the common physiological deviations of cardio-vascular, respiratory, musculoskeletal and nervous systems related to physiotherapy practice. (KH) | 3 | 1 | 1 | - | - | 1 | - | - | 2 | - |
| **CO10:** Explain normal physiological changes of various systems during exercise. (KH) | 3 | 1 | 1 | - | - | 1 | - | - | 2 | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO11:** Discuss the physiological adaptations to exercise. (KH) | 3 | 1 | 1 | - | - | 1 | - | - | 2 | - |

**B. Course Content**

**Unit 1: General Physiology**

HP 1.1. Discuss Cell: Morphology. Organelles: their structure and functions And Transport Mechanisms across the cell membrane

HP 1.2. Discuss Body fluids: Distribution, composition.

**Unit 2: Blood**

HP 2.1. Explain Composition and functions of blood and Plasma:

HP 2.2. Describe RBC: count and its variations. Erythropoiesis- stages, factors regulating. Reticulo-endothelial system (in brief)

HP 2.3. Describe Hemoglobin –structure, function and derivatives Anemia (in detail), types of Jaundice. Blood indices, PCV, ESR.

HP 2.4. Discuss WBC. Morphology, functions, count, its variation of each. Immunity

HP 2.5. Describe Platelets: Morphology, functions, count, its variations

HP 2.6. Discuss Hemostatic mechanisms: Blood coagulation–factors, mechanisms: their disorders. Anticoagulants.

HP 2.7. Describe Blood Groups

HP 2.8. Describe Cross matching. Indications and complications of Blood Transfusion

HP 2.9. Discuss Composition, formation, circulation and functions of Lymph

**Unit 3: Cardiovascular system**

HP 3.1. Describe: Physiological anatomy and nerve supply of the heart and blood vessels. Organisation of CVS. Cardiac muscles: Structure. Ionic basis of action potential and pacemaker potential. Properties.

HP 3.2. Explain Conducting system in terms of Components. Impulse conduction Cardiac Cycle: Definition. Phases of cardiac cycle. Pres- sure and volume curves. Heart sounds – causes, character. ECG: Definition. Different types of leads. Waves and their causes. P-R interval. Heart block.

HP 3.3. Discuss Normal value. Determinants. Stroke volume and regulation of Cardiac Output: Heart rate and its regulation. Their variations

HP 3.4. Describe Definition Normal values and its variations. Determinants. Peripheral resistance of Arterial Blood Pressure Regulation of BP Arterial Pulse

HP 3.5. Discuss the causes and features of Shock

HP 3.6. Discuss Regional Circulations such as Coronary, Cerebral and Cutaneous circulation.

HP 3.7. Discuss cardiovascular changes during exercise.

**Unit 4: Respiratory System**

HP 4.1. Discuss the functions of – Pleura, tracheo-bronchial tree, alveolus, respiratory membrane and their nerve supply. Functions of respiratory system. Respiratory muscles.

HP 4.2. Explain the Mechanics of breathing in terms of Intra pleural and intrapulmonary pressure changes during respiration. Chest expansion.

HP 4.3. Discuss Spirometry- Lung volumes and capacities. Timed vital capacity and its clinical significance. Maximum ventilation volume. Respiratory minute volume

HP 4.4. Discuss Pulmonary Circulation. Ventilation-perfusion ratio and its importance.

HP 4.5. Explain Transport of respiratory gases: Diffusion across the respiratory membrane. Oxygen transport – Different forms, oxygen- hemoglobin dissociation curve. Factors affecting it. P50, Haldane and Bohr effect. Carbon dioxide transport: Different forms, chloride shift.

HP 4.6. Explain Regulation of Respiration: Neural Regulation. Hering-Breuer's reflex. Voluntary control. Chemical Regulation.

HP 4.7. Discuss Hypoxia: Effects of hypoxia. Types of hypoxia. Hyperbaric oxygen therapy. Acclimatization Hypercapnia. Asphyxia. Cyanosis – types and features. Dysbarism

HP 4.8. Explain Respiratory changes during exercise.

**Unit 5: Digestive System**

HP 5.1. Describe the functions of digestive system

HP 5.2. Describe Salivary Secretion: Saliva: Composition. Functions. Regulation. Mastication

HP 5.3. Discuss the stages and Function of Swallowing

HP 5.4. Describe Stomach in terms of Functions. Gastric juice: Gland, composition, function, regulation. Gastrin: Production, function and regulation. Peptic ulcer. Gastric motility. Gastric emptying. Vomiting.

HP 5.5. Describe Pancreatic Secretion: Composition, production, function. Regulation.

HP 5.6. Discuss the Functions of liver, Gall bladder And Composition, functions of bile.

**Unit 6: Renal System**

HP 6.1. Describe the functions of renal system. Nephrons – cortical and juxtamedullary. Juxtaglomerular apparatus. Glomerular mem- brane. Renal blood flow and its regulation. Functions of kidneys.

HP 6.2. Discuss the Mechanism of Urine Formation: Glomerular Filtration: Mechanism of glomerular filtration. GFR – normal value and factors affecting. Renal clearance. Inulin clearance. Creatinine clearance.

HP 6.3. Explain Tubular Reabsorption: Reabsorption of Na+, glucose, HCO3-, urea and water. Filtered load. Renal tubular transport maxi- mum. Glucose clearance: TmG. Renal threshold for glucose.

HP 6.4. Discuss the Mechanism of concentrating and diluting the Urine: Counter-current mechanism. Regulation of water excretion. Diuresis. Diuretics.

HP 6.5. Describe Mechanism of micturition. Cystometrogram. Atonic bladder, automatic bladder.

HP 6.6. Describe Acid-Base balance

**Unit 7: Reproductive System**

HP 7.1. Discuss the physiology of reproductive organs. Sex determination. Sex differentiation. Disorder

HP 7.2. Describe Male Reproductive System: Functions of testes. Pubertal changes in males. Spermatogenesis. Testosterone: action. Regulation of secretion. Semen.

HP 7.3. Describe Female Reproductive System: Functions of ovaries and uterus. Pubertal changes in females. Oogenesis.

HP 7.4. Hormones: estrogen and progesterone-action. Regulation of secretion.

HP 7.5. Describe Menstrual Cycle: Phases. Ovarian cycle. Uterine cycle. Hormonal basis. Menarche. Menopause.

HP 7.6. Describe Pregnancy: Pregnancy tests. Physiological changes during pregnancy. Functions of placenta. Lactation. Contraception methods

**Unit 8: Endocrine System**

HP 8.1. Enumerate Major endocrine glands.

HP 8.2. Describe classification, mechanism of action and Functions of hormones

HP 8.3. Describe Pituitary hormones: Secretory cells, action on target cells, and regulation of secretion of each hormone.

HP 8.4. Describe Thyroid hormone and calcitonin: secretory cells, synthesis, storage, action and regulation of secretion. Disorders: Myxedema, Cretinism, Grave's disease.

HP 8.5. Describe Parathyroid hormones: secretory cell, action, regulation of secretion. Disorders: Hypoparathyroidism. Hyperthyroidism. Calcium metabolism and its regulation.

HP 8.6. Describe Adrenal Medulla: Secretory cells, action, regulation of secretion of adrenaline and noradrenaline. Disorders: Pheochromocytoma.

HP 8.7. Describe Endocrine Pancreas: Secretory cells, action, regulation secretion of insulin and glucagon. Glucose metabolism and its regulation. Disorder: Diabetes mellitus.

**Unit 9: Nerve Muscle Physiology**

HP 9.1. Discuss Resting membrane potential. Action potential – ionic basis and properties.

HP 9.2. Describe Structure and functions of neurons. Classification, Properties and impulse transmission of nerve fibers. Nerve injury – degeneration and regeneration.

HP 9.3. Describe Neuroglia: Types and functions

HP 9.4. Classify Skeletal Muscle Structure.

HP 9.5. Discuss the physiology of neuromuscular transmission

HP 9.6. Discuss the applied aspects of neuromuscular disorders.

**Unit 10: Nervous System**

HP 10.1. Describe Organisation of CNS – central and peripheral nervous system.

HP 10.2. Describe Functions of the nervous system. Synapse: Functional anatomy, classification, Synaptic transmission. Properties

HP 10.3. Discuss Sensory Mechanism: Sensory receptors: function, classification and properties. Sensory pathway: The ascending tracts, Posterior column tracts, lateral spinothalamic tract and the anterior spinothalamic tract – their origin, course, termination and functions. The trigeminal pathway

HP 10.4. Discuss Sensory cortex. Somatic sensations: crude touch, fine touch tactile localization, tactile discrimination, stereo gnosis vibration sense.

HP 10.5. Describe kinesthetic sensations. Pain sensation: mechanism of pain. Cutaneous pain – slow and fast pain, hyperalgesia. Deep pain. Visceral pain – referred pain.

HP 10.6. Describe Motor Cortex. Motor pathway: The descending tracts – pyramidal tracts, extrapyramidal tracts – origin, course, termination and functions. Upper motor neuron and lower motor neuron. Paralysis, monoplegia, paraplegia, hemiplegia and quadriplegia.

HP 10.7. Describe Muscle tone – definition, and properties hypotonia, atonia and hypertonia. UMNL and LMNL

HP 10.8. Discuss Spinal cord Lesions: Complete transection and Hemi section of the spinal cord.

HP 10.9. Describe Cerebellum: Functions. Cerebellar ataxia.

HP 10.10. Describe Posture and Equilibrium: Postural reflexes – spinal, medullary, midbrain and cerebral reflexes.

HP 10.11. Describe Functions of Thalamus and Hypothalamus: Nuclei. Thalamic syndrome

HP 10.12. Describe Reticular Formation and Limbic System: Components and Functions.

HP 10.13. Describe Structures and functions of Basal Ganglia: Parkinson's disease

HP 10.14. Describe Cerebral Cortex: Lobes. Brodmann's areas and their functions. Higher functions of the cerebral cortex – learning, memory and speech.

HP 10.15. Describe Formation, composition, circulation and functions of CSF Lumbar puncture and its significance. Blood brain barrier. Hydrocephalus.

HP 10.16. Describe Features and actions of parasympathetic and sympathetic nervous system

**Unit 11: Physiology of Exercise – Explain the Effects of acute and chronic exercise on**

HP 11.1 Respiratory

HP 11.2 Cardio vascular

HP 11.3 Musculoskeletal system

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Human Physiology (HP) | BPT 102 (P) | 1 | Practical | 4 | 120 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Perform hematological procedures differential blood cell identification, blood cell counts, blood grouping, and bleeding/clotting time using correct technique and safe sample handling. | 3 | 3 | 1 | - | - | 2 | - | - | 2 | - |
| **CO2:** Measure and record vital parameters (body temperature, pulse rate, blood pressure, oxygen saturation, respiratory rate) accurately and reproducibly in a clinical examination setting. | 3 | 3 | 1 | - | - | 2 | - | - | 2 | - |
| **CO3:** Elicit superficial and deep tendon reflexes and assess muscle tone, demonstrating correct neurological examination technique and interpreting normal responses. | 3 | 3 | 1 | - | - | 2 | - | - | 2 | - |
| **CO4:** Interpret normal cardiac and respiratory findings ECG wave patterns, heart sounds and murmurs, and breath sounds and relate them to underlying physiological function. | 3 | 3 | 1 | - | - | 2 | - | - | 2 | - |
| **CO5:** Document findings systematically, communicate results to patients and team members, and practise laboratory ethics, biosafety, and accountability during all procedures. | 1 | 3 | 1 | 2 | 2 | 2 | - | 1 | 2 | - |

**B. Course Content:**

HP (P) 12.1 Practical classes include

1. Hematology experiments,

2. Clinical examinations,

3. Amphibian chart, and

4. Recommended demonstrations.

HP (P) 12.2 Recommended demonstrations include but are not limited to:

i. Differentiate Blood cells

ii. Determine the blood cell counts

iii. Determine Blood groups

iv. Calculate bleeding and clotting time

v. Observe the procedures of common blood investigations

vi. Elicit superficial and deep tendon reflexes

vii. Determine muscle tone

viii. Interpret normal ECG wave pattern

ix. Identify normal breath sound

x. Differentiate Heart sounds including murmurs

HP (P) 12.3 Perform the following clinical examination procedures:

i. Body Temperature measurement

ii. Pulse rate

iii. Blood Pressure

iv. Oxygen saturation

v. Respiratory rate

**Recommended text Book for HP**

1. Text book of Physiology –Anand & Manchanda, Tata McGraw Hill.

2. Human Physiology – Vol. 1 & 2, Chatterjee. CC, Calcutta. Medical Allied.

3. Concise Medical Physiology. Chaudhari, S.K, New Central Agency, Calcutta.

4. Principles of Anatomy and Physiology. Tortora & Grabowski –Harper Collins.

5. Text book of Practical Physiology – Ghai – Jaypee

6. Text book of Medical Physiology –Guyton Arthur (Mosby.)

7. Best & Taylor's Physiological Basis of Medical Practice

8. West’s Respiratory Physiology.

9. Nunn and Lumb’s Applied Respiratory Physiology

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Biochemistry (BC) | BPT 103 | 1 | Theory | 6 | 90 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Describe the structure, composition and functions of cell (K) | 3 | 1 | - | - | - | 2 | - | - | 2 | - |
| **CO2:** Describe the structure and functions of cell membrane (K) | 3 | 1 | - | - | - | 2 | - | - | 2 | - |
| **CO3:** Explain the metabolism of carbohydrates, Lipids, proteins and amino acids (K) | 3 | 1 | - | - | - | 2 | - | - | 2 | - |
| **CO4:** Describe the types, composition and utilization of vitamins (K) | 3 | 1 | - | - | - | 2 | - | - | 2 | - |
| **CO5:** Explain the effect of exercise related biochemical changes and its application to exercise prescription (KH) | 3 | 1 | 1 | - | - | 2 | - | - | 2 | - |

**B. Course Content**

**SECTION A**

**Unit 1**

BC 1.1. Acid-Base balance - Acids, bases and buffers, pH. Buffer systems of the body, bicarbonate buffer system Role of lungs and kidneys in acid base balance, Acid base imbalance.

BC 1.2. Carbohydrate Chemistry –

1. Definition, general classification with examples, Glycosides bond
2. Structures, composition, sources, properties and functions of Monosaccharides, Disaccharides, Oligosaccharides and Poly- saccharides.
3. Glycosaminoglycan (mucopoly saccharides)
4. Carbohydrate Metabolism - Introduction, Glycolysis – Aerobic, Anaerobic Citric acid cycle, Substrate level phosphorylation.
5. Glycogen metabolism – Glycogenesis, Glyco Geno lysis, Metabolic disorders glycogen, Gluconeogenesis, Cori cycle Hormonal regulation of glucose, Glycosuria, Diabetes mellitus
6. Role of carbohydrates in diet: Digestible carbohydrates and dietary fibers.

BC 1.3. Lipid Chemistry –

1. Definition, general classification

2. Definition, classification, properties and functions of Fatty acids, Triacylglycerol, Phospholipids, Cholesterol

3. Essential fatty acids and their importance

4. Lipoproteins: Definition, classification, properties, Sources and function Ketone bodies

5. Role of lipids in diet

BC 1.4. Amino-acid Chemistry –

1. Amino acid chemistry: Definition, Classification, Peptide bonds

2. Peptides: Definition, Biologically important peptides

3. Protein chemistry: Definition, Classification, Functions of proteins,

4. Role of proteins in diet: Quality of proteins - Biological value, net protein utilization, Nutritional aspects of proteins-essential and non- essential amino acids. Nitrogen balance

BC 1.5. Nutrition –

1. Introduction, Importance of nutrition Calorific values, Respiratory quotient –Definition, and its significance Energy requirement of a person - Basal metabolic rate: Definition, Normal values, factor affecting BMR Special dynamic action of food.

2. Physical activities - Energy expenditure for various activities. Calculation of energy requirement of a person

3. Balanced diet

i. Recommended dietary allowances

ii. Nutritional disorders.

**Unit 2:**

BC 2.1. Enzymes – Definition, Active site, Cofactor (Coenzyme, Activator), Proenzyme. Classification with examples, Factors affecting enzyme activity, Enzyme inhibition and significance, Isoenzymes, Diagnostic enzymology (clinical significance of enzymes)

BC 2.2. Nucleotide and Nucleic acid Chemistry -

1. Nucleotide chemistry: Nucleotide composition, functions of free nucleotides in body.

2. Nucleic acid (DNA and RNA) chemistry: Difference between DNA and RNA, Structure of DNA (Watson and Crick model), Functions of DNA. Structure and functions of tRNA, rRNA, mRNA.

BC 2.3. Vitamins -

1. Definition, classification according to solubility,

2. Individual vitamins - Sources, Coenzyme forms, functions, RDA, digestion, absorption and transport, deficiency and toxicity.

BC 2.4. Mineral Metabolism- Definition, Sources, RDA, Digestion, absorption, transport, excretion, functions, disorder of Individual minerals - Calcium, phosphate, iron, Magnesium, fluoride, selenium, molybdenum, copper. Phosphate, calcium and iron in detail.

BC 2.5. Clinical Biochemistry - Normal levels of blood and urine constituents, Relevance of blood and urine levels of Glucose, Urea, Uric acid, Creatinine, Calcium, Phosphates, pH and Bicarbonate. Liver function tests, Renal function tests.

**Recommended Text Books for BC**


1. Textbook of Biochemistry- Chatterjee M.N.-Jaypee Brothers.

2. Textbook of Biochemistry for Medical Students Vasudeval D.M. Jaypee Brothers.

3. Clinical Biochemistry- metabolic & Clincial aspects- Marshall &Bangert- Churchill Linvingstone.

4. Biochemistry Southerland-Churchill Livingstone.

5. Drugs in Sports: David R. Mottram and Sally Gunnel E. &F.N.Span.

6. Normal and Therapeutic Nutrition Robison H. Cortinne et al;, Mac Millian Publish Company, New York.

7. Physiological Chemistry. By Harpar

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Fundamentals of Exercise Modalities (FoEM) | BPT 104 | 1 | Theory | 8 | 120 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Apply the principles of physics in describing movements (Force, inertia, Laws of motion) (KH) | 3 | 2 | 1 | - | - | 1 | - | - | 1 | - |
| **CO2:** Explain planes and axis of movements (KH) | 3 | 2 | 1 | - | - | 1 | - | - | 1 | - |
| **CO3:** Discuss the methods of measuring joint movements (KH) | 3 | 2 | 1 | - | - | 1 | - | - | 1 | - |
| **CO4:** Demonstrate joint movement measurements (Including electronic goniometer) (SH) | 3 | 2 | 1 | - | - | 2 | - | - | 2 | - |
| **CO5:** Demonstrate fundamental and derived positions and muscle actions (SH) | 3 | 2 | 1 | - | - | 2 | - | - | 2 | - |
| **CO6:** Demonstrate transfer techniques (SH) | 3 | 2 | 1 | 1 | 1 | 2 | - | 1 | 2 | - |
| **CO7:** Perform basic assessment techniques (Motor, sensory, coordination and balance) (SH) | 3 | 2 | 1 | 1 | 1 | 2 | - | - | 2 | - |
| **CO8:** Demonstrate knowledge and skills in prescribing basic movement aids (SH) | 3 | 2 | 1 | 1 | 1 | 2 | - | 2 | 2 | - |

**B. Course Content**

**Unit 1: Basic principles**

FoEM 1.1. Describe the aims of Exercise Therapy, The techniques of Exercise Therapy, Approach to patient's problems, and Assessment of patient's condition – Measurements of Vital parameters

FoEM 1.2. Apply the principles of mechanics applied to Exercise Therapy: Force, Composition, Resolution, Equilibrium- stable, unstable, neutral gravity-LOG-COG, levers-types, Speed, velocity, work, energy, power, acceleration, momentum, friction and inertia

FoEM 1.3. Discuss Muscle work group action of muscles, angle of pull and mechanical efficiency of the muscles.

**Unit 2: Starting and Derived Positions**

FoEM 2.1 Demonstrate the starting positions, their muscle work, effects and uses and Standing, Kneeling, Sitting, Lying and Hanging.

FoEM 2.2 Demonstrate derived positions. Discuss the muscle work of each derived position

FoEM 2.3 Demonstrate different methods of measuring range of motion (ROM).

FoEM 2.4 Discuss Reliability and Validity of Goniometry. Functional ROM and Normal Range of Motion of various joints. Techniques of Goniometry.

FoEM 2.5 Perform ROM measurement of individual joints using a goniometer.

**Unit 3: Muscle testing**

FoEM 3.1 Discuss the Principles & Aims, Indications & Limitations, and Techniques of MMT for group & individual testing .

FoEM 3.2 Demonstrate Manual Muscle testing procedure .

FoEM 3.3 Perform MMT for upper limb, lower limb spine and face muscles.

**Unit 4: Classification of therapeutic exercise**

FoEM 4.1. Classify therapeutic exercises: Technique, effects, therapeutic use

FoEM 4.2. Demonstrate Active Movements

FoEM 4.3. Discuss active movements in terms of Definition of strength, power & work, endurance, muscle actions, Causes of decreased muscle performance,

FoEM 4.4. Explain the Physiological adaptation to training: Strength & Power, Endurance.

FoEM 4.5. Demonstrate Free exercise: Classification, principles, techniques, indications, contraindications, effects and uses

FoEM 4.6. Demonstrate Active Assisted Exercise.

FoEM 4.7. Discuss the principles, techniques, indications, contraindications, effects and uses Assisted-Resisted Exercise: principles, techniques, indications, contraindications, effects and uses

FoEM 4.8. Demonstrate Resisted Exercise: Discuss the principles, indications, contraindications, precautions &techniques, effects and uses Types of resisted exercises: Manual and Mechanical

resistance exercise, Isometric exercise, Dynamic exercise: Concentric and Eccentric, Dynamic exercise: Constant versus variable resistance, Isokinetic exercise, Open-Chain and Closed-Chain exercise

FoEM 4.9. Demonstrate Passive Movements: Discuss Causes of immobility, Classification of Passive movements, Specific definitions related to passive movements, Principles of giving passive movements, Indications, contraindications, effects of uses, Techniques of giving passive movements, demonstrate mobilization exercises of the joints region-wise passive, active

**Unit 5**

FoEM 5.1 Classify various types of soft tissue manipulation techniques.

FoEM 5.2 Discuss Physiological effects, therapeutic effects and contraindications of soft tissue manipulation.

FoEM 5.3 Describe effleurage, stroking, kneading, petrissage, deep friction, vibration and shaking etc.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Fundamentals of Exercise Modalities (FoEM) | BPT 104 (P) | 1 | Practical | 2 | 60 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Demonstrate the different types of muscle contraction, muscle work, group action of muscles, coordinated movements, and the fundamental & derived positions on self. | 3 | 3 | 2 | – | 1 | 2 | – | – | 2 | – |
| **CO2:** Measure the range of motion of upper limb, lower limb, and trunk joints accurately using a handheld goniometer on a human model. | 3 | 3 | 2 | – | 1 | 2 | – | – | 2 | – |
| **CO3:** Perform relaxed passive movements and passive/active mobilisation exercises of the upper and lower limb joints on self/human model. | 3 | 3 | 2 | – | 1 | 2 | – | – | 2 | – |
| **CO4:** Assess muscle strength and function region-wise (upper limb, lower limb, trunk) on a human model. | 3 | 3 | 2 | – | 1 | 2 | – | – | 2 | – |
| **CO5:** Execute soft tissue manipulative techniques region-wise (upper limb, lower limb, neck, back, face) on a human model with correct handling and technique. | 3 | 3 | 2 | – | 1 | 2 | – | – | 2 | – |

**B. Course Content:**

FoEM (P) 6.1. Demonstrate the different types of muscle contraction, muscle work, group action of muscles and co-coordinated movements on self .

FoEM (P) 6.2. Demonstrate various fundamental and derived positions. And describe muscle work, and uses on self .

FoEM (P) 6.3. Measure the ROM of joints using hand held goniometer – upper limb, lower limb & trunk on human model

FoEM (P) 6.4. Demonstrate the relaxed passive movement of joints of upper limb and lower limb on human model

FoEM (P) 6.5. Instruct the patient to perform the active mobilisation exercises of joints of upper limb and lower limb on a human model .

FoEM (P) 6.6. Perform passive mobilisation exercises of different joints region wise on self / human model

FoEM (P) 6.7. Demonstrate the testing of muscle strength/ function region wise – upper limb, lower limb and trunk On human model

FoEM (P) 6.8. Perform all the soft tissue manipulative techniques region wise – upper limb, lower limb, neck, back and face on human model .

FoEM (P) 6.9. Demonstration ONLY [ to be shown to the student by the teacher ]

1. Digital goniometry
2. Pelvic inclinometry
3. Dynamometry
4. Accessory passive movement

**Recommended Text Books for FoEM**


1. Principle of Exercise Therapy -Gardiner - C.B.S. Delhi
2. Practical Exercise Therapy - Hollis - Blackwell Scientific Publications.
3. Therapeutic Exercises Foundations and Techniques - Kisner and Colby -F.A. Davis.
4. Principles and practices of therapeutic massage – Sinha 3rd edition. Jaypee brothers Delhi
5. Margaret Hollis-Textbook of Massage.
6. Muscle testing and functions - Kendall - Williams & Wilkins.
7. Daniels and Worthingham’s - Muscle testing - Hislop & Montgomery - W.B. Saunders.
8. Measurement of Joint Motion: A Guide to Goniometry - Norkins& White - F.A. Davis.
9. Therapeutic Exercises - Basmajian - Williams and Wilkins.
10. Licht SH, editor. Massage, manipulation, and traction. E. Licht;
11. World Health Organization; Global Strategy on Diet, Physical Activity and Health
12. McArdle WD, Katch FI, Katch VL. Exercise physiology: nutrition, energy, and human performance. Lippincott Williams & Wilkins; 2010.
13. Kennedy-Armbruster C, Yoke M. Methods of group exercise instruction. Human Kinetics; 2014.
14. ACSM's Guidelines for Exercise Testing and Prescription

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Fundamentals of Electro Physical Agents (FoEA) | BPT 105 | 1 | Theory | 8 | 120 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Explain the production, physiological and therapeutic effects Biophysics, principles, therapeutic uses, indications, contraindications electrical stimulation agents (KH) | 3 | 1 | - | - | 1 | 2 | - | - | 1 | - |
| **CO2:** Explain the production, physiological and therapeutic effects Biophysics, principles, therapeutic uses, indications, contraindications electrical stimulation agents (KH) | 3 | 1 | - | - | 1 | 2 | - | - | 1 | - |
| **CO3:** Demonstrate competencies in operational skills of equipment and patient preparation and techniques of application of electrical stimulation agents (P) | 3 | 2 | 2 | 1 | 2 | 2 | - | - | 1 | - |
| **CO4:** Discuss the physiology and pathophysiology of pain (KH) | 3 | 1 | - | - | - | 2 | - | - | 1 | - |
| **CO5:** Discuss theories of pain and its implications to physiotherapy clinical decision making (SH) | 3 | 2 | 1 | 1 | 1 | 2 | - | 1 | 1 | - |
| **CO6:** Explain physiological effects, therapeutic uses, indications, contraindications and demonstrate practical/operational skills required and demonstrate competencies in equipment maintenance, care and safety- precautions (P) | 3 | 2 | 2 | 1 | 2 | 2 | - | 1 | 1 | - |

**B. Course Content**

**Unit 1**

**FoEA 1.1. Physical Principles In Relation to Physiotherapy:**

1. Structure and Properties of matter-solids, liquids and gases, adhesion, surface tension, viscosity, density and elasticity. Structure of atoms, molecules, elements and compounds, election theory, static and current electricity.

2. Conduction, Insulators, Potential difference, Resistance and Intensity. Ohm's Law its application to AC and DC currents.

3. Rectifying Devices-Thermionic valves, semiconductors, Transistors, Amplifiers, Transducers, Oscillator Circuits. Capacitance, Condensers in DC and AC circuits.

4. Display devices and indicators-analogue & digital.

**FoEA 1.2. Effects of Current Electricity**

1. Chemical effects- ions and electrolytes, ionization, production of E.M.F by chemical actions. Magnetic effects, Molecular theory of Magnetism. Magnetic fields, electromagnetic induction.

2. Milli ammeter and voltmeter, transformers and chosen coil, thermal effects-joules law and heat production.

3. Physical principles of light and its properties.

4. Physical principles of sound and its properties.

5. Electromagnetic spectrum-biophysical application.

**FoEA 1.3. Electrical Supply**

1. Brief outline of main supply of electric current. Dangers short circuits, electric shocks.

2. Precautions, safety devices, earthing, fuses etc. First and initial management of electric shock

**Unit 2**

**FoEA 2.1. Low Frequency Currents Introduction to direct, alternating and modified currents.**

1. Iontophoresis: Biophysics, principles, therapeutic uses, indications, contraindications, operational skills of equipment and patient preparation.

2. Faradic current: Biophysics, principles, therapeutic uses, indications, contraindications, operational skills of equipment and patient preparation

3. Interrupted direct current: Biophysics, principles, therapeutic uses, indications, contra-indications, operational skills of equipment and patient preparation

4. Transcutaneous Electrical Nerve Stimulations (TENS) Types of low frequency, pulse widths, frequencies and intensities used as TENS applications, Theories of pain relief by TENS. Principles of clinical application, effects and uses, indications, contraindications, precautions. Operational skills of equipment patient preparation.

**Unit 3**

**FoEA 3.1. Electrical Reactions and Electro-Diagnostic Tests**

1. Electrical stimuli and normal behavior of nerve and muscle tissue. Types of lesions and development of reaction of degeneration.
2. Faradic/Intermittent direct current test.
3. S.D. Curve and its application. Chronaxie, Rheobase and pulse ratio.

**Unit 4**

**FoEA 4.1. Infrared Rays-**Wavelength, frequency, types and sources of IRR generation techniques of irradiation, physiological and therapeutic effects indications, contraindications, precautions, Operational skills of equipment and patient Preparation.

**FoEA 4.2. Superficial Heat:** Paraffin wax bath, moist heat, electrical heating pads.

1. Mechanism of production.
2. Mode of heat transfer.
3. Physiological & therapeutic effects.
4. Indications, contraindications, precautions, operational skills of equipment and patient preparation.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Fundamentals of Electro Physical Agents (FoEA) | BPT 105 (P) | 1 | Practical | 2 | 60 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Identify the components and safety devices of the electrical supply and ensure electrical and patient safety in the electrotherapy department. | 3 | 1 | 1 | - | 1 | 2 | - | 1 | 1 | - |
| **CO2:** Demonstrate sensory and motor stimulation using low-frequency currents and accurately locate and stimulate motor points of the upper limb, lower limb, trunk and face on self and human model. | 3 | 2 | 2 | - | 2 | 2 | - | - | 1 | - |
| **CO3:** Perform special low-frequency techniques Faradic foot bath, faradism under pressure and iontophoresis with correct dosage and electrode placement. | 3 | 2 | 2 | - | 2 | 2 | - | 1 | 1 | - |
| **CO4:** Plot the strength–duration curve and determine Chronaxie and Rheobase to interpret nerve–muscle excitability. | 3 | 2 | - | - | - | 2 | - | - | 1 | - |
| **CO5:** Apply superficial thermal and electroanalgesic modalities IR lamp, paraffin wax bath and TENS to various body regions, observing indications, contraindications and safety. | 3 | 2 | 2 | - | 3 | 2 | - | 1 | 1 | - |

**B. Course content:**

FoEA (P) 5.1. Identify components and safety devices involved in electric supply of the electrotherapy department.

FoEA (P) 5.2. Experience sensory and motor stimulation of nerves and muscles by various types of low frequency currents on self.

FoEA (P) 5.3. Locate and stimulate different motor points region wise including the upper & lower limb, trunk face. On human model

FoEA (P) 5.4. Demonstrate the application of special techniques of low frequency current including Faradic foot bath, faradism under pressure

FoEA (P) 5.5. Demonstrate the application of techniques of Iontophoresis.

FoEA (P) 5.6. Demonstrate the plotting of the strength duration curve and find out Chronaxie and Rheobase.

FoEA (P) 5.7. Demonstrate the techniques of application of various types of IR lamps to various body regions.

FoEA (P) 5.8. Demonstrate the techniques of application of paraffin wax bath to various body regions

FoEA (P) 5.9. Demonstrate the techniques of application of TENS to various body regions.

**Recommended Text Books for FoEA**


1. Electro therapy Explained: Principles & Practice Low& Reed, Butterworth Heinemann.
2. Claytons Electro therapy, Forster & Palastange Baillier Tindal.
3. Principles & Practice of Electrotherapy, Kahn, Churchill Livingstone
4. Clinical electrotherapy Currier and nelson
5. Therapeutic Heat & Cold, Lehmann, Willians & Wilkins.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Psychology and Sociology (PS) | BPT 106 | 1 | Theory | 8 | 120 |

**A. COURSE OUTCOMES (CO) FOR PSYCHOLOGY**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Describe the principles of psychology and its relationship to human behaviour (K) | 3 | 1 | 1 | - | - | 1 | - | - | 1 | - |
| **CO2:** Discuss the theories of psychology and its implications to health (KH) | 3 | 1 | 1 | - | - | 1 | - | - | 1 | - |
| **CO3:** Discuss physiology of emotions and its applications in health care (KH) | 3 | 1 | 1 | – | - | 1 | - | - | 1 | - |
| **CO4:** Explain the theories of motivation (KH) | 3 | 1 | 1 | - | - | 1 | - | - | 2 | - |
| **CO5:** Discuss the theories, concepts, development and assessment of personality (KH) | 3 | 1 | 1 | - | 1 | 1 | - | - | 2 | - |
| **CO6:** Explain the concepts of intelligence and its assessment (KH) | 3 | 1 | 1 | - | - | 1 | - | - | 1 | - |
| **CO7:** Describe the psychological concepts of frustration (K) | 3 | 1 | 1 | - | 1 | 1 | - | - | 1 | - |
| **CO8:** Apply the principles of psychology in clinical decision making (KH) | 3 | 3 | 2 | 2 | 2 | 2 | - | 1 | 2 | - |

**B. COURSE CONTENT FOR PSYCHOLOGY:**

**Unit 1:**

**PSY 1.1. Introduction to Psychology**

1. Describe Schools: Structuralism, functionalism, behaviorism, Psychoanalysis.
2. Describe Methods: Introspection, observation, inventory and experimental method.
3. Describe in brief Branches: pure psychology and applied psychology
4. Describe importance of study of Psychology to physiotherapy

**Unit 2:**

**PSY 1.2. Developmental Psychology**

1. Describe Growth and Development Nature of growth and development, Characteristics of growth and development. Developmental periods of infancy.
2. Describe Childhood, adolescence, adulthood and old age, Factors affecting growth and development.
3. Describe Role of heredity and environment and their relative importance in physical, psychological and social development

**Unit 3:**

**PSY 1.3. Emotions and perception**

1. Describe Emotions Concept and definition, Theories of emotions, Physiological changes due to emotional state. Nature and control of anger, fear and anxiety.
2. Describe Sensation, attention and perception Meaning and definition.
3. Describe Types of sensation and Perception.
4. Describe Principles of Perception. Illusion and hallucination concept of 1attention and Factors determining attention.

**Unit 4:**

**PSY 1.4. Motivation and Learning**

1. Definition, needs, drives and motives, primary motives and secondary motives, Achievement motivation.
2. Discuss the theories of motivation.
3. Describe theories of Learning
4. Describe Concepts, Characteristics, Types, Laws of Leaning, Theories of learning, Trial and Error theory
5. Describe Conditioning-classical and operant, Insight theory of learning, Factors influencing learning.
6. Describe the effective ways to learn: Massed/Spaced, Whole/Part, Recitation/Reading, Serial/Free recall, Incidental/Intentional learning, Knowledge of results, association, organization, and mnemonic methods.
7. Describe Intelligence; Discuss Characteristics, Types. IQ. Mental age.
8. Describe Assessment of intelligence, intelligence tests-verbal and performance test

**Unit 5:**

**PSY 1.5. Psychology of frustration and Stress**

1. Describe Frustration and stress under the following headings: Definition. Causes, Sources of frustrations, Conflict, Different types of conflicts, Adjustment and maladjustment. Defense Mechanism.
2. Describe Different types of Anxiety, Tension, Physiological symptoms, causes reactions to stresses, psycho-somatic problems, copying strategies.
3. Discuss the management of stress

**Unit 6:**

**PSY 1.6. Personality**

1. Define Personality and describe factors in personality development
2. Describe tools of Measurement of Personality-: observation, situational test, questionnaire, rating scale, interview, and projective techniques.
3. Describe Defense Mechanisms: denial of reality, rationalization, projection, reaction formation, identification, repression, regression, intellectualization, undoing, introjection, acting out.
4. Describe psychological reactions of a patient during admission and treatment in terms of possible Anxiety, shock denial, suspicion. Loneliness, shame, guilt, rejection, fear, withdrawal, depression, egocentric, justify and loss of hope.

**Unit 7:**

**PSY 1.7. Social psychology**

1. Describe Different types of leaders and Different theoretical approaches to leadership.
2. Describe development of attitude and Change of attitude.

**Unit 8:**

**PSY 1.8. Clinical psychology**

1. Describe Models of training, abnormal behavior assessment, clinical judgement, psychotherapy, self-management methods, physiotherapist patient interaction, aggression,
2. Discuss the following
    i. Self-imaging
    ii. stress management
    iii. assertive training
    iv. Group therapy

v. Body awareness

vi. Pediatric, child and geriatric clinical psychology.

**Recommended Text Books for PSY**

1. Morgan C.T. & King R.A. Introduction to Psychology– recent edition [Tata McGraw-Hill publication]

2. Munn N.L. Introduction to Psychology [Premium Oxford, I.B.P. publishing.]

3. Clinical Psychology –Akolkar

4. Hurlock EB. Development psychology. McGraw-Hill

5. Psychology Indian continent edition Raron RA mishra 2018

6. Abnormal Psychology Sarason IG Sarason BR Prentice Hall India

7. Introduction to psychology Atkinson RL Hilgard ER 2019

8. Development a lifespan approach Johnson ML 2020 Pearson education

9. Abnormal psychology an integrative approach Thomson brooks / Cole publishing

10. Theories of counselling and psychotherapy a case approach Murdock nl person education New Zealand

11. Theories of personality. Hall CS, Lindzey G Wiley and sons inc

## C. COURSE OUTCOMES (CO) FOR SOCIOLOGY:

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Discuss the sociological concepts in relations to health, healthcare, and disorders (KH) | 3 | 2 | 1 | 1 | 1 | 1 | - | 2 | 1 | - |
| **CO2:** Explain social theories in relations to health and health care (KH) | 3 | 2 | 1 | 1 | 1 | 1 | - | 2 | 1 | - |
| **CO3:** Discuss biomedical and biopsychosocial health models (KH) | 3 | 2 | 2 | 1 | 1 | 1 | - | 2 | 1 | - |
| **CO4:** Explain Concept of social groups, influence of groups on health and sickness, the role of primary groups and secondary groups in the hospitals and rehabilitation settings (KH) | 3 | 2 | 2 | 1 | 1 | 1 | - | 2 | 1 | - |
| **CO5:** Discuss the influence of family on human personality, individual's health, family and nutrition and the effects of sickness on family along with psychosomatic disease (KH) | 3 | 2 | 2 | 1 | 1 | 1 | - | 2 | 1 | - |
| **CO6:** Analyse the social cause for activity limitations and participatory restrictions caused by various disorders (KH) | 3 | 2 | 1 | 1 | 1 | 1 | - | 2 | 1 | - |

## D. COURSE CONTENT FOR SOCIOLOGY:

**Unit 1**

SOC 1.1 Introduction to sociology

SOC 1.2 Meaning- Definition and scope of sociology

SOC 1.3 Its relation to Anthropology, Psychology, Social Psychology.

SOC 1.4 Methods of Sociological investigations- Case study, social survey, questionnaire, Interview and opinion poll methods.

SOC 1.5 Importance of its study with special reference to Health Care Professionals.

SOC 1.6 Social Factors in Health and disease situations:

1. Meaning of social factors
2. Role of social factors in health and illness

SOC 1.7 Socialization:

1. Meaning and nature of socialization.
2. Primary, Secondary and Anticipatory socialization.
3. Agencies of socialization.

SOC 1.8 Social Groups:

Concepts of social groups, influence of formal and informal groups on health and sickness. The role of primary groups and secondary groups in the hospital and rehabilitation setup.

SOC 1.9 Family:

1. The family, meaning and definitions.
2. Functions of types of family
3. Changing family patterns
4. Influence of family on the individuals health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their importance to physiotherapy.

**Unit 2**

SOC 2.1. Community:

1. Rural community: Meaning and features –Health hazards of ruralities, health hazards to tribal communities.

2. Urban community: Meaning and features- Health hazards of urbanities.

SOC 2.2. Culture and Health:

1. Concept of Health
2. Concept of Culture
3. Culture and Health
4. Culture and Health Disorders

SOC 2.3. Social change:

1. Meaning of social changes.
2. Factors of social changes.
3. Human adaptation and social change
4. Social change and stress.
5. Social change and deviance.
6. Social change and health programme
7. The role of social planning in the improvement of health and rehabilitation.

SOC 2.4. Social Problems of disabled: Consequences of the following social problems in relation to sickness and disability, remedies to pre- vent these problems.

1. Population explosion

2. Poverty and unemployment
3. Beggary
4. Juvenile delinquency
5. Prostitution
6. Alcoholism
7. Problems of women in employment
8. Geriatric problems
9. Problems of the underprivileged.

SOC 2.5. Social Security: Social security and social legislation in relation to the disabled.

**Recommended Text Books for SOC**


1. McGee - Sociology - Drydon Press Illinois.
2. Kupuswamy - Social Changes in India - Vikas, Delhi.
3. Ahuja - Social Problems - Bookhive, Delhi.
4. Ginnsberg - Principles of Sociology - Sterling Publications.
5. Parter & Alder - Psychology & Sociology applied to medicine - W.B. Saunders.
6. Julian - Social Problems - Prentice Hall. Indian Social Problems - Madan, Vol-I-Madras
7. Bhushan, V., & Sachdeva, D. R. (2005). Introduction to sociology. Kitab Mahal.
8. Sociology Anthony gidden
9. Sociology themes and perspectives Haralambos and holborn
10. Society an introductory analysis Maclaver and page
11. Rules of sociological methods emile durkeim
12. Essay on sociology max webber

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Fundamentals of Healthcare delivery System in India (FoHS) | BPT 107 | 1 | Theory | 8 | 120 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Explain the structure and organization of the healthcare delivery system in India, including primary, secondary, and tertiary levels of care (K) | 3 | 1 | - | 1 | 1 | 2 | - | 2 | 2 | - |
| **CO2:** Analyze national health policies, National Health Mission, and major national health programs in terms of objectives, implementation, and outcomes (KH) | 3 | 1 | - | 1 | 1 | 2 | - | 2 | 2 | - |
| **CO3:** Evaluate the role of community participation, private sector, and healthcare financing in influencing healthcare delivery in India (KH) | 3 | 1 | - | 1 | 2 | 2 | - | 2 | 2 | - |
| **CO4:** Compare the Indian healthcare system with those of developed countries and assess the impact of globalization and corporatization on healthcare services (KH) | 3 | 1 | - | 1 | 2 | 2 | - | 2 | 2 | - |
| **CO5:** Demonstrate understanding of health concepts, disease prevention, and the role of physiotherapy professionals within the healthcare system and national health priorities (K) | 3 | 2 | 1 | 1 | 2 | 2 | - | 2 | 2 | - |

**B. Course Content**

**SECTION-A**

FoHC 1.1. Introduction to healthcare delivery system

FoHC 1.2. Healthcare delivery system in India at primary, secondary and tertiary care

FoHC 1.3. Community participation in healthcare delivery system

FoHC 1.4. Health system in developed countries.

FoHC 1.5. Private Sector

FoHC 1.6. National Health Mission

FoHC 1.7. National Health Policy

FoHC 1.8. Issues in Health Care Delivery System in India

**SECTION- B**

FoHC 1.9. National Health Programme- Background objectives, action plan, targets, operations, achievements and constraints in various National Heath Programme.

FoHC 1.10. Health scenario of India- past, present and future

FoHC 1.11. Introduction to the profession of physiotherapy role of physiotherapy in national health issues and the expectations of society from physiotherapists

FoHC 1.12. The concepts of health and disease, risk factors, and the role of health promotion and disease prevention

FoHC 1.13. Explore the corporatization of health care.

FoHC 1.14. Identify the globalisation of health care.

FoHC 1.15. Assess the prospects of new health care reform.

FoHC 1.16. Understand various types of health services professionals and their training, practice requirements, and practice settings

FoHC 1.17. Differentiate between primary care and specialty care, and identify the causes of the imbalance between primary care and specialty care

FoHC 1.18. Study the role of health care financing and its impact on the delivery of health care.

FoHC 1.19. Understand the basic concept of insurance and how general insurance terminology applies to health insurance.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| English (EG) | BPT 108 | 1 | Theory | 4 | 60 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Apply basics of grammar and writing skills apply and communicate ideas orally and in writing with a high level of proficiency use appropriate expressions in varied situations and topics of interest, speak in English both in terms of fluency and comprehensibility demonstrate independence in using basic language structure in oral and written (SH) | 1 | 2 | 3 | 2 | - | 2 | 1 | - | 2 | |

**B. Course Content**

**SECTION A**

EG 1.1. Basic Language Skills: Grammar and Usage.

EG 1.2. Business Communication Skills. With focus on speaking - Conversations, discussions, dialogues, short presentations, pronunciation.

EG 1.3. Teaching the different methods of writing like letters, E-mails, report, case study, collecting the patient data etc. Basic compositions, journals, with a focus on paragraph form and organization.

EG 1.4. Basic concepts & principles of good communication

**SECTION-B**

EG 1.5. Special characteristics of health communication

EG 1.6. Types & process of communication – verbal, non-verbal and written communication. Upward, downward and lateral communication.

EG 1.7. Therapeutic communication: empathy versus sympathy.

EG 1.8. Communication methods for teaching and learning.

EG 1.9. Communication methods for patient education.

EG 1.10. Barriers of communication & how to overcome them.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Information Technology (IT) | BPT 109 | 1 | Theory | 4 | 60 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** To know the parts of computer (K) | 3 | - | - | - | - | 1 | - | - | 1 | - |
| **CO2:** To have working knowledge of a computing system (KH) | 3 | 1 | - | - | - | 1 | - | - | 2 | - |
| **CO3:** Use computer for word processing and presentation and data management CO4 use the internet for personal and professional purpose (SH) | 3 | 1 | 1 | - | - | 2 | - | - | 2 | - |
| **CO4:** Understand the role of digital technology in the Health sciences (KH) | 3 | 2 | 1 | 1 | - | 2 | - | - | 3 | - |

**B. Course Content**

IT 1.1. Introduction to computer: Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages.

IT 1.2. Input output devices: Input devices (keyboard, point and draw devices, data scanning devices, digitizer, electronic card reader, voice recognition devices, vision-input devices), output devices(monitors, pointers, plotters, screen image projector, voice response systems).

IT 1.3. Processor and memory: The Central Processing Unit (CPU), main memory.

IT 1.4. Storage Devices: Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass storage devices.

IT 1.5. Introduction of windows: History, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing, minimizing and maximizing, etc.).

IT 1.6. Introduction to MS-Word: introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge.

IT 1.7. Introduction to Excel: introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs.

IT 1.8. Introduction to power-point: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs/ photos/ Videos.

IT 1.9. Introduction of Operating System: introduction, operating system concepts, types of operating system.

IT 1.10. Computer networks: introduction, types of network (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network.

IT 1.11. Internet and its Applications: definition, brief history, basic services (E-Mail, File Transfer Protocol, telnet, the World Wide Web (WWW)), www browsers, use of the internet.

IT 1.12. Application of Computers in clinical settings.

**PRACTICAL: BPT. IT (P)**

**IT (P) 2.1. Practical on fundamentals of computers -**

1. Learning to use MS office: MS word, MS PowerPoint, MS Excel.
2. To install different software.
3. Data entry efficiency

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Clinic Orientation (COr) | BPT 110 | 1 | Practical | 5 | 150 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** The objective of this particular section of the foundation course is to sensitize potential learners with essential knowledge; this will lay a sound foundation for their learning across the under-graduate program and across their career. Innovative teaching methods should be used to ensure the attention of a student and make them more receptive such as group activities, interactive fora, role plays, and clinical bed-side demonstrations (KH) | 2 | 3 | 2 | 3 | 3 | 2 | 1 | 2 | 2 | - |

**B. Course Content**

COr 1.1. The community orientation and clinical visit will include visits to the entire chain of healthcare delivery systems -Sub centre, PHC, CHC, SDH, DH and Medical College, private hospitals, dispensaries and clinics.

COr 1.2. The student will also be briefed regarding governance at village level interaction and group discussion with village panchayat and front line health Clinical visit to their respective professional department within the hospital.

## 2ND Year BPT Syllabus

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Pathology & Microbiology (PM) | BPT 201 | 2 | Theory | 8 | 120 |

### A. Course Outcomes (CO)

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Explain important pathological processes including cell death and injury, inflammation, thrombosis and neoplasia (KH) | 3 | 1 | - | - | - | - | - | 1 | 1 | - |
| **CO2:** Discuss the relationship between pathological process and pathogenesis of musculoskeletal, cardio-vascular, neurological and oncological diseases (KH) | 3 | 2 | - | - | - | - | - | 1 | 1 | - |
| **CO3:** Describe the predisposing factors, causes, pathogenesis, morphology and complications of MSK, CVS, neurological and oncological diseases (K) | 3 | 2 | - | - | - | - | - | 1 | 1 | - |
| **CO4:** Discuss the clinical features in relation to causes and pathogenesis of the diseases (KH) | 3 | 2 | - | - | - | - | - | 1 | 1 | - |
| **CO5:** Describe the classification and characteristics of microorganisms that cause diseases (K) | 3 | 1 | - | - | - | - | - | 1 | 1 | - |
| **CO6:** Describe the reproduction of common bacterial, fungal and viral pathogens (K) | 3 | 1 | - | - | - | - | - | 1 | 1 | - |
| **CO7:** Discuss the mechanism of infectious disease and the body's immune defense (KH) | 3 | 1 | - | - | - | - | - | 2 | 1 | - |
| **CO8:** Explain infection control practices that prevent the spread of infection (KH) | 3 | 2 | 1 | 2 | 2 | 1 | - | 3 | 1 | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO9:** Discuss the process of infection and mechanism to create a sterile field in physiotherapy practice (KH) | 3 | 2 | 1 | 2 | 2 | 1 | - | 3 | 1 | - |

**B. Course Content**

**SECTION A**

**UNIT 1**

PM 1.1. Discuss the Causes of disease, cell injury

PM 1.2. Describe the mechanism of cell injury – hypoxia, free radical injury. Necrosis and gangrene

PM 1.3. Explain the pathology inflammation

PM 1.4. Differentiate acute and chronic inflammation

PM 1.5. Explain the process of primary healing, secondary healing

PM 1.6. Discuss the factors affecting healing and repair of soft tissues and skin.

**UNIT 2**

PM 2.1. Describe Fluid and hemodynamic derangements

PM 2.2. Discuss the pathophysiology of edema, hyperemia, Hemorrhage, shock, embolism, thrombosis, and infarction

PM 2.3. Discuss Immune mechanisms (natural and acquired)

PM 2.4. Discuss the features of autoimmune diseases and immunodeficiency diseases.

PM 2.5. Discuss the characteristic of benign and malignant tumors

PM 2.6. Describe grading and staging of malignant tumors

PM 2.7. Describe general effects of malignancy on the host

PM 2.8. Outline the carcinogenic agents

PM 2.9. Outline the methods of diagnosis of malignancy

PM 2.10. Classify the Nutritional disorders

PM 2.11. Discuss the deficiency disorders (protein deficiency, vitamin deficiency (A,B,C,D,E,K) iodine deficiency)

PM 2.12. Discuss the effect of nutrition deficiency on skeletal muscles, bones and neurological functions

PM 2.13. Describe the hypersensitivity reactions

**UNIT 3**

PM 3.1. Discuss the causative factors, pathology, clinical features, diagnosis and management of Disorders of blood

1. Discuss the causative factors, pathology, clinical features, diagnosis and management of Disease of circulatory system (atherosclerosis,
2. Thromboangitis obliterans, varicose vein, DVT, thrombophlebitis, lymphedema, congestive cardiac failure, rheumatic heart disease,)
3. Explain the causative factors, pathology, clinical features, diagnosis and management of ischemic heart disease
4. Explain the causative factors, pathology, clinical features, diagnosis and management of Congenital Heart disease.
5. Explain the causative factors, pathology, clinical features, diagnosis and management of Disease of Respiratory System (Pneumonias, Bronchiectasis, Emphysema, Chronic bronchitis, Asthma, Occupational lung diseases, Carcinoma of lungs)
6. Explain the causative factors, pathology, clinical features, diagnosis and management of Disorders of musculoskeletal system. (Arthritis: rheumatoid, degenerative, infective, metabolic. osteoporosis, pagets disease, osteogenesis imperfecta, osteomyelitis, a brief outline of bone tumors. Muscular dystrophy, myasthenia gravis, myositis.)

PM 3.2. Explain the causative factors, pathology, clinical features, diagnosis and management of Diseases of Nervous system. (Meningitis, encephalitis, vascular diseases of brain, peripheral nerve lesions. Degenerative diseases parkinsonism, Alzheimer's disease)

PM 3.3. Describe the causative factors, pathology, clinical features, diagnosis and management of Diseases endocrine system. (Diabetes Mellitus, Thyroiditis, Thyrotoxicosis, myxedema.)

PM 3.4. Describe the causative factors, pathology, clinical features, diagnosis and management of the Disorders of blood (anemias, Leukemia) 1. Describe the causative factors, pathology, clinical features, diagnosis and management of the Disorders atherosclerosis, thromboangitis obliterans, varicose vein, DVT

**SECTION – B**

**UNIT 4**

**Classify microorganisms**

PM 4.1. Discuss the type, source and mechanism of Infection

PM 4.2. Describe the prevention and management of common infections

PM 4.3. Describe the causative factors, and pathology of common Infectious diseases: PM 4.4. Outline of the management of common infective diseases

PM 4.5. List the causative factors, pathology, clinical features, diagnosis and management of Bacterial disease (Diphtheria, Whooping Cough Tetanus Pyogenic, Diphtheria, Gram negative infection, bacillary dysentery. STD Gastroenteritis, Food Poisoning Tuberculosis, Leprosy, Syphilis)
PM 4.6. Describe the causative factors, pathology, clinical features, diagnosis and management of viral diseases: (Poliomyelitis, Herpes, Rabies, Measles, Rickets, Chlamydial infection, HIV infection. Chicken Pox, Measles, Mumps, Influenza)
PM 4.7. Describe the causative factors, pathology, clinical features, diagnosis and management of Fungal and opportunistic infections.
PM 4.8. Describe the causative factors, pathology, clinical features, diagnosis and management of: Malaria, Filaria, Amoebiasis, Kala-azar, Cysticercosis, Hydatid cyst.

**Recommended Text Books for PM**


1. Cotran, Kumar & Robbins Robbins Pathological Basis of Disease - - W.B. Saunders.

2. Harsh Mohan Text book of Pathology - - Jaypee Brothers.

3. Goodmann and Boissonnault Pathology: Implications for Physical Therapists - - W.B. Saunders.

4. Bhatia & Lal Essential of Medical Microbiology - - Jaypee Brothers.

5. Medical Microbiology - Mims - Jaypee Brothers.

6. Walter & Israel, General Pathology - - Churchill Livingstone.

7. Anderson Muirs Textbook of Pathology - - Edward Arnold Ltd.

8. Ackerman and Richards - Microbiology: An Introduction for the Health Sciences – W.B. Saunders

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Pharmacology (PC) | BPT 202 | 2 | Theory | 6 | 90 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Describe the concepts of pharmacology (including pharmacokinetics and pharmacodynamics) of commonly used drugs (K) | 3 | 2 | - | - | - | 1 | - | - | 1 | - |
| **CO2:** Discuss the effects of commonly used drugs on body function (KH) | 3 | 2 | - | - | - | 1 | - | - | 1 | - |
| **CO3:** Discuss the therapeutic and adverse effects, contraindications and precautions for commonly used drugs (KH) | 3 | 2 | - | - | 2 | 1 | - | 1 | 1 | - |
| **CO4:** Discuss the pharmacological effects of drugs used in pain, inflammatory, cardio-vascular, respiratory, neurological and oncological disorders (KH) | 3 | 2 | - | 2 | 1 | 2 | - | 1 | 1 | - |
| **CO5:** Explain the effect of commonly prescribed drugs on exercise and movement (KH) | 3 | 2 | 1 | 2 | 1 | 2 | - | 1 | 1 | - |
| **CO6:** Identify the red and yellow flags for physiotherapy prescription based on the pharmacological effect of commonly prescribed drugs (KH) | 3 | 2 | 1 | 2 | 3 | 2 | - | 1 | 1 | - |

**B. Course Content**

**SECTION -A**

**Unit 1:**

PC 1.1. General Pharmacology

1. Define and Classify drugs.

2. Describe Sources of drugs, Routes of drug administration, Distribution of drugs,

3. Discuss Metabolism and Excretion of drugs Pharmacokinetics, Pharmacodynamics, Factors modifying drug response, adverse effects.

PC 1.2. Inflammatory/Immune Diseases –

1. Describe Non-narcotic Analgesics and Nonsteroidal Anti-Inflammatory Drugs: Acetaminophen, NSAIDs, Aspirin, Non aspirin NSAIDs, drug Inter- actions with NSAIDs

2. Discuss Pharmacological Uses of Glucocorticoids, adverse effects, Physiologic Use of Glucocorticoids

3. Discuss Drugs Used in Treatment of Arthritic Diseases: Rheumatoid Arthritis, Osteoarthritis, Gout

PC 1.3. Discuss Drugs Used in the Treatment of Neuromuscular Immune/Inflammatory Diseases: Myasthenia gravis, Idiopathic Inflammatory Myopathies, systemic lupus Erythematous, Scleroderma, Demyelinating Disease

**UNIT 2: Autonomic Nervous system**

PC 2.1. Describe General considerations – The Sympathetic and Parasympathetic Systems, Receptors, Somatic Nervous System

PC 2.2. Discuss cholinergic and Anti-Cholinergic drugs, Adrenergic and Adrenergic blocking drugs, Peripheral muscle relaxants.

**Cardiovascular Pharmacology –**

PC 2.3. Describe Drugs used in the treatment of heart failure: Digitalis, Diuretics, Vasodilators, ACE inhibitors

1. Describe Antihypertensive Drugs: Diuretics, Beta Blockers, Calcium Channel Blockers, ACE Inhibitors, Central Acting Alpha Agonists, Peripheral Alpha Antagonists, Direct acting Vasodilators

2. Describe Antiarrhythmic Drugs

3. Discuss the Drugs used in the treatment of vascular disease and tissue ischemia: Vascular Disease, Hemostasis Lipid-Lowering agents, Antithrombotics, Anticoagulants and Thrombolytics

PC 2.4. Discuss the Drugs used in the treatment of Ischemic Heart Disease – Nitrates, BetaBlockers, Calcium Channel Blockers, Cerebral Ischemia Peripheral Vascular Disease

**SECTION -B**

**UNIT 3:**

PC 3.1. Neuropharmacology

1. Discuss Sedative-Hypnotic Drugs: Barbiturates, Benzodiazepines
2. Describe Antianxiety Drugs: Benzodiazepines, Other Anxiolytics
3. Discuss Drugs Used in Treatment of Mood Disorders: Monoamine Oxidase Inhibitors, Tricyclic Antidepressants, Atypical Antidepressants, Lithium
4. Describe Antipsychotic drugs

PC 3.2. Disorders of Movement –

1. Discuss Drugs used in Treatment of Parkinson ’s disease
2. Describe Antiepileptic Drugs
3. Discuss Spasticity and Skeletal Muscle Relaxants

PC 3.3. Discuss Respiratory Pharmacology and Drugs used in Treatment of Obstructive airway Diseases, Allergic Rhinitis

**UNIT 4**

PC 4.1. Describe Gastrointestinal Pharmacology and drugs used in Peptic Ulcer Disease, Constipation, and Diarrhea Drugs

PC 4.2. Describe Hormones and drugs affecting endocrine functions Used in Treatment of Diabetes Mellitus: Insulin, Oral Hypoglycemic

**Geriatrics –**

PC 5.1. Discuss the adverse effects of special concern in the Elderly, Dementia, and Postural hypotension.

PC 5.2. Describe chemotherapeutic agents

**Recommended Text Books for PC**

1. Udaykumar P. Pharmacology for physiotherapy. Jaypee Bros. Medical Publishers;2011.

2. Ramesh KV, Shenoy KA. Pharmacology for Physiotherapist. Jaypee Brothers Medical Publishers Pvt. Limited;2005.

3. Tripathi KD. Essentials of medical pharmacology. JP Medical Ltd

4. The Pharmacological basis of Therapeutics - Goodman and Gilman - MacMillan.

5. Satoskar RS, Rege N, Bhandarkar SD. Pharmacology and pharmacotherapeutics. Elsevier India; 2017

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Public Health & Health Promotion (PH) | BPT 203 | 2 | Theory | 8 | 120 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Discuss the determinants of health in relation to the local context (KH) | 3 | 1 | 1 | 2 | 1 | 1 | - | 3 | 1 | - |
| **CO2:** Discuss National health policy, programmes and their application to physiotherapy practice (KH) | 3 | 2 | 1 | 2 | 1 | 1 | - | 3 | 1 | - |
| **CO3:** Explain the health care delivery system of India (K) | 3 | 1 | 1 | 2 | 1 | 1 | - | 3 | 1 | - |
| **CO4:** Describe the role of individual, family and community on health (K) | 3 | 1 | 1 | 2 | 1 | 1 | - | 3 | 1 | - |
| **CO5:** Discuss the levels of prevention and their application in health care delivery (KH) | 3 | 2 | 1 | 2 | 1 | 1 | - | 3 | 1 | - |
| **CO6:** Explain basic epidemiological principles of health (K) | 3 | 1 | 1 | 2 | 1 | 1 | - | 3 | 1 | - |
| **CO7:** Discuss the prevention of communicable and non-communicable diseases (KH) | 3 | 2 | 1 | 2 | 1 | 1 | - | 3 | 1 | - |

**B. Course Content**

**SECTION –A**

**Unit 1**

PH 1.1. Health and Disease: Definitions, Concepts, Dimensions and Indicators of Health, Concept of well-being, Spectrum and Determinants of Health, Concept and natural history of Disease, Concepts of disease control and prevention, Modes of Intervention, Population Medicine.

PH 1.2. Epidemiology, definition and scope. Principles of Epidemiology and Epidemiological methods: Components and Aims, Basic measurements, Methods, Uses of Epidemiology, Infectious disease epidemiology, Dynamics and modes of disease transmission, Host defenses and Immunizing agents, Hazards of Immunization, Disease prevention and control, Disinfection. Screening for Disease: Concept of screening, Aims and Objectives, Uses and types of screening

PH 1.3. Epidemiology of communicable disease: Respiratory infections, Intestinal infections, Arthropod-borne infections, Zoonoses, Surface infections, Hospital acquired infections Epidemiology of chronic non-communicable diseases and conditions: Cardiovascular diseases: Coronary heart disease, Hypertension, Stroke, Rheumatic heart disease, Cancer, Diabetes, 0besity, Blindness, Accidents and Injuries.

**Unit 2**

PH 2.1. Public health administration- an overview of the health administration set up at Central and state levels. The national health programme highlighting the role of social, economic and cultural factors in the implementation of the national programmes. Health problems of vulnerable groups- pregnant and lactating women, infants and pre-school children, occupational groups.

PH 2.2. Health programmes in India: Vector borne disease control programme, National leprosy eradication programme, National tuberculosis programme, National AIDS control programme, National programme for control of blindness, Iodine deficiency disorders (IDD) programme, Universal Immunisation programme, Reproductive and child health programme, National cancer control programme, National mental health programme. National diabetes control programme, National family welfare programme, National sanitation and water supply programme, Minimum needs programme.

PH 2.3. Demography and Family Planning: Demographic cycle, Fertility, Family planning objectives of national family planning programme and family planning methods, A general idea of advantage and disadvantages of the methods.

PH 2.4. Preventive Medicine in Obstetrics, Paediatrics and Geriatrics: MCH problems, Antenatal, Intranatal and post-natal care, Care of children, Child health problems, Rights of child and National policy for children, MCH services and indicators of MCH care, Social welfare programmes for women and children, Preventive medicine and geriatrics.

**SECTION -B**

**Unit 3**

PH 3.1. Nutrition and Health: Classification of foods, Nutritional profiles of principal foods, Nutritional problems in public health, Community nutrition programmes.

PH 3.2. Environment and Health: Components of environment, Water and air pollution and public health: Pollution control, Disposal of waste, Medical entomology.

PH 3.3. Hospital waste management: Sources of hospital waste, Health hazards, Waste management.

PH 3.4. Disaster Management: Natural and man-made disasters, Disaster impact and response, Relief phase, Epidemiologic surveillance and disease control, Nutrition, Rehabilitation, Disaster preparedness.

**Unit 4**

PH 4.1. Occupational Health: Occupational environment, Occupational hazards, Occupational diseases, Prevention of occupational diseases. Social security and other measures for the protection from occupational hazard accidents and diseases. Details of compensation acts.

PH 4.2. Mental Health: Characteristics of a mentally healthy person, Types of mental illness, Causes of mental ill health, Prevention, Mental health services, Alcohol and drug dependence. Emphasis on community aspects of mental health. Role of Physiotherapist in mental health problems such as Intellectual Disability.

PH 4.3. Health Education: Concepts, aims and objectives, Approaches to health education, Models of health education, Contents of health education, Principles of health education, Practice of health education.

PH 4.4. Exercise as Preventive Medicine: for Old age, Working Population, Adolescents and Children. How to keep your Society fit.

**Recommended text books for PH**

1. Park K: Park's textbook of preventive and social medicine. 24th Ed, M/s Banarasidas Bhanot, Jabalpur, 2017

2. Rao SB: Principles of community medicine. 4th Ed, AITBS Publishers & distributors, New Delhi, 2005.

3. Rahim A: Principles and practice of community medicine. 1st Ed, Jaypee brothers, New Delhi. 2008.

4. Gupta MC & Mahajan BK: Textbook of preventive and social medicine. 3rd Ed, Jaypee Brothers, New Delhi, 2003

5. Matzen RN, Lang RS: Clinical preventive medicine. Mosby, Missouri, Abramson JH, Abramson ZH: Survey methods in community medicine, Churchill Livingstone, Edinburgh, Jekel JF, Katz DL, Elmore JG: Epidemiology, Biostatistics and Preventive Medicine, 2nd Ed, Saunders, Philadelphia, 2001.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Basics of Emergency Care and Life Support Skills (ECLS) | BPT 204 | 2 | Theory | 6 | 90 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Perform Opening and maintaining and patent airway: assessment and knowledge of airway maneuvers and adjuncts (SH) | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 2 | 2 | - |
| **CO2:** Ventilate patients: assessment and management of breathing with mouth-to-mouth and mouth-to-mask (SH) | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 2 | 2 | - |
| **CO3:** Administer basic life support skills including cardiopulmonary resuscitation (SH) | 3 | 3 | 3 | 2 | 3 | 2 | 1 | 2 | 2 | - |
| **CO4:** Provide first aid of simple and multiple system trauma such as • Controlling hemorrhage • Managing Burns and wounds • Response to effects of weapons of mass destruction • manually stabilizing injured extremities (SH) | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 2 | 2 | - |
| **CO5:** Provide first aid to patients with medical emergencies like heart attack and stroke • Identifying signs of Stroke and heart attack and safe transfer after first aid without delay in transfer. • Manage general medical complaints seizures and animal bites (snake /dog bite) (SH) | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 2 | 2 | - |
| **CO6:** Reassure patients and bystanders by working in a confident, efficient | 3 | 3 | 3 | 2 | 3 | 2 | 1 | 2 | 2 | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| manner • Avoid mishandling and undue haste while working expeditiously to accomplish the task (SH) | | | | | | | | | | |
| **CO7:** Manage safe patient transport Entailing-Extrication of the victim, helmet removal and spine protection during transport (SH) | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 2 | 2 | - |
| **CO8:** Explain the roles, responsibilities and limitations of a first responder (SH) | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 2 | 2 | - |

**B. Course Content**

**SECTION -A**

**UNIT 1**

ECLS 1.1. Emergent conditions and magnitude, Concept of golden hour, Duties and responsibilities of first responder

ECLS 1.2. Ethical issues and Gather information from observation, experience and reasoning. Identification of rapidly changing situations and adapt accordingly. Planning and organization of work. Scene safety. Dealing with emotional reactions family members and bystanders

ECLS 1.3. Well-being of first responder Personal protection

1. Steps to be taken against airborne and blood-borne pathogens
2. Personal protective equipment necessary for each of the following situations: Hazardous materials Rescue Operations Violent Scenes Crime scenes
3. Electricity, Water and ice
4. Exposure to blood-borne pathogens Exposure to airborne pathogens

**UNIT 2**

**ECLS 2.1. Airway**

1. Signs of inadequate breathing
2. Mechanism of injury to opening the airway
3. Steps in the head-tilt chin-lift
4. Steps in the jaw thrust
5. Taking out foreign body
6. Ensuring patent airway during seizures and vomiting.

**ECLS 2.2. Ventilation**

1. Of a patient with a mask or barrier device
2. Steps in providing mouth-to-mouth and mouth-to-stoma ventilation

**ECLS 2.3. Circulation**

1. Evaluate the cardiac status of the patient
2. Determine the need for and take necessary action to proper circulation
3. Steps for control of bleeding: Pressure bandage and tourniquet

**ECLS 2.4. Clearing a foreign body airway obstruction**

**ECLS 2.5. CPR**

1. Implications of cardiac arrest
2. Cardiopulmonary resuscitation (CPR)
    i. How it works
    ii. Steps
    iii. When to stop CPR
3. Brief overview of AED Automated external defibrillator (only demonstration –no hands on)

**SECTION -B**

**UNIT 3**

**ECLS 3.1. Bleeding and Soft Tissue Injuries**

1. Difference between arterial and venous bleeding
2. Stopping external bleeding
3. Identification of Internal bleeding
4. types and Functions of dressings and bandages
5. How to help a victim of burn injury

**ECLS 3.2. Injuries to Muscles and Bones**

1. Suspecting bony/spinal injury
2. Splinting –materials used
3. Importance of splinting

**UNIT 4**

**ECLS 4.1** Medical Emergencies

**ECLS 4.2**

1. Identification of the patient steps in providing first aid to a patient with
    i. A general medical complaint –Seizures
    ii. Chest-pain
        a. Shortness of breath

b. Exposure to heat

c. Including other medical complaints like allergy, diarrhea, fainting, low blood sugar, stroke

2. Drowning

3. Poisoning

**ECLS 4.3** Transportation Importance of timely and proper transportation methods of transportation of victim from site of injury to ambulance. Importance of spine protection methods of spine protection during transportation

**ECLS 4.4** Disaster preparedness-. Preparedness and risk reduction Incident command and institutional mechanisms Resource management

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Emergency Care and life support Skills (ECLS) | BPT 204 (P) | 2 | Practical | 1 | 30 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Demonstrate airway management, ventilation, and basic life support (CPR) on manikins per current resuscitation guidelines (SH) | 3 | 3 | 3 | 2 | 2 | 2 | - | 1 | 1 | - |
| **CO2:** Perform initial management of thermal injury, electric injury, wounds, and stabilization of injured extremities using appropriate first-aid principles (SH) | 3 | 3 | 3 | 2 | 2 | 2 | - | 1 | 1 | - |
| **CO3:** Apply bandaging techniques, extrication, helmet removal, spinal protection, and stretcher/transfer methods safely and correctly (SH) | 3 | 3 | 3 | 2 | 2 | 2 | - | 1 | 1 | - |
| **CO4:** Communicate clearly and coordinate actions within a multidisciplinary emergency response team during simulated scenarios (SH) | 1 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | - |
| **CO5:** Practice emergency care with ethical responsibility, accountability, and awareness of professional scope, seeking assistance when appropriate (KH) | 1 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | - |

**B. Course Content:**

ECLS (P) 5.1. Provide Airway & Ventilation

ECLS (P) 5.2. Perform Basic Life Support: CPR

ECLS (P) 5.3. Perform Initial management of Thermal injury, electric injury

ECLS (P) 5.4. Perform stabilizing injured extremity and wound management

ECLS (P) 5.5. Demonstrate bandaging techniques to various body parts

ECLS (P) 5.6. Demonstrate Extrication, Helmet removal and spine protection

ECLS (P) 5.7. Demonstrate Stretcher use

**Recommended text books for ECLS**

Indian red cross : INDIAN FIRST AID MANUAL 2016 (7th edition) available at: https://www.indianredcross.org/publications/FA-manual.pdf

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Exercise therapy (ExT) | BPT 205 | 2 | Theory | 10 | 150 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Explain the physiological effects of endurance, strengthening, balance and coordination effects on various systems (KH) | 3 | 2 | 1 | 1 | 1 | 1 | - | - | 1 | - |
| **CO2:** Differentiate types of exercise based on their therapeutic effects (SH) | 3 | 3 | 1 | 1 | 1 | 1 | - | - | 1 | - |
| **CO3:** Discuss the indications, contraindications and precautions to be taken while performing i. Passive Range of Motion ii. Active Range of Motion iii. Assisted exercises iv. Endurance exercise v. Strengthening exercise vi. Balance and coordination exercise (SH) | 3 | 3 | 1 | 1 | 2 | 2 | - | - | 1 | - |
| **CO4:** Demonstrate competencies in prescribing i. Passive Range of Motion ii. Active Range of Motion iii. Assisted exercises iv. Endurance exercise v. Strengthening exercise vi. Balance and coordination exercise (SH) | 3 | 3 | 2 | 1 | 2 | 3 | 1 | - | 1 | - |
| **CO5:** Prescribe therapeutic exercise based on the assessment findings (SH) | 3 | 3 | 2 | 2 | 2 | 3 | 1 | - | 1 | - |
| **CO6:** Demonstrate competencies in preparing and implementing evidence-based exercise protocols for movement impairments under supervision (SH) | 3 | 3 | 2 | 2 | 2 | 3 | 1 | - | 1 | - |
| **CO7:** Demonstrate abilities to document the dosage and progression as per the prescribed format (SH) | 2 | 3 | 3 | 2 | 3 | 3 | 1 | - | 1 | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO8:** Communicate the exercise protocol effectively to the stakeholders (SH) | 2 | 2 | 3 | 3 | 2 | 3 | 2 | 1 | 1 | - |

**B. Course Content**

**SECTION-A**

**UNIT 1**

**ExT 1.1. RELAXATION**

1. Discuss Muscle Tone, Postural tone, Voluntary Movement, Degrees of relaxation, Pathological tension in muscle, Stress mechanics, types of stresses, Effects of stress on the body mechanism,

2. Discuss the Indications of relaxation, Methods & techniques of relaxation-Principles & uses:

3. Demonstrate General, Local, Jacobson's, Mitchel's, additional methods

**ExT 1.2. SUSPENSION THERAPY:**

1. Discuss the principles, indications, contraindications and benefits of suspension therapy

2. Demonstrate types of suspension therapy – axial, vertical, pendulum; techniques of suspension therapy for upper limb & lower limb

**ExT 1.3. FUNCTIONAL RE-EDUCATION**

1. Discuss the muscle activities of Lying to sitting:

2. Demonstrate Activities on the Mat/Bed, Movement and stability at floor level; Sitting activities and gait; Lower limb and Upper limb activities.

**ExT 1.4. POSTURE**

1. Discuss Active and Inactive Postures, Postural Mechanism, Patterns of Posture, Principles of re-education:

2. Demonstrate corrective methods and techniques

3. Demonstrate skills in Patient education

**ExT 1.5. BREATHING EXERCISES:**

1. Describe normal breathing

2. Discuss types, techniques, indications, contraindications, therapeutic effects and precautions of breathing exercises

3. Perform Chest expansion measurement and evaluation

**ExT 1.6. GROUP EXERCISES**

1. Discuss the advantages and Disadvantages of group exercises

2. Demonstrate skills in Organization of Group exercises; Recreational Activities and Sports.

**Unit 2**

**ExT 2.1. STRETCHING**

1. Describe terms related to stretching;
2. Discuss Tissue response towards immobilization and elongation
3. Discuss the determinants of stretching exercise
4. Discuss the Effects of stretching, Inhibition and relaxation procedures,
5. Discuss the Precautions to be taken and contraindications of stretching.
6. Perform passive and active stretching for upper and lower limb muscles

**ExT 2.2. MANUAL THERAPY & PERIPHERAL JOINT MOBILIZATION**

1. Discuss Principles, Grades, Indications and Contraindications, Effects and Uses – Maitland, Kaltenborn, Mulligan
2. Discuss Biomechanical basis for mobilization,
3. Explain the Effects of joint mobilisation, in terms of Indications and contraindications, Grades of mobilization, Principles of mobilization
4. Identify red flags for mobilisation
5. Perform mobilization for upper limb lower limb, and spine
    i. Demonstrate clinical reasoning skills in selection and application of manual therapy techniques
    ii. Demonstrate skills in examining joint integrity, contractile and non-contractile tissues
    iii. Identify accessory movements and end feel
    iv. Demonstrate Assessment of articular & extra-articular soft tissue status
    v. Myofascial assessment
    vi. Acute & Chronic muscle hold
    vii. Tightness
    viii. Pain-original & referred
6. Discuss the principles, Indications, Contra-Indications and evidence for schools of mobilization (Maitland, Mulligan, McKenzie, Muscle Energy Technique, Myofascial stretching, Cyriax, Neuro Dynamics)
7. Discuss the Principles, physiological and therapeutic effects of traction
8. Discuss the types, indications, contraindications for traction
9. Perform manual and mechanical tractions

**Section B**

**Unit 3**

**ExT 3.1. THERAPEUTIC GYMNASIUM:**

1. Identify the equipment used in the therapeutic gymnasium
2. Discuss the usage of identified equipment
3. Demonstrate skills in handling the equipment

**ExT 3.2. AEROBIC EXERCISE**

1. Explain the Physiological response to aerobic exercise
2. Discuss the methods of exercise testing
3. Explain the Normal and abnormal response to acute aerobic exercise
4. Discuss the Physiological changes that occur with training,
5. Apply the Principles of Aerobic conditioning program while prescribing exercise

**ExT 3.3. CO-ORDINATION EXERCISE**

1. Discuss the physiology of Co-ordination
2. Appreciate the causes and pathophysiology of Inco-ordination
3. Demonstrate Test for co-ordination: (equilibrium test, non-equilibrium test)
4. Discuss the Principles of co-ordination exercise.
5. Discuss Frenkel's Exercise in terms of its effects, mechanism, indications and Evidence
6. Demonstrate skills in prescribing Frenkel's exercise (Prescription progression, home exercise)

**Unit 4**

**ExT 4.1. MOTOR LEARNING AND FUNCTIONAL RE-EDUCATION:**

1. Describe Motor Learning:
2. Classify of Motor skills
3. Discuss the methods of Measurement of Motor Performance
4. Discuss the Theories of motor control and its application

**ExT 4.2. Discuss Learning under the following headings**

1. Learning Environment:
2. Learning of skill
3. Instruction and augmented feedback Practice Conditions

**ExT 4.3. PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION:**

1. Definitions & goals

2. Explain the neurophysiologic principles of PNF: Muscular activity, Diagonals patterns of movement: upper limb, lower limb

3. Demonstrate skills in performing PNF components (timing for emphasis, resisted progression Endurance: slow reversals, agonist reversal)

4. Demonstrate the following PNF techniques, Procedure: components of PNF

5. Demonstrate skills in performing PNF components (timing for emphasis, resisted progression Endurance: slow reversals, agonist reversal)

6. Demonstrate the following PNF techniques

i. Mobility: Contract relax, Hold relax, Rhythmic initiation

ii. Strengthening: Slow reversals, repeated contractions, timing for emphasis, rhythmic stabilization Stability: Alternating isometric, rhythmic stabilization

**ExT 4.4. WALKING AIDS**

1. Identify different types of walking aids (Crutches, Canes, Frames)

2. Discuss Principles of prescribing walking aids

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Exercise therapy (ExT) | BPT 205 (P) | 2 | Practical | 4 | 120 |

**A. Course Code:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Perform foundational therapeutic exercise techniques PNF patterns and special techniques (UL/LL/trunk), suspension therapy, muscle stretching, and resistance strengthening with correct grip, body mechanics, and dosage (P) | 3 | 2 | 1 | - | 1 | 2 | - | 1 | 2 | - |
| **CO2:** Demonstrate cardiorespiratory and relaxation procedures chest-expansion measurement, breathing exercises, general and special relaxation training and design a graded aerobic training programme (SH) | 3 | 2 | 2 | - | 1 | 2 | - | 1 | 2 | - |
| **CO3:** Apply neuromuscular re-education and functional training Frenkel's coordination exercises, functional re-education, and gait training with crutches/walker (P) | 3 | 2 | 2 | - | 1 | 2 | - | 1 | 2 | - |
| **CO4:** Assess and evaluate posture, gait, limb length, and body circumference using standardised techniques, and interpret findings to justify exercise selection (SH) | 3 | 2 | 2 | - | 1 | 2 | - | 1 | 2 | - |
| **CO5:** Practise safe, ethical, patient-centred conduct during all procedures including clear instruction, consent, hand placement safety, and infection control and observe hydrotherapy and advanced relaxation demonstrations (SH) | 2 | 1 | 3 | 1 | 2 | 2 | 1 | 1 | 2 | - |

**B. Course Content:**

ExT (P) 5.1. Demonstrate the PNF techniques – patterns [ upper limb lower limb trunk], special techniques

ExT (P) 5.2. Demonstrate preparation for relaxation training

ExT (P) 5.3. Measure chest expansion and demonstrate various breathing exercises

ExT (P) 5.4. Demonstrate exercises for training co-ordination – Frenkel's exercise

ExT (P) 5.5. Demonstrate techniques for functional re-education lying to side lying, lying to sitting, sitting to standing

ExT (P) 5.6. Assess and train for using walking aids axillary crutch [ 3 point, 2 point 4-point gait}, elbow crutch walker

ExT (P) 5.7. Demonstrate to use the technique of suspension therapy for mobilizing and strengthening joints and muscles .

ExT (P) 5.8. Demonstrate the techniques for muscle stretching.

ExT (P) 5.9. Assess and evaluate posture and gait .

ExT (P) 5.10. Design and conduct aerobic training programmes .

ExT (P) 5.11. Demonstrate techniques of strengthening muscles using resisted exercises .

ExT (P) 5.12. Demonstrate techniques for measuring limb length and body circumference .

**Observation [Demonstration by the teacher]**

ExT (P) 5.13. Techniques of hydrotherapy in hydrotherapy pool

ExT (P) 5.14. Special techniques of relaxation

**Recommended Text Books for ExT**


1. Practical Exercise Therapy: Hollis, Blackwell, Scientific Publications.

2. Therapeutic Exercise: Foundations and Techniques, Kisner & Colby.

3. Principles Of Exercise Therapy: Gardiner

4. Manipulation and Mobilization: Extremities and Spinal Techniques, Edmond, Mosby.

5. Aquatic Exercise Therapy-Bates and Hanson -W.B. Saunders.

6. Hydrotherapy: Principles & Practices, Campion, Butterworth & Heinemann.

7. Proprioceptive Neuromuscular Facilitation: Voss et al, Williams & Wilkins

8. Orthopedic Physical Therapy: Woods, Churchill Livingstone

9. Manual Examination and Treatment of Spine & Extremities: Wadsworth, Lippincott.

10. Motor Control: Theory and Practical Applications, Shumway Walcott-Lippincott

11. Therapeutic Exercises: Basmajian, Williams &Wilkins.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Electrotherapy (ET) | BPT 206 | 2 | Theory | 10 | 150 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Explain the pathophysiology of inflammation in relation to tissue injury and healing (KH) | 3 | 2 | - | - | - | 1 | - | - | 1 | - |
| **CO2:** Discuss the physiology and pathophysiology of pain (KH) | 3 | 2 | - | - | - | 1 | - | - | 1 | - |
| **CO3:** Discuss theories of pain and their implications for physiotherapy clinical decision making (KH) | 3 | 3 | - | - | - | 1 | - | - | 1 | - |
| **CO4:** Explain the production, physiological and therapeutic effects of electro-physical agents (KH) | 3 | 2 | - | - | 1 | 1 | - | - | 1 | - |
| **CO5:** Discuss the indications, contraindications and precautions when applying electro-physical agents (KH) | 3 | 3 | 1 | - | 1 | 2 | - | - | 1 | - |
| **CO6:** Demonstrate competencies in applying (selection, dosage calculation, progression) electro-physical agents (SH) | 3 | 3 | 2 | - | 1 | 2 | - | - | 1 | - |
| **CO7:** Rationalize the use of electro-physical agents as appropriate to the stage of healing (SH) | 3 | 3 | 1 | - | 1 | 2 | - | - | 1 | - |
| **CO8:** Demonstrate competencies in preparing and implementing evidence-based electro physical agents' protocols for movement impairments under supervision (SH) | 3 | 3 | 2 | - | 2 | 3 | 1 | - | 1 | - |
| **CO9:** Demonstrate the ability to document dosage and progression as per the prescribed format (SH) | 2 | 3 | 3 | - | 3 | 2 | 1 | - | 1 | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO10:** Demonstrate competencies in equipment maintenance, care and safety precautions (SH) | 2 | 3 | 3 | 1 | 3 | 2 | 1 | 1 | 1 | - |
| **CO11:** Demonstrate competencies in communicating to the stakeholders effectively (SH) | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | - |

**B. Course Content**

**Unit 1: Introduction**

ET 1.1. Explain the Physiological responses to heat gain or loss on various tissues of the body.

ET 1.2. Discuss the Physical principles of electromagnetic radiation.

ET 1.3. Discuss the Physics of sound including characteristics and propagation.

ET 1.4. Rationalize the use of electro physical agents as appropriate to the stage of healing

**Unit 2: Therapeutic Ultrasound**

ET 2.1. Explain the mechanism of Production, biophysical effects, types, therapeutics types, indication, and contraindication, precautions, of therapeutic Ultra sound.

ET 2.2. Calculate dosage of ultrasound for various structures and types of injuries

ET 2.3. Demonstrate the skills in application of Therapeutic ultrasound

ET 2.4. Demonstrate the skills in handling the equipment including preparation, maintenance and safety.

**Unit 3 – Therapeutic LASER**

ET 3.1. Discuss the historical background and physical principles of LASER.

ET 3.2. Classify LASER

ET 3.3. Explain the Production, Biophysical effects, types, therapeutic effects, techniques of application, indication, contraindications, and precautions of LASER therapy

ET 3.4. Calculate dosage of LASER for various structures and types of injuries

ET 3.5. Demonstrate the skills in application of LASER

ET 3.6. Demonstrate the skills in handling the equipment including preparation, maintenance and safety

ET 3.7. Discuss the current evidence pertaining to LASER therapy

**Unit 4: Therapeutic Cold (Cryotherapy)**

ET 4.1. Explain the Production, Biophysical effects, types, therapeutic effects, techniques of application, indication, contraindications, and precautions of cryotherapy

ET 4.2. Demonstrate the skills in application of cryotherapy

ET 4.3. Demonstrate the skills in handling the equipment including preparation, maintenance and safety

ET 4.4. Discuss the current evidence pertaining to cryotherapy

**Unit 5: Therapeutic mechanical pressure (Intermittent Compression Therapy)**

ET 5.1. Discuss the Principles, biophysical effects, types, therapeutic effects, indications, and contraindications of intermittent compression therapy

ET 5.2. Demonstrate the skills in application of compression therapy

ET 5.3. Demonstrate the skills in handling the equipment including preparation, maintenance and safety.

ET 5.4. Discuss the current evidence pertaining to intermittent compression therapy

**Unit 6: Shockwave therapy**

ET 6.1. Discuss the Principles, biophysical effects, types, therapeutic effects, indications, and contraindications of shockwave therapy

ET 6.2. Demonstrate the skills in application of shockwave therapy

ET 6.3. Demonstrate the skills in handling the equipment including preparation, maintenance and safety.

ET 6.4. Discuss the current evidence pertaining to intermittent shockwave therapy

**Unit 7:**

ET 7.1. Case Discussion on EPA: Design a management protocol for a client with identified impairments, activity limitations and participatory restrictions.

**Unit 8:**

ET 8.1 TENS: a) Definition b) Theories of pain modulation emphasizing on “Pain Suppression System”, c) Types of TENS d) Techniques of application e) Types of Electrodes & Placement of Electrodes f) Physiological Effects and therapeutic uses g) Indication and contra –indications

ET 8.2 Interferential current: Definition, characteristics, physiological & therapeutic effects of Interferential current, techniques of application, indications, contra-indications and precautions

Russian Currents Parameters, technique of application, effects and uses, Indications and Contraindications Rebox currents Parameters, technique of application, effects and uses, Indications and Contraindications

ET 8.3 Bio-feedback: a) Introduction b) Principles of bio-feedback c) Therapeutic effects of bio-feedback d) Different types of biofeedback e) EMG biofeedback f) Positive and negative feedback g) Technique of application h) Indications and contra-indications

ET 8.4 Combination therapy: a) Principles, b) Therapeutic uses and indications like, Ultrasound therapy with stimulation or TENS etc.

ET 8.5 Short Wave Diathermy (SWD): a) Introduction b) Physiological effects and Therapeutic effects of SWD c) Methods of application (capacitor field method and cable method etc.) d) Techniques of treatment, indication, contra-indications and dangers.

ET 8.6 Pulsed SWD: a) Definition b) Characteristics c) Mechanism of work d) Physiological effects and therapeutic effects e) Indications, techniques of application f) Principles of treatment and contra-indications

ET 8.7 Hydrotherapy: a) Properties of water buoyancy b) Effects of buoyancy on movement c) Hubbard tank d) Contrast bath, e) Whirlpool bath

ET 8.8 Recent advances in Electro-physiotherapy: a) High power class IV LASER b) Shockwave c) PEMF (Pulse Electro Magnetic Energy), High Intensity Magnetotherapy d) Spinal Decompression, e) Pneumatic Compression therapy f) Functional Electrical Stimulation g) TECAR Therapy h) Cold air cryotherapy i) Virtual and Augmented Reality j) Brief idea about Robotic therapy

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Electrotherapy (ET) | BPT 206 (P) | 2 | Practical | 4 | 120 |

**A. Course Outcomes**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Demonstrate safe patient preparation, sensory/skin testing, and equipment handling for electrophysical agents in accordance with standard safety protocols and contraindication screening (SH) | 3 | 3 | 1 | - | 2 | 2 | - | 1 | 2 | - |
| **CO2:** Perform accurate application, parameter selection, and dosage of therapeutic ultrasound, laser, and shockwave therapy for common musculoskeletal presentations (P) | 3 | 3 | 1 | - | 1 | 2 | - | 1 | 2 | - |
| **CO3:** Apply cryotherapy and intermittent compression techniques with parameters appropriate to the stage of tissue healing and patient response (P) | 3 | 3 | 1 | - | 1 | 2 | - | 1 | 2 | - |
| **CO4:** Integrate case-based clinical reasoning to select, sequence, and justify electrophysical agents and adjunct techniques within a goal-directed treatment plan (SH) | 3 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | - |
| **CO5:** Communicate procedures, obtain informed consent, and document treatment delivery while demonstrating professional, ethical, and accountable conduct (SH) | 1 | 3 | 3 | 2 | 3 | 2 | 1 | 1 | 2 | - |

**B. Course Content:**

1. Basic Electrotherapy Skills, Patient Preparation, and Safety Protocols
2. Application and Dosage of Therapeutic Ultrasound
3. Application and Dosage of Therapeutic Laser
4. Application Techniques of Cryotherapy

5. Application of Intermittent Compression Therapy
6. Application of Shockwave Therapy
7. Case-Based Clinical Decision Making Using Electro-Physical Agents
8. Application of Electrotherapy Modalities and Adjunct Techniques

**Recommended Text Books for ET**


1. Electrotherapy Explained: Principle and Practice, Low and Reed, Butterworth Heinemann.

2. Claytons Electrotherapy -Kitchen and Basin.

3. Principles and Practice of Electrotherapy -Kahn Church hill Livingstone.

4. Therapeutic Heat and Cold- William and Wilkins

5. Electrotherapy: Clinics in Physical therapy- Wolf Churchill Livingstone.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Biomechanics & Kinesiology (BK) | BPT 207 | 2 | Theory | 8 | 120 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Discuss the principles of physics and laws related to human movement (KH) | 3 | 3 | - | - | - | 1 | - | - | 1 | - |
| **CO2:** Demonstrate understanding of functional movement (kinetics and kinematics) of the human body (SH) | 3 | 3 | - | - | - | 2 | - | - | 1 | - |
| **CO3:** Identify the relationship between structure, function and mechanical properties of the movement system (SH) | 3 | 3 | - | - | - | 2 | - | - | 1 | - |
| **CO4:** Analyse the components of human movement in both normal and pathological conditions (SH) | 3 | 3 | - | - | 1 | 2 | - | - | 1 | - |
| **CO5:** Apply the principles of movement analysis in understanding normal and abnormal gait and posture (SH) | 3 | 3 | - | - | - | 2 | - | - | 1 | - |
| **CO6:** Perform basic movement analysis to identify gait and postural abnormalities (SH) | 3 | 3 | 2 | - | 1 | 2 | 1 | - | 1 | - |
| **CO7:** Apply the principles of biomechanics in designing physiotherapy protocols (SH) | 3 | 3 | - | - | 1 | 2 | 1 | - | 1 | - |
| **CO8:** Interpret data obtained from movement analysis such as gait and postural analysis (KH) | 3 | 3 | - | - | - | 2 | 1 | - | 1 | - |

**B. Course Content**

**Unit 1:**

**BK 1.1. Basics of Bio-mechanics: Discuss the basic Concepts in Biomechanics: Kinematics and Kinetics in following terms**

1. Types of Motion
2. Location of Motion
3. Direction of Motion
4. Magnitude of Motion
5. Definition of Forces
6. Force of Gravity
7. Reaction forces
8. Equilibrium
9. Objects in Motion
10. Force of friction
11. Concurrent force systems
12. Parallel force system
13. Work
14. Moment arm of force
15. Force components
16. Equilibrium of levers

**BK 1.2. Introduction to Biomechanical Analysis:**

1. Discuss the techniques of biomechanical analysis
2. Explain the importance of biomechanical analysis

**BK 1.3. Explain Joint structure and Function in terms of**

1. Joint design
2. Materials used in human joints
3. General properties of connective tissues
4. Human joint design
5. Joint function
6. Joint motion
7. General effects of disease, injury and immobilization.

**BK 1.4. Discuss Muscle structure and function –**

1. Mobility and stability functions of muscles
2. Elements of muscle structure

3. Muscle function

4. Effects of immobilization, injury and aging

**Unit 2**

**BK 2.1. Biomechanics of spine:**

Discuss the Biomechanics of Cervical spine, Lumbar Spine and Pelvic complex in terms of

1. Structure and function of cervical spine,
2. Factors responsible for stability of cervical spine
3. Movements of cervical spine.
4. Structure and function of lumbar spine,
5. Factors responsible for stability of lumbar spine
6. Movements of lumbar spine.
7. Structure and function of pelvic complex- Sacro-iliac Joint, Sacrum, symphysis pubic joint and lumbo-sacral joint

**BK 2.2.** Analyse the movement of spine

**BK 2.3.** Identify the abnormal movements of Spine

**Unit: 3**

**BK 3.1. Biomechanics of the Thorax and Chest wall –**

Discuss Biomechanics of the Thorax and Chest wall in terms of

1. General structure and function
2. Rib cage and the muscles associated with the rib cage
3. Ventilator motions: its coordination and integration
4. Developmental aspects of structure and function
5. Changes in normal structure and function I relation to pregnancy, scoliosis and COPD
    i. Identify the abnormal movements of thoracic cage
    ii. Discuss the mechanics of abnormal thoracic movement
    iii. Describe the Temporomandibular Joint in terms of General features, structure, function and dysfunction
    iv. Discuss the mechanics of abnormal TMJ movements

**Unit 4:**

**BK 4.1. Biomechanics of the upper extremity joints –**

1. Explain the shoulder complex in terms of Structure and components of the shoulder complex and their integrated function
2. Identify the normal and abnormal movements of shoulder

3. Discuss static and dynamic stability of Shoulder

4. Describe the common abnormalities of shoulder movement

5. Describe elbow complex in terms of Structure and function of the elbow joint – humero-ulnar and humero-radial articulations, superior and inferior radioulnar joints; mobility and stability of the elbow complex; the effects of immobilization and injury.

6. Identify the normal and abnormal movements of elbow joint

7. Describe the common abnormalities of elbow movement

8. Discuss wrist and hand complex in terms of : Structural components and functions of the wrist complex; structure of the hand complex; functional position of the wrist and hand.

9. Identify the normal and abnormal movements of wrist complex

10. Describe the common abnormalities of wrist complex

**Unit 5:**

**BK 5.1. Biomechanics of the lower extremity joints**

1. Explain The hip complex in terms of: structure and function of the hip joint; hip joint pathology- arthrosis, fracture, bony abnormalities of the femur

2. Identify the normal and abnormal movements of Hip joint

3. Discuss stability of Hip

4. Describe the common abnormalities of hip movement

5. Explain knee complex in terms of structure and function of the knee joint – tibiofemoral joint and patellofemoral joint; effects of injury and disease.

6. Identify the normal and abnormal movements of knee joint

7. Discuss stability of knee complex

8. Describe the common abnormalities of knee movement

9. Explain ankle and foot complex in terms of structure and function of the ankle joint, subtalar joint, talo calcaneo navicular joint, transverse tarsal joint, tarsometatarsal joints, metatarsophalangeal joints, interphalangeal joints,

10. Discuss the structure and function of the plantar arches, muscles of the ankle and foot, deviations from normal structure and function – Pes Planus and Pes Cavus

**Unit 6:**

**BK 6.1. Posture**

1. Define Posture

2. Explain normal posture

3. Discuss the factors affecting posture

4. Explain the causes for abnormal posture

5. Discuss kinetics and kinematics of posture
6. Identify postural abnormalities
7. Discuss the role of posture in preventing musculoskeletal disorders.
8. Describe ergonomics
9. Discuss the effects of age, pregnancy, occupation and recreation on posture.

**Unit 7:**

**BK 7.1. Gait**

1. Explain the normal gait cycle
2. Discuss the kinetics and kinematics of gait
3. Discuss the determinants of gait
4. Identify gait abnormalities
5. Discuss the energy recruitment of normal and abnormal gait
6. Explain the kinetic and kinematic analysis of stair climbing
7. Identify the effects of muscle weakness on gait

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Biomechanics & Kinesiology (BK) | BPT 207 (P) | 2 | Practical | 2 | 60 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1**: Analyze the movements occurring at individual joints during ADL (sitting-to-standing, lifting, throwing), identifying the muscles involved, the muscle action produced, and the axes and planes of motion (SH) | 3 | 3 | 2 | - | - | 1 | - | 1 | 2 | - |
| **CO2**: Demonstrate systematic analysis of posture and gait on models, skeletons, and live subjects, and explain the underlying kinematic and muscular contributions (SH) | 3 | 3 | 2 | - | - | 1 | - | 1 | 2 | - |
| **CO3**: Perform analysis of various grips and pinches, correlating hand and upper-limb movements with the muscles and joint mechanics responsible for functional task performance (SH) | 3 | 3 | 2 | - | - | 1 | - | 1 | 2 | - |
| **CO4**: Apply biomechanical principles to interpret functional movement, building the foundation for clinical reasoning in normal and abnormal motion (SH) | 3 | 3 | 2 | 2 | 1 | 2 | - | 1 | 2 | - |

**B. Course Content:**

**BK 8.1.**

Describe Movement Analysis: ADL activities like sitting – to standing, lifting, various grips, pinches Shall be conducted for various joint movements and analysis of the same.

Demonstrations may also be given as to how to analyze posture and gait.

The student shall be taught and demonstrated to analyze activities of daily living – ADL – (like sitting to standing, throwing, lifting etc.)

The student should be able to explain and demonstrate the movements occurring at the joints, the muscles involved, the movements or muscle action produced, and mention the axis and planes through which the movements occur.
The demonstrations may be done on models or skeletons.

**Recommended Reference Books For BK**


1. Cynthia C, Norkin D, Pamela K. Joint structure and function. A comprehensive analysis.

2. Houglum PA, Bertoti DB. Brunnstrom's clinical kinesiology. FA Davis; 2011

3. Steindler A. Kinesiology of the human body under normal and pathological conditions. Springfield, IL. Charles C Thomas.Neumann DA. Kinesiology of the musculoskeletal system-e-book: foundations for rehabilitation. Elsevier Health Sciences;

4. Oatis CA. Kinesiology: the mechanics and pathomechanics of human movement. Lippincott Williams & Wilkins;2009.

5. Hamill J, Knutzen KM. Biomechanical basis of human movement. Lippincott Williams & Wilkins; 2006 Oct1.

6. Robert shawe P. Kapandji AI.: The Physiology of the Joints, Volume 3: The Spinal Column, Pelvic Girdle and Head. Journal of the Australian Traditional-Medicine Society. 2009 Sep1;15(3):178-9.

7. Margareta Nordin: Basic Biomechanics of Musculoskeletal System, 4thEdition

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Yoga and Systems of Medicine (AYUS) | BPT 208 | 2 | Theory | 8 | 120 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** To understand the conceptual aspect of yoga and other Systems of Medicine (K) | 3 | 1 | 1 | 2 | 1 | 1 | - | 2 | 2 | - |
| **CO2:** To appreciate the role of yoga in maintaining personal and societal health (KH) | 3 | 1 | 1 | 2 | 1 | 1 | 1 | 3 | 2 | - |
| **CO3:** To perform basic asanas and pranayama (SH) | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | - |
| **CO4:** To have an understanding of kriyas (SH) | 3 | 1 | 1 | 1 | - | 1 | - | 1 | 2 | - |

**B. Course Content**

**Section A: Yoga**

**Unit 1: Foundations of Yoga**

AYUS 1.1. Introduction to Yoga and its philosophy

AYUS 1.2. Brief history, development of Yoga

AYUS 1.3. Streams & types of Yoga

**Unit 2: Yoga and Health**

AYUS 2.1. Concept of body in yoga – Pancha kosha theory

AYUS 2.2. Concept of Health and Disease in yoga

AYUS 2.3. Stress management through yoga

AYUS 2.4. Disease prevention and promotion of positive health through yoga

**Unit 3: Physiological effects of Yoga practices**

AYUS 3.1. Physiological effects of Shat kriyas

AYUS 3.2. Physiological effects of Asanas

AYUS 3.3. Physiological effects of Pranayamas

AYUS 3.4. Physiological effects of Relaxation techniques and Meditation

**Section B: Other Systems of Medicine**

**Unit 4: Other Systems of Medicine and Need for integration of various system of medicine**

AYUS 4.1. Introduction to AYUSH system of medicine

AYUS 4.2. Introduction to Ayurveda.[Philosophy and Principals, Methods and Brief Treatment Techniques].

AYUS 4.3. Naturopathy [Philosophy and Principals, Methods and Brief Treatment Techniques]

AYUS 4.4. Unani [Philosophy and Principals, Methods and Brief Treatment Techniques].

AYUS 4.5. Siddha [Philosophy and Principals, Methods and Brief Treatment Techniques].

AYUS 4.6. Homeopathy [Philosophy and Principals, Methods and Brief Treatment Techniques].

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Yoga and Systems of Medicine (AYUS) | BPT 208 (P) | 2 | Practical | 2 | 60 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Demonstrate Sukshma Vyayama, 12-step Surya Namaskar, and standing/prone/supine/sitting yogasanas with correct alignment, sequencing, and breath coordination (SH) | 3 | 2 | 1 | - | 1 | 2 | 1 | 1 | 2 | - |
| **CO2:** Perform pranayama techniques and relaxation methods (Shavasana, Yoga Nidra) with accurate breathing control and demonstrate their application for stress and recovery (SH) | 3 | 2 | 1 | - | 1 | 2 | 1 | 1 | 2 | - |
| **CO3:** Describe the principles of yogic kriyas and the AYUSH systems of medicine, and explain their scope and relevance within a multidisciplinary, integrative health framework (KH) | 3 | 2 | 1 | 3 | 1 | 2 | 1 | 1 | 2 | - |
| **CO4:** Apply selected yoga practices for health promotion, fitness, and wellness in healthy individuals, integrating safety screening and contraindication awareness (SH) | 3 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | - |
| **CO5:** Exhibit professional conduct, instructional clarity, and ethical, accountable behaviour while guiding or self-practising yoga, including patient safety and informed communication (SH) | 3 | 2 | 1 | 2 | 3 | 2 | 1 | 2 | 2 | - |

**B. Course Content**

AYUS (P) 5.1. Sukshma Vyayama/Sithilikarna Vyayama and Surya Namaskar: (3 hours) Loosening exercises of each part of the body particularly of the joints 12 step Surya namaskar

AYUS (P) 5.2. Yogic kriyas [Observation/ demonstration only] (3 hours)

1. Neti (Jala Neti, Sutra Neti)
2. Dhauti (Vamana Dhauti, Vastra Dhauti)
3. Trataka
4. Shankaprakshalana (Laghu & Deergha)

AYUS (P) 5.3. Yogasanas:

1. Standing postures (4 hours)
    i. Tadasana (Upward stretch posture)
    ii. Ardha Chakrasana (Half wheel posture)
    iii. Ardha Katichakrasana (Half lumber wheel posture)
    iv. Utkatasana (Chair posture)
    v. Pada Hastasana (Hand to toes posture)
    vi. Trikonasana (Triangle posture)
    vii. Parshva Konasana (Side angle posture)
    viii. Garudasana (Eagle posture)
    ix. Vrikshasana (Tree posture)
2. Prone positions (4 hours)
    i. Makarasana (Crocodile posture)
    ii. Bhujangasana (Cobra posture)
    iii. Salabhasana (Locust posture)
    iv. Dhanurasana (Bow posture)
    v. Naukasana (Boat posture)
    vi. Marjalasana (Cat posture)
3. Supine postures (4 hours)
    i. Ardha halasana/ Uttana Padasana
    ii. Sarvangasana (All limb posture)
    iii. Pawana muktasana (Wind releasing posture)
    iv. Matsyasana (Fish posture)
    v. Halasana (plough posture)
    vi. Chakrasana (Wheel posture)
    vii. Setu Bandhasana (Bridge posture)
    viii. Shavasana (Corpse posture)
4. Sitting postures
    i. Parvatasana (Mountain posture)

ii. Bhadrasana (Gracious posture)

iii. Vajrasana (Adamantine posture)

iv. Paschimottanasana (Back stretching posture)

v. Janushirasana (Head to knee posture)

vi. Simhasana (Lion posture)

vii. Gomukhasana (Cow head posture)

viii. Ushtrasana (Camel posture)

ix. Ardha Matsyendrasana (Half matsyendra spine twist posture)

x. Vakrasana (Spinal twist posture)

xi. Kurmasana (Turtle posture)

xii. Shashankasana (Rabbit posture)

xiii. Mandukasana (Frog Posture)

5. Meditative postures and Meditation techniques (2 hours)

i. Siddhasana (Accomplished pose)

ii. Padmasana (Lotus posture)

iii. Samasana

6. Swastikasana (Auspicious posture)

AYUS (P) 5.4. Pranayamas:

1. The practice of correct breathing and Yogic deep breathing

2. Kapalabhati

3. Bhastrika

4. Sitali

5. Sitkari

6. Sadanta

7. Ujjayi

8. Surya Bhedana

9. Chandra Bhedana

10. Anuloma-Viloma/Nadishodana

11. Bhramari

AYUS (P) 5.5. Relaxation Techniques

1. Shavasana

2. Yoga Nidra

**Recommended text books for AYUS**

1. Lights on yoga by BKS Iyenngar

2. Lights on pranayam by BKS Iyenngar

3. Anatomy and Physiology of Yogic Practices - M.M Ghore, Kaivalyadhama, Lonavala, Pune.

4. A Systematic course in the ancient tantric techniques of yoga and kriya - Bihar School of Yoga, Munger.

5. Yoga for different ailments - series published by SVYASA, Bangalore and Bihar Yoga Bharati.

6. Yoga for common ailments : Robin Monro, Nagarathna & Nagendra - Guia Publication, U.K.

7. Yoga therapy : by Swami Kuvalayanand, Kaivalaya dhama, Lonavala.

8. Yogic therapy : Swami Shivananda, Umachal Yoga Ashram, Kamakhya, Assam.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Clinical Observation (COb) | BPT 209 | 2 | Practical | 2 | 210 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1**: Describe the organizational structure, patient-flow, and workflow of physiotherapy service delivery across OPD and ward/community settings observed during posting (KH) | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | - |
| **CO2**: Identify the scope and indications of physiotherapy practice across core specialties (orthopaedics, neurology/neurosurgery, developmental paediatrics, geriatrics, community/PHC, ergonomics) through structured observation (KH) | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | - |
| **CO3**: Maintain a systematic, accurate case portfolio/diary of observed activities, demonstrating professional conduct, patient confidentiality, and ethical accountability (SH) | 1 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | - |
| **CO4**: Recognize the physiotherapist's role within the multidisciplinary health team and observe effective therapists–patient and inter-professional communication (KH) | 1 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | - |
| **CO5**: Appreciate the social, community, and occupational context of physiotherapy through PHC, old-age-home, and industrial/ergonomic exposure, recognizing the profession's social accountability (KH) | 1 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | - |

**B. Course Content**

Students will be posted in rotation in the physiotherapy OPDs and various wards of hospitals attached with the college. The students will observe the process of providing physiotherapy care for the patients. They may assist the clinical staff as well in executing non clinical aspects of service delivery. Each student shall maintain a case portfolio / diary to record the various activities performed during clinical posting. This diary should be presented before the final exam and the grade should be awarded by the college.

## 3rd Year BPT

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| General Medicine and Pediatrics (GMP) | BPT 301 | 3 | Theory | 6 | 90 |

### A. Course Outcomes (CO)

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Describe aetiology, pathophysiology, clinical manifestations, diagnostic measures and management of communicable/infectious, cardiovascular, nervous, respiratory, GI, genito-urinary and integumentary disorders (K) | 3 | 2 | – | 1 | – | 1 | – | – | 2 | – |
| **CO2:** Acquire skill of history taking and clinical examination of respiratory and cardiovascular systems as part of clinical teaching (SH) | 2 | 2 | 2 | 1 | 1 | 1 | – | – | 1 | – |
| **CO3:** Demonstrate competencies in identifying common clinical signs of various disorders (SH) | 2 | 2 | 1 | 1 | – | 1 | – | – | 1 | – |
| **CO4:** Interpret auscultation findings related to the respiratory and cardiac systems (KH) | 2 | 2 | 1 | 1 | – | 1 | – | – | 1 | – |
| **CO5:** Interpret Chest X-ray, blood gas analysis, pulmonary function tests and haematological studies relevant to cardiovascular, respiratory and general medical conditions (KH) | 3 | 2 | – | 1 | – | 1 | – | – | 2 | – |
| **CO6:** Acquire knowledge of drugs used in each condition to understand their influence on physiotherapy management (K) | 2 | 1 | – | 2 | 1 | 1 | – | – | 1 | – |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO7:** Appreciate the role of different specialists in diagnosing and managing the disorders (K) | 1 | 1 | 1 | 3 | 1 | 1 | – | – | – | – |
| **CO8:** Describe the aetiology, pathophysiology, clinical manifestations, diagnostic measures and management across infectious, CVS, nervous, respiratory, GI, GU and integumentary systems (reinforcement of CO1) (K) | 3 | 2 | – | 1 | – | 1 | – | – | 2 | – |
| **CO9:** Demonstrate competencies in identifying common clinical signs of various disorders (reinforcement of CO3) (SH) | 2 | 2 | 1 | 1 | – | 1 | – | – | 1 | – |
| **CO10:** Demonstrate knowledge in common diagnostic procedures used (blood investigations, radiologic procedures) (K) | 2 | 2 | – | 1 | – | 1 | – | – | 1 | – |
| **CO11:** Appreciate the role of different specialists in diagnosing and managing the disorders (reinforcement of CO7) (K) | 1 | 2 | 1 | 3 | 1 | 1 | – | – | – | – |

**B. Course Content**

**SECTION -A**

**Unit 1: Infections**

GMP 1.1. Classify communicable diseases

GMP 1.2. Discuss the importance of prevention of communicable diseases

GMP 1.3. Discuss the physiological changes caused due to infection.

GMP 1.4. Describe the methods of spreading the infections

GMP 1.5. Discuss different types vaccination used in Infections

GMP 1.6. Discuss the importance of vaccination

GMP 1.7. Discuss the clinical features, Diagnosis, Complications and medical management of

1. Food poisoning and gastroenteritis
2. Sexually transmitted diseases
3. Tuberculosis Leprosy
4. Rheumatic fever

5. Tetanus, Typhoid, Diphtheria

6. Pneumonia

7. Influenza Herpes – simplex and zoster, Varicella, Measles, Mumps, Hepatitis B & C, HIV infections and AIDS.

**Unit 2:**

GMP 2.1. Metabolic and Deficiency Diseases: Discuss etiology, clinical features, diagnosis, complications and treatment

1. Diabetes
2. Anemia
3. Vitamin &Mineral Deficiency diseases
4. Diseases of the endocrine glands

**Unit 3:**

GMP 3.1. Diseases of Respiratory System: Explain the Etiology, clinical features, diagnosis, complications and treatment of the following conditions:

1. Asthma
2. Bronchitis
3. Tuberculosis
4. Massive collapse of lungs
5. Bronchiectasis
6. Bronchial Pneumonia
7. lung abscess
8. Emphysema
9. Pleural effusion
10. Pneumothorax & vocal cords
11. chronic infection of larynx and trachea
12. Abnormalities of trachea 13. infract of lungs
14. chronic obstructive pulmonary disease
15. chest wall deformities

**Unit 4:**

GMP 4.1. Diseases of Circulatory System: Explain the Etiology, clinical features, diagnosis, complications and treatment of the following conditions

1. Atherosclerosis, Thrombosis, Embolism, Hemorrhage, various diseases of arteries,
2. Vascular diseases
3. ischemic heart disease

4. rheumatic heart disease
5. congenital heart disease
6. cardiac arrest
7. Hypertension

**SECTION -B**

**Unit 5: Nutritional Disorders**

GMP 5.1. Describe in details about Nutritional and Energy requirements

GMP 5.2. Explain detail clinical Features and treatment of Deficiency diseases (Protein, Vitamin)

GMP 5.3. Discuss Management of Obesity – diet, exercise and medications

**Unit 6:**

GMP 6.1. Diseases of Digestive and renal Systems: Discuss etiology, clinical features, diagnosis, complications and treatment of the following:

1. Reflux Esophagitis, Achalasia Cardia, Carcinoma of Esophagus, GI bleeding, Peptic Ulcer disease, Carcinoma of Stomach, Pancreatitis, Malabsorption Syndrome, Ulcerative Colitis, Peritonitis, Infections of Alimentary Tract
2. Viral Hepatitis, Wilson's disease, Alpha1-antitrypsin deficiency, Tumors of the Liver, Gall stones, Cholecystitis.
3. Renal Failure, Nephrotic Syndrome, Nephritis, Urinary tract infections, Urinary calculi.

**Unit 7:**

GMP 7.1. Diseases of Skin: Discuss the Causes, clinical features and management of the following skin conditions: Acne, Boil, Carbuncles, Impetigo, Herpes, Urticaria, Psoriasis, Warts, Corn, Psoriasis, Fungal infections, Leprosy, Dermatitis, Eczema, Venereal diseases.

**Unit 8: Pediatrics**

GMP 8.1. Enumerate the problems and management LOW Birth Weight Babies

GMP 8.2. Describe the common congenital Abnormalities with causes and its management.

GMP 8.3. Explain the causes, types, complications, clinical manifestations, and medical management of cerebral palsy

GMP 8.4. Explain the causes, types, complications, clinical manifestations, and medical management of spinal malformations

GMP 8.5. Describe the causes, types, complications, clinical manifestations, and medical management of epilepsies

GMP 8.6. Discuss the causes, clinical manifestations, investigation procedures and medical management of autism spectrum disorders.

GMP 8.7. Discuss the causes, clinical manifestations, investigation procedures and management of hydrocephalus (Including surgical)

**Unit 9: Geriatrics**

GMP 9.1. Discuss the epidemiology, pathogenesis, clinical evolution, presentation and course of common diseases in the elderly

GMP 9.2. Discuss the causes, signs and symptoms degenerative disorders of the aging population (Neurological and musculoskeletal)

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| General Medicine and Pediatrics (GMP) | BPT 301 (P) | 3 | Practical | 1 | 30 |

**A. Course Outcomes (A)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Perform a systematic physiotherapy assessment of patients with general medical, paediatric and geriatric conditions, identifying physiotherapy-relevant impairments and contraindications (SH) | 3 | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | - |
| **CO2:** Demonstrate and safely execute appropriate physiotherapy techniques (e.g., airway clearance, breathing exercises, mobilization, exercise prescription) for the conditions covered in theory (P) | 3 | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | - |
| **CO3:** Formulate problem-based, prioritized treatment goals and an evidence-informed physiotherapy management plan for assigned GMP/paediatric/geriatric cases (SH) | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | - |
| **CO4:** Conduct and present a structured case study history, examination, clinical reasoning, documentation and patient/caregiver communication coordinating with the broader care team (P) | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | - |
| **CO5:** Integrate theoretical knowledge in viva and apply professional, ethical and infection-control practices (consent, confidentiality, standard precautions, patient safety) during patient handling (SH) | 2 | 2 | 2 | 2 | 3 | 3 | 1 | 2 | 2 | - |

**B. Course Content**

1. Various techniques of Physiotherapy mentioned in theory in various conditions/diseases should be demonstrated and practiced by the students.
2. Assessment, goal planning and management of General Medicine and Pediatrics conditions mentioned in theory.
3. General viva.
4. Case Study

**Recommended text books for GMP**


1. Davidson's Principles and Practices of Medicine – Edward – Churchill Livingstone.

2. Hutchinson's Clinical Methods – Swash – Bailliere Tindall.

3. A Short Text book of Medicine – Krishna Rao – Jaypee Brothers.

4. A Short Text book of Psychiatry – Ahuja Niraj – Jaypee Brothers.

5. Shah SN: API text book of Medicine. Vol I & II, 8th Ed, The Association of Physicians of India, Mumbai, 2008.

6. Golwalla SA, Golwalla AF: Medicine for students. 21st Ed, National book depot, Mumbai, 2005.

7. Das PC: Textbook of medicine. 4th Ed, Current books international, Kolkata, 2000.

8. Mehta PJ, Joshi SR, Mehta NP: Practical Medicine. 17th Ed, National Book Depot, New Delhi, 2005.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| General Surgery (GS) | BPT 302 | 3 | Theory | 6 | 90 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1**: Discuss the principles of general surgery and their implications for physiotherapy practice (K) | 3 | 2 | – | 1 | – | 1 | – | – | 1 | – |
| **CO2**: Explain the pathophysiology of wound healing including the factors affecting healing (K) | 3 | 2 | – | – | – | 1 | – | – | 1 | – |
| **CO3**: Discuss the effects of general anaesthesia on various systems and postoperative complications (K) | 3 | 2 | – | 1 | – | 1 | – | – | 1 | – |
| **CO4**: Describe indications, procedures and complications of common surgeries and their implications in PT clinical decision-making (KH) | 3 | 3 | – | 1 | – | 1 | – | – | 1 | – |
| **CO5**: Discuss the common procedures used in plastic surgery and skin grafting (K) | 3 | 1 | – | 1 | – | 1 | – | – | 1 | – |
| **CO6**: Apply basic surgical knowledge in physiotherapy clinical decision-making (KH) | 2 | 3 | – | 1 | – | 1 | – | – | 1 | – |
| **CO7**: Discuss the principles of general surgery and their implications for PT practice (reinforcement of CO1) (K) | 3 | 2 | – | 1 | – | 1 | – | – | 1 | – |
| **CO8**: Explain the pathophysiology of wound healing including factors affecting healing (reinforcement of CO2) (K) | 3 | 2 | – | – | – | 1 | – | – | 1 | – |
| **CO9**: Discuss the effects of general anaesthesia and postoperative complications (reinforcement of CO3) (K) | 3 | 2 | – | 1 | – | 1 | – | – | 1 | – |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO10**: Describe indications, procedures and complications of abdominal, thoracic, neurological, pelvic and vascular surgeries and their PT implications (KH) | 2 | 3 | – | 1 | – | 1 | – | – | 1 | – |
| **CO11**: Apply basic surgical knowledge in PT clinical decision-making (reinforcement of CO6) (KH) | 2 | 3 | – | 1 | – | 1 | – | – | 1 | – |
| **CO12**: Interpret pathological/biochemical studies pertaining to surgical pre- and post-operative conditions (KH) | 2 | 2 | – | 1 | – | 1 | – | – | 1 | – |
| **CO13**: Acquire the skill of clinical examination of the pelvic floor (SH) | 2 | 2 | 1 | – | 2 | 1 | – | 1 | 1 | – |
| **CO14**: Acquire the skill of clinical examination of the pregnant woman (SH) | 2 | 2 | 2 | 1 | 2 | 1 | – | 1 | 1 | – |
| **CO15**: Describe normal and abnormal physiological events during puberty, labour, puerperium, post-natal stage and menopause, and aspects of urogenital dysfunction and their management (K) | 2 | 1 | – | 1 | 1 | 1 | – | 1 | 1 | – |

**B. Course Content**

**SECTION -A**

**Unit 1: Introduction to General Surgery**

GS 1.1. Discuss the principles of surgeries

GS 1.2. Explain the process of wound healing

GS 1.3. Discuss the surgical management of non-healing wounds

GS 1.4. Explain the principles of incision and suturing

GS 1.5. Discuss the types of anesthesia

GS 1.6. Explain the complications of general anesthesia on various systems

GS 1.7. Discuss the Principles of Post-operative management

**Unit 2: Abdominal surgeries**

GS 2.1. Explain the common abdominal incisions

GS 2.2. Discuss the common abdominal and pelvic organ surgical procedures and its Physiotherapy implications (Herniorrhaphy, Colostomy, Ileostomy, Hysterectomy, Prostatectomy, cystectomy, Appendectomy and Cholecystectomy)

**SECTION –B**

**Unit 3: Thoracic surgeries**

GS 3.1. Explain the common thoracic incisions

GS 3.2. Discuss the common thoracic organ surgical procedures and its Physiotherapy implications (CABG, Cardiac transplantation, Valve surgeries, Thoracotomy, Pleural surgeries, Lobectomy, Lung Volume reduction surgeries, Lung transplantation)

**Unit 4: Burns and Plastic Surgery**

GS 4.1. Explain the types of burns

GS 4.2. Explain the assessment procedures followed in standard burn care unit

GS 4.3. Discuss the medical and surgical management of Burns

GS 4.4. Discuss the common procedures used in plastic surgery and skin grafting

GS 4.5. Discuss the role of Physiotherapy following skin grafts

**Unit 5: Soft tissue surgeries**

GS 5.1. Discuss the principles of tendon transfer surgeries

GS 5.2. Discuss the common tendon transfer surgery procedures in terms of indications, prognosis, postoperative care and Physiotherapy role.

**Unit 6: Obstetrics and Gynaecology**

OBG 6.1. Anatomy and physiology of the female reproductive organs. Puberty dynamics.

OBG 6.2. Physiology of menstrual cycle-ovulation cycle, uterine cycle Cx. cycle, Duration. Hormonal regulation of menstruation.

OBG 6.3. Diagnosis of pregnancy.

OBG 6.4. Abortion

OBG 6.5. Physiological changes during pregnancy.

OBG 6.6. Antenatal care.

OBG 6.7. High risk pregnancy., prenatal, common complications Investigation and management

OBG 6.8. Musculoskeletal disorders during pregnancy

OBG 6.9. Normal labour. Multiple Child birth

OBG 6.10. Child birth complications, investigations and management

OBG 6.11. Normal puerperium, lactation and postnatal.

OBG 6.12. Family planning. Medical Termination of pregnancy (MTP).

OBG 6.13. Infection of female genital tract including sexually transmitted diseases, low backache.

OBG 6.14. Prolapse of uterus and vagina.

OBG 6.15. Principles of common gynaecological operations Hysterectomy, D&C, D&E, PEP Smear OBG

6.16. Menopause and its effects

OBG 6.17. Sterility- Pathophysiology, investigations, management

OBG 6.18. Urogenital dysfunction – pre and post natal condition OBG 6.19. Carcinoma of female reproductive organs – surgical management in brief

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| General Surgery (GS) | BPT 302 (P) | 3 | Practical | 1 | 30 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Perform a structured pre- and post-operative physiotherapy assessment of patients across general, abdominal, thoracic, burns, soft-tissue, and OBG conditions, and arrive at a physiotherapy diagnosis (SH) | 3 | 3 | 2 | 1 | 1 | 2 | - | 1 | 2 | - |
| **CO2:** Demonstrate appropriate physiotherapy techniques (e.g., airway clearance, breathing exercises, scar/graft management, mobilisation, pelvic floor/antenatal–postnatal protocols) selected for the specific surgical condition (SH) | 3 | 3 | 2 | - | 1 | 2 | - | 1 | 2 | - |
| **CO3:** Formulate, prioritise, and progress an individualised goal-based treatment plan, modifying it according to surgical precautions, complications, and patient response (P) | 3 | 3 | 2 | 1 | 2 | 2 | - | 1 | 2 | - |
| **CO4:** Communicate professionally and ethically with patients, caregivers, and the multidisciplinary surgical/OBG team, including documentation and safe handling consistent with post-operative precautions (P) | 1 | 3 | 3 | 3 | 2 | 3 | 1 | 1 | 2 | - |
| **CO5:** Present a case study integrating assessment findings, clinical reasoning, and evidence, and defend it through viva demonstrating reflective, self-directed practice (SH) | 2 | 3 | 2 | - | 3 | 3 | 1 | - | 2 | - |

**B. Course Content:**

1. Various techniques of Physiotherapy mentioned in theory in various conditions/diseases should be demonstrated and practiced by the students.
2. Assessment, goal planning and management of general surgery conditions mentioned in theory.
3. General viva.
4. Case Study

**Recommended text Books for GS**


1. S. Das: A concise textbook of surgery. 3rd Ed, Dr. S.Das, Calcutta, 2001.

2. S. Das: A manual on clinical surgery. 6th Ed, Dr. S. Das, Calcutta, 2004.

3. Dutta DC: Text book of obstetrics / Textbook of gynecology. 5th / 6th Ed, New central book agency (P) ltd, Kolkata, 2003/2004.

4. Basak KS: Essentials of ophthalmology. 3rd Ed, Current books international, Kolkata, 2004.

5. Bhargava KB, Bhargava SK & Shah TM: A short textbook of E.N.T diseases. 7th Ed, Usha publications, Mumbai, 2005

6. Text book of Gynecology – by Dutta – New Central Book Agency

7. Dewhurst's Textbook of Obstrutics & Gynaecology

8. "Gabbie's Obstrtrics " and "Clinical Obstrtics and Gynaecology

9. Russell RCG, Williams NS, Bulstrode CJK: Bailey & Love's short practice of surgery. 24th Ed, Arnold, London, 2004

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Orthopedics (OR) | BPT 303 | 3 | Theory | 6 | 90 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Describe aetiology, pathophysiology, clinical manifestations, diagnostic measures, conservative and surgical management of disorders of bones, joints, muscles and soft tissues, including trauma (K) | 3 | 2 | 1 | 1 | – | 1 | – | – | 2 | – |
| **CO2:** Demonstrate competencies in identifying common clinical signs of various musculoskeletal disorders (SH) | 2 | 3 | 1 | – | – | 1 | 1 | 1 | 2 | – |
| **CO3:** Demonstrate abilities in performing special tests to differentially diagnose soft tissue injuries (SH) | 2 | 3 | 1 | – | 1 | 1 | 1 | 1 | 2 | – |
| **CO4:** Demonstrate abilities to interpret radiological findings related to physiotherapy practice (KH) | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | – |
| **CO5:** Appreciate the role of different specialists in diagnosing and managing musculoskeletal disorders (K) | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 2 | – |

**B. Course Content**

**SECTION -A**

**Unit 1**

**OR 1.1. Introduction**

1. Introduction to orthopedics.
2. Clinical examination in an orthopedic patient.
3. Common investigative procedures.
4. Radiological and Imaging techniques in Orthopedics.
5. Inflammation and repair, Soft tissue healing.

**OR 1.2. Traumatology**

1. Fracture: definition, types, signs and symptoms.

2. Fracture healing.

3. Complications of fractures.

4. Conservative and surgical approaches.

5. Principles of management – reduction (open/closed, immobilization etc.).

6. Subluxation/ dislocations – definition, signs and symptoms, management (conservative and operative).

**OR 1.3. Fractures and Dislocations of Upper Limb**

1. Fractures of Upper Limb - causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures:

2. Fractures of clavicle and scapula.

3. Fractures of greater tuberosity and neck of humerus.

4. Fracture shaft of humerus.

5. Supracondylar fracture of humerus.

6. Fractures of capitulum, radial head, olecranon, coronoid, and epicondyles.

7. Side swipe injury of elbow.

8. Both bone fractures of ulna and radius.

9. Fracture of forearm – monteggia, galaezzi fracture –dislocation.

10. Chauffer's fracture.

11. Colle's fracture.

12. Smith's fracture.

13. Scaphoid fracture.

14. Fracture of the metacarpals.

15. Bennett's fracture.

16. Fracture of the phalanges. (Proximal and middle.)

**OR 1.4. Dislocations of Upper Limb –**

1. Anterior dislocation of shoulder – mechanism of injury, clinical feature, complications, conservative management (Kocher's and Hippocrates maneuver), surgical management (putti plat, Bankart's) etc.

2. Recurrent dislocation of shoulder.

3. Posterior dislocation of shoulder – mechanism of injury, clinical features and management.

4. Posterior dislocation of elbow – mechanism of injury, clinical feature, complications & management.

5. Hand Injuries - mechanism of injury, clinical features, and management

6. Crush injuries.

7. Flexor and extensor injuries.

8. Burn injuries of hand

**UNIT 2**

**OR 2.1. Fracture of Spine**

1. Fracture of Cervical Spine - Mechanism of injury, clinical feature, complications (quadriplegia); Management-immobilization (collar, cast, brace, traction); Management for stabilization, management of complication (bladder and bowel, quadriplegia).

2. Clay shoveller's fracture.

3. Hangman's fracture.

4. Fracture odontoid.

5. Fracture of atlas.

**OR 2.2. Fracture of Thoracic and Lumbar Regions -** Mechanism of injury, clinical features, and management— conservative and surgical of common fractures around thoracic and lumbar regions

**OR 2.3. Fracture of coccyx.**

**OR 2.4. Fracture of Rib Cage -** Mechanism of injury, clinical features, management for Fracture Ribs, Fracture of sternum.

**OR 2.5. Fractures and Dislocations of Lower Limb**

1. Fracture of Pelvis and Lower Limb - causes, clinical features, mechanism of injury, complications, conservative a surgical management of the following fractures:

2. Fracture of pelvis.

3. Fracture neck of femur – classification, clinical features, complications, management - conservative and surgical.

4. Fractures of trochanters.

5. Fracture shaft femur—clinical features, mechanism of injury, complications, management-conservative and surgical.

6. Supracondylar fracture of femur.

7. Fractures of the condyles of femur.

8. Fracture patella.

9. Fractures of tibial condyles.

10. Both bones fracture the tibia and fibula.

11. Dupuytren's fracture

12. Maisonneuve fracture.

13. Pott's fracture – mechanism of injury, management.

14. Bimalleolar fracture
15. Trimalleolar fracture
16. Fracture calcaneum – mechanism of injury, complications and management.
17. Fracture of talus.
18. Fracture of metatarsals—stress fractures Jones's fracture.
19. Fracture of phalanges.

**OR 2.6. Dislocations of Lower Limb -** mechanism of injury, clinical features, complications, management of the following dislocations of lower limb.

1. Anterior dislocation of hip.
2. Posterior dislocation of hip.
3. Central dislocation of the hip.
4. Dislocation of patella.
5. Recurrent dislocation of patella.

**OR 2.7. Soft Tissue Injuries -** Define terms such as sprains, strains, contusion, tendinitis, rupture, tenosynovitis, tendinosis, bursitis.

**OR 2.8. Mechanism of injury of each, clinical features, managements- conservative and surgical of the following soft tissue injuries:**

1. Meniscal injuries of knee.
2. Cruciate injuries of the knee.
3. Medial and lateral collateral injuries of the knee.
4. Lateral ligament of ankle.
5. Wrist sprains.
6. Strains- quadriceps, hamstrings, calf, biceps, triceps etc.
7. Contusions- quadriceps, gluteal, calf, deltoid etc.
8. Tendon ruptures-Achilles, rotator cuff muscles, biceps, pectorals etc.

**SECTION -B**

**UNIT 3**

**OR 3.1. Amputations** - Definition, levels of amputation of both lower and upper limbs, indications, complications.

**OR 3.2. Traumatic Spinal Cord Injuries** - Clinical features, complications, medical and surgical management of Paraplegia and Quadriplegia.

**OR 3.3. Deformities** - clinical features, complications, medical and surgical management of the following Congenital and Acquired deformities.

1. Congenital Deformities –

i. CTEV.

ii. CDH.

iii. Torticollis.

iv. Scoliosis.

v. Flat foot.

vi. Vertical talus.

vii. Hand anomalies- syndactyly, polydactyly and ectrodactyly. Arthrogryposis multiplex congenita (amyoplasia congenita).

viii. Limb deficiencies- Amelia and Phocomelia. Klippel feil syndrome. Osteogenesis imperfecta(fragile ossium).

ix. Cervical rib.

2. Acquired Deformities –

i. Acquired Torticollis.

ii. Scoliosis.

iii. Kyphosis.

iv. Lordosis.

v. Genu varum.

vi. Genu valgum.

vii. Genu recurvatum

viii. Coxa vara.

ix. Pes cavus.

x. Hallux rigidus.

xi. Hallux valgus.

xii. Hammer toe.

xiii. Metatarsalgia.

**OR 3.4. Disease of Bones and Joints:** Causes, Clinical features, Complications, Managementmedical and surgical of the following conditions:

1. Infective conditions: Osteomyelitis (Acute / chronic). Brodie's abscess. TB spine and major joints like shoulder, hip, knee, ankle, elbow etc.

2. Arthritic conditions: Pyogenic arthritis. Septic arthritis. Syphilitic infection of joints.

3. Bone Tumors: classification, clinical features, management - medical and surgical of the following tumors: Osteoma. Osteosar- coma, Osteochondroma. Enchondroma. Ewing's sarcoma. Gaint cell tumor. Multiple myeloma. Metastatic tumors.

4. Perthes disease, Slipped Capital Femoral Epiphysis and Avascular Necrosis.

5. Metabolic Bone Diseases: Rickets. Osteomalacia, Osteopenia. Osteoporosis.

6. Inflammatory and Degenerative Conditions: causes, clinical feature, complications, deformities, radiological features, management- conservative and surgical for the following conditions:

7. Osteoarthritis. Rheumatoid arthritis. Ankylosing spondylitis Gouty arthritis. Psoriatic arthritis. Hemophilic arthritis. Still's disease (juvenile rheumatoid arthritis). Charcot's joints.

8. Connective Tissue Disorders- Systemic Lupus Erythematosus, Scleroderma, Dermatomyositis, Poliomyelitis, Mixed connective tissue Disease (MCTD)

**UNIT 4**

**OR 4.1. Syndromes:** Causes, Clinical features, complications, management- conservative and surgical of the following:

1. Cervico brachial syndrome.
2. Thoracic outlet syndrome. Vertebro- basilar syndrome.
3. Scalene syndrome.
4. Costo clavicular syndrome.
5. Levator scapulae syndrome.
6. Piriformis syndrome.

**OR 4.2. Neuromuscular Disorders:** Definition, causes, clinical feature, complications, management. (Multidisciplinary approach) medical and surgical of the following conditions:

1. Cerebral palsy.
2. Poliomyelitis.
3. Spinal Dysraphism.
4. Leprosy.

**OR 4.3. Cervical and Lumbar Pathology:** Causes, clinical feature, patho-physiology, investigations, management-Medical and surgical for the following:

1. Prolapsed intervertebral disc (PID)
2. Spinal Canal Stenosis
3. Spondylosis (cervical and lumbar)
4. Spondylolysis.
5. Spondylolisthesis.
6. Lumbago/ Lumbosacral strain.
7. Sacralisation.
8. Lumbarisation.
9. Coccydynia.

10. Hemivertebra.

**OR 4.4. Orthopedic Surgeries:** Indications, Classification, Types, Principles of management of the following Surgeries:

1. Arthrodesis.
2. Arthroplasty (partial and total replacement).
3. Osteotomy
4. External fixators.
5. Spinal stabilization surgeries (Harrington's, Luque's, Steffi plating) etc
6. Limb re-attachments.

**OR 4.5. Regional Conditions:** Definition, Clinical features and management of the following regional conditions

1. Shoulder: Periarthritic shoulder (adhesive capsulitis). Rotator cuff tendinitis. Supraspinatus Tendinitis. Infraspinatus Tendinitis. Bicipital Tendinitis. Subacromial Bursitis.

2. Elbow: Tennis Elbow. Golfer's Elbow. Olecranon Bursitis (student's elbow). Triceps Tendinitis.

3. Wrist and Hand: De Quervain's Tenosynovitis. Ganglion. Trigger Finger/ Thumb. Mallet Finger, Carpal Tunnel Syndrome, Dupuytren's Contracture.

4. Pelvis and Hip: IT Band Syndrome. Piriformis Syndrome. Trochanteric Bursitis.

5. Knee: Osteochondritis Dissecans. Prepatellar and Suprapatellar Bursitis. Popliteal Tendinitis. Patellar Tendinitis. Chondromalacia Patella. Plica Syndrome. Fat Pad Syndrome (Hoffa's syndrome).

6. Ankle and Foot: Ankle Sprains. Plantar Fasciitis / Calcaneal Spur. Tarsal Tunnel Syndrome. Achilles Tendinitis. Metatarsalgia. Morton's Neuroma.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Orthopedics (OR) | BPT 303 (P) | 3 | Practical | 1 | 30 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Perform a systematic orthopedic assessment (history, inspection, palpation, ROM, special tests) on patients with upper-limb, lower-limb, and spinal conditions (P) | 3 | 3 | 2 | 1 | 2 | 2 | - | 1 | 2 | - |
| **CO2:** Interpret plain radiographs and common investigations to identify fractures, dislocations, and skeletal/joint abnormalities (SH) | 3 | 3 | 1 | 2 | 1 | 2 | - | - | 2 | - |
| **CO3:** Integrate clinical and radiological findings to formulate a provisional diagnosis and a reasoned differential diagnosis (SH) | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | - |
| **CO4:** Demonstrate correct selection, application, and handling of orthopedic equipment, appliances, and assessment tools (OSPE) (P) | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | - |
| **CO5:** Communicate findings and demonstrate ethical, safe, patient-centred conduct throughout examination and handover (P) | 1 | 3 | 3 | 2 | 3 | 2 | 1 | 2 | 2 | - |

**B. Course Content:**

Long /short case examination of patients focusing on history taking examination observation, palpation, special tests, identification of abnormalities in radiograph diagnosis, differential diagnosis, OSPE on equipment.

**Recommended Text Books for OR**

1. Outline of Fracture-Adams
2. Outline of Orthopaedics-Adams

3. Orthopaedics and Traumatology-Natrajan

4. Apley's Orthopaedics

5. Textbook of orthopaedics- Maheshwari

6. Tureks Orthopaedics.

7. Cambells Operative Orthopaedics.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Physiotherapy in Adult and Pediatric Medical and Surgical Conditions (PTMS) | BPT 304 | 3 | Theory | 12 | 180 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Assess and identify impairments, activity limitations and participatory restrictions caused by acute/chronic infections and integumentary, genito-urinary and gastro-intestinal diseases (SH) | 3 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | – |
| CO2: Plan and implement evidence-based PT protocols to manage impairments, activity limitations and participation restrictions caused by the above conditions (SH) | 3 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | - |
| CO3: Assess and identify impairments, activity limitations and participation restrictions due to common surgical procedures (abdomen, thorax, pelvis, tendon transfer, plastic/reconstructive, organ transfer) (SH) | 3 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | - |
| CO4: Plan and implement evidence-based PT protocols to manage impairments and restrictions due to those surgical procedures (SH) | 3 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | - |
| CO5: Select and use appropriate outcome measures in postoperative care (SH) | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | - |
| CO6: Demonstrate competencies in documenting PT assessment and management protocols in managing medical and surgical clients (SH) | 2 | 2 | 3 | 1 | 2 | 2 | 1 | 1 | 1 | – |

**B. Course Content**

**SECTION -A**

**Unit 1**

PTMS 1.1. Oedema-Traumatic, Obstructive, Paralytic, oedema due to poor muscle and laxity of fascia Lymphedema

PTMS 1.2. Role of Physiotherapy in wounds and local infections Care of ulcers and wounds - Care of surgical scars-U.V.R and other electro therapeutics for healing of wounds, prevention of Hyper-granulated Scars Keloids, Electrotherapeutics measures for relief of pain during mobilization of scars tissues.

PTMS 1.3. Physiotherapy in skin conditions Documentation of assessment, treatment and follow up skin conditions. U.V.R therapy in various skin conditions; Vitiligo; Hair loss; Pigmentation; Infected wounds ulcers. Faradic foot bath for Hyperhydrosis. Massage maneuvers for cosmetic purpose of skin; use of specific oil as medium; Care of anesthetic hand and foot;

**Unit 2**

PTMS 2.1. Principles of Pre and post operative Physiotherapy in abdominal surgeries common Complication, Abdominal incisions assessment

PTMS 2.2. Physiotherapy in pre and post-operative stages of Operations on upper G.I.T.-oesophagus, stomach, duodenum, Operations on large and small intestine – Appendicectomy, cholecystectomy, partial colectomy, ileostomy, hernia and herniotomy, herniorrhaphy, hernioplasty.

PTMS 2.3. Physiotherapy in burns, skin grafts, and reconstructive surgeries

**SECTION –B**

**Unit 3**

PTMS 3.1. Vestibular Rehabilitation: Role of vestibular system in postural control Assessment of Balance and vestibular ocular reflex Benign Paroxysmal Positional Vertigo, Unilateral Vestibular Loss, Bilateral Vestibular Disorder– Assessment and management of Posterior Canal, Anterior Canal, Horizontal Cana Treatment theory, goals of management and progression Exercise Prescription in Vertigo

PTMS 3.2. Physiotherapy in obstetrics & gynecology :Physiotherapy in mother and child care – ante and post-natal management, early intervention and stimulation therapy in child care (movement therapy Physiotherapy in mother and child care – ante and post-natal management, early intervention and stimulation therapy in child care (movement therapy) Complication of pregnancy Labour training Antenatal and post-natal training Abdominal and pelvic floor muscles exercise Prolapse Uterus Pelvic Inflammatory Conditions Stress Incontinence,Yoga in Obstetric and Gynecological conditions

PTMS 3.3. Physiotherapy in Oncology and palliative care Introduction and common symptoms of cancer Breast Cancer Head and neck cancer Lung Cancer Oral Cavity Bone Cancer Pre and post-surgical evaluation Lymphedema managements Palliative care Common Physiotherapy approaches

**Unit 4**

PTMS 4.1. Geriatric Physiotherapy I: Normal Ageing – Definition, the anatomical, physiological and cognitive changes related to aging. Epidemiology and socio-economic impact of aging. The examination and assessment of a geriatric patient Diet and nutritional requirement of the elderly, Falls in the elderly Dementia – types and principles of management

PTMS 4.2. Physiotherapy in metabolic disorders: Role of Physiotherapy in Hypertension Role of Physiotherapy in Diabetes

PTMS 4.3. Ear, Nose and Throat conditions: Otitis Media, Sinusitis mastoidectomy, chronic rhinitis, laryngectomy, pharyngeolaryngectomy, facial palsy. Physiotherapy in dentistry – TMJ rehabilitation

**Unit 5**

PTMS 5.1. Abdominal Surgeries

PTMS 5.2. Cleft lip and Cleft Palate

PTMS 5.3. Health Fitness and Promotion: Fitness Evaluation, Analysis of Body composition, Evaluation and prescription of Exercise, Factors affecting exercise Performance, Exercise Prescription for Children.

PTMS 5.4. CBR in paediatrics

PTMS 5.5. Evidence based practice (desirable to know)

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Physiotherapy in Adult and Pediatric Medical and Surgical Conditions (PTMS) | BPT 304 (P) | 3 | Practical | 4 | 120 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1**: Assess and identify impairments/limitations using ICF (SH) | 3 | 3 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | - |
| **CO2**: Apply exercise, respiratory, mobilization & electrotherapy techniques (P) | 3 | 3 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | - |
| **CO3**: Plan & execute management protocols + patient/caregiver education (P) | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | - |
| **CO4**: Prescribe aids/orthoses & deliver ergonomic advice (SH) | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | - |
| **CO5**: Present cases & communicate within the MDT ethically (P) | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | - |

**B. Course Content:**

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

PTMS (P) 6.1. Bedside case presentations and case discussions

PTMS (P) 6.2. Lab sessions consisting of evaluation and assessment methods and treatment techniques on student models/ simulation.

PTMS (P) 6.3. Identification of impairment activity limitation and participation restriction and Planning and execution of management protocol for various medical and surgical conditions with respect to

1. Active exercise regimen
2. Respiratory techniques
3. Passive mobilization and stretching procedures
4. Selection of electrotherapeutic modalities
5. Patient and caregiver education and training
6. Functional training programme

7. Bladder bowel training
8. Integumentary care

PTMS (P) 6.4. Prescription and training of suitable aids appliances and Orthotic devices

PTMS (P) 6.5. Ergonomic advice

**Recommended text books for PTMS**


1. Physiotherapy in Gynecological & Obstetrical conditions–Mantle
2. Text of Physiotherapy for obstetrics and Gynecology – G.B. Madhuri&Pruthvish
3. Physical Rehabilitation-Susan B O'Sullivan, Thomas. J. Schmitz
4. Multani and Verma – Principles of Geriatric Physiotherapy
5. Tidys Textbooks of Physiotherapy. Elsevier
6. Cash Textbook of Physiotherapy in Medical and Surgical Conditions.
7. Physical Rehabilitation, Assessment and management; Susan Sullivan
8. Physiotherapy in Obstetrics and Gynaecology, Polden
9. Women's Health – Sapsford
10. Geriatric Physical therapy- Andrew A. Guccione

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Physiotherapy in Adult and Pediatric Orthopedics Conditions (PTO) | BPT 305 | 3 | Theory | 12 | 180 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1**: Assess and identify physiotherapy-related problems due to trauma, infection and rheumatic disorders of bones, joints, muscles, soft tissues and post-surgical conditions (SH) | 3 | 3 | 2 | 1 | 1 | 2 | 1 | – | 2 | – |
| **CO2**: Demonstrate competencies in differentially diagnosing various musculoskeletal disorders (SH) | 3 | 3 | 2 | 1 | – | 2 | 1 | 1 | 2 | – |
| **CO3**: Develop and implement evidence-based physiotherapy protocols in managing MSK and post-surgical conditions (joint replacement and reconstructive surgeries) (SH) | 3 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | - |
| **CO4**: Select and use appropriate outcome measures in managing clients with musculoskeletal disorders (SH) | 2 | 3 | 1 | – | – | 2 | 1 | 1 | 2 | - |
| **CO5**: Document assessment findings, clinical decision-making, PT protocol and prognosis as per the prescribed format (SH) | 2 | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | – |
| **CO6**: Demonstrate competencies in communicating effectively to stakeholders, including healthcare providers (SH) | 1 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 2 | – |

**B. Course Content**

**SECTION -A**

**Unit 1**

PTO 1.1. PT assessment for Orthopedic conditions - SOAP format. Subjective - history taking, informed consent, personal, past, medical and socioeconomic history, chief complaints, history of present illness. Pain assessment- intensity, character, aggravating and relieving factors, site and location. Objective- on observation - body built swelling, muscle atrophy, deformities, posture and gait. On palpation- tenderness-grades, muscle spasm, swelling- methods of swelling assessment, bony prominences, soft tissue texture and integrity, warmth and vasomotor disturbances. On examination – ROM – active and passive, resisted isometric tests, limb length-apparent, true and segmental, girth measurement, muscle length testing-tightness, contracture and flexibility, manual muscle testing, peripheral neurological examination-dermatomes, myotomes and reflexes, special tests and functional tests. Prescription of home program. Documentation of case records, and follow up.

PTO 1.2. Fractures - types, classification, signs and symptoms, complications. Fracture healing - factors affecting fracture healing. Principles of fracture management - reduction - open and closed, immobilization - sling, cast, brace, slab, traction - manual, mechanical, skin, skeletal, lumbar and Cervical traction, external fixation, functional cast bracing. PT management in complications - early and late - shock, compartment syndrome, VIC, fat embolism, delayed and mal union, RSD, myositis ossificans, AVN, pressure sores etc. Physiotherapy assessment in fracture cases. Aims of PT management in fracture cases - short and long term goals. Principles of PT management in fractures - Guidelines for fracture treatment during period of immobilization and guidelines for treatment after immobilization period.

PTO 1.3. Principles of various schools of thought in manual therapy. (Briefly Maitland and Mc kenzie

PTO 1.4. Principles of Pre and post-operative PT assessment, goals, precautions and PT management of Orthopedic surgeries: Arthrodesis, Osteotomy, Arthroplasty-partial and total - Excision arthroplasty, excision arthroplasty with implant, interpositional arthroplasty and total replacement; Tendon transplant, Soft tissue release- tenotomy, myotomy, lengthening; Arthroscopy, Spinal stabilization, Re-attachment of limbs, External fixators, Synovectomy.

PTO 1.5. Degenerative and inflammatory conditions: Definition, signs and symptoms, clinical features, path physiology, radiological features, deformities, medical, surgical management. Describe the PT assessment and management and home program for the following conditions – Osteoarthritis - emphasis mainly on knee, hip and hand, Rheumatoid Arthritis, Ankylosing spondylitis, Gout, Perthes disease, Periarthritic shoulder.

PTO 1.6. Infective conditions: Definition, signs and symptoms, clinical features, pathophysiology, radiological features, medical, surgical management. De- scribe PT assessment and management for

following conditions – Osteomyelitis – acute and chronic, Septic arthritis, pyogenic arthritis, TB spine and major joints - knee and hip.

**Unit 2 Conservative and/peri-operative PT management in**

PTO 2.1. Traumatic conditions of upper limb shoulder arm elbow forearm wrist and hand upper limb fractures and dislocations. sprains Hand Injuries: Flexor tendon, Extensor tendon, Compartment Syndrome, Reflex sympathetic dystrophy:

PTO 2.2. Non traumatic conditions of upper limb conservative and post-operative PT management of Shoulder instabilities, TOS, RSD, Impingement syndrome - AC joint injuries - Rotator cuff tears- Subacromial decompression Carpal tunnel syndrome – deformities

PTO 2.3. pre and peri operative PT management following upper limb surgeries: Total shoulder replacement Hemi replacement Repair of ruptured extensor tendons. Total wrist arthroplasty Flexor and extensor tendon lacerations Excision of radial head -. Total elbow arthroplasty

PTO 2.4. Amputations of upper limb Definition, levels, indications, types, PT assessment, aims, management pre and post operatively. PT management with emphasis on stump care and bandaging. Pre and post prosthetic training, checking out prosthesis, complications of amputations and its management

**Section-B**

**Unit 3 Conservative and/peri-operative PT management.**

PTO 3.1. Traumatic conditions of lower limb: pelvis, hip knee ankle and foot fractures and dislocations

PTO 3.2. Non-Traumatic conditions of lower limb hip knee ankle and foot Tendonitis and bursitis Plica syndrome, patellar dysfunction and Hoffa's syndrome Deformities of lower limb: CTEV, CDH, pes planus, pes cavus, coxa vara, genu varum, valgum and recurvatum

PTO 3.3. pre and peri operative PT management following lower limb surgeries - hemi and total hip replacement -. - Lateral retinacular release, chondroplasty ACL and PCL reconstruction surgeries Management. Realignment of extensor mechanism Meniscectomy and meniscal repair TKR Patellectomy Ligamentous tears

PTO 3.4. Amputations of lower limb Definition, levels, indications, types, PT assessment, aims, management pre and post operatively. PT management with emphasis on stump care and bandaging. Pre and post prosthetic training, checking out prosthesis, complications of amputations and its management

**Unit 4 Conservative and/peri-operative PT management**

PTO 4.1. Traumatic conditions of spine: SPINAL FRACTURES cervical thoracic lumber Spinal CORD INJURY Intervertebral disc prolapsed (PIVD) sprain contusion

PTO 4.2. Non traumatic condition of spine: Cervical and lumbar spinal disorders: spondylosis, spondylolisthesis, Stenosis Cervical spondylosis, Lumbar spondylosis, Spondylolisthesis, Spinal canal stenosis, Spondylolysis, Sacroiliac joint dysfunction, Sacralisation, Lumbarisation, Intervertebral disc prolapse, Coccydynia, Spina bifida occulta, Thoracic Outlet Syndrome TB SPINE, non-specific low back pain Ankylosis spondylitis Scoliosis, kyphosis, Lordosis, sway back, torticollis

PTO 4.3. Pre and peri operative PT management following spine surgeries

PTO 4.4. Concepts of mechanize school of spinal disorders, back school

**Unit 5**

PTO 5.1. Deformities – Review the Causes, Clinical Features, Complications, radiological features, Medical and Surgical Management of the Following Congenital and Acquired

1. Deformities: Congenital deformities - CTEV. CDH. Torticollis. Scoliosis. Flat foot. Vertical talus. Hand anomalies - syndactyly, polydactyly and ectrodactyly. Arthrogryposis multiplex congenital (amyoplasia congenita). Limb deficienciesAmelia and Phocomelia. Klippel feil syndrome. Osteogenesis imperfect (fragile ossium).
2. Acquired deformities - Acquired Torticollis. Scoliosis. Kyphosis. Lordosis. Genu varum. Genu valgum. Genu recurvatum Coxa vara. Pes cavus.

PTO 5.2. Diseases of Bones and Joints – Introduction, Causes, Clinical features, Types, Complications, Investigations and Management - medical and surgical of the following conditions:

1. Infective: Osteomyelitis, TB Spine and other major joints
2. Perthes, Slipped Capital Femoral Epiphysis, Avascular Necrosis
3. Metabolic: Rickets, Osteomalacia

PTO 5.3. Soft tissue injuries in Paediatrics - Overview, Investigations and Management

PTO 5.4. Fractures and dislocations of Upper extremity, Lower extremity and Spine in Paediatrics - Introduction, Investigations and Orthopedic management

PTO 5.5. Low back pain and neck pain in Paediatrics - Introduction, Causes, Types, Investigations and Management

PTO 5.6. Paediatric sports injuries - Introduction, Types, Investigations and Management

PTO 5.7. Amputations, Illizarov

PTO 5.8. Surgeries for cerebral palsy (Rhizotomy, Tendon lengthening, osteotomies, arthrodesis)

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Physiotherapy in Adult and Pediatric Orthopedics Conditions (PTO) | BPT 305 (P) | 3 | Practical | 4 | 120 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Perform a comprehensive SOAP-based orthopedic PT assessment (history, informed consent, observation, palpation, ROM, MMT, muscle length, special tests, peripheral neuro exam) and arrive at a functional diagnosis with proper documentation, for adult and pediatric musculoskeletal conditions (P) | 3 | 3 | 2 | - | 1 | 2 | 1 | 1 | 2 | - |
| **CO2:** Independently execute therapeutic interventions graded active/resisted exercise, passive joint mobilization, manual therapy (Maitland/McKenzie principles), and appropriate selection of electrotherapeutic modalities for traumatic, non-traumatic, degenerative, inflammatory, and infective conditions of upper limb, lower limb, and spine (P) | 3 | 3 | 1 | - | 1 | 2 | 1 | 1 | 2 | - |
| **CO3:** Plan and apply structured conservative and pre/peri/post-operative management protocols (including fracture stages, arthroplasty, soft-tissue/ligament reconstruction, spinal surgery) and demonstrate amputation rehabilitation with stump care, bandaging, and orthotic/prosthetic checkout and training (P) | 3 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | - |
| **CO4:** Communicate effectively across the care pathway delivering patient | 1 | 2 | 3 | 3 | 2 | 1 | 2 | 2 | 2 | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| education, home exercise programs, ergonomic advice, and functional training while collaborating within a multidisciplinary team and maintaining accurate clinical records and follow-up (P) | | | | | | | | | | |
| **CO5:** Demonstrate ethical, accountable, and evidence-informed professional conduct in clinical and lab settings, including consent, patient safety, scope awareness, and self-directed correction of technique reflecting commitment to professional excellence and lifelong learning (P) | 1 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 3 | - |

**B. Course Content:**

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

1. Bedside case presentations and case discussions
2. Lab sessions consist of evaluation and assessment methods on student models, treatment techniques and practice sessions.
3. Student should be able to execute independently the following procedures on self / human model / patient History taking: examination observation palpation tests, investigation, diagnosis, functional diagnosis [impairment, functional restriction, activity limitation] documentation
4. Planning and execution of management protocol for various conditions of upper limb, lower limb, and spine in various clinical settings with respect to adult and Paediatric conditions
5. Active exercise regimen
6. Passive mobilization procedures Selection of electrotherapeutic modalities
7. Patient education
8. Functional training programme
9. Orthotic and prosthetic checkout and training Ergonomic advice

**Recommended Text Books for PTO**


1. Orthopaedic Physiotherapy, Robert A Donatelli, Churchill Livingstone.
2. Tidy's Physiotherapy, Ann Thomasons, Varghese publishing House.

3. Physical Rehabilitation Assessment and Treatment, Susan Sullivan, Japee brothers

4. Textbook of Orthopaedics, John Ebnezar, Japee Brothers.

5. Textbook of Orthopaedics and Rheumatology for Physiotherapists, Patricia A Downie.

6. Orthopedic Physical Assessment – David Magee

7. Clinical Orthopaedic Diagnosis – Surishwar Pandey

8. Orthopaedics for Physiotherapist – Jayant Joshi.

9. Therapeutic Exercise: Foundations and Techniques - Kolby & Carolyn Kisner

10. Apley's system of Orthopaedics and fractures -Louis Solomon, David J. Warwick Arnold Publishers, London

11. Turek's Orthopaedics: Principles and their Application, Weinstein SL and Buckwalter JA, Lippincott

12. Clinical Orthopaedic Rehabilitation, Brent Brotzman.

13. Peripheral Mobilisation – GD Maitlant, Butterworth

14. Vertebral Mobilisation – GD Maitland, Butterworth and Heinmann Publication.

15. Manual Therapy: Nags, Snags, MWMs, etc - 6th Edition Brian Mulligan

16. Neural tissue mobilization –Butler

17. Therapeutic Exercise: Moving Toward Function - Carrie M. Hall, Lori Thein Brody

18. Manual Mobilization of Extremity Joints-Kaltenborn

19. Clinical Orthopaedic rehabilitation- Broadsman

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Physical & functional Diagnosis & Prescription (PFDP) | BPT 306 | 3 | Theory | 8 | 120 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Explain movement dysfunction and the models used to evaluate function in the ICIDH and ICF approaches (KH) | 3 | 3 | 1 | 1 | - | 1 | 1 | – | 1 | - |
| CO2: Explain the choice of appropriate tools/instruments of assessment in musculoskeletal, neurological, cardiovascular and respiratory conditions (KH) | 3 | 3 | 1 | 1 | - | 1 | 1 | 2 | 1 | - |
| CO3: Demonstrate the skills for independent performance of various tests and procedures (SH) | 2 | 3 | 2 | 1 | 1 | 1 | 1 | – | 1 | - |
| CO4: Document evaluation findings based on the ICF model, identifying structural/functional impairments, participation, contextual factors and capacity/performance measurement (SH) | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | - |

**B. Course Content**

**SECTION -A**

**Unit 1**

PFDP 1.1. Introduction to International Classification of Function, Disability & Health (I.C.F.) as a basis Functional Diagnosis of impairment, activity limitation and participation restriction Assessment of Musculoskeletal Dysfunction oft tissue flexibility, Joint mobility, Muscle strength & Endurance, Trick movement, Sensations, Limb length, Abnormal posture, Gait deviations due to musculoskeletal dysfunction Special Tests Cervical Spine: Foraminal compression, Distraction, Shoulder depression, vertebral artery, Dizziness tests Shoulder: Yergason's, Speed's, Drop- Arm, Supraspinatus, Impingement, Anterior & Posterior Apprehension, Allen's, Adson's test. Elbow: Cozen's, Miller's,

Tinel's sign Forearm, Wrist &Hand: Phalen's, Bunnel-Littler, Froment's sign Lumbar Spine: Schober's, SLR, Prone,Knee Bending, Slump. Sacro Iliac joint: Faber- Patrick's, Gaenslen, Gillet, March's test Hip: Nelaton's line, Bryant's triangle, Thomas, Ober's, Tripod sign, Trendlenburg sign Knee: Tests for collateral & cruciate ligaments (valgus, varus, Lachman, Drawer's, McMurray's, Fluctuation, Patellar tap, Q- angle, Clarke's test Ankle & Foot: Anterior Drawer, Talar Tilt, Homan's & Moses tes

PFDP 1.2. Assessment of pain Types of pain: Somatic, Somatic referred, Neurogenic, Visceral Subjective Assessment: Location, duration, progression, distribution, quality, diurnal variations, modifying factors, Severity, nature of pain, tissue irritability Objective Measurement & Documentation- Visual Analogue Scale (V.A.S), Numerical Rating Scale(N.R.S.), McGill"s modified questionnaire (including Body Charts)

PFDP 1.3. Basics in Manual Therapy with Clinical Reasoning: Assessment of Articular and extraarticular soft tissue status Contractile tissues, Non contractile tissues, Examination of joint integrity, Accessory movement, End feel Examination of musculoskeletal Dysfunction: Subjective examination, Objective examination, Special tests, Functional Diagnosis using ICF

PFDP 1.4. Neurological Assessment and Movement Dysfunction, Higher functions, Cranial nerves, Sensations, sensory organization & body image, Joint mobility, Tone, Reflexes-Superficial & Deep, Voluntary control, Muscle Strength, Co-ordination, Balance, Endurance, Trick movements, Limb Length, Posture deviations, Gait deviations due to neurological dysfunction, Functional Diagnosis using I.C.F., electro diagnosis- Faradic Galvanic Test, Strength Duration Curve-tests, Test for Sensory & Pain Threshold/Pain Tolerance

PFDP 1.5. Electro-Myography a) Definition b) Instrumentation – Basic components like C.R.O., Filter, Amplifier & Preamplifier and Types of Electrodes Normal & Abnormal E.M.G. pattern i. at rest ii. on minimal contraction iii. on maximal contraction c) Nerve Conduction Studies i. Principles & Technique ii. F wave H reflex), routine Biochemical investigations

PFDP 1.6. SCALES: Berg Balance, Modified Ashworth, F.I.M., Barthel Index, G.C.S., D.G.I., M.M.S., S.T.R.E.A.M. & A.S.I.A.

**SECTION -B**

**Unit 2**

PFDP 2.1. General principles of Human development& maturation

1. Aspects a) Physical b) motor c) Sensory d) Cognitive & Perceptive e) Emotional f) Social
2. Factors influencing human development & growth: a) Biological b) Environmental inherited

3. Principles of maturation in general & anatomical directional pattern – a) Cephelo – caudal b) Proximo – distal c) Centero – lateral d) Mass to specific pattern e) Gross to fine motor development f) Reflex maturation tests

4. Development in specific fields - Oromotor development, sensory development, neurodevelopment of hand function

PFDP 2.2. Assessment of Cardio Vascular & Pulmonary Dysfunction: cardiorespiratory Assessment and management techniques: Vital parameters, Chest expansion, Symmetry of chest movement, Breath Holding Test, Breath Sounds, Rate of Perceived Exertion (R.P.E.), 6minute walk test, Auscultation, Breathing exercises, postural drainage, thoracic expansion, rib mobilization, Respiratory PNF

PFDP 2.3. Evaluation of Functional Capacity using sub maximal tests (Exercise Tolerance – Six Minute Walk test)Theoretical bases of different protocols for maximal exercise testing (e.g.: Bruce Protocol, Modified Bruce Protocol, Balke) Interpretation of reports – A.B.G., P.F.T., P.E.F.R., E.C.G.- (Normal & Variations due to Ischemia & Infarction), X-ray Chest, Biochemical Reports Ankle Brachial Index Tests for Peripheral Arterial & Venous circulation, BMI, Waist – Hip Ratio, Skin fold Caliper, Girth measurements

PFDP 2.4. Diagnostic Imaging:

1. Radiological studies in musculoskeletal, neurological, cardiovascular and respiratory conditions.

2. Basic principles of X-rays, instrumentation, observations related to musculoskeletal, neurological and cardiovascular and respiratory conditions

3. Ultrasonography- Principles, instrumentation, observations in vascular disorders, gynecological conditions, recent advances in musculoskeletal ultrasonography

4. CT scan and MRI- Principles, instrumentation and observations related to musculoskeletal, neurological and cardiovascular and respiratory conditions

5. Interventional Radiology

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Physical & functional Diagnosis & Prescription (PFDP) | BPT 306 (P) | 3 | Practical | 2 | 60 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Perform musculoskeletal and neurological assessment procedures soft-tissue flexibility, joint mobility, muscle strength, tone, reflexes, posture, gait, and region-specific special tests accurately on self/human model, and justify the clinical reasoning behind each (SH) | 3 | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 3 | - |
| **CO2:** Assess cardiovascular and pulmonary dysfunction using vital parameters, chest expansion, auscultation, RPE, and sub-maximal exercise tests, and interpret the findings against normative values (SH) | 3 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 3 | - |
| **CO3:** Interpret diagnostic imaging (X-ray, USG, CT, MRI) and laboratory/cardio-respiratory reports (ABG, PFT, ECG, biochemical) relevant to musculoskeletal, neurological, cardiovascular, and respiratory conditions (KH) | 3 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 3 | - |
| **CO4:** Formulate a functional diagnosis using the ICF framework classifying impairment, activity limitation, and participation restriction and administer/score standardized outcome scales (P) | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | - |
| **CO5:** Document and communicate assessment findings, pain profiles, and diagnostic interpretations accurately and ethically to patients and the multidisciplinary team (P) | 2 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 3 | - |

**B. Course Content:**

Students shall be able to perform the Demonstration of all the test procedures mentioned in the syllabus on self / human model and provide interpretation of x ray image.

**Recommended Text Books for PFDP**


1. Orthopaedic Physical Examination–Magee

2. Clinical Electro Therapy – Nelson – Currier --- Appleton &Lange publication

3. Clinical Electromyography–Mishra

4. Physical Rehabilitation, Assessment and treatment - Susan BO's Sullivan

5. Neurological Examination –John Patten

6. Diagnostic and Interventional Radiology- Thomas J. Vogl, Wolfgang Reith, Ernst J. Rummeny.

7. Learning Radiology- William Herring.

8. Ruppel's Manual of Pulmonary Function Testing by Carl Mottram 10thEdition

9. Pulmonary Function Tests & Interpretation In Health & Diseases By P.S.Shankar3rd Edition

10. World Health Organization 2001. The International Classification of Functioning, Disability and Health (ICF). Geneva: WHO. http://www.who.int/clas- sifications/icf/en/

11. Maitland‟s book on Manual therapy,

12. Mobilisation of Extremities – Kaltenborn

13. Clinical Electromyography–Kimura

14. Orthopaedic Physical therapy–Donnatelli

15. NAGS, SNAGS and MWMS – Brian Mulligan

16. Physical Dysfunction –Trombly Scoot

17. Infant Motor Development-Jan Piek

18. Neuro-developmental Therapy–Janett Howle

19. Textbook of Radiology and Imaging- David Sutton

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Research Methodology , Biostatistics and Evidence Based Practice (RMB) | BPT 307 | 3 | Theory | 8 | 120 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Discuss the need for research in physiotherapy practice (K) | 3 | 1 | – | – | – | 2 | – | 1 | 2 | - |
| **CO2**: Explain the process of research (K) | 3 | – | – | – | – | 1 | – | – | 2 | - |
| **CO3**: Discuss the study designs with appropriate examples (K) | 3 | 1 | – | – | – | 1 | – | – | 2 | - |
| **CO4**: Discuss the methods of data collection in physiotherapy research (KH) | 3 | 1 | - | – | – | 1 | – | – | 2 | - |
| **CO5**: Discuss the components of statistical analysis (KH) | 3 | 1 | – | – | – | 1 | – | – | 2 | - |
| **CO6**: Explain the process of evidence-based physiotherapy practice (KH) | 3 | 2 | - | – | 1 | 2 | – | 1 | 2 | - |
| **CO7**: Demonstrate skills in literature search through primary and secondary databases (SH) | 3 | 1 | - | – | – | 1 | – | – | 2 | - |
| **CO8**: Demonstrate skills in critically appraising the evidence (KH) | 3 | 2 | - | – | 1 | 2 | – | – | 2 | - |
| **CO9**: Discuss the importance of evidence-based practice (K) | 3 | 2 | - | 2 | 1 | 2 | – | 1 | 2 | - |
| **CO10**: Explain research methodology meaning, objectives, motivation, types/approaches, methods vs methodology, criteria for good research, and ethics of research (K) | 3 | 1 | – | – | 2 | 1 | – | 2 | 2 | - |
| **CO11**: Describe the research problem, statement of purpose and objectives, | 3 | 1 | – | – | – | 1 | – | – | 2 | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| hypothesis, limitations, delimitations and significance of the study (K) | | | | | | | | | | |
| **CO12**: Discuss the meaning, need, features and basic principles of research design (K) | 3 | 1 | – | – | – | 1 | – | – | 2 | - |
| **CO13**: Discuss sampling fundamentals, criteria for selecting a sampling procedure, steps in sampling design and types of sample design (K) | 3 | 1 | – | – | – | 1 | – | – | 2 | - |

**B. Course Content**

**SECTION -A**

**Unit 1: Introduction to Biostatistics**

RMB 1.1. Discuss the Introduction of biostatistics, definition, characteristics of statistics. Importance of the study of statistics, Branches of statistics, Statistics and health science including physiotherapy, Parameters and Estimates, Descriptive and inferential statistics, Variables and their types, Measurement scales.

RMB 1.2. Explain introduction of the Tabulation of Data which includes Basic principles of tabulation and graphical representation, Types of diagrams – histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, Normal probability curve. Pie chart

RMB 1.3. Describe the Measure of Central Tendency, need for measures of central Tendency, Definition and calculation of mean – ungrouped and grouped, Meaning, interpretation and calculation of median ungrouped and grouped., Meaning and calculation of mode, Comparison of the mean, median and mode, Guidelines for the use of various measures of central tendency.

RMB 1.4. Discuss the Probability and Standard Distributions: Meaning of probability of standard distribution, the binomial distribution, the normal distribution, Divergence from normality – skewness, kurtosis.

RMB 1.5. Discuss the Sampling techniques, sample size, calculation of sample size for survey, and experimental research designs, Sampling variation and tests of significance. type I and type II errors, Power

RMB 1.6. Discuss the Testing of hypothesis: Basic concepts concerning testing of hypothesis, Procedure of hypothesis testing, measuring the power of hypothesis test, Tests of hypothesis, parametric and non-parametric tests for difference, correlation and association

RMB 1.7. Describe Analysis of variance & covariance: Analysis of variance (ANOVA), what is ANOVA? Basic principle of ANOVA, ANOVA technique, Analysis of Co variance (ANACOVA)

RMB 1.8. Define EBP, Discuss the importance of EBP in Physiotherapy practice, Describe the process of EBP, Formulate clinical questions for evidence search using structured format (PICO, PICOT, SPDER, SPICE), Aetiology, Prevention, Intervention, Diagnosis, Discuss the importance of evidence search, Discuss the levels of evidence, Describe the process of literature search, Identify primary and secondary database for literature search, Demonstrate skills in searching through primary and secondary database, Explain internal and external validity of evidence

RMB 1.9. Discuss the process of systematic review, Discuss meta-analysis, Appraise the evidence using appropriate critical appraisal tools (RCT, Systematic Reviews, Cohort studies).

RMB 1.10. Discuss the importance of Outcome measures, Identify appropriate outcome measures, Discuss sensitivity, Specificity and Minimal Clinical Significance difference

RMB 1.11. Discuss the importance of Clinical Practice Guidelines (CPGs), Search for CPGs through common database and search engines, Appraise CPGs using appropriate tools, Discuss the challenges and Barriers in implementing EBP

**SECTION -B**

**UNIT 2**

RMB 2.1. Introduction to Research methodology: Meaning of research, objectives of research, Motivation in research, Types of research & research approaches, Research methods vs methodology, Criteria for good research, ethics of research

RMB 2.2. Research problem: Statement of research problem., Statement of purpose and objectives of research problem, Necessity of defining the problem, hypothesis, limitations, delimitations significance of the study

RMB 2.3. Research design: Meaning of research design, need for research design, Features for good design, Different research designs, Basic principles of research design

RMB 2.4. Sampling Sampling fundamentals, need for sampling & some fundamental definitions, important sampling distributions, Criteria for selecting sampling procedure, Implications for sample design, steps in sampling design, characteristics of good sample design, Different types of sample design

RMB 2.5. Measurement & scaling techniques: Measurement in research- Measurement scales, sources of error in measurement, reliability, validity, sensitivity and specificity of a measurement tool Technique of developing measurement tools, Meaning of scaling, its classification. Important scaling techniques.

RMB 2.6. Methods of data collection: collection of primary data, collection data through questionnaires & schedules, Difference between questionnaires & schedules.

RMB 2.7. Format of scientific documents. (Structure of protocols, formats reporting in scientific journals, systematic reviews and meta-analysis).

RMB 2.8. Computer technology: Introduction to Computers, computer application in research, Introduction to data analysis software's

**UNIT 3**

RMB 3.1. Introduction: Meaning, definition, characteristics of statistics., Importance of the study of statistics, Branches of statistics, Statistics and health science including physiotherapy, Parameters and Estimates, Descriptive and inferential statistics, Variables and their types, Measurement scales.

RMB 3.2. Tabulation of Data: Basic principles of tabulation and graphical representation, Types of diagrams – histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, Normal probability curve. Pie chart

RMB 3.3. Measure of Central Tendency: Need for measures of central Tendency, Definition and calculation of mean – ungrouped and grouped, Meaning, interpretation and calculation of median ungrouped and grouped., Meaning and calculation of mode, Comparison of the mean, median and mode, Guidelines for the use of various measures of central tendency.

RMB 3.4. Probability and Standard Distributions: Meaning of probability of standard distribution, the binomial distribution, the normal distribution, Divergence from normality – skew ness, kurtosis.

RMB 3.5. Sampling techniques: sample size, calculation of sample size for survey, and experimental research designs, Sampling variation and tests of significance. type I and type II errors, Power

RMB 3.6. Testing of hypothesis: Basic concepts concerning testing of hypothesis, Procedure of hypothesis testing, measuring the power of hypothesis test, Tests of hypothesis, parametric and non-parametric tests for difference, correlation and association

RMB 3.7. Analysis of variance & covariance: Analysis of variance (ANOVA), what is ANOVA? Basic principle of ANOVA, ANOVA technique, Analysis of Co variance (ANACOVA).

**UNIT 4**

RMB 4.1. Introduction to Evidence Based practice Definition, background, importance, model of Evidence Based Physiotherapy, role of evidence-based practitioner

RMB 4.2. Searching for the Evidence: Asking Questions, identifying different sources of evidence, Electronic Bibliographic databases and World Wide Web, Conducting a literature search. Step by-step search for evidence

RMB 4.3. Exploring different terminologies Validity, reliability, Randomized Control Trial, Systemic Review, Meta-Analysis, Case Study, Diagnostic research study, Prognostic Research study, Intervention research study,

RMB 4.4. Assessing the Evidence: Evaluating the evidence; Levels of evidence in research using quantitative methods, Levels of evidence classification system

RMB 4.5. Using the evidence: Building evidence in practice; Critically Appraised Topics (CATs), CAT format, Using CATs, Drawbacks of CATs

**UNIT 5**

RMB 5.1. Appraisal of the quality of the studies, result of the studies, technique of pull out the summary of the studies and communicate evidence about di- agnostic test Diagnostic test and process in Physiotherapy

RMB 5.2. Evidence about prognosis Concept of prognosis, research design relevant to prognostic studies, process of knowing the quality of study

RMB 5.3. Evidence about outcome measure Elements of outcome measure, method of knowing validity and reliability, take out the outline from the studies

RMB 5.4. Evidence about intervention Concept of various types of intervention in Physiotherapy, Research design related to intervention studies, know the strength and weakness of the study

RMB 5.5. Evidence about systemic reviews and other research design Overview of systematic reviews, Meta-analysis, The Cochrane collaboration stages and techniques involved in it, procedure to critically appraise it and extract the terminal results to make valid and relevant clinical decision, Introduction to case study and qualitative research, evaluating the robustness and fragility of the studies

RMB 5.6. Practice guidelines, algorithms, and clinical pathways: Recent trends in health care, Clinical Practice Guidelines (CPG), Algorithms, Clinical path- ways, Legal implications in clinical pathways and CPG, Comparison of CPGs, Algorithms and Clinical Pathways

**Recommended Text Book for RMB**


1. Mahajan, B. K. (2002). Methods in biostatistics. Jaypee Brothers Publishers.

2. Hicks, C. Research for Physiotherapists: project design and analysis. Churchill

3. Livingstone.

4. Practical Evidence-Based Physiotherapy by Robert Herbert, Gro Jamtvedt, Kåre Birger Hagen, Judy Mead, Sir Iain Chalmers

5. Bajpai S.R. –Methods of Social Survey and Research, Kitab Ghar, Kanpur.

6. Mohsin S.M. – Research methods in Behavioral Sciences. Orient publications, New Delhi

7. Gupta S.P. – Statistical Methods. Sultan Chand and sons Publishers, New Delhi.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Clinical Education (CEd) | BPT 308 | 3 | Practical | 10 | 300 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Perform systematic bedside and OPD patient assessment history taking, relevant special tests, and outcome measures across rotational postings under supervision (P) | 3 | 3 | 2 | 1 | 2 | 3 | 1 | 1 | 3 | - |
| **CO2:** Formulate and execute evidence-based physiotherapy management plans, justifying indications, ruling out contraindications, and selecting appropriate treatment parameters and dosage (P) | 3 | 3 | 2 | 1 | 2 | 3 | 1 | 1 | 3 | - |
| **CO3:** Communicate effectively with patients, caregivers, and the multidisciplinary team, and document care accurately within ethical and professional boundaries (P) | 1 | 3 | 3 | 3 | 3 | 3 | 1 | 2 | 3 | - |
| **CO4:** Critically appraise clinical problems through critique enquiry, case presentation, and case discussion, integrating current evidence into reasoning (SH) | 2 | 3 | 2 | 2 | 2 | 3 | 1 | 2 | 3 | - |
| **CO5:** Maintain a structured case portfolio/diary demonstrating accountability, reflective practice, and professional conduct across all clinical departments and community/industrial settings (P) | 1 | 3 | 1 | 2 | 3 | 3 | 1 | 3 | 3 | - |

**B. Course Content:**

Students will be posted in rotation in the various wards, hospitals and physiotherapy OPDs attached with the college. The students will be clinically trained to provide physiotherapy care for the patients

under supervision. They will be trained on bed side approach, patient assessment, performing special tests, identifying indications for treatment, ruling out contraindications, decision on treatment parameters, dosage and use relevant outcome measures under supervision. Evidence based practice will be part of training. Critique Enquiry, Case Presentation, and Case Discussion shall be essential part of posting. Each student shall maintain a case portfolio / diary to record the various activities performed during clinical posting. This diary should be presented before the final exam and the grade should be awarded by the college.

## 4th YEAR BPT

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Neurology, Psychiatry and Neurosurgery (NPNS) | BPT 401 | 4 | Theory | 6 | 90 |

### A. Course Outcomes (CO)

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1**: Describe the aetiology, pathophysiology, clinical manifestations, diagnostic measures and management of disorders of the central, peripheral and neuro-muscular systems (K) | 3 | 2 | – | 1 | – | 2 | 1 | - | 2 | – |
| **CO2**: Demonstrate competencies in identifying common clinical signs of various neurological disorders (KH) | 3 | 2 | - | 1 | – | 2 | 1 | – | 2 | – |
| **CO3**: Demonstrate knowledge of common diagnostic procedures used in differential diagnosis of neurological and psychiatric disorders (blood investigations, radiologic procedures) (KH) | 3 | 2 | - | 2 | – | 2 | 1 | – | 2 | – |
| **CO4**: Appreciate the role of different specialists in diagnosing and managing neurological and psychiatric disorders (K) | 2 | 2 | - | 3 | 1 | 2 | 1 | 1 | 2 | – |

### B. Course Content

**SECTION -A**

**Unit 1**

NPNS 1.1. Disorders of function in the context of Pathophysiology, Anatomy in Neurology and Cortical Mapping. Classification of neurological involvement depending on level of lesion.

NPNS 1.2. Reviews in brief the neurophysiologic basis of tone and Disorders of tone and Posture, Bladder control, Muscle conduction, Movement and Pain, Management of Pain, Electrical Stimulation of Brain and Spinal cord.

NPNS 1.3. Trauma - Broad localization, first aid and management.

NPNS 1.4. Neurological assessment: Principles of clinical diagnosis, higher mental function, assessment of brain & spinal cord function, evaluation of cranial nerves and evaluation of autonomic nervous system.

1. Basic history taking to determine whether the brain, spinal cord or peripheral nerve is involved.
2. Assessment of higher mental functions such as Orientation, Memory, Attention, Speech and Language.
3. Assessment of Cranial nerves.
4. Assessment of Motor system.
5. Assessment of Sensory function, Touch, Pain and Position.
6. Assessment of Tone-Spasticity, Rigidity and Hypotonia.
7. Assessment of Cerebral function.
8. Assessment of Higher cortical function - Apraxia.
9. Assessment of Gait Abnormalities.

NPNS 1.5. Investigations: principles, methods, views, normal/abnormal values/features, types of following investigative procedures- skull x-ray, CT, MRI, evoked potentials, lumbar puncture, CSF examination, EMG, NCV.

NPNS 1.6. Deafness, vertigo, and imbalance: Physiology, tests of vestibular function, vertigo, peripheral vestibular disorders, central vestibular vertigo.

NPNS 1.7. Cerebro-vascular diseases: Define stroke, TIA, RIA, stroke in evolution, multi infarct dementia and Lacunar infarct. Classification of stroke – Ischemic, hemorrhagic, venous infarcts. Risk factors, cause of ischemic stroke, causes of hemorrhagic stroke. Classification of hemorrhagic stroke, classification of stroke based on symptoms, stroke syndrome, investigations, differential diagnosis, medical and surgical management.

NPNS 1.8. Spinal cord disorders: Functions of tracts, definition, etiology, risk factors, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders – Spinal cord injury, Brain injury, Compression by Space occupying lesion, infections of brain, etc.

NPNS 1.9. IVD prolapse, Spinal epidural abscess, Transverse myelitis, Viral myelitis, Syringomyelia, Spina bifida, Sub acute combined degeneration of the cord, Hereditary spastic

paraplegia, Radiation myelopathy, Progressive encephalomyelitis, Conus medullaris syndrome, Bladder & bowel dysfunction, and Sarcoidosis

NPNS 1.10. Motor neuron diseases: - Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, and complications of following disorders - Amyotrophic lateral sclerosis, Spinal muscular atrophy, Hereditary bulbar palsy, Neuromyotonia and Post-irradiation lumbosacral polyradiculopathy.

**Unit 2**

NPNS 2.1. Brain tumors and spinal tumors: Classification, clinical features, investigations, medical and surgical management.

NPNS 2.2. Movement disorders: Definition, etiology, risk factors, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders – Parkinson's disease, Dystonia, Chorea, Ballism, Athetosis, Tics, Myoclonus and Wilson's disease.

NPNS 2.3. Multiple sclerosis - Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, and complications

NPNS 2.4. Cerebellar and coordination disorders: Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, management of Congenital ataxia, Friedreich's ataxia, Ataxia telangiectasia, Metabolic ataxia, Hereditary cerebellar ataxia, Tabes dorsalis and Syphilis.

NPNS 2.5. Higher cortical, neuro psychological and neurobehavioral disorders: Causes of blackouts, physiological nature of Epilepsy, classification, clinical features, investigations, medical& surgical management of following disorders – Non-epileptic attacks of childhood, Epilepsy in childhood, Seizers, and Epilepsy syndromes in adult. Classification and clinical features of Dyssomnias, Parasomnias, Dementia, Obsessive-compulsive disorders. Neural basis of consciousness, causes &investigations of Coma, criteria for diagnosis of Brain death. Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, management of Perceptual disorders and Speech disorders. Alzheimer disease

**Unit 3**

NPNS 3.1. Disorders of neuromuscular junction – Etiology, classification, signs & symptoms, investigations, management, of following disorders Myasthenia gravis, Eaton-Lambert syndrome, and Botulism.

NPNS 3.2. Muscle diseases: Classification, investigations, imaging methods, Muscle biopsy, management of muscle diseases, genetic 326ounseling. Classification, etiology, signs & symptoms

of following disorders – Muscular dystrophy, Myotonic dystrophy, myopathy, Non-dystrophic myotonia.

NPNS 3.3. Polyneuropathy – Classification of Polyneuropathies, Hereditary motor sensory neuropathy, hereditary sensory and Autonomic neuropathies, Amyloid neuropathy, acute idiopathic Polyneuropathies. Guillain-Barre syndrome – Causes, clinical features, management of GBS, Chronic Idiopathic Polyneuropathies, diagnosis of polyneuropathy, nerve biopsy.

NPNS 3.4. Focal peripheral neuropathy: Clinical diagnosis of focal neuropathy, neurotmesis, Axonotmesis, Neuropraxia. Etiology, risk factors, classification, neurological signs & symptoms, investigations, management, of following disorders – RSD, Nerve tumors, Brachial plexus palsy, Thoracic outlet syndrome, Lumbosacral plexus lesions, Phrenic & Intercostal nerve lesions, Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy, Musculocutaneous nerve palsy, Anterior & Posterior interosseous nerve palsy, Axillary nerve palsy, Long thoracic nerve palsy, Suprascapular nerve palsy, Sciatic nerve palsy, Tibial nerve palsy, Common peroneal nerve palsy, Femoral nerve palsy, Obturator nerve palsy, Pudendal nerve palsy.

NPNS 3.5. Paediatric neurology: Neural development, Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders – Cerebral palsy, Hydrocephalus, Arnold-chiari malformation, Basilar impression, Klippel-Feil syndrome, Achondroplacia, Cerebral malformations, Autism, Dandy walker syndrome and Down's syndrome.

NPNS 3.6. Toxic, metabolic and environmental disorders: Etiology, risk factors, classification, neurological signs & symptoms, investigations, management, of following disorders – Encephalopathy, Alcohol toxicity, Recreational drug abuse, Toxic gases & Asphyxia, Therapeutic & diagnostic agent toxicity, Metal toxicity, Pesticide poisoning, Environmental & physical insults, Plant & Fungal poisoning, Animal poisons, & Complications of organ transplantation.

NPNS 3.7. Head injury: Etiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications.

NPNS 3.8. Introduction, Indications and Complications of following Neuro surgeries: Craniotomy, Cranioplasty, Stereotactic surgery, Deep brain stimulation, Burr-hole, Shunting, Laminectomy, Hemilaminectomy, Rhizotomy, Microvascular decompression surgery, Endarterectomy, Embolization, Pituitary surgery, Ablative surgery – Thalamotomy and Pallidotomy, Coiling of aneurysm, Clipping of aneurysm, and Neural implantation

**Unit 4**

NPNS 4.1. Psychiatric Disorders: Classifications, Causes, Clinical manifestations and treatment methods used in Psychiatry. Modalities of psychiatric treatment, Psychiatric illness and

physiotherapy, Brief description of Etio-pathogenesis, manifestations, and management of psychiatric illnesses -. Anxiety neurosis, Depression, Obsessive compulsive neurosis, Psychosis, Maniac-depressive psychosis, Post-traumatic stress disorder, Psychosomatic reactions: Stress and Health, theories of Stress – Illness.

NPNS 4.2. Etio-pathogenesis, manifestations, and management of psychiatric illness

NPNS 4.3. Drug dependence and alcoholism, Somatoform and Dissociate Disorders – conversion reactions, Somatization, Dissociate Amnesia, and Dissociate Fugue, Personality disorders

NPNS 4.4. Child psychiatry - manifestations, and management of childhood disorders - Intellectual Disability attention deficit syndrome and behavioral disorders.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Neurology, Psychiatry and Neurosurgery (NPNS) | BPT 401 (P) | 4 | Practical | 1 | 30 |

**A. Course Outcomes**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Perform a systematic neurological examination history, higher mental function, cranial nerves, motor, sensory, reflex, tone, coordination and gait assessment on patients with neurological, neurosurgical and psychiatric conditions (P) | 3 | 3 | 2 | 2 | 2 | 1 | - | - | 1 | - |
| **CO2:** Interpret relevant neuro-investigations (skull X-ray, CT, MRI, EMG, NCV, evoked potentials, CSF/LP) and integrate them with clinical findings to localize the lesion by level (SH) | 3 | 3 | 1 | - | - | 1 | - | - | 2 | - |
| **CO3:** Formulate a clinical diagnosis and reasoned differential diagnosis through long-case and short-case presentation, justifying conclusions from examination and investigative data (SH) | 3 | 3 | 2 | 1 | 1 | 2 | - | - | 2 | - |
| **CO4:** Communicate assessment findings, diagnosis and management rationale effectively to patients, caregivers and the multidisciplinary team, with appropriate documentation (P) | 1 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 2 | - |
| **CO5:** Demonstrate ethical conduct, accountability, evidence-based reasoning and commitment to ongoing learning while handling neurological and psychiatric caseloads (P) | 1 | 3 | 1 | 2 | 3 | 2 | 1 | 2 | 3 | - |

**B. Course Content**

LONG CASE SHORT CASE examination of neurological patient's history taking, motor sensory reflex examination, interpretation of investigative findings, diagnosis differential diagnosis

**Recommended Text Books for NPNS**


1. Davidson's Principles and practices of medicine - Edward – Churchill Livingstone.
2. API- Text book of Medicine, 5th edition
3. Medicine and Neurology by Golewala.
4. Brain's Diseases of the Nervous System - Nalton – ELBS.
5. Guided to clinical Neurology - Mohn&Gaettier - Churchill Livingstone.
6. Principles of Neurology - Victor – McGraw Hill International edition.
7. Neurological Rehabilitation - Darcy Umphred.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Physiotherapy in Adult and Pediatric Neurological and Neurosurgical conditions (PTN) | BPT 402 | 4 | Theory | 10 | 150 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Describe the aetiology, pathophysiology, clinical manifestations, diagnostic measures and physiotherapy management of CNS, PNS and neuro-muscular disorders (KH) | 3 | 3 | 1 | 1 | – | 2 | – | - | 2 | – |
| **CO2:** Demonstrate competencies in identifying common clinical signs of various neurological disorders during physiotherapy assessment (SH) | 3 | 3 | 2 | 1 | – | 2 | – | – | 2 | – |
| **CO3:** Demonstrate knowledge of common diagnostic procedures used in differential diagnosis of neurological and psychiatric disorders (KH) | 2 | 2 | 1 | 2 | – | 2 | – | – | 2 | – |
| **CO4:** Appreciate the role of different specialists in diagnosing and managing neurological and psychiatric disorders within the rehabilitation team (K) | 1 | 2 | 2 | 3 | 1 | 2 | 1 | 1 | 2 | – |

**B. Course Content**

**SECTION-A**

**UNIT 1**

PTN 1.1. Neurological Assessment: Chief complaints, History taking – Present, Past, medical, familial, personal histories, Observation, Palpation, Higher mental function – Consciousness, Orientation, Wakefulness, memory, Speech, Reading, Language, Writing, Calculations, Perception, Left right confusion, Reasoning, and Judgment, Motor Examination – Muscle power, Muscle tone, Spasticity, Flaccidity, Reflexes – Developmental reflexes, deep tendon reflexes, Superficial reflexes,

Sensory examination – Superficial, Deep and Cortical sensations, Special tests – Romberg's, Kernig's sign, Brudenzki sign, Tinels's sign, Slum test, Lehermitte's sign, Bells Phenomenon, Gower's sign, Sun set sign, Battle's sign, Glabellar tap sign, etc, Balance examination, coordination examination, Gait analysis – Kinetics & Kinematics (Quantitative & Qualitative analysis), Functional Analysis, Assessment tools & Scales – Modified Ashworth scale, Berg balance scale, FIM, Barthel index, Glasgow coma scale, Mini mental state examination, Rancho Los Amigos Scale for Head injury, APGAR score, ASIA scale, Reflex Grading. Differential diagnosis.

PTN 1.2. Neuro physiological Techniques – Concepts, Principles, Techniques, Effects of following Neurophysiological techniques: NDT, PNF, Rood's Sensory motor Approach, Sensory Integration Approach, Brunnstrom movement therapy, Motor relearning program, Contemporary task oriented approach, Muscle re-education approach and Constraint induced movement therapy.

**UNIT 2**

PTN 2.1. Evaluation and Management of Brain and Spinal Cord Disorders : History, Observation, Palpation, Higher mental function, Cranial nerve examination, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches& Modalities in Cerebro vascular Accident, Meningitis, Encephalitis, Head Injury, Brain Tumors, Perceptual disorders, Amyotrophic lateral sclerosis, and Multiple sclerosis

PTN 2.2. Evaluation and Management of Cerebellar, Spinal Cord and Muscle Disorders : History, Observation, Palpation, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches& Modalities in Ataxia, Sensory Ataxia, Parkinson's disease, Muscular dystrophy (DMD), Myasthenia Gravis, Eaton-Lambert Syn- drome, Spinal tumors, Spinal cord injury, Transverse myelitis, Bladder & Bowel Dysfunction, Spinal muscular atrophies, Poliomyelitis, Post-Polio Syndrome.

**UNIT 3**

PTN 3.1. Paediatric Neurology: Paediatric Examination, Developmental milestones, developmental reflexes, Neuro developmental screening tests. Evaluation & Management - History, Observation, Palpation, Milestone Examination, developmental reflex Examination, Higher mental function, Cranial nerve examination, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of

Mechanical Complications, Use of various Neurophysiological approaches & Modalities in Risk babies, Minimum brain damage, Developmental disorders, Cerebral palsy, Autism, Down's Syndrome, Hydrocephalus, Chorea, Spina bifida, and syringomyelia

PTN 3.2. Assessment and management of Neurological gaits: Quantitative and Qualitative (Kinetic & Kinematics) analysis, List of Problems, short- & Long-Term goals, Management of following Neurological Gaits - Hemiplegic gait, Parkinson gait, High step gait, Hyperkinetic gait, Hypokinetic gait, Waddling gait, Scissoring gait, Spastic gait, Chorea form Gait, Diplegic Gait, and Myopathic Gait.

**SECTION-B**

**UNIT 4**

PTN 4.1. Evaluation and Management of Peripheral Nerve Injuries and Disorders : History, Observation, Palpation, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches& Modalities in Hereditary motor sensory neuropathy, Guillain-Barre syndrome, Brachial plexus palsy, Thoracic outlet syndrome, Lumbosacral plexus lesions, Phrenic & intercostals nerve lesions, Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy, Musculocutaneous nerve palsy, Anterior & Posterior interosseous nerve palsy, Axillary nerve palsy, Long thoracic nerve palsy, Suprascapular nerve palsy, sciatic nerve palsy, Tibial nerve palsy, Common peroneal nerve palsy, Femoral nerve palsy, Obturator nerve palsy, and Pudendal nerve palsy.

PTN 4.2. Pre and post-surgical assessment and treatment following conditions - Spinal disc herniation, Spinal stenosis, Spinal cord trauma, Head trauma, Brain tumors, Tumors of the spine, Spinal cord and peripheral nerves, Cerebral aneurysms, Subarachnoid hemorrhages, epilepsy, Parkinson's dis- ease, Chorea, Hemiballismus, Psychiatric disorders, Malformations of the nervous system, Carotid artery stenosis, Arteriovenous malformations, and Spina bifida.

PTN 4.3. Applied Yoga in Neurological conditions.

**UNIT 5**

PTN 5.1. Problems and management of LBW infants, Perinatal problems and management, Respiratory conditions of childhood, Epilepsies – types, diagnosis and treatment; Sensory disorders – problems resulting from loss of vision and hearing; Learning and behavioural problems – Hyperactivity, Autism, Challenging behaviours, educational delay, The Clumsy Child.

PTN 5.2. Cerebral palsy: Definition, etiology, classification, clinical features, complications, deformities, medical management

PTN 5.3. Developmental assessment scales (Motor, sensory, cognitive, neurological, functional scales used for neonates like Brazelton, TIMP, MAI, NBA, AIMS etc.). Overview of speech, cognition and social development

PTN 5.4. PT assessment and management of Developmental delay and High-risk babies

PTN 5.5. Exercise testing protocols/ tests – Common protocols used in pediatric in Obesity and Juvenile Diabetes

PTN 5.6. Pre and post-surgical PT assessment and management of Traumatic brain injury, spinal cord disorders (Traumatic and nontraumatic spinal cord injuries, Spina Bifida), Brachial Plexus Injury, peripheral nerves (Chemical Neuritis of Upper and Lower extremities) and cranial nerves (Bell's Palsy), Hydrocephalus

PTN 5.7. Physiotherapy management for disorders of the muscles – Myopapathies – congenital and acquired. Muscular dystrophy (Duchenne's, Becker's, Spinal Muscle atrophy)

PTN 5.8. Paediatric neurology – Developmental disorders, Learning disabilities, Meningitis and encephalitis, Guillain Barre syndrome, Autism, Down's syndrome, ADHD, Poliomyelitis, Bell's palsy, congenital facial palsy

PTN 5.9. Physiotherapy management of Neuropsychiatric disorders, Cerebral & Craniovertebral anomalies & metabolic disorders of nervous system

PTN 5.10. Poliomyelitis - Definition, etiology, types, pathophysiology, clinical features, deformities, medical and surgical management.

PTN 5.11. Neural Tube defects

PTN 5.12. Introduction and Classification of Metabolic and Genetic disorders and Genetic Counselling – Down's Syndrome, West's syndrome, Wilson's syndrome, Leigh's disease, Angelman's syndrome

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Physiotherapy in Adult and Pediatric Neurological and Neurosurgical conditions (PTN) | BPT 402 (P) | 4 | Practical | 2 | 60 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Perform a comprehensive neurological examination (history, observation, palpation, standardized tests, relevant investigations) and formulate a functional diagnosis using the ICF framework impairment, activity limitation, participation restriction with accurate documentation, for adult and pediatric neuro/neurosurgical conditions (SH) | 3 | 3 | 2 | 2 | 1 | 2 | 1 | - | 2 | - |
| **CO2:** Plan and execute independently an evidence-based management protocol for commonly encountered neurological conditions, integrating active exercise regimens, inhibitory/facilitatory techniques, passive mobilization, stretching, and appropriate selection of electrotherapeutic modalities (P) | 3 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | - |
| **CO3:** Deliver patient- and caregiver-centred education and functional training, including bladder–bowel training and integumentary care, adapting communication to the patient's cognitive and functional status (P) | 2 | 3 | 3 | 2 | 2 | 2 | 1 | 2 | 1 | - |
| **CO4:** Prescribe and train the patient in suitable aids, appliances, and orthotic devices, and provide ergonomic advice appropriate to the neurological impairment and home/work environment (P) | 2 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO5:** Demonstrate ethical, accountable, and professional conduct while functioning as an effective member of a multidisciplinary rehabilitation team during bedside case discussions and management (P) | 1 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | - |

**B. Course Content**

PTN (P) 6. Practical shall be conducted for all the relevant topics discussed in theory in the following forms:

1. Bedside case presentations and case discussions

2. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions Student should be able to execute independently the following procedures on self / human model / patient

3. History taking: examination observation palpation tests, investigation, diagnosis, functional diagnosis [impairment, functional restriction, activity limitation] documentation

4. Planning and execution of management protocol for commonly encountered neurological condition in clinical practice of Physiotherapy with respect to Active exercise regimen

5. Inhibitory and facilitator techniques

6. Passive mobilization and stretching procedures Selection of electrotherapeutic modalities

7. Patient and caregiver education and training Functional training programme

8. Bladder bowel training Integumentary care

9. Prescription and training of suitable aids appliances and Orthotic Devices Ergonomic advice

**Recommended Text Books for PTN**


1. Patricia A D. Cash's Text book for Physio Therapist in Neurological disorders. Jaypee bros;

2. Adler B. PNF in practice. Springer.

3. Hollis M. Practical Physical Therapy

4. O'Sullivan S. Physical Rehabilitation

5. Johnstone M. Therapy for stroke. Edinburgh: Churchill Livingstone;

6. Bromley I. Tetraplegia and Paraplegia: A guide for physiotherapists

7. Carr and shepherd neurological rehabilitation

8. Umphred D. Neurological rehabilitation. Saint Louis: Mosby/Elsevier;

9. Donaghy M. Brain's diseases of the nervous system. Oxford: Oxford University Press; 2009

10. Bobath B. Adult hemiplegia. Oxford (England): Heinemann Medical Books. Patricia M D. Right in the middle. Springer-Verlag

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Cardiothoracic diseases and surgeries (CTD) | BPT 403 | 4 | Theory | 6 | 90 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Explain the anatomy and physiology of the cardiothoracic system and correlate it with normal and pathological functions (K) | 3 | 1 | – | – | – | 1 | – | – | 2 | – |
| **CO2:** Describe the aetiopathogenesis, clinical features, diagnostic investigations and management principles of common cardiovascular and respiratory disorders (K) | 3 | 2 | – | 1 | – | 1 | – | - | 2 | – |
| **CO3:** Differentiate between various cardiothoracic conditions based on clinical presentation and interpret relevant diagnostic findings (KH) | 3 | 2 | - | 1 | – | 2 | – | – | 2 | – |
| **CO4:** Demonstrate understanding of pre-operative and post-operative management in cardiothoracic surgeries, including critical care procedures like ventilation and resuscitation (KH) | 3 | 2 | 1 | 2 | 1 | 2 | – | 1 | 2 | – |
| **CO5:** Apply theoretical knowledge to clinical scenarios involving cardiothoracic diseases and surgical interventions for effective patient management (KH) | 3 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | - |

**B. Course Content**

**SECTION -A**

CTD 1.1 Brief idea of Anatomy and Physiology of Cardio- respiratory systems,

CTD 1.2 Outline Aetiopathogenesis of Cardio -Vascular System disorders, Investigations, Diagnostic, Differential diagnosis and principles of management.

1. Cardiac failure - Definition, Causes, Symptoms and Signs and Brief management of Cardiac failure.

2. Rheumatic Fever - Definition, Brief description of Aetiology, Clinical features, Complication and Treatment.

3. Congenital Heart Diseases: Classification and brief outline of diseases like ASD, VSD, PDA, Fallot's Tetralogy with complication.

4. Ischemic Heart Disease - Aetiopathogenesis, Classification. Symptoms, Diagnosis and Medical and Surgical treatment.

5. Hypertension - Definition, Classification, Symptomatology, Complications and Treatment

6. Infective Endocarditis - Brief aetiopathogenesis, clinical features, Diagnosis and Treatment.

7. Brief description of Deep Vein Thrombosis and Pulmonary embolism. 8. Vascular Disease: Atherosclerosis, Burger's disease, Phlebitis etc.

CTD 1.3 Respiratory System: Respiratory diseases including diseases of chest wall

1. Chronic Bronchitis and Emphysema, Definition. Clinical features, and investigation, complication and treatment.

2. Bronchial asthma - Definition, Aetio pathogenesis, clinical features, Diagnosis and Treatment.

3. Pneumonia - Definition, Classification, clinical features, Complications and Treatment.

4. Tuberculosis - Aetiopathogenesis, clinical test of pulmonary tuberculosis, Diagnosis Complication & Treatment.

5. Lung abscess and Bronchiectasis - Definition, clinical features, Diagnosis and Treatment.

6. Chest wall deformities- Describe various deformities of chest wall, its effect and Pulmonary diseases associated with it.

7. Occupational Lung Diseases - Clinical features, Diagnosis and Treatment.

8. Respiratory failure - Classification, Causes and Treatment.

**SECTION -B**

CTD 1.4 Cardio thoracic surgery Theory

1. Introduction-types of incision, pre and post operative assessment, management and complications of cardio thoracic surgery and their management.

2. Describe in detail the following procedure: management of endotracheal tubes, tracheal Suction, Weaning the patient from ventilator, Extubation and Postextubation care.

3. Describe the principles of cardio-pulmonary Resuscitation, cardiac Massage, Artificial respiration, defibrillators and their use.

4. Cardiac Surgery-Outline indication, contra indication, site of incision, pre and post Operative management and complications of the following:

i. Valvotomy and Valve Replacement

ii. Open heart surgery/ cardiac bypass surgery, Surgery of pericardium Heart transplantation

iii. Pacemaker

iv. Coronary angioplasty and Balloon angioplasty

5. Vascular surgery (Outline surgery and artery and veins)

6. Thoracic Surgery

i. Outline clinical features and management of the following; fracture of ribs, Flail chest, stove in chest, Pneumothorax, Haemothorax, Lung contusion and Laceration and injury to vessels and bronchus.

ii. Outline indications, contradiction, site of incision, pre and post operative management and complication of following-Lobectomy, Pneumonectomy, segmentectomy, pleuro-pneumonectomy, Thoracoplasty, decortication, Tracheostomy.

iii. Outline clinical features and management of carcinoma of lung.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Cardiothoracic diseases and surgeries (CTD) | BPT 403 (P) | 4 | Practical | 1 | 30 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Perform a structured cardiopulmonary assessment (history, observation, auscultation, chest expansion, breathing pattern, exercise tolerance) and interpret relevant investigations (ABG, CXR, ECG, PFT) for cardiothoracic and respiratory conditions (SH) | 3 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | - |
| **CO2:** Demonstrate and execute physiotherapy techniques (breathing control, ACBT, postural drainage, percussion, incentive spirometry, mobilisation, secretion clearance) appropriate to the patient's diagnosis and stage (P) | 3 | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | - |
| **CO3:** Formulate and justify a goal-oriented pre- and post-operative physiotherapy management plan for cardiac, thoracic, and vascular surgical patients, including complication prevention (SH) | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | - |
| **CO4:** Apply physiotherapy management in critical-care contexts endotracheal/tracheostomy care principles, suctioning, ventilator weaning support, post-extubation care, and demonstrate CPR/BLS technique (P) | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 1 | 3 | - |
| **CO5:** Present a clinical case study and respond to viva, communicating reasoning, evidence base, and | 2 | 2 | 3 | 3 | 2 | 3 | 1 | 1 | 3 | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| management rationale to peers and the healthcare team (P) | | | | | | | | | | |

**B. Course Content**

1. Various techniques of Physiotherapy mentioned in theory in various conditions/diseases should be demonstrated and practiced by the students.

2. Assessment, goal planning and management of Cardiothoracic diseases and surgeries mentioned in theory.

3. General viva.

4. Case Study

**Book References for CTD**


1. Cardiothoracic Surgery: Recent Advances and Techniques- by Daniel Willson

2. Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine - By Douglas P. Zipes , Peter Libby

3. Textbook of Interventional Cardiology Hardcover – by Eric J. Topol MD and Paul S. Teirstein MD

4. Textbook of Pulmonary and Critical Care Medicine (vol 1&vol 2)by SK Jindal

5. Principles of Respiratory Medicine - by Farokh Erach, Zarir Farokh Udwadia, Anirudh Kohli Udwadia

6. Davidson's Principles and Practice of Medicine, International Edition

7. Murray & Nadel's Textbook of Respiratory Medicine – by Robert J. Mason MD

8. Bailey & Love's Short Practice of Surgery text book

9. Oxford Textbook of Fundamentals of Surgery- by William E. G. Thomas, Malcolm W. R. Reed, Michael G. Way

10. Surgery by Nan.

11. Short Practice of Surgery by Rain & Ritelife.

12. Russell, R.C.G. Short practice In Surgery Arnold, London

13. Gupta, R. L. Text Book of Surgery Jaypee, New Delhi

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Physiotherapy in Adult and Pediatric Cardiothoracic conditions and Surgical Conditions (PTCT) | BPT 404 | 4 | Theory | 10 | 150 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Demonstrate competencies in assessing and identifying physiotherapy related problems due to Respiratory diseases (Acute and chronic) Cardiac diseases (Acquired, Congenital and infective) Lung surgeries Open and closed heart surgeries Vascular surgeries Lung and cardiac transplantation (SH) | 3 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | – |
| **CO2:** Demonstrate competencies in developing and implementing evidence-based physiotherapy protocol in managing respiratory diseases (Acute and chronic) Cardiac diseases (Acquired, Congenital and infective) Lung surgeries Open and closed heart surgeries Vascular surgeries Lung and cardiac transplantation (P) | 3 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | – |
| **CO3:** Demonstrate competencies in performing clinical exercise testing as part of clinical decision making (SH) | 2 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | – |
| **CO4:** Demonstrate competencies in selecting and using appropriate outcome measures in managing clients with cardio-respiratory disorders) (SH) | 2 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | – |
| **CO5:** Document assessment findings, clinical decision making, PT protocol and prognosis as per the prescribed format. (P) | 1 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | – |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO6:** Demonstrate competencies in communicating effectively to the stakeholders including Healthcare providers. (P) | 1 | 2 | 3 | 3 | 1 | 1 | 1 | 1 | 2 | – |
| **CO7:** Demonstrate competencies in assessing and identifying physiotherapy related problems due to: 1. Respiratory diseases (Acute and chronic), 2. Cardiac diseases (Acquired, Congenital and infective), 3. Lung surgeries, 4. Open and closed heart surgeries, 5. Vascular surgeries, and 6. Lung and cardiac transplantation (SH) | 2 | 3 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | – |
| **CO8:** Demonstrate competencies in developing and implementing evidence-based Physiotherapy protocol in managing: 1. Bed-side demonstration, 2. Respiratory diseases (Acute and chronic), 3. Cardiac diseases (Acquired, Congenital and infective), 4. Lung surgeries, 5. Open and closed heart surgeries, 6. Vascular surgeries, and 7. Lung and cardiac transplantation (P) | 2 | 3 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | _ |
| **CO9:** Demonstrate competencies in performing clinical exercise testing as part of clinical decision making. (SH) | 2 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | – |
| **CO10:** Demonstrate competencies in selecting and using appropriate outcome measures in managing clients with cardio-respiratory disorders (SH) | 2 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | – |
| **CO11:** Document assessment findings, clinical decision making, PT protocol and prognosis as per the prescribed format. (SH) | 1 | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | – |
| **CO12:** Demonstrate competencies in communicating effectively to the stakeholders including Healthcare providers. (SH) | 1 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 2 | – |

**B. Course Content**

**SECTION A**

**Unit 1: Basics of Respiratory System**

PTCT 1.1. Discuss the process of gaseous exchange

PTCT 1.2. Explain the possible factors which affects gaseous exchange

PTCT 1.3. Discuss the effect of impaired gaseous exchange on function

**Unit 2: Cardio Respiratory Evaluation assessment**

PTCT 2.1. Demonstrate skills to interpret the common investigations to identify problems that can be managed by Physiotherapy

PTCT 2.2. Discuss the principles of cardio respiratory assessment pertaining to Physiotherapy clinical decision making

PTCT 2.3. Demonstrate skills in reading medical records to formulate Physiotherapy related hypothesis

PTCT 2.4. Demonstrate skills in conducting subjective assessment

PTCT 2.5. Demonstrate skills in performing physical examination to identify the problems

i. Palpation

ii. Chest expansion measurements

iii. Percussion note

iv. Tactile and vocal fremitus

v. Auscultation

vi. Six minute walk test

vii. Blood investigations

viii. ABG

ix. Chest X ray

x. PFT

xi. ECG

xii. Exercise testing report

PTCT 2.6. Demonstrate skills in selecting and applying appropriate outcome measures used cardiorespiratory care.

PTCT 2.7. Demonstrate skills in identifying impairments, activity limitations and participatory restrictions caused by cardio respiratory disorders with appropriate rationale

PTCT 2.8. Prioritise and formulate Physiotherapy goals

**Unit 3: Physiotherapy techniques in cardiorespiratory dysfunction**

PTCT 3.1. Physiotherapy techniques used for airway secretions

1. Explain the physiological mechanism, Indications, Contra indications, precautions and evidence pertaining to physiotherapy techniques used for airway secretions and

2. Demonstrate physiotherapy techniques used to clear airway secretions for

i. Positioning

ii. Postural Drainage

iii. Chest wall manipulation

iv. Forced Expiratory techniques

v. Active Cycle of breathing techniques

vi. Autogenic drainage

vii. Positive Expiratory Pressure

viii. IPPB

PTCT 3.2. Physiotherapy techniques used for improving lung volume

1. Explain the physiological mechanism, Indications, Contra indications, precautions and evidence pertaining to Physiotherapy techniques used for improving lung volume

2. Demonstrate Physiotherapy techniques used to improve lung volume for

i. Deep Breathing Exercise

ii. Thoracic expansion exercise

iii. Sustained maximal Inspiration

iv. IPPB v. CPAP

PTCT 3.3. Physiotherapy techniques used for reducing breathlessness

1. Explain the Physiological mechanism, Indications, Contra indications, precautions and evidence pertaining to physiotherapy techniques used for reducing breathlessness

2. Demonstrate Physiotherapy techniques used to reduce breathlessness

i. Relaxation positions

ii. Breathing control techniques

iii. Pacing techniques

PTCT 3.4. Adjuncts used in respiratory physiotherapy care

1. Explain the Physiological mechanism, Indications, Contra indications, precautions and evidence pertaining to adjuncts used in respiratory physiotherapy care

2. Demonstrate skills in selecting and administering

i. Humidification therapy

ii. Aerosol therapy

iii. Oxygen therapy

PTCT 3.5. Demonstrate skills in assessing and identifying impairments, activity limitations and participatory restrictions in clients with respiratory disorders (Acute exacerbations and chronic)

1. Asthma
2. COPD
3. Interstitial lung disease Bronchiectasis
4. Pneumonia
5. Pleural disorders

PTCT 3.6. Prioritise Physiotherapy related problems based on the assessment in providing respiratory care

PTCT 3.7. Plan Physiotherapy care with rationale for the identified problems in respiratory care

PTCT 3.8. Demonstrate skills in providing Physiotherapy care for the identified problems in clients with respiratory disorders

PTCT 3.9. Pulmonary Surgeries:

1. Demonstrate skills in assessing and identifying impairments, activity limitations and participatory restrictions in clients undergoing pulmonary surgeries
2. Demonstrate skills in providing Physiotherapy care for the identified problems in clients undergone pulmonary surgeries for:
    i. Lung volume reduction
    ii. Lung transplantation
    iii. Pleural surgeries

PTCT 3.10. Pulmonary Rehabilitation

1. Define Pulmonary Rehabilitation
2. Discuss the need for pulmonary rehabilitation
3. Explain the components of Pulmonary Rehabilitation
4. Demonstrate skills in performing Physiotherapy assessment in clients referred for pulmonary rehabilitation
    i. Subjective assessment
    ii. Physical examination
    iii. Exercise testing
    iv. Respiratory muscle testing
5. Prescribe exercise based on the assessment for the clients in pulmonary rehabilitation programme

**UNIT 4: Neonatal and Pediatric Cardiopulmonary Physiotherapy assessment and Care:**

PTCT 4.1. Anatomical and Physiological differences between the Adult and Pediatric lung

PTCT 4.2. Neonatal and Pediatric Physiotherapy – Chest physiotherapy for children, The neonatal unit, Modifications of chest physiotherapy for specific neonatal disorders

PTCT 4.3. Postural Drainage for pediatric population and modifications at home

PTCT 4.4. Therapeutic tools, Equipment's, Aids and appliances in Pediatric Physiotherapy rehabilitation

PTCT 4.5. Intensive care unit and Physiotherapy – Equipments, instruments, Common Physiotherapy procedures in Neonatal and pediatric intensive care

PTCT 4.6. Cardio-Thoracic surgeries – Thoracotomy – Definition, Types of Incisions with emphasis to the site of incision, muscles cut and complications. Lung surgeries: Pneumonectomy, Lobectomy segmentectomy – Indications, Physiological changes and Complications; Thoracoplasty, Pleurectomy, Pleurodesis and Decortication of the Lung. An overview of cardiac surgeries in paediatrics

PTCT 4.7. Disorders of the Cardiovascular System – Definition, Clinical features, diagnosis and choice of management for the following disorders: Congenital Heart diseases – Acyanotic congenital heart disease & Cyanotic congenital heart disease: Patent Ductus Arteriosus, Coarctation of Aorta, Atrial Septal Defect, Ventricular Septal Defect, Tetralogy of Fallot, Transposition of Great Vessels

PTCT 4.8. Physiotherapy assessment and management in Pediatrics Cardiac conditions

PTCT 4.9. Physiotherapy assessment and management in Respiratory conditions in Pediatrics - Childhood asthma, Respiratory distress syndrome, Hyaline membrane disease/Bronchopulmonary dysplasia, Meconium aspiration syndrome, Pneumonia, Cystic fibrosis, Bronchiectasis, Congenital diaphragmatic hernia

**SECTION -B**

**Unit 5: Physiotherapy Techniques in Cardiac Disorders and Surgeries**

PTCT 5.1. Cardiac Surgeries:

1. Demonstrate skills in assessing and identifying impairments, activity limitations and participatory restrictions in clients' undergone cardiac surgeries
2. Demonstrate skills in providing physiotherapy care for the identified problems in clients undergone cardiac surgeries like
    i. CABG
    ii. Valve repair and replacement surgeries
    iii. Cardiac pacemaker insertion
    iv. Surgeries to correct congenital heart disease

PTCT 5.2. Cardiac Disorders:

1. Demonstrate skills in assessing and identifying impairments, activity limitations and participatory restrictions in clients with cardiac disorders

2. Demonstrate skills in providing physiotherapy care for the identified problems in clients with cardiac disorders

i. IHD

ii. Cardiac Failure

iii. Rheumatic heart disease

PTCT 5.3. Prioritise Physiotherapy related problems based on the assessment in providing cardiac care

PTCT 5.4. Plan physiotherapy care with rationale for the identified problems in clients with cardiac disorders

PTCT 5.5. Cardiac Rehabilitation

1. Define cardiac rehabilitation

2. Discuss the need for cardiac rehabilitation

3. Appreciate the roles of other health care providers in cardiac rehabilitation

4. Demonstrate skills in performing Physiotherapy assessment in clients referred for cardiac rehabilitation

i. Subjective assessment

ii. Physical examination

iii. Exercise testing

5. Prescribe exercise based on the assessment for the clients in cardiac rehabilitation programme

**Unit 6: Critical care Physiotherapy**

PTCT 6.1. Identify the common lines and tubes used in critical care units

PTCT 6.2. Interpret the ICU monitor and incorporate the findings in clinical decision making

PTCT 6.3. Analyse and Interpret the investigation procedures required to make physiotherapy diagnosis

PTCT 6.4. Identify and prioritize the problems which could be addressed by Physiotherapists

PTCT 6.5. Discuss the Indications, Precautions to be taken, advantages and disadvantages of commonly used Physiotherapy techniques based on available evidence.

PTCT 6.6. Design and discuss evidence informed physiotherapy protocol

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Physiotherapy in Adult and Pediatric Cardiothoracic conditions and Surgical Conditions (PTCT) | BPT 404 (P) | 4 | Practical | 2 | 60 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Demonstrate comprehensive cardiorespiratory assessment by interpreting common investigations, performing physical examination, and formulating a prioritised physiotherapy diagnosis with SMART goals using the ICF framework (SH) | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | - |
| **CO2:** Perform evidence-based airway clearance, lung volume recruitment, breathlessness-reduction techniques and respiratory adjuncts on patients with acute/chronic respiratory disorders and post pulmonary surgery, observing indications, contraindications and precautions (P) | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | - |
| **CO3:** Design and execute individualised pulmonary and cardiac rehabilitation programmes, including exercise prescription and progression, for patients with cardiac disorders and post cardiac surgery (P) | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | - |
| **CO4:** Demonstrate modified neonatal and pediatric chest physiotherapy and cardiopulmonary management for congenital cardiac and pediatric respiratory conditions, accounting for anatomical/physiological differences and family-centred safety (SH) | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | - |
| **CO5:** Manage the critically ill patient by interpreting ICU monitors, lines and tubes, prioritising physiotherapy | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | - |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| problems, designing an evidence-informed protocol, and integrating findings within the multidisciplinary team evidenced through case study and viva (P) | | | | | | | | | | |

**B. Course Content**

1. Various techniques of Physiotherapy mentioned in theory in various conditions/diseases should be demonstrated and practiced by the students.
2. Assessment, goal planning and management of Adult and Pediatric Cardiothoracic conditions and Surgical Conditions mentioned in theory.
3. General viva.
4. Case Study

**Recommended Text Books for PTCT**


1. Cash's Textbook for Physiotherapists in Chest, Heart & Vascular diseases
2. Cash's text book in General Medicine & Surgical conditions for Physiotherapists
3. Chest Physical therapy & pulmonary rehabilitation -- Donna Frown Filter
4. Brompton's hospital guide
5. Physiotherapy in respiratory and cardiac problem - Pryor and Prasad
6. Physiotherapy in Cardio – Vascular rehabilitation –Webber
7. Chest physiotherapy in intensive care Colin Mackenzie
8. Mechanical ventilation – Ashfaq Hasan
9. Management of Mechanical ventilation –Pierce
10. Exercise & the Heart –Wenger
11. ECG – P.J. Mehta
12. Cardiopulmonary Physical Therapy -- IrwinScott
13. Essential of cardio pulmonary physical therapy –Hillgass and Sodosky
14. Exercise physiology, energy, nutrition and human performance –M'cardle
15. Exercise testing and prescription - Skinner 8. Exercise in health and disease-Pollock

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Sports Physiotherapy & Exercise Prescription (PTS) | BPT 405 | 4 | Theory | 10 | 150 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Understand the importance of sports and physical activities in health promotion (K) | 2 | 1 | _ | – | – | 1 | – | 1 | 2 | – |
| **CO2:** Describe the methods for safe participation in sports and physical activities (K) | 3 | 2 | _ | – | 2 | 1 | – | 2 | 2 | – |
| **CO3:** Identify, evaluate, analyse and discuss common acute and overuse injuries encountered in sports and plan initial management (KH) | 3 | 3 | _ | _ | – | 1 | 1 | 2 | 2 | – |
| **CO4:** Demonstrate the techniques used in the area of sports physiotherapy (taping, bandaging, on-field management, rehabilitation) (SH) | 3 | 3 | 2 | _ | – | 2 | 1 | 2 | 2 | – |
| **CO5:** Execute physical fitness testing of a healthy population (SH) | 3 | 3 | 2 | – | 2 | 2 | 1 | 2 | 2 | – |
| **CO6:** Apply the theoretical basis of physiological effects and best available evidence on the safe application of management guidelines (KH) | 3 | 2 | 2 | – | 2 | 2 | 1 | 2 | 2 | – |
| **CO7:** Understand the needs of specific populations participating in sports (K) | 2 | 2 | _ | _ | 1 | 1 | – | 2 | 2 | – |

**B. Course Content**

**SECTION -A**

**Unit I**

PTS 1.1. Introduction to Sports: importance of sports in health promotion, types of sportscontact, non-contact, team sports, individual sports, social economic importance of sports role of Physiotherapist in sports

PTS 1.2. Sports injuries: types acute overuse, soft tissue injury Stages of healing principles of Treatment for soft tissue injuries- Acute, Sub acute and chronic stages.

PTS 1.3. Safe participation: causes, risk factors of sports injuries, principles of Prevention of injuries in sports and physical activities, levels of prevention, methods of prevention- active measures passive measures, protective equipment

PTS 1.4. Management of Common sports injuries: sprain, strain, contusion, laceration Lateral ligament sprain of ankle. Rotator cuff injuries. Col- lateral and Cruciate injuries of knee Meniscal injuries of knee Supraspinatus and Bicipital tendonitis Pre patellar and Subacromial bursitis Tennis and Golfer's elbow Hamstring strains, Quadriceps contusion, TA rupture Dequervain's tenosynovitis Trigger and Mallet finger Plantar fasciitis. Wrist sprains

PTS 1.5. Techniques of sports Physiotherapy: Taping, bandaging, Moving the injured participant stretcher use Cardio Pulmonary Resuscitation; Causes of Collapse and Treatment of collapsed athlete, recovery methods

PTS 1.6. Rehabilitation in Sports

**SECTION -B**

**Unit 2**

PTS 2.1. Physical fitness definition – component of physical fitness (strength, endurance, flexibility power, aerobic and anerobic capacity agility, coordination, body composition) - description

PTS 2.2. Assessment of physical fitness: Physical Activities Readiness Questionnaire, Fitness Screening for Mental and Physical Fitness tests of individual components of fitness, Body Mass Index

PTS 2.3. Health, fitness, and wellness promotion: principles, methods cardiopulmonary endurance (continuous, intermittent, fartlek), anaerobic capacity, strength, flexibility, agility, coordination, health education, healthy nutrition, balance diet, relaxation

PTS 2.4. Health, fitness, and wellness issues of specific population groups: childhood and adolescence, pregnancy, older adult’s hypertension diabetes

PTS 2.5. Special ability in sports : Paralympics sports, types, classification of athlete, specific problems

PTS 2.6. Guidelines for Exercise Testing and Prescription Benefits and Risks Associated with Physical Activity.

PTS 2.7. Pre participation Health Screening

PTS 2.8. General Principles of Exercise Prescription

PTS 2.9. Exercise Prescription for Healthy Populations with Special Considerations

PTS 2.10. Topics for Exercise Prescription for Populations with Other Chronic Diseases and Health Conditions, Overweight and Obesity

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Sports Physiotherapy & Exercise Prescription (PTS) | BPT 405 (P) | 4 | Practical | 2 | 60 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Perform a structured pre-participation examination to identify musculoskeletal, cardiovascular, and modifiable risk factors, and determine fitness-to-play (P) | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 1 | 2 | - |
| **CO2:** Execute evidence-informed acute (on-field and clinic) management of common sports injuries, including immediate care and triage decisions (P) | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 1 | 2 | - |
| **CO3:** Administer and interpret standardized tests for the major components of physical fitness (strength, endurance, flexibility, power, agility) to establish an athlete's baseline (SH) | 3 | 3 | 2 | _ | 2 | 3 | 2 | 1 | 2 | - |
| **CO4:** Apply appropriate bandaging and taping techniques for prevention and management of common sports injuries with correct rationale and patient consent (P) | 3 | 3 | 2 | _ | 2 | 3 | 2 | 1 | 2 | - |
| **CO5:** Design and progress an individualized exercise prescription based on identified impairments and activity limitations, integrating findings from examination and fitness testing (P) | 3 | 3 | 2 | _ | 2 | 3 | 2 | 1 | 2 | - |

**B. Course Content**

Students should be able to execute independently the following

PTS (P) 3.1. Pre-participation examination for risk factor identification

PTS (P) 3.2. Acute management of sports injuries

PTS (P) 3.3. Testing of various components of fitness

PTS (P) 3.4. Apply bandaging and taping for common sports injuries

PTS (P) 3.5. Plan exercise programme based on impairment and activity limitation

**Recommended text books for PTS**


1. Brukner and Khan: Clinical Sports Medicine, McGraw Hill.

2. Zulunga et al: Sports Physiotherapy, W.B. Saunders.

3. Reed: Sports Injuries – Assessment and Rehabilitation, W.B. Saunders.

4. Norris: Sports Injuries – Diagnosis and Management for Physiotherapists, Heinmann

5. Morris B. Mellion: Office Sports Medicine, Hanley & Belfus.

6. Bartlett R. Introduction to sports biomechanics: Analysing human movement patterns. Routledge;2007 Oct25.

7. William D. McArdle, Frank I. Katch, Victor L. KatchAstrand, P.-O. and Rodahl, K. Text book of Work Physiology Physiological basis of exercise

8. Fu and Stone: Sports Injuries: Mechanism, Prevention and Treatment, Williams and Wilkins.

9. Kulund: The Injured Athlete, Lippincott.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Ethics, Medico Legal aspects, Management & Administration (PTLM) | BPT 406 | 4 | Theory | 6 | 90 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Compare and contrast morality, ethics and legality, and discuss the ethical issues pertaining to physiotherapy practice (K) | 3 | 1 | 2 | 1 | 3 | 2 | 1 | 3 | 1 | – |
| **CO2:** Discuss professionalism, the code of professional ethics, salient national/international codes and the legal framework of physiotherapy practice (K) | 3 | 1 | 2 | 2 | 3 | 2 | 1 | 3 | 2 | – |
| **CO3:** Discuss the principles and elements of management and their relevance to physiotherapy practice (K) | 3 | 1 | 2 | 1 | 2 | 2 | 1 | 3 | 2 | – |
| **CO4:** Discuss the principles and methods of quality control and the skills necessary to run a physiotherapy clinic as an entrepreneur (KH) | 3 | 1 | 2 | 1 | 2 | 2 | 1 | 3 | 2 | – |

**B. Course Content**

**SECTION -A**

**Unit 1**

PTLM 1.1. Concept of Morality, Ethics and Legality Personal values- ethical or moral values

PTLM 1.2. ethical issues in Physiotherapy practice: Professionalism, informed consent, confidentiality, sexual and physical abuse, social characteristics, and personal relationships, professional issues, Client interest and Satisfaction, Confidence and Communication, malpractice, negligence, rights of patients, liability and obligations

PTLM 1.3. Professional ethics in research, education and patient care delivery

PTLM 1.4. Professionalism, Professional values- Integrity, Objectivity, Professional competence and due care, Confidentiality. Core values- Accountability, Altruism, Compassion/ caring, excellence, integrity, professional duties, social responsibility Attitude and behavior professional behavior professional accountability and responsibility, misconduct

PTLM 1.5. code of professional conduct = Differences between professions and importance of team efforts Relationship with patients Relationship with Healthcare institutions Relationship with colleagues and peers Relationship with medical and other professional Referral relationships

PTLM 1.6. Salient features of Helsinki declaration, ICMR code of ethics of research involving human subjects Ethical principles of WCPT

**Unit 2**

PTLM 2.1. Laws governing Physiotherapy practice - NCAHP Act, 2021, Consumer Protection Act, 2019, Rights of Persons with Disabilities Act, 2016 and Professional Indemnity insurance policy

PTLM 2.2. direct access meaning and responsibilities The consulting process The skills of a good consultant Trust in the consultant/client relationship Ethical and legal issues in consultation

PTLM 2.3. Development of Physiotherapy Profession

**SECTION-B**

**Unit 3**

PTLM 3.1. Introduction to management and administration meaning definition scope, principles, elements of management relevance of management to physio- therapy practice

PTLM 3.2. Planning: definition nature, principles of planning, advantage and disadvantages, component of planning [objectives, policy, procedure, rules, methods, project, budget strategy], types of plan process of planning, decision making

PTLM 3.3. Organizing definition, steps in organizing, types of organization, organizational chart hierarchy, authority, power, responsibility, accountability, delegation of authority, centralization, decentralization

PTLM 3.4. Staffing: definition functions Manpower planning: according to organizational structure and needs Recruitment Training and development Appraisal Remuneration

PTLM 3.5. Controlling and monitoring, types of control steps in control process methods of control [management information system. Quality Management System (QMS), Quality Assurance (QA) and Quality Control (QC) inventory, store Record keeping

**Unit 4**

PTLM 4.1. Directing: definition, nature significance, principles of directing elements of directing function [supervision communication, motivation, leader- ship

PTLM 4.2. Finance: MEANING, NATURE AND SCOPE OF FINANCE, Financial Goals, Finance Functions [ investment decisions, dividend decisions, financial decisions] budgeting

PTLM 4.3. marketing, meaning, concept importance elements of marketing [ product, price, promotion, physical distribution], branding, pricing, advertising publicity social marketing advocacy and sensitization

PTLM 4.4. Quality assurance: establishment of standards, audit – financial audit clinical audit, total quality management

PTLM 4.5. Setting of a Physiotherapy service unit Organization of physiotherapy department Entrepreneurship in Physiotherapy Practice: Need, Advantages and Opportunities, Challenges and Barriers

**Recommended Text Books for PTLM**


1. CM Francis Medical Ethics jay pee new Delhi

2. Raja K Davis F Ethical Issues: Perspectives for the Physiotherapists Jaypee brothers new delhi

3. Percival, T. (2014). Medical ethics. Cambridge University Press.

4. Dunn, M., & Hope, T. (2018). Medical ethics: a very short introduction. Oxford University Press.

5. Sakharkar BM Principles of hospital administration and planning jaypee brothers new delhi

6. Hébert, P. C., & Rosen, W. (2009). Doing right: a practical guide to ethics for medical trainees and physicians (p. 352). Don Mills, ON: Oxford University Press. American

7. Medical Association, & New York Academy of Medicine. (1848).

8. Code of medical ethics. H. Ludwig &Company

9. Blackburn, S. (2003). Ethics: A very short introduction (Vol. 80). Oxford University Press.

10. Joydeep Das Gupta Hospital Administration and Management: A Comprehensive Guide jaypee brothers

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Community Physiotherapy & Rehabilitation (CPTR) | BPT 407 | 4 | Theory | 6 | 90 |

**A. Course Outcomes (CO)**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Describe the conceptual framework of rehabilitation with emphasis on the roles of rehabilitation team members and various models of rehabilitation (K) | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | – |
| **CO2:** Describe the concept and methods of epidemiology with emphasis on locomotor disability (K) | 3 | 1 | 1 | 1 | – | 2 | – | 2 | 1 | – |
| **CO3:** Describe the concept of community-based rehabilitation and outreach programmes to rehabilitate persons with disabilities in rural areas (K) | 3 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | – |
| **CO4:** Explain the principles of orthotics along with region-wise uses and fitting (KH) | 3 | 2 | 1 | _ | – | 2 | – | 1 | 1 | – |
| **CO5:** Describe the principles of prosthetics along with region-wise uses and fitting (KH) | 3 | 2 | 1 | _ | – | 2 | – | 1 | 1 | – |
| **CO6:** Describe the identification and process of rehabilitation of speech and hearing, visual, and intellectual disability (K) | 3 | 2 | 1 | 2 | 1 | 2 | 1 | 3 | 1 | – |
| **CO7:** Explain the principles of vocational rehabilitation, including evaluation and vocational goals for people with disability (K) | 3 | 2 | 1 | 2 | 1 | 2 | 1 | 3 | 1 | – |
| **CO8:** Apply the concept of health education (KH) | 3 | 2 | 2 | 1 | 1 | 2 | 1 | 3 | 3 | – |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO9:** Understand occupational therapy and the importance of ADL and training of wheelchair, bed, transfer, locomotor and self-care activities (KH) | 3 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | – |
| **CO10:** Discuss architectural barriers and possible modifications with reference to common disabling conditions (KH) | 3 | 2 | 1 | 1 | 2 | 2 | _ | 3 | 2 | – |
| **CO11:** Outline the principles of disability evaluation (K) | 3 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | – |
| **CO12:** Discuss the principles of occupational health and ergonomics (KH) | 3 | 2 | 1 | 1 | 1 | 2 | _ | 3 | 2 | – |

**B. Course Content**

**SECTION -A**

**Unit -1**

CPTR 1.1. National District Level Community Program: Primary rehabilitation unit, Regional training center, District rehabilitation center, Primary Health center, Village rehabilitation worker, Anganwadi worker.

CPTR 1.2. Role of Physiotherapy in CBR: Screening for disabilities, prescribing exercise program, Prescribing and devising low cost locally available assistive aids, Modifications physical and architectural barriers for disabled, Disability prevention, Strategies to improve ADL, Rehabilitation program for various neuro-musculoskeletal and cardiothoracic disabilities.

CPTR 1.3. Assessment of disability in rural & urban setups. Healthcare delivery system & preventive measures with specific reference to disabling conditions. Community education program.

CPTR 1.4. Application of Physiotherapy skills at community level with special reference to the need at rural level.

CPTR 1.5. Role of voluntary Organizations in CBR: Charitable Organizations, Voluntary health agencies – National level and International NGO"s, Multilateral and Bilateral agencies. International Health Organizations: WHO, UNICEF, UNDP, UNFPA, FAO, ILO, World bank, USAID, SIDA, DANIDA, Rockfeller, Ford foundation, CARE, RED CROSS

**Unit 2**

CPTR 2.1. Introduction of Rehabilitation & History

CPTR 2.2. Epidemiology of disability (Impairment, disability, phases of disability process, etc.).

CPTR 2.3. Principles of Rehabilitation & concept of team approach with rolls of each individual participant.

CPTR 2.4. Organization of Rehabilitation unit.

CPTR 2.5. Disability prevention evaluation & principles of Rehabilitation Management.

CPTR 2.6. Role of Physiotherapy in Rehabilitation (Preventive, treatment & restoration)

CPTR 2.7. Brief outline of Communication disorder & its implications on Rehabilitation process.

CPTR 2.8. Brief outline of psychosocial & vocational aspects of Rehabilitation.

CPTR 2.9. Introduction to Occupational therapy.

CPTR 2.10. Activities of daily living, functional assessment & training for functional independence.

CPTR 2.11. Brief outline of basic community medicine with special reference to community-based Rehabilitation, infrastructure and role of CBR

CPTR 2.12. Disability and Rehabilitation: concept and Definition, models of disability international classification of functioning Definition and concept of Impairment, Persons with Disabilities and Disability activity limitation, participation restriction, environmental factors, contextual factors Types. Conceptual framework of rehabilitation, roles of rehabilitation team members, definitions and various models of rehabilitation, Role of family members in the rehabilitation of a physically Persons with Disabilities. PWD Act 1995 and Rights of person with Disability Act 2016, National Trust Act (Note wherever applicable: The Gazette of India is regularly updated, and its publications can change over time. Refer the recent Gazette publications issued by the Government of India, from the official website)

CPTR 2.13. Introduction to Community Based Rehabilitation: Definition, Historical review, Concept of CBR, Need for CBR, Difference between Institution based and Community based Rehabilitation, Objectives of CBR, Scope of CBR, Members of CBR team, Models of CBR Extension services and mobile units: Introduction, Need, Camp approach.

CPTR 2.14. Disability Evaluation: Introduction, What, Why and How to evaluate, Quantitative versus Qualitative data, Uses of evaluation findings. GOI guidelines

CPTR 2.15. Principles of Orthotics- types, indications, contra indications, assessment (check out), uses and fitting –region wise.

1. Orthotics for the Upper Limb
2. Orthotics for the Lower Limb
3. Orthotics for the Spine

CPTR 2.16. Principles of Prosthetics –types, indications, contraindications, assessment check out, uses and fitting – region wise

CPTR 2.17. Assistive devices and Technologies.

CPTR 2.18. Introduction to Occupational therapy Definition, scope and importance of Activities of Daily Living (ADLs)self-care activities, such as toilet, eating, dressing etc

**SECTION -B**

**Unit 3**

CPTR 3.1. Identification, assessment and classification of intellectual disabilities. Etiogenesis and principles of management including prevention and Rehabilitation of Intellectual disabilities, including vocational training & home education programme.

CPTR 3.2. Principles & mechanisms of Communication including speech & hearing, Common disorders of speech & hearing – etiogenesis, clinical features, assessment & principles of management

CPTR 3.3. Identification, assessment and classification of visual disabilities Etiogenesis and principles of management including prevention, Rehabilitation of visual disabilities, vocational training & home education programme

**Unit 4**

CPTR 4.1. Vocational and social rehabilitation vocational and social aspects of disability, including evaluation & vocational goals for people with disability Role of social worker in rehabilitation

CPTR 4.2. Architectural Barriers: Describe architectural barriers and possible modifications with reference to Rheumatoid Arthritis, CVA, Spinal Cord Injury and other disabling conditions. physical and architectural barriers for disabled,

CPTR 4.3. Health Education: Concepts, aims and objectives, Approaches to health education, Models of health education, Contents of health education, Principles of health education, Practice of health education

CPTR 4.4. Occupational health & Ergonomics - Occupational Hazards in the industrial area -- Accidents due to Physical agents-Chemical agents- Mechanical hazards-overuse/fatigue injuries due to ergonomic alteration & ergonomic evaluation of work place-mechanical stresses due to sedentary table work –executives, clerk, inappropriate seating arrangement- vehicle drivers constant standing-watchman- Defense forces, surgeons, Over-exertion in laborers,-common accidents –Role of P.T.-Stress management. Psychological hazards- e.g.-executives, monotonicity & dissatisfaction in job, anxiety of work completion with quality, Role of P.T. in Industrial setup & Stress management/relaxation modes.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Community Physiotherapy & Rehabilitation (CPTR) | BPT 407 (P) | 4 | Practical | 1 | 30 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1**: Conduct disability screening and community/village disability surveys in urban and rural settings, and interpret findings to identify rehabilitation needs (P) | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | - |
| **CO2**: Perform community-based evaluation and prescribe appropriate physiotherapy for musculoskeletal, neuromuscular, cardio-respiratory, paediatric, gynaecological and geriatric conditions during camps and PHC/field visits (P) | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | - |
| **CO3**: Demonstrate evaluation, prescription and training for ambulatory and assistive devices, and fabricate low-cost assistive devices using locally available materials (SH) | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | - |
| **CO4**: Plan, develop and deliver community education programs on health and disability issues for awareness, prevention and care, adapted to the target population (P) | 1 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | - |
| **CO5**: Function effectively and ethically as a member of a multidisciplinary rehabilitation team during mobile camps, PHC visits and regional rehabilitation centre placements (P) | 1 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | - |

**B. Course Content:**

CPTR (P) 5. This will consist of Field visits to urban and rural PHC's., Visits to regional rehabilitation training center, Regular mobile camps, Disability surveys in villages, Disability screening, Demonstration of Evaluation and Physiotherapy prescription techniques for musculoskeletal,

neuromuscular, cardio-respiratory, paediatric, gynecological and geriatric problems in community, Demonstration of evaluation and prescription techniques for ambulatory and assistive devices, Fabrication of low cost assistive devices with locally available materials. And preparing and delivering community education program on various health and disability related issue for awareness, prevention and care

**Recommended Text Books for CPTR**


1. Handbook of Rehabilitation – Sunder

2. Orthotics in Rehabilitation : Mckee and Morgan – F. A. Davis

3. Orthotics and prosthetic and assistive devices for physiotherapists by sinha, sharma and tripathy jaypee brothers

4. Park's Textbook of Preventive & Social Medicine - K.Park

5. Physical Rehabilitation – Assessment and Treatment – Sullivan & Schmitz F. A. Davis.

6. Occupational Therapy and Physical Dysfunction. Principles, Skills and Practices – Hand Splinting - Tuner, Forster & Johnson – Churchill Living- stone

7. Piyush Gupta O.P.Ghai; T.B. of Preventive & social medicine 2nd edition CBS publishers & distributors 2007.

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Project Work Orientation | BPT 408 | 4 | Theory | 6 | 90 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Explain basic research methodology, common study designs, and the literature review process relevant to physiotherapy practice (KH) | 3 | 2 | - | - | - | 2 | - | - | 2 | - |
| **CO2:** Formulate a focused clinical question and develop a structured project proposal (case study / literature review / recent-technique appraisal) under faculty supervision (SH) | 3 | 2 | - | - | - | 2 | - | - | 2 | - |
| **CO3:** Conduct the supervised project collecting, analysing, and interpreting evidence/data while maintaining ethical standards and accurate logbook documentation (P) | 2 | 3 | - | - | 3 | 2 | 2 | 3 | 2 | - |
| **CO4:** Communicate project findings effectively through a written report and an oral case/research presentation to faculty and peers (SH) | 1 | 1 | 3 | - | - | 2 | 2 | - | 2 | - |
| **CO5:** Demonstrate professional accountability, teamwork, and a scientific, evidence-based attitude reflecting commitment to lifelong learning (P) | - | 3 | 1 | 2 | 3 | 2 | 3 | 3 | 3 | - |

**B. Course Content:**

**PW 1.0. RESEARCH PROJECT**

1. The candidate shall submit a project under the supervision of a Physiotherapy faculty during internship. The project may be a case study or of recent technique or literature reviews and etc. to make the student to have research mind and to facilitate for higher studies

2. The interns shall maintain the record of work which is to be verified and certified by the Physiotherapy faculty under whom he/she works. Based on the record of work and project, The Internship completion shall be reported in the form of grades by the HOD/ principle while issuing "Certificate of Satisfactory Completion" of internship following which University shall award the BPT degree

3. All internees will be assessed based on their satisfactory attendance, performance in the postings/and the presentation of the logbook and project. The credits and hours of internship will be mentioned in transcript

4. The internship assessment weightage will be based on following criteria:
Domains (% of the total marks)
a) Attendance (10%)
b) Log book (60%)
c) Project (30%)
of the internship assessment

CRITIQUE ENQUIRY, CASE PRESENTATION AND CASE DISCUSSION: Should be the regular part of clinical education from third year on wards

| Course Name | Course Code | Year | Course Description | Credit | Total Hours |
|---|---|---|---|---|---|
| Clinical Rotation | BPT 409 | 4 | Practical | 13 | 390 |

**A. Course Outcomes:**

| Course Outcome Statement | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **CO1:** Perform systematic, setting-appropriate patient assessment history, physical examination, relevant special tests, and validated outcome measures across diverse clinical postings under supervision (SH) | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | - |
| **CO2:** Formulate and execute evidence-based physiotherapy treatment plans, correctly identifying indications and contraindications and selecting appropriate parameters and dosage for the clinical condition (P) | 3 | 3 | 1 | 2 | 2 | 3 | 3 | 3 | 3 | - |
| **CO3:** Communicate effectively with patients, caregivers, and multidisciplinary team members, and maintain accurate, professional clinical documentation (SH) | 1 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | - |
| **CO4:** Demonstrate ethical, accountable, and patient-centred conduct, respecting confidentiality, consent, and professional boundaries in all clinical interactions (P) | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - |
| **CO5:** Adapt physiotherapy care to varied populations and contexts (neuro, ortho, paediatric, geriatric, community/PHC, industrial-ergonomic), applying reflective and lifelong-learning practices. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | - |

**B. Course Content:**

CLRo1. Students will be posted in rotation in the following areas/wards. The students will be clinically trained to provide physiotherapy care for the patients under supervision. They will be trained on bed side approach, patient assessment, performing special tests, identifying indications for

treatment, ruling out contraindications, decision on treatment parameters, dosage and use relevant outcome measures under supervision. Evidence based practice will be part of training.

1. Physiotherapy OPD
2. Neurology, Neurosurgery & Neuro ICU
3. Community - PHC
4. Orthopedics
5. General Medicine & MICU
6. General Surgery & CTVS ICU
7. Developmental Pediatrics & Child Guidance Clinic
8. OBG
9. Geriatric – Old Age Homes
10. Industrial Visits – Ergonomics

## 21. MODEL PAPERS

### QUESTION PAPER TEMPLATE FOR BPT 1st YEAR

**INSTRUCTIONS FOR PAPER SETTERS FOR BPT YEAR 1:**

1. All questions must be framed in alignment with the NCAHP competency framework. Map each question to the relevant Course Outcome (CO) and NCAHP competency code (K / KH / SH / P) in the annotation column on the question paper master copy.
2. Every question must carry two mandatory annotations: **(a)** Course Outcome (CO): e.g., CO2, CO5; **(b)** Highest Bloom's Level Attained: e.g., L3 - Application. These must be written in brackets after the question text.
3. The Bloom's Taxonomy ceiling for BPT Year 1 is Level 3 - Application. No question in this paper shall exceed this level. The paper setter must self-audit using the Bloom's reference table provided in this template.
4. Question distribution across Bloom's levels [L1 - Knowledge; L2 - Comprehension; and L3 - Application] must be documented on the master copy. Recommended distribution for Year 1: **L1–L2: ~50–60%; L3: ~40–50%; L4–L6: ~0% (not applicable)**.
5. Avoid repetition of topics across sections. Q1, Q2, Q4, Q5 should collectively cover a minimum of 6 different system/topic areas to ensure adequate syllabus sampling.
6. All LAQs must carry sufficient internal scope. A 10-mark Long Answer Question should have 4–5 expected response components; a 15-mark Long Answer Question should have 6–8 components. These expected answers must be included in the model answer key submitted alongside the paper.
7. The paper setter must submit: (i) Question Paper with CO + Bloom's Level annotations; (ii) Model Answer Key with marking scheme. All documents are confidential and must be submitted in a sealed envelope to the Examination Cell.

**BPT Year 1: Question-Level Mapping Table**

| Q. No. | Section | Question Type | Bloom's Range | Case/Clinical Requirement |
|---|---|---|---|---|
| **Q1** | I | Long Answer (LAQ) | L1 – L3 | Optional |

| | | | | |
|---|---|---|---|---|
| **Q2** | I | Short Answer (SAQ) | L1 – L3 | Optional |
| **Q3** | I | Very Short Answer (VSAQ) | L1 – L2 only | Not applicable |
| **Q4** | II | Long Answer (LAQ) | L2 – L3 (target) | Mandatory ≥1 case/vignette |
| **Q5** | II | Short Answer (SAQ) | L1 – L3 | Mandatory ≥1 clinical/applied (L3) + ≥1 case |
| **Q6** | II | MCQs (10 items) | L1 – L3 | Mandatory ≥2 case-based |

**Question Paper Structure:**

**Subject Code** **Subject Abb.**

**BPT (Main/ Remanded) Examination Month /Year**

**Subject Name**

**Paper I**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, student shall be allowed to take only one supplementary copy along with one main answer book*
*(Any Question having parts should be answered as whole at one place only)*

*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

**SECTION I**

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Write question text here. *[CO: ____ ; L: ____ ]*
2. Write question text here. *[CO: ____ ; L: ____ ]*
3. Write question text here. *[CO: ____ ; L: ____ ]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Write question text here. *[CO: ____ ; L: ____ ]*
2. Write question text here. *[CO: ____ ; L: ____ ]*
3. Write question text here. *[CO: ____ ; L: ____ ]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

1. Write question text here. *[CO: ____ ; L: ____ ]*

2. Write question text here. *[CO: ____ ; L: ____ ]*

3. Write question text here. *[CO: ____ ; L: ____ ]*

4. Write question text here. *[CO: ____ ; L: ____ ]*

5. Write question text here. *[CO: ____ ; L: ____ ]*

6. Write question text here. *[CO: ____ ; L: ____ ]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

1. Write question text here. *[CO: ____ ; L: ____ ]*

2. Write question text here. *[CO: ____ ; L: ____ ]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

1. Write question text here. *[CO: ____ ; L: ____ ]*

2. Write question text here. *[CO: ____ ; L: ____ ]*

3. Write question text here. *[CO: ____ ; L: ____ ]*

4. Write question text here. *[CO: ____ ; L: ____ ]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** [Case-based] Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**2.** [Case-based] Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**3.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**4.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**5.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**6.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**7.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**8.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**9.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**10.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**BPT 1st Year**

**BPT 101** **HA**

**BPT (Main / Remanded) Examination Month / Year**

**Human Anatomy**

**Paper I**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, the student shall be allowed to take only one supplementary copy along with one main answer book.*

*(Any question having parts should be answered as a whole at one place only.)*

*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe the knee joint under the following headings: type, articular surfaces, ligaments, menisci, movements, and nerve supply. Add a note on the applied anatomy of the collateral ligaments. *[CO6, CO11; L3]*
2. Describe the formation of the brachial plexus and its major branches. Add a note on the anatomical basis of Erb's palsy. *[CO4, CO10, CO11; L3]*
3. Classify joints with examples. Describe the general features of a synovial joint and the factors permitting and limiting joint movement. *[CO6; L2]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Describe the origin, insertion, nerve supply, actions, and openings of the diaphragm.

*[CO4, CO9; L2]*

2. Describe the boundaries and contents of the axilla. *[CO7; L2]*
3. Describe the arches of the foot and explain their functional significance in weight-bearing and gait. *[CO7, CO11; L3]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6) 5 × 2 = 10**

1. Define the anatomical position and name the three cardinal planes of the body. *[CO1; L1]*
2. List the openings in the diaphragm with the structures passing through each. *[CO9; L1]*
3. Name the muscles of the rotator cuff. *[CO4; L1]*
4. Differentiate between a fibrous and a synovial joint with one example of each. *[CO6; L2]*
5. Name the three germ layers and give one derivative of each. *[CO2; L1]*
6. Define a dermatome. *[CO10; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2) 1 × 15 = 15**

1. A 30-year-old man develops wrist drop following a mid-shaft fracture of the humerus. Name the nerve most likely injured, describe its course and relations in the arm, and explain the resulting motor and sensory deficits. Add the applied anatomy of humeral shaft fractures.

*[CO4, CO10, CO11; L3]*

2. Describe the organisation of the spinal cord: external features, internal arrangement of grey and white matter, and the principal ascending and descending tracts. Add a note on the applied anatomy of hemisection of the spinal cord. *[CO10, CO11; L3]*

**Q5. Short Answer Questions (Attempt any 3 out of 4) 3 × 5 = 15**

1. Describe the divisions and contents of the mediastinum. *[CO9; L2]*
2. Describe the arterial supply of the brain, with emphasis on the circle of Willis. *[CO10; L2]*
3. A footballer sustains an inversion injury of the ankle. Name the ligament most commonly injured and describe the ligaments stabilising the ankle joint. *[CO7, CO11; L3]*
4. Describe the boundaries and contents of the femoral triangle. *[CO7; L2]*

**Q6. Multiple Choice Questions (Attempt all)** **10 × 1 = 10**

**1.** A patient is unable to initiate the first 15° of shoulder abduction after trauma. Which muscle is most likely affected? *[CO4, CO11; L3]*

(a) Deltoid

(b) Supraspinatus

(c) Infraspinatus

(d) Teres major

**2.** Following a fracture of the surgical neck of the humerus, a patient cannot abduct the arm between 15° and 90° and has sensory loss over the upper lateral arm. The injured nerve is the:

*[CO10, CO11; L3]*

(a) Radial nerve

(b) Axillary nerve

(c) Musculocutaneous nerve

(d) Median nerve

**3.** The primary curves of the vertebral column, present at birth, are the: *[CO3; L1]*

(a) Cervical and lumbar

(b) Cervical only

(c) Thoracic and sacral

(d) Lumbar only

**4.** An example of a pivot joint is the: *[CO6; L1]*

(a) Shoulder joint

(b) Atlanto-axial joint

(c) Knee joint

(d) Wrist joint

**5.** The chief flexor of the elbow joint is the: *[CO4; L1]*

(a) Biceps brachii

(b) Brachialis

(c) Brachioradialis

(d) Pronator teres

**6.** The motor nerve supply of the diaphragm is the: *[CO9; L1]*

(a) Vagus nerve

(b) Phrenic nerve

(c) Intercostal nerve

(d) Sympathetic trunk

**7.** The structure passing through the foramen ovale of the skull is the: *[CO8; L1]*

(a) Maxillary nerve

(b) Mandibular nerve

(c) Ophthalmic nerve

(d) Facial nerve

**8.** The lateral longitudinal arch of the foot is maintained mainly by the: *[CO7; L2]*

(a) Deltoid ligament

(b) Long plantar ligament and peroneus longus

(c) Spring ligament alone

(d) Tibialis anterior

**9.** The germ layer that gives rise to the nervous system is the: *[CO2; L1]*

(a) Endoderm

(b) Mesoderm

(c) Ectoderm

(d) Trophoblast

**10.** Lymph from the lateral quadrants of the breast drains mainly to the: *[CO8; L2]*

(a) Internal thoracic nodes

(b) Axillary nodes

(c) Supraclavicular nodes

(d) Posterior mediastinal nodes

**BPT 102** **HP**

**BPT (Main / Remanded) Examination Month / Year**

**Human Physiology**

**Paper II**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

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*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe the ionic basis of the resting membrane potential and the sequence of events in the generation and propagation of a nerve action potential. *[CO4; L2]*
2. Describe the sliding-filament mechanism of skeletal muscle contraction, including excitation–contraction coupling. *[CO5; L2]*
3. Explain the baroreceptor and renal mechanisms regulating arterial blood pressure. *[CO6; L3]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Describe erythropoiesis and the factors regulating it. *[CO2; L2]*
2. Describe the physiological basis of the ECG waves and their clinical significance. *[CO6; L3]*
3. Describe the transport of carbon dioxide in the blood. *[CO6; L2]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

1. Define homeostasis and give one example of a negative-feedback mechanism. *[CO3; L1]*

2. Define glomerular filtration rate and state its normal value. *[CO7; L1]*
3. Name the plasma proteins and state one function of each. *[CO2; L1]*
4. Define cardiac output and state its normal resting value. *[CO6; L1]*
5. Differentiate between isometric and isotonic muscle contraction. *[CO5; L2]*
6. List the four lung volumes. *[CO6; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2) 1 × 15 = 15**

1. Describe the mechanism of urine formation. Add a note on the counter-current mechanism. *[CO7; L2]*
2. A 25-year-old athlete undertakes a 12-week progressive resistance-training programme. Explain the cardiovascular and skeletal-muscle adaptations to exercise and relate them to improved performance. *[CO10, CO11; L3]*

**Q5. Short Answer Questions (Attempt any 3 out of 4) 3 × 5 = 15**

1. Describe neuromuscular transmission and its applied aspects in myasthenia gravis. *[CO5, CO9; L3]*
2. Describe the physiological changes in the cardiovascular system during acute dynamic exercise. *[CO10; L3]*
3. Describe the functions of the cerebellum and the clinical features of cerebellar dysfunction. *[CO6; L2]*
4. A patient presents with polyuria, polydipsia, and a raised blood glucose level. Explain the physiological basis of the osmotic diuresis occurring in this condition. *[CO7, CO9; L3]*

**Q6. Multiple Choice Questions (Attempt all) 10 × 1 = 10**

**1.** Under normal conditions, the pacemaker of the heart is the: *[CO6; L1]*

(a) AV node

(b) SA node

(c) Bundle of His

(d) Purkinje fibres

**2.** An athlete's spirometry shows a normal FVC but a reduced FEV1/FVC ratio. This is MOST suggestive of: *[CO6, CO9; L3]*

(a) Restrictive lung disease

(b) Obstructive lung disease

(c) Normal athletic adaptation

(d) Neuromuscular weakness

**3.** The resting membrane potential of a typical neuron is approximately: *[CO4; L1]*

(a) -70 mV

(b) +30 mV

(c) -30 mV

(d) 0 mV

**4.** Erythropoietin is primarily secreted by the: *[CO7; L1]*

(a) Liver

(b) Kidney

(c) Bone marrow

(d) Spleen

**5.** The Bohr effect describes the influence on the oxygen–haemoglobin dissociation curve of: *[CO6; L2]*

(a) Carbon dioxide and hydrogen ions

(b) Temperature alone

(c) 2,3-DPG on fetal haemoglobin

(d) Altitude alone

**6.** After a spinal injury, a patient loses pain and temperature sensation on the side opposite and below the lesion while fine touch is preserved. The tract involved is the: *[CO6, CO9; L3]*

(a) Dorsal column

(b) Lateral spinothalamic tract

(c) Corticospinal tract

(d) Spinocerebellar tract

**7.** During moderate dynamic exercise, cardiac output increases mainly due to a rise in:

*[CO10; L2]*

(a) Stroke volume only

(b) Heart rate and stroke volume

(c) Total peripheral resistance

(d) Venous capacitance

**8.** The hormone chiefly responsible for water reabsorption in the collecting duct is: *[CO7; L1]*

(a) Aldosterone

(b) Antidiuretic hormone (ADH)

(c) Renin

(d) Atrial natriuretic peptide

**9.** Skeletal muscle contraction is triggered by the binding of calcium to: *[CO5; L1]*

(a) Myosin

(b) Troponin C

(c) Actin

(d) Tropomyosin

**10.** The principal buffer of plasma is the: *[CO3; L2]*

(a) Phosphate buffer

(b) Bicarbonate buffer

(c) Protein buffer

(d) Ammonia buffer

**BPT 103** **BC**

**BPT (Main / Remanded) Examination Month / Year**

**Biochemistry**

**Paper III**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, the student shall be allowed to take only one supplementary copy along with one main answer book.*

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## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe glycolysis and its reactions, key regulatory enzymes, and the net ATP yield under aerobic and anaerobic conditions. Add its significance during exercise. *[CO3, CO5; L3]*
2. Describe the structure and functions of the plasma membrane and classify the mechanisms of transport across it. *[CO2; L2]*
3. Classify lipoproteins and describe their composition, sources, and functions. Add a note on their role in atherosclerosis. *[CO3; L3]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Describe the bicarbonate buffer system and the role of the lungs and kidneys in acid–base balance. *[CO3; L2]*
2. Describe the citric acid cycle and explain its importance as an amphibolic pathway. *[CO3; L2]*
3. Define basal metabolic rate, state its normal value, and list the factors affecting it. *[CO5; L2]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

1. Define an enzyme and name its active site. *[CO3; L1]*
2. Differentiate between DNA and RNA (any two points). *[CO1; L2]*
3. Define respiratory quotient and state its value for carbohydrate. *[CO5; L1]*
4. Name two water-soluble vitamins and their respective deficiency diseases. *[CO4; L1]*
5. Define essential fatty acids and give two examples. *[CO3; L1]*
6. Define nitrogen balance. *[CO3; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

1. Describe carbohydrate metabolism at rest and during exercise, including glycogen metabolism, the Cori cycle, and the hormonal regulation of blood glucose. Relate this to energy supply during endurance activity. *[CO3, CO5; L3]*
2. A 45-year-old sedentary patient presents with fasting hyperglycaemia and glycosuria. Explain the biochemical basis of type 2 diabetes mellitus and the metabolic rationale for prescribing exercise as part of management. *[CO3, CO5; L3]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

1. Describe the sources, coenzyme forms, and deficiency features of any two B-complex vitamins. *[CO4; L2]*
2. Classify enzymes with one example of each class and describe the factors affecting enzyme activity. *[CO3; L2]*
3. Describe the formation, metabolism, and clinical significance of ketone bodies. *[CO3; L3]*
4. A marathon runner develops muscle fatigue and a fall in blood pH after a race. Explain the biochemical basis of lactic acid accumulation and its subsequent clearance. *[CO5; L3]*

**Q6. Multiple Choice Questions (Attempt all)** **10 × 1 = 10**

**1.** The net ATP produced by glycolysis (glucose → 2 pyruvate) via substrate-level phosphorylation is:

*[CO3; L1]*

(a) 2

(b) 4

(c) 6

(d) 8

**2.** The rate-limiting enzyme of glycolysis is: *[CO3; L2]*

(a) Hexokinase

(b) Phosphofructokinase-1

(c) Pyruvate kinase

(d) Aldolase

**3.** A child presents with bowing of the legs, delayed dentition, and low serum calcium. The deficient vitamin is MOST likely: *[CO4; L3]*

(a) Vitamin A

(b) Vitamin D

(c) Vitamin K

(d) Vitamin C

**4.** The vitamin acting as a coenzyme in transamination reactions is: *[CO4; L2]*

(a) Thiamine (B1)

(b) Pyridoxine (B6)

(c) Cyanocobalamin (B12)

(d) Ascorbic acid (C)

**5.** The normal fasting blood glucose range (mg/dL) is: *[CO3; L1]*

(a) 70–110

(b) 120–160

(c) 40–60

(d) 160–200

**6.** Ketone bodies are synthesised primarily in the: *[CO3; L2]*

(a) Skeletal muscle

(b) Liver

(c) Kidney

(d) Brain

**7.** An endurance athlete relies on fat oxidation during prolonged low-intensity exercise. The primary intracellular site of β-oxidation is the: *[CO5; L3]*

(a) Cytoplasm

(b) Mitochondrion

(c) Ribosome

(d) Nucleus

**8.** The buffer contributing most to the buffering capacity of plasma is the: *[CO3; L2]*

(a) Phosphate buffer

(b) Bicarbonate buffer

(c) Haemoglobin buffer

(d) Protein buffer

**9.** Deficiency of vitamin B12 characteristically causes: *[CO4; L1]*

(a) Scurvy

(b) Megaloblastic anaemia

(c) Rickets

(d) Beri-beri

**10.** An essential amino acid among the following is: *[CO3; L1]*

(a) Alanine

(b) Leucine

(c) Glycine

(d) Serine

**BPT 104** **FoEM**

**BPT (Main / Remanded) Examination Month / Year**

**Fundamentals of Exercise Modalities**

**Paper IV**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

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## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Classify levers into their three orders with anatomical examples, and explain how the angle of pull affects the mechanical efficiency of a muscle. *[CO1; L3]*
2. Describe the starting position “standing”, and derive four positions from it, explaining the muscle work and uses of each. *[CO5; L2]*
3. Describe manual muscle testing (MMT) along with its principles, aims, grading, indications, and limitations. *[CO7; L2]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Define force. Describe the composition and resolution of forces with a physiotherapy-relevant example. *[CO1; L3]*
2. Describe the technique of goniometry and discuss its reliability and validity. *[CO3; L2]*
3. Classify passive movements and state the indications and contraindications of relaxed passive movements. *[CO5; L2]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

1. Define centre of gravity and line of gravity. *[CO1; L1]*
2. Name the three cardinal planes and the axis of movement in each. *[CO2; L1]*
3. Define range of motion and state the normal ROM of the elbow joint. *[CO3; L1]*
4. List two indications and two contraindications of resisted exercise. *[CO5; L1]*
5. Define base of support and state its effect on stability. *[CO1; L2]*
6. Name any four fundamental positions. *[CO5; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

1. Classify active movements. Explain free exercise, active-assisted exercise, and resisted exercise with their principles, techniques, effects, and uses. *[CO5; L3]*
2. A patient has Grade 2/5 quadriceps power. Explain how you would select and progress the appropriate types of therapeutic exercise, justifying each stage biomechanically.

*[CO5, CO7; L3]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

1. Describe the physiological and therapeutic effects of soft-tissue manipulation and its contraindications. *[CO5; L2]*
2. Describe the principles of transferring a hemiplegic patient from bed to wheelchair. *[CO6; L3]*
3. Describe the clinical assessment of coordination and balance. *[CO7; L2]*
4. A 70-year-old patient with impaired balance and fear of falling requires a walking aid. Describe how you would select and measure an appropriate aid and the gait pattern you would teach.

*[CO8; L3]*

**Q6. Multiple Choice Questions (Attempt all)** **10 × 1 = 10**

**1.** In a first-order lever, the fulcrum lies: *[CO1; L1]*

(a) Between the effort and the load

(b) At the load

(c) Between the fulcrum and effort

(d) At the effort

**2.** The plane that divides the body into right and left halves is the: *[CO2; L1]*

(a) Median (sagittal) plane

(b) Coronal plane

(c) Transverse plane

(d) Oblique plane

**3.** Abduction of the shoulder occurs in the: *[CO2; L2]*

(a) Sagittal plane about a coronal axis

(b) Coronal plane about an antero-posterior axis

(c) Transverse plane about a vertical axis

(d) Oblique plane

**4.** A patient's knee ROM is recorded as 10°– 90°. This indicates: *[CO3; L3]*

(a) Normal full extension

(b) A 10° fixed flexion deformity

(c) Hyperextension of the knee

(d) Full available flexion

**5.** The MMT grade denoting full ROM against gravity but with no added resistance is : *[CO7; L1]*

(a) Grade 2

(b) Grade 3

(c) Grade 4

(d) Grade 5

**6.** An isometric muscle contraction is characterised by: *[CO5; L2]*

(a) Change in length with constant tension

(b) Constant length with change in tension

(c) Muscle shortening under load

(d) Muscle lengthening under load

**7.** An elderly patient with weakness of the right lower limb is prescribed a walking stick. It should be held: *[CO8; L3]*

(a) In the right (weak) hand

(b) In the left (sound) hand

(c) In either hand

(d) In both hands

**8.** The stability of a body is increased when the: *[CO1; L2]*

(a) Base of support is narrowed

(b) Line of gravity falls within a wide base of support

(c) Centre of gravity is raised

(d) Base is reduced

**9.** A concentric muscle contraction produces: *[CO5; L1]*

(a) Muscle lengthening

(b) Muscle shortening

(c) No change in length

(d) An isometric hold

**10.** Effleurage is a massage manipulation classified as a: *[CO5; L1]*

(a) Percussion technique

(b) Stroking technique

(c) Deep-friction technique

(d) Vibration technique

**BPT 105** **FoEA**

**BPT (Main / Remanded) Examination Month / Year**

**Fundamentals of Electro-Physical Agents**

**Paper V**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, the student shall be allowed to take only one supplementary copy along with one main answer book.*

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## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe transcutaneous electrical nerve stimulation (TENS): types, pulse parameters, physiological basis of pain relief, indications, contraindications, and precautions. *[CO1, CO5; L3]*
2. Describe the physiology and pathophysiology of pain and explain the Gate Control Theory of pain modulation. *[CO4, CO5; L2]*
3. Describe infrared radiation: production, types, physiological and therapeutic effects, indications, and contraindications. *[CO6; L2]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. State Ohm's law and describe its application to alternating and direct currents. *[CO1; L3]*
2. Describe iontophoresis: principle, indications, and precautions. *[CO1; L2]*
3. Describe the first-aid and initial management of electric shock in the physiotherapy department. *[CO1; L3]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

1. Define potential difference and resistance. *[CO1; L1]*
2. Differentiate between a conductor and an insulator with one example of each. *[CO1; L2]*
3. Define rheobase and chronaxie. *[CO1; L1]*
4. List two contraindications to superficial heat therapy. *[CO6; L1]*
5. Define pain threshold and pain tolerance. *[CO4; L1]*
6. Name any four regions of the electromagnetic spectrum in order of increasing wavelength. *[CO1; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

1. Describe the reaction of degeneration and the strength–duration (S-D) curve. Explain how the S-D curve, chronaxie, and rheobase help differentiate a normally innervated muscle from a denervated one. *[CO1; L3]*
2. A patient with acute lateral epicondylitis is referred for electrotherapy for pain relief. Justify your choice of electrophysical agent(s) with reference to the underlying pain mechanism, and state the parameters, indications, and precautions. *[CO4, CO5, CO6; L3]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

1. Describe faradic current and the physiological basis of faradic stimulation of an innervated muscle. *[CO1; L2]*
2. Describe the mode of heat transfer and the physiological effects of a paraffin-wax bath. *[CO6; L2]*
3. Describe the safety measures, earthing, and precautions required in an electrotherapy department. *[CO1; L3]*
4. A patient reports increased pain and marked skin redness after a hot pack was left in place for 40 minutes. Explain the likely cause, the precautions that were missed, and how you would prevent recurrence. *[CO6; L3]*

**Q6. Multiple Choice Questions (Attempt all)** **10 × 1 = 10**

**1.** According to the Gate Control Theory, pain transmission is inhibited by stimulation of:

*[CO4, CO5; L2]*

(a) C fibres

(b) Large-diameter Aβ fibres

(c) Aδ fibres

(d) Sympathetic fibres

**2.** Chronaxie is defined as the: *[CO1; L1]*

(a) Minimum current at an infinitely long duration

(b) Duration required to excite a tissue at twice the rheobase

(c) Maximum tolerable current

(d) Threshold voltage of the tissue

**3.** A patient with an implanted cardiac pacemaker is referred for TENS over the anterior chest wall. The correct action is to: *[CO5; L3]*

(a) Apply TENS as usual

(b) Avoid TENS in this region as it is contraindicated

(c) Increase the intensity for effect

(d) Use only a high frequency

**4.** Ohm's law is expressed as: *[CO1; L1]*

(a) V = IR

(b) V = I/R

(c) I = VR

(d) R = VI

**5.** Infrared radiation produces its therapeutic effect mainly through: *[CO6; L2]*

(a) Ionisation of tissues

(b) Superficial heating

(c) Cavitation

(d) Magnetic induction

**6.** In iontophoresis, a positively charged drug ion is driven into the tissues from the: *[CO1; L2]*

(a) Cathode

(b) Anode

(c) Indifferent electrode

(d) Earth electrode

**7.** Thermal sensation is found to be impaired over a patient's forearm scheduled for wax therapy. The appropriate step is to: *[CO6; L3]*

(a) Proceed with treatment normally

(b) Regard the impaired thermal sensation as a contraindication/precaution

(c) Increase the wax temperature

(d) Extend the treatment duration

**8.** A positive reaction of degeneration on electrical testing indicates: *[CO1; L2]*

(a) Normal innervation

(b) Lower motor neuron / denervation

(c) An upper motor neuron lesion

(d) Muscle hypertrophy

**9.** The frequency range generally used for conventional (high-rate) TENS is approximately: *[CO1; L1]*

(a) 1–5 Hz

(b) 80–120 Hz

(c) 0.5 Hz

(d) 500 Hz

**10.** Earthing of electrotherapy equipment is provided primarily to: *[CO1; L1]*

(a) Increase the output

(b) Protect the patient and operator from electric shock

(c) Reduce treatment time

(d) Improve the heating effect

**BPT 106** **PS**

**BPT (Main / Remanded) Examination Month / Year**

**Psychology and Sociology**

**Paper VI**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, the student shall be allowed to take only one supplementary copy along with one main answer book.*

*(Any question having parts should be answered as a whole at one place only.)*

*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe the theories of emotion and the physiological changes accompanying emotional states. *[PSY-CO3; L2]*
2. Describe the theories of learning and their application to patient rehabilitation. *[PSY-CO2; L3]*
3. Define personality. Describe the tools used to measure personality and the common defence mechanisms. *[PSY-CO5; L2]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Describe frustration and conflict, and explain the different types of conflict. *[PSY-CO7; L2]*
2. Describe the physiological symptoms of stress and outline the strategies for stress management. *[PSY-CO7; L3]*
3. Define intelligence and describe the concepts of IQ and mental age. *[PSY-CO6; L2]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

1. Define psychology and name any two schools of psychology. *[PSY-CO1; L1]*
2. Give two examples each of primary and secondary motives. *[PSY-CO4; L1]*
3. Differentiate between illusion and hallucination. *[PSY-CO3; L2]*
4. Define attitude. *[PSY-CO1; L1]*
5. Define socialization and name its types. *[SOC-CO1; L1]*
6. Define a social group and give one example. *[SOC-CO4; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

1. Describe the biomedical and biopsychosocial models of health and illness, and explain the relevance of the biopsychosocial model to physiotherapy practice with a clinical example. *[SOC-CO3; L3]*
2. A patient with a recent spinal cord injury shows denial, anger, and withdrawal during rehabilitation. Explain the psychological reactions of patients to illness and disability, and describe how the physiotherapist can respond therapeutically. *[PSY-CO8; L3]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

1. Describe the influence of the family on the individual's health and the effects of sickness on the family. *[SOC-CO5; L2]*
2. Describe the social problems of persons with disability and the remedies to prevent them. *[SOC-CO6; L2]*
3. Describe the role of primary and secondary groups in hospital and rehabilitation settings. *[SOC-CO4; L2]*
4. A physiotherapy outreach team plans a community programme for a rural population with limited healthcare access. Discuss the social factors that influence the health-seeking behaviour of this community. *[SOC-CO1, SOC-CO6; L3]*

**Q6. Multiple Choice Questions (Attempt all)** **10 × 1 = 10**

**1.** The school of psychology founded by John B. Watson is: *[PSY-CO1; L1]*

(a) Structuralism

(b) Behaviourism

(c) Psychoanalysis

(d) Functionalism

**2.** Classical conditioning is associated with: *[PSY-CO2; L1]*

(a) B. F. Skinner

(b) Ivan Pavlov

(c) Wolfgang Köhler

(d) Sigmund Freud

**3.** A stroke patient practises a task repeatedly and is praised for each success, which increases performance. This illustrates: *[PSY-CO2; L3]*

(a) Classical conditioning

(b) Operant conditioning

(c) Insight learning

(d) Latent learning

**4.** In Maslow's hierarchy of needs, the need placed at the apex is: *[PSY-CO4; L1]*

(a) Safety needs

(b) Self-actualization

(c) Physiological needs

(d) Esteem needs

**5.** The defence mechanism of attributing one's own unacceptable feelings to another person is: *[PSY-CO5; L2]*

(a) Repression

(b) Projection

(c) Regression

(d) Denial

**6.** The biopsychosocial model of health was proposed by: *[SOC-CO3; L1]*

(a) René Descartes

(b) George Engel

(c) Sigmund Freud

(d) Émile Durkheim

**7.** A worker with a physical disability is repeatedly denied employment and becomes socially isolated. This best illustrates: *[SOC-CO6; L3]*

(a) A biological cause of disability

(b) A social cause of participation restriction

(c) A psychosomatic disease

(d) Anticipatory socialization

**8.** The family is an example of a: *[SOC-CO4; L1]*

(a) Secondary group

(b) Primary group

(c) Reference group

(d) Formal organisation

**9.** The intelligence quotient (IQ) is calculated as: *[PSY-CO6; L2]*

(a) (Mental age / Chronological age) × 100

(b) (Chronological age / Mental age) × 100

(c) Mental age − Chronological age

(d) Chronological age × 100

**10.** The method of sociological investigation involving an in-depth study of a single unit is the: *[SOC-CO1; L1]*

(a) Social survey

(b) Case study

(c) Opinion poll

(d) Questionnaire

**BPT 107** **FoHS**

**BPT (Main / Remanded) Examination Month / Year**

**Fundamentals of Healthcare Delivery System in India**

**Paper VII**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, the student shall be allowed to take only one supplementary copy along with one main answer book.*

*(Any question having parts should be answered as a whole at one place only.)*

*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe the structure and organisation of the healthcare delivery system in India at the primary, secondary, and tertiary levels of care. *[CO1; L2]*
2. Describe the National Health Mission and its objectives, major components, and implementation. *[CO2; L3]*
3. Describe the levels of disease prevention with physiotherapy-relevant examples at each level. *[CO5; L3]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Describe community participation in the healthcare delivery system. *[CO3; L2]*
2. Describe the concept of health and the major risk factors of health. *[CO5; L2]*
3. Describe the role of healthcare financing and the basic concept of health insurance. *[CO3; L3]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

1. Define primary health care and name any two of its components. *[CO1; L1]*
2. List two functions of a Primary Health Centre (PHC). *[CO1; L1]*
3. Differentiate between primary care and specialty care. *[CO4; L2]*
4. Name any two national health programmes of India. *[CO2; L1]*
5. Define health as per the World Health Organization (WHO). *[CO5; L1]*
6. Name two roles of the private sector in Indian healthcare. *[CO3; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2) 1 × 15 = 15**

1. Describe any two National Health Programmes of India, explaining their objectives, action plan, targets, and constraints. Add a note on the role of physiotherapy within national health priorities. *[CO2, CO5; L3]*
2. A district reports poor rehabilitation access for stroke survivors in its rural areas. Applying your knowledge of the healthcare delivery system, describe how primary, secondary, and tertiary services together with community participation could be organised to improve access. *[CO1, CO3, CO5; L3]*

**Q5. Short Answer Questions (Attempt any 3 out of 4) 3 × 5 = 15**

1. Describe the National Health Policy and its key objectives. *[CO2; L2]*
2. Compare the Indian healthcare system with that of a developed country. *[CO4; L2]*
3. Describe the impact of corporatization and globalization on healthcare services. *[CO4; L3]*
4. A private corporate hospital opens in a semi-urban area with high out-of-pocket costs. Discuss how healthcare financing and the private sector influence access and equity for the local population. *[CO3, CO4; L3]*

**Q6. Multiple Choice Questions (Attempt all) 10 × 1 = 10**

**1.** The first level of contact between the community and the health system in rural India is the: *[CO1; L1]*

(a) District hospital

(b) Sub-centre / Primary Health Centre

(c) Medical college

(d) Corporate hospital

**2.** The National Health Mission was formed by combining the NRHM with the: *[CO2; L1]*

(a) National Urban Health Mission (NUHM)

(b) Employees' State Insurance (ESI)

(c) Central Government Health Scheme (CGHS)

(d) ICDS

**3.** According to the WHO, health is a state of complete: *[CO5; L1]*

(a) Physical well-being only

(b) Physical, mental, and social well-being

(c) Mental well-being only

(d) Economic well-being

**4.** A village lacks specialist rehabilitation but has an active health committee and trained ASHA workers. Improving stroke rehabilitation here best relies on: *[CO3; L3]*

(a) Tertiary care alone

(b) Community participation and primary-level services

(c) Corporate hospitals

(d) Medical tourism

**5.** Immunisation of children is an example of ___ prevention: *[CO5; L2]*

(a) Primary

(b) Secondary

(c) Tertiary

(d) Quaternary

**6.** Rehabilitating a patient after disease to restore function is an example of ___ prevention: *[CO5; L2]*

(a) Primary

(b) Tertiary

(c) Primordial

(d) Secondary

**7.** A patient pays the entire hospital bill from personal savings with no insurance cover. This is an example of: *[CO3; L3]*

(a) Tax-based financing

(b) Out-of-pocket expenditure

(c) Social insurance

(d) Community financing

**8.** Tertiary-level care is typically provided at a: *[CO1; L1]*

(a) Sub-centre

(b) Teaching or super-specialty hospital

(c) Primary Health Centre

(d) Anganwadi

**9.** Compared with India, a developed country's health system generally has a: *[CO4; L2]*

(a) Higher out-of-pocket share of spending

(b) Higher per-capita health expenditure

(c) Lower insurance coverage

(d) Fewer health workers per capita

**10.** The ASHA worker is a key community functionary of the: *[CO2; L1]*

(a) ESI scheme

(b) National Health Mission

(c) Private corporate sector

(d) Medical Council of India

## QUESTION PAPER TEMPLATE FOR BPT 2nd YEAR

**INSTRUCTIONS FOR PAPER SETTERS FOR BPT YEAR 2:**

1. All questions must be framed in alignment with the NCAHP competency framework. Map each question to the relevant Course Outcome (CO) and NCAHP competency code (K / KH / SH / P) in the annotation column on the question paper master copy.
2. Every question must carry two mandatory annotations: **(a)** Course Outcome (CO): e.g., CO2, CO5; **(b)** Highest Bloom's Level Attained: e.g., L4. These must be written in brackets after the question text.
3. The Bloom's Taxonomy ceiling for BPT Year 2 is Level 4 - Analysis. No question in this paper shall exceed this level. The paper setter must self-audit using the Bloom's reference table provided in this template.
4. Question distribution across Bloom's levels [L1 - Knowledge; L2 - Comprehension; L3 - Application; and L4 - Analysis] must be documented on the master copy. Recommended distribution for Year 2: **L1–L2: ~50–60%; L3–L4: ~40–50%.**
5. Avoid repetition of topics across sections. Q1, Q2, Q4, Q5 should collectively cover a minimum of 6 different system/topic areas to ensure adequate syllabus sampling.
6. All LAQs must carry sufficient internal scope. A 10-mark Long Answer Question should have 4–5 expected response components; a 15-mark Long Answer Question should have 6–8 components. These expected answers must be included in the model answer key submitted alongside the paper.
7. The paper setter must submit: (i) Question Paper with CO + Bloom's Level annotations; (ii) Model Answer Key with marking scheme. All documents are confidential and must be submitted in a sealed envelope to the Examination Cell.

**BPT Year 2: Question-Level Mapping Table**

| Q. No. | Section | Question Type | Bloom's Range | Case/Clinical Requirement |
|---|---|---|---|---|
| **Q1** | I | Long Answer (LAQ) | L1 – L4 | Optional |
| **Q2** | I | Short Answer (SAQ) | L1 – L4 | Optional |

| | | | | |
|---|---|---|---|---|
| **Q3** | I | Very Short Answer (VSAQ) | **L1 – L2 only** | Not applicable |
| **Q4** | II | Long Answer (LAQ) — highest weightage | L3 – L4 (target) | **Mandatory ≥1 case/vignette** |
| **Q5** | II | Short Answer (SAQ) | L1 – L4 | **Mandatory ≥1 clinical/applied (L3+) + ≥1 case/vignette** |
| **Q6** | II | MCQs (10 items) | L1 – L4 | **Mandatory ≥2 case-based** |

**Question Paper Structure:**

**Subject Code** **Subject Abb.**

**BPT (Main/ Remanded) Examination Month /Year**

**Subject Name**

**Paper I**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, student shall be allowed to take only one supplementary copy along with one main answer book*
*(Any Question having parts should be answered as whole at one place only)*

*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

**SECTION I**

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Write question text here. *[CO: ____ ; L: ____ ]*
2. Write question text here. *[CO: ____ ; L: ____ ]*
3. Write question text here. *[CO: ____ ; L: ____ ]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Write question text here. *[CO: ____ ; L: ____ ]*
2. Write question text here. *[CO: ____ ; L: ____ ]*
3. Write question text here. *[CO: ____ ; L: ____ ]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

1. Write question text here. *[CO: ____ ; L: ____ ]*
2. Write question text here. *[CO: ____ ; L: ____ ]*
3. Write question text here. *[CO: ____ ; L: ____ ]*
4. Write question text here. *[CO: ____ ; L: ____ ]*
5. Write question text here. *[CO: ____ ; L: ____ ]*
6. Write question text here. *[CO: ____ ; L: ____ ]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

1. Write question text here. *[CO: ____ ; L: ____ ]*
2. Write question text here. *[CO: ____ ; L: ____ ]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

1. Write question text here. *[CO: ____ ; L: ____ ]*
2. Write question text here. *[CO: ____ ; L: ____ ]*
3. Write question text here. *[CO: ____ ; L: ____ ]*
4. Write question text here. *[CO: ____ ; L: ____ ]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** [Case-based] Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1
(B) Option 2
(C) Option 3
(D) Option 4

**2.** [Case-based] Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1
(B) Option 2

(C) Option 3

(D) Option 4

**3.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**4.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**5.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**6.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**7.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**8.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**9.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**10.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**BPT 2nd Year**

**BPT 201** **PM**

**BPT (Main / Remanded) Examination Month / Year**

**Pathology & Microbiology**

**Paper I**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

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## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

**1.** Describe the pathogenesis of acute inflammation and explain the vascular and cellular events involved. *[CO1 ; L2]*

**2.** Differentiate between benign and malignant tumours with respect to morphology, growth pattern, and clinical behaviour. *[CO3 ; L4]*

**3.** Explain the pathophysiology of Virchow's triad and describe its complications in an immobilised patient. *[CO1 ; L2]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

**1.** Describe the stages of wound healing by primary intention. *[CO1 ; L2]*

**2.** Classify shock and summarise the pathophysiology of hypovolaemic shock. *[CO3 ; L2]*

**3.** Differentiate between acute and chronic inflammation. *[CO1 ; L4]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

**1.** Define necrosis and name any two of its types. *[CO1 ; L1]*

**2.** List four systemic factors that delay wound healing. *[CO1 ; L1]*

**3.** Define embolism and give one example. *[CO1 ; L1]*

**4.** Describe the composition of granulation tissue. *[CO1 ; L2]*

**5.** State the four cardinal signs of acute inflammation. *[CO1 ; L1]*

**6.** Classify tumours based on their tissue of origin. *[CO3 ; L2]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

**1.** A 55-year-old man with long-standing type 2 diabetes presents with a non-healing ulcer over the sole of the foot. Analyse the pathological factors contributing to impaired wound healing in this patient and their implications for physiotherapy management. *[CO4 ; L4]*

**2.** Compare the pathogenesis, morphology, and clinical features of rheumatoid arthritis and osteoarthritis, and analyse how these differences influence physiotherapy considerations.

*[CO2 ; L4]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

**1.** Describe the classification and characteristics of microorganisms that cause infection.

*[CO5 ; L2]*

**2.** A physiotherapist treats a patient with open wounds in a ward. Apply the principles of infection control to describe how a sterile field is maintained during the intervention.

*[CO9 ; L3]*

**3.** Explain the mechanism of transmission of infectious disease and the body's immune defence. *[CO7 ; L2]*

**4.** Describe the causative organism, mode of transmission, and clinical features of pulmonary tuberculosis. *[CO4 ; L2]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A patient on prolonged bed rest develops sudden dyspnoea and pleuritic chest pain. The most likely embolic complication is: *[CO1 ; L3]*

(A) Fat embolism

(B) Pulmonary thromboembolism

(C) Air embolism

(D) Amniotic fluid embolism

**2.** A wound examined on day 5 shows abundant red, granular tissue that bleeds easily. This tissue is: *[CO1 ; L3]*

(A) Keloid

(B) Granulation tissue

(C) Caseous necrosis

(D) Dry gangrene

**3.** The hallmark cell of chronic inflammation is the: *[CO1 ; L1]*

(A) Neutrophil

(B) Macrophage

(C) Eosinophil

(D) Platelet

**4.** Which feature is characteristic of a malignant tumour? *[CO3 ; L1]*

(A) Encapsulation

(B) Slow growth

(C) Metastasis

(D) Well differentiation

**5.** Virchow's triad does NOT include: *[CO1 ; L2]*

(A) Endothelial injury

(B) Stasis of blood

(C) Hypercoagulability

(D) Hyperkalaemia

**6.** The causative organism of tuberculosis is: *[CO5 ; L1]*

(A) Mycobacterium tuberculosis

(B) Streptococcus pyogenes

(C) Clostridium tetani

(D) Vibrio cholerae

**7.** Most bacteria reproduce asexually by the process of: *[CO6 ; L1]*

(A) Binary fission

(B) Meiosis

(C) Budding only

(D) Sexual conjugation only

**8.** Which vitamin deficiency impairs collagen synthesis and delays wound healing? *[CO4 ; L2]*

(A) Vitamin A

(B) Vitamin C

(C) Vitamin K

(D) Vitamin D

**9.** Autoclaving achieves sterilisation primarily through: *[CO8 ; L1]*

(A) Dry heat

(B) Moist heat under pressure

(C) Filtration

(D) Ultraviolet radiation

**10.** The type of hypersensitivity reaction seen in anaphylaxis is: *[CO7 ; L2]*

(A) Type I

(B) Type II

(C) Type III

(D) Type IV

**BPT 202** **PC**

**BPT (Main / Remanded) Examination Month / Year**

**Pharmacology**

**Paper II**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, the student shall be allowed to take only one supplementary copy along with one main answer book.*

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## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

**1.** Explain the pharmacokinetic processes of absorption, distribution, metabolism, and excretion of a drug. *[CO1 ; L2]*

**2.** Discuss the mechanism of action, therapeutic uses, and adverse effects of NSAIDs. *[CO4 ; L2]*

**3.** Differentiate between the actions of cholinergic and anticholinergic drugs on body systems. *[CO2 ; L4]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

**1.** Describe the pharmacological actions and adverse effects of glucocorticoids. *[CO3 ; L2]*

**2.** Classify diuretics and explain their use in heart failure. *[CO4 ; L2]*

**3.** Differentiate between competitive and non-competitive antagonism. *[CO1 ; L4]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

**1.** Define bioavailability. *[CO1 ; L1]*

**2.** List four routes of drug administration. *[CO1 ; L1]*

**3.** Define first-pass metabolism. *[CO1 ; L1]*

**4.** Name two peripheral muscle relaxants. *[CO4 ; L1]*

**5.** State two adverse effects of aspirin. *[CO3 ; L1]*

**6.** Define the biological half-life of a drug. *[CO1 ; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

**1.** A 60-year-old hypertensive patient on a beta-blocker reports fatigue and a blunted heart-rate response during a cardiac rehabilitation session. Analyse the pharmacological basis of these effects and their implications for exercise prescription and monitoring. *[CO5 ; L4]*

**2.** Compare the major classes of antihypertensive drugs with respect to mechanism, effects, and relevance to physiotherapy. *[CO4 ; L4]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

**1.** Describe the pharmacological management of Parkinson's disease. *[CO4 ; L2]*

**2.** Apply your knowledge of drug effects to identify the red and yellow flags a physiotherapist should watch for in a patient on long-term corticosteroid therapy. *[CO6 ; L3]*

**3.** Describe the drugs used in the treatment of diabetes mellitus. *[CO4 ; L2]*

**4.** Explain the effect of skeletal muscle relaxants on movement and exercise. *[CO5 ; L3]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A patient on warfarin is referred for physiotherapy. The main precaution the therapist must observe is the risk of: *[CO6 ; L3]*

(A) Hypertension

(B) Bleeding/bruising

(C) Hyperglycaemia

(D) Bradycardia

**2.** A patient on long-term corticosteroid therapy is at increased risk of: *[CO6 ; L3]*

(A) Osteoporosis

(B) Hyperkalaemia

(C) Bradycardia

(D) Weight loss

**3.** The prototype non-steroidal anti-inflammatory drug is: *[CO4 ; L1]*

(A) Paracetamol

(B) Aspirin

(C) Morphine

(D) Diazepam

**4.** A characteristic side effect of ACE inhibitors is: *[CO3 ; L2]*

(A) Dry cough

(B) Constipation

(C) Tremor

(D) Hyperglycaemia

**5.** Levodopa is used in the treatment of: *[CO4 ; L1]*

(A) Epilepsy

(B) Parkinson's disease

(C) Depression

(D) Asthma

**6.** Which drug is a beta-2 agonist used in asthma? *[CO4 ; L1]*

(A) Salbutamol

(B) Atenolol

(C) Digoxin

(D) Furosemide

**7.** Insulin is usually administered by which route? *[CO1 ; L1]*

(A) Oral

(B) Subcutaneous

(C) Rectal

(D) Inhalation

**8.** Diazepam belongs to which class of drugs? *[CO4 ; L1]*

(A) Barbiturate

(B) Benzodiazepine

(C) SSRI

(D) Antipsychotic

**9.** The specific antidote for opioid overdose is: *[CO3 ; L2]*

(A) Naloxone

(B) Atropine

(C) Flumazenil

(D) Vitamin K

**10.** A beta-blocker's most relevant effect on exercise testing is a: *[CO5 ; L3]*

(A) Rise in heart rate

(B) Blunted heart-rate response

(C) Rise in blood pressure

(D) Increase in respiratory rate

**BPT 203** **PH**

**BPT (Main / Remanded) Examination Month / Year**

**Public Health & Health Promotion**

**Paper III**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

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## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

**1.** Explain the various determinants of health and their relevance to physiotherapy practice.

*[CO1 ; L2]*

**2.** Describe the levels of prevention with suitable examples relevant to physiotherapy.

*[CO5 ; L2]*

**3.** Differentiate between the primary, secondary, and tertiary levels of health care in India.

*[CO3 ; L4]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

**1.** Describe the concept of health promotion and its guiding principles. *[CO1 ; L2]*

**2.** Explain the role of the individual, family, and community in health. *[CO4 ; L2]*

**3.** Classify the modes of transmission of communicable diseases. *[CO7 ; L2]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

**1.** Define health as per the WHO definition. *[CO1 ; L1]*

**2.** List the levels of prevention. *[CO5 ; L1]*

**3.** Define incidence and prevalence. *[CO6 ; L1]*

**4.** Name two national health programmes in India. *[CO2 ; L1]*

**5.** State two functions of a Primary Health Centre. *[CO3 ; L1]*

**6.** Define epidemiology. *[CO6 ; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

**1.** A rural community shows a rising incidence of non-communicable diseases such as diabetes and hypertension. Analyse the contributing determinants and, applying the levels of prevention, outline a health promotion strategy for this community. *[CO7 ; L4]*

**2.** Discuss the National Health Policy and analyse the application of national health programmes to physiotherapy practice. *[CO2 ; L4]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

**1.** Describe the health care delivery system of India. *[CO3 ; L2]*

**2.** Apply epidemiological principles to describe how you would investigate an outbreak of a communicable disease in a community. *[CO6 ; L3]*

**3.** Explain the prevention and control of tuberculosis under the National TB Elimination Programme. *[CO7 ; L2]*

**4.** Describe the role of physiotherapy in the prevention of non-communicable diseases. *[CO7 ; L3]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A patient recovering from stroke is enrolled in a programme to prevent complications and disability. This is an example of: *[CO5 ; L3]*

(A) Primordial prevention

(B) Primary prevention

(C) Secondary prevention

(D) Tertiary prevention

**2.** Immunising children against poliomyelitis is an example of: *[CO5 ; L3]*

(A) Primary prevention

(B) Secondary prevention

(C) Tertiary prevention

(D) Rehabilitation

**3.** WHO defines health as a state of complete physical, mental, and ____ well-being: *[CO1 ; L1]*

(A) Financial

(B) Social

(C) Spiritual

(D) Occupational

**4.** The number of new cases of a disease occurring in a population over a defined period is called: *[CO6 ; L1]*

(A) Prevalence

(B) Incidence

(C) Mortality rate

(D) Case-fatality rate

**5.** The first point of contact between the community and the health system in rural India is the: *[CO3 ; L1]*

(A) Sub-centre

(B) Primary Health Centre

(C) Community Health Centre

(D) District Hospital

**6.** Herd immunity in a population is best achieved through: *[CO7 ; L2]*

(A) Isolation

(B) Immunisation

(C) Quarantine

(D) Disinfection

**7.** Which of the following is a non-communicable disease? *[CO7 ; L1]*

(A) Tuberculosis

(B) Diabetes mellitus

(C) Malaria

(D) Measles

**8.** The National TB Elimination Programme delivers treatment mainly through the strategy of: *[CO2 ; L1]*

(A) DOTS

(B) BCG vaccination only

(C) Isolation wards

(D) Surgery

**9.** Primordial prevention is directed at: *[CO5 ; L2]*

(A) Early diagnosis

(B) Preventing risk factors before they arise

(C) Rehabilitation

(D) Curative treatment

**10.** An epidemic is best defined as the occurrence of disease: *[CO6 ; L2]*

(A) Constantly present in an area

(B) In excess of the expected number

(C) Spread worldwide

(D) In an animal reservoir

**BPT 204** **ECLS**

**BPT (Main / Remanded) Examination Month / Year**

**Basics of Emergency Care and Life Support Skills**

**Paper IV**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, the student shall be allowed to take only one supplementary copy along with one main answer book.*

*(Any question having parts should be answered as a whole at one place only.)*

*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

**1.** Explain the sequence of Basic Life Support (BLS) and the steps of cardiopulmonary resuscitation in an adult. *[CO3 ; L2]*

**2.** Describe the concept of the 'golden hour' and explain the roles, responsibilities, and limitations of a first responder. *[CO8 ; L2]*

**3.** Differentiate between the management of a conscious and an unconscious patient with foreign-body airway obstruction. *[CO1 ; L4]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

**1.** Describe the methods of opening and maintaining a patent airway. *[CO1 ; L2]*

**2.** Explain the technique of mouth-to-mask ventilation. *[CO2 ; L2]*

**3.** Differentiate between the presenting signs of a heart attack and a stroke. *[CO5 ; L4]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

**1.** Define the golden hour. *[CO8 ; L1]*

**2.** List the components of the chain of survival. *[CO3 ; L1]*

**3.** State the recommended compression-to-ventilation ratio in single-rescuer adult CPR. *[CO3 ; L1]*

**4.** Name two basic airway adjuncts. *[CO1 ; L1]*

**5.** List the four elements of the FAST assessment for stroke. *[CO5 ; L1]*

**6.** State two principles of reassuring a patient and bystanders while working at an emergency scene. *[CO6 ; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

**1.** A road-traffic-accident victim is found unconscious with external bleeding from the thigh and a suspected spinal injury. Apply the principles of emergency care to outline your systematic management, including haemorrhage control and safe transport. *[CO4 ; L3]*

**2.** Analyse the steps involved in the first-aid management of burns and multiple-system trauma, and justify the priorities of intervention. *[CO4 ; L4]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

**1.** Describe the first-aid management of a snake bite. *[CO5 ; L2]*

**2.** [Clinical] Apply spine-protection principles to describe the safe extrication and transport of a patient with a suspected cervical spine injury. *[CO7 ; L3]*

**3.** Explain the principles of disaster preparedness and risk reduction. *[CO4 ; L2]*

**4.** Describe the first-aid management of a fracture of a long bone. *[CO4 ; L3]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A collapsed adult is unresponsive and not breathing normally. After calling for help, the immediate priority is to: *[CO3 ; L3]*

(A) Give sips of water

(B) Start chest compressions

(C) Check the pupils

(D) Elevate the legs

**2.** A patient suddenly develops facial drooping and slurred speech. The most likely emergency is: *[CO5 ; L3]*

(A) Heart attack

(B) Stroke

(C) Simple fainting

(D) Panic attack

**3.** The recommended chest-compression rate in adult CPR is: *[CO3 ; L1]*

(A) 60–80 per minute

(B) 100–120 per minute

(C) 140–160 per minute

(D) 40–60 per minute

**4.** The compression-to-ventilation ratio in single-rescuer adult CPR is: *[CO3 ; L1]*

(A) 15:2

(B) 30:2

(C) 5:1

(D) 10:2

**5.** The first step in controlling external haemorrhage is: *[CO4 ; L2]*

(A) Applying a tourniquet

(B) Applying direct pressure

(C) Elevation alone

(D) Applying ice

**6.** The Heimlich manoeuvre (abdominal thrusts) is used for: *[CO1 ; L1]*

(A) Cardiac arrest

(B) Foreign-body airway obstruction

(C) Stroke

(D) Burns

**7.** In the FAST mnemonic for stroke, 'T' stands for: *[CO5 ; L1]*

(A) Temperature

(B) Time to call emergency services

(C) Tremor

(D) Tone

**8.** The 'rule of nines' is used to estimate the: *[CO4 ; L2]*

(A) Blood loss

(B) Total burn surface area

(C) Level of consciousness

(D) Fracture severity

**9.** The correct hand position for adult chest compression is over the: *[CO3 ; L1]*

(A) Upper sternum

(B) Lower half of the sternum

(C) Left nipple

(D) Tip of the xiphoid

**10.** During transport of a patient with a suspected spinal injury, the priority is: *[CO7 ; L2]*

(A) Rapid movement

(B) In-line spinal immobilisation

(C) A sitting position

(D) A prone position

**BPT 205** **ExT**

**BPT (Main / Remanded) Examination Month / Year**

**Exercise Therapy**

**Paper V**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, the student shall be allowed to take only one supplementary copy along with one main answer book.*

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*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

**1.** Explain the physiological effects of strengthening and endurance exercise on the musculoskeletal and cardiovascular systems. *[CO1 ; L2]*

**2.** Describe the principles, techniques, and therapeutic uses of suspension therapy. *[CO3 ; L2]*

**3.** Differentiate between passive, active-assisted, and active range-of-motion exercises with respect to their indications and technique. *[CO2 ; L4]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

**1.** Describe the grades of peripheral joint mobilisation and their clinical uses. *[CO3 ; L2]*

**2.** Explain the principles and techniques of therapeutic relaxation. *[CO3 ; L2]*

**3.** Differentiate between static and dynamic stretching. *[CO2 ; L4]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

**1.** Define range of motion. *[CO3 ; L1]*

**2.** List four types of suspension therapy. *[CO3 ; L1]*

**3.** Define muscle tone. *[CO1 ; L1]*

**4.** State two key points for effectively communicating an exercise protocol to a patient. *[CO8 ; L1]*

**5.** State two components that must be recorded when documenting an exercise prescription. *[CO7 ; L1]*

**6.** Classify exercises based on the degree of assistance provided. *[CO2 ; L2]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

**1.** A patient presents with a stiff, painful shoulder and restricted flexion two weeks after a period of immobilisation. Apply your knowledge of exercise therapy to design a progressive treatment programme, justifying your selection and progression of techniques. *[CO5 ; L3]*

**2.** Analyse the neurophysiological principles of Proprioceptive Neuromuscular Facilitation (PNF) and differentiate between its strengthening and relaxation techniques. *[CO2 ; L4]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

**1.** Describe the principles of aerobic exercise prescription. *[CO4 ; L2]*

**2.** Apply the principles of Frenkel's exercises in the management of a patient with ataxia. *[CO5 ; L3]*

**3.** Explain the selection and measurement of walking aids. *[CO4 ; L3]*

**4.** Describe the principles of motor learning and their application in functional re-education. *[CO6 ; L2]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A patient can produce no visible muscle contraction (Grade 0) in the quadriceps. The most appropriate initial exercise is: *[CO3 ; L3]*

(A) Resisted exercise

(B) Passive range-of-motion

(C) Active range-of-motion

(D) Plyometrics

**2.** A patient with cerebellar ataxia and poor coordination would benefit most from: *[CO5 ; L3]*

(A) Frenkel's exercises

(B) Isometric strengthening only

(C) Plyometric training

(D) Passive movements only

**3.** A Grade II Maitland mobilisation is best described as a: *[CO3 ; L2]*

(A) Small-amplitude movement at the beginning of range

(B) Large-amplitude movement within range, not reaching the limit

(C) Small-amplitude movement at the limit of range

(D) Sustained end-range stretch

**4.** The overload principle in exercise refers to: *[CO1 ; L2]*

(A) Longer rest between sets

(B) Progressively increasing the training stimulus

(C) Reducing repetitions over time

(D) Substituting passive movement

**5.** Which of the following is a closed kinetic chain exercise? *[CO2 ; L2]*

(A) Seated knee extension

(B) Squat

(C) Seated leg curl

(D) Straight leg raise

**6.** Frenkel's exercises are primarily aimed at improving: *[CO2 ; L1]*

(A) Muscle strength

(B) Coordination

(C) Cardiovascular endurance

(D) Flexibility

**7.** The recommended hold time for a static stretch is approximately: *[CO4 ; L1]*

(A) 2–3 seconds

(B) 15–30 seconds

(C) 2 minutes

(D) 10 minutes

**8.** An isometric muscle contraction is characterised by: *[CO1 ; L1]*

(A) Change in length with no tension

(B) Tension without change in muscle length

(C) A lengthening (eccentric) contraction

(D) A shortening (concentric) contraction

**9.** Axial suspension is used mainly to assist joint movement occurring in the: *[CO3 ; L2]*

(A) Horizontal plane

(B) Vertical plane against gravity

(C) Sagittal plane only

(D) Frontal plane only

**10.** The length of an axillary crutch is approximately measured as the patient's height minus: *[CO4 ; L2]*

(A) 10 cm

(B) 41 cm (about three finger-widths below the axilla)

(C) 60 cm

(D) 5 cm

**BPT 206** **ET**

**BPT (Main / Remanded) Examination Month / Year**

**Electrotherapy**

**Paper VI**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, the student shall be allowed to take only one supplementary copy along with one main answer book.*

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## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

**1.** Explain the production, biophysical effects, and therapeutic uses of therapeutic ultrasound.

*[CO4 ; L2]*

**2.** Describe the Gate Control Theory of pain and its implications for electrotherapy.

*[CO3 ; L2]*

**3.** Differentiate between the thermal and non-thermal effects of therapeutic ultrasound.

*[CO4 ; L4]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

**1.** Describe the physiological and therapeutic effects of LASER therapy. *[CO4 ; L2]*

**2.** Explain the pathophysiology of inflammation in relation to tissue injury and healing, and its relevance to the selection of electro-physical agents. *[CO1 ; L2]*

**3.** Differentiate between continuous and pulsed ultrasound. *[CO4 ; L4]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

**1.** Define therapeutic ultrasound. *[CO4 ; L1]*

**2.** State what is meant by Beam Non-uniformity Ratio. *[CO4 ; L1]*

**3.** State two parameters that must be documented after applying an electro-physical agent. *[CO9 ; L1]*

**4.** Define the term 'coupling medium'. *[CO6 ; L1]*

**5.** Name two theories of pain. *[CO3 ; L1]*

**6.** Define nociceptive pain and name one type. *[CO2 ; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

**1.** A patient-48-years old presents with an acute lateral ankle sprain with swelling and pain. Rationalise your selection of electro-physical agents appropriate to this stage of tissue healing and justify your dosage decisions. *[CO7 ; L4]*

**2.** Compare TENS and Interferential Therapy (IFT) with respect to their principles, parameters, physiological effects, and clinical applications. *[CO4 ; L4]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

**1.** Describe the biophysical effects and therapeutic uses of cryotherapy. *[CO4 ; L2]*

**2.** Apply your knowledge to describe the dosage parameters of TENS for a patient with chronic low back pain. *[CO6 ; L3]*

**3.** Explain the principles and clinical uses of intermittent compression therapy. *[CO4 ; L2]*

**4.** Describe the principles and therapeutic applications of shockwave therapy. *[CO5 ; L3]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** For an acute soft-tissue injury within the first 48 hours, the most appropriate electro-physical agent is: *[CO7 ; L3]*

(A) Continuous ultrasound

(B) Cryotherapy

(C) Shortwave diathermy

(D) Paraffin wax bath

**2.** A patient with chronic pain is treated with conventional high-frequency TENS. It relieves pain mainly through the: *[CO3 ; L3]*

(A) Release of endorphins

(B) Gate control mechanism

(C) Strong muscle contraction

(D) Deep tissue heating

**3.** The frequency range of therapeutic ultrasound is: *[CO4 ; L1]*

(A) 20–50 Hz

(B) 0.75–3 MHz

(C) 50 kHz

(D) 10 MHz

**4.** A duty cycle of 20% in pulsed ultrasound means the output is on for: *[CO4 ; L2]*

(A) 80% and off for 20% of the time

(B) 20% and off for 80% of the time

(C) 100% of the time

(D) 50% of the time

**5.** LASER stands for Light Amplification by Stimulated Emission of: *[CO4 ; L1]*

(A) Rays

(B) Radiation

(C) Resonance

(D) Reflection

**6.** Conventional (high-frequency) TENS typically uses a frequency of: *[CO4 ; L2]*

(A) 1–5 Hz

(B) 50–100 Hz

(C) 500 Hz

(D) 5 kHz

**7.** The typical carrier frequency used in Interferential Therapy is: *[CO4 ; L1]*

(A) 50 Hz

(B) 4000 Hz

(C) 1 MHz

(D) 100 Hz

**8.** A major contraindication to therapeutic ultrasound is application: *[CO5 ; L2]*

(A) Over a muscle spasm

(B) Over a malignancy

(C) For chronic pain

(D) Over a stiff joint

**9.** A physiological effect of cryotherapy is: *[CO4 ; L2]*

(A) Vasodilation

(B) Vasoconstriction

(C) Increased tissue metabolism

(D) Increased nerve conduction velocity

**10.** Biofeedback is used in physiotherapy mainly to: *[CO4 ; L2]*

(A) Heat deep tissues

(B) Give the patient information about physiological activity for voluntary control

(C) Reduce oedema by external pressure

(D) Sterilise equipment

**BPT 207** **BK**

**BPT (Main / Remanded) Examination Month / Year**

**Biomechanics & Kinesiology**

**Paper VII**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, the student shall be allowed to take only one supplementary copy along with one main answer book.*

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## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

**1.** Explain the types of levers in the human body with examples and their mechanical significance. *[CO1 ; L2]*

**2.** Describe the biomechanics of the lumbar spine, including its structure, factors responsible for stability, and movements. *[CO3 ; L2]*

**3.** Differentiate between kinetics and kinematics with suitable examples of human movement. *[CO2 ; L4]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

**1.** Describe the concept of equilibrium and the factors affecting the stability of the human body. *[CO1 ; L2]*

**2.** Explain the force of friction and its relevance to human movement. *[CO1 ; L2]*

**3.** Differentiate between a first-class and a third-class lever, giving a body example of each.

*[CO1 ; L4]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

**1.** Define the moment arm of a force. *[CO1 ; L1]*

**2.** State Newton's first law of motion. *[CO1 ; L1]*

**3.** Define the centre of gravity. *[CO1 ; L1]*

**4.** Name the three cardinal planes of movement. *[CO1 ; L1]*

**5.** Define torque. *[CO1 ; L1]*

**6.** Classify synovial joints based on their structure. *[CO3 ; L2]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

**1.** A patient presents with an antalgic gait following a knee injury. Perform a movement analysis to identify the gait deviations present and explain, using biomechanical principles, the compensatory strategies you would expect to observe. *[CO6 ; L4]*

**2.** Apply the principles of movement analysis to describe normal standing posture, and analyse the biomechanical factors contributing to postural deviations such as kyphosis and lordosis.

*[CO5 ; L4]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

**1.** Describe the phases of the normal gait cycle. *[CO4 ; L2]*

**2.** Apply biomechanical principles to explain the scapulohumeral rhythm during arm elevation.

*[CO7 ; L3]*

**3.** Interpret the biomechanical factors responsible for the stability of the sacroiliac joint.

*[CO8 ; L3]*

**4.** Explain the structure and function of the temporomandibular joint. *[CO3 ; L2]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** While a patient rises onto tiptoe, the foot acts as which class of lever (load = body weight, fulcrum at the toes)? *[CO1 ; L3]*

(A) First-class

(B) Second-class

(C) Third-class

(D) Fourth-class

**2.** During gait analysis, the period when both feet are simultaneously in contact with the ground is termed: *[CO4 ; L3]*

(A) Single-limb support

(B) Double support

(C) Swing phase

(D) Toe-off

**3.** The elbow joint, with the biceps flexing the forearm, is an example of a: *[CO1 ; L1]*

(A) First-class lever

(B) Second-class lever

(C) Third-class lever

(D) Fourth-class lever

**4.** Scapulohumeral rhythm during full shoulder abduction is approximately (glenohumeral:scapular): *[CO2 ; L2]*

(A) 1:1

(B) 2:1

(C) 1:2

(D) 3:1

**5.** The stance phase occupies approximately what proportion of the normal gait cycle? *[CO4 ; L2]*

(A) 40%

(B) 60%

(C) 80%

(D) 20%

**6.** The plane that divides the body into right and left halves is the: *[CO1 ; L1]*

(A) Frontal plane

(B) Sagittal plane

(C) Transverse plane

(D) Oblique plane

**7.** Newton's third law of motion states the principle of: *[CO1 ; L1]*

(A) Inertia

(B) Force equals mass times acceleration

(C) Action and reaction

(D) Universal gravitation

**8.** Pronation and supination of the forearm occur primarily at the: *[CO3 ; L2]*

(A) Radioulnar joints

(B) Radiocarpal joint

(C) Glenohumeral joint

(D) Elbow hinge only

**9.** The stability of a body is increased when the: *[CO1 ; L2]*

(A) Base of support is decreased

(B) Centre of gravity is lowered

(C) Gravity line falls outside the base

(D) Body mass is decreased

**10.** The greatest range of shoulder motion is provided by the: *[CO3 ; L1]*

(A) Glenohumeral joint

(B) Sternoclavicular joint

(C) Acromioclavicular joint

(D) Scapulothoracic articulation

**BPT 208** **AYUS**

**BPT (Main / Remanded) Examination Month / Year**

**Yoga and Systems of Medicine**

**Paper VIII**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, the student shall be allowed to take only one supplementary copy along with one main answer book.*

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## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

**1.** Explain the concept of Pancha Kosha and the concept of health and disease in yoga.

*[CO2 ; L2]*

**2.** Describe the physiological effects of asanas and pranayama on the body systems.

*[CO2 ; L2]*

**3.** Differentiate between the various streams and types of yoga. *[CO1 ; L4]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

**1.** Describe the shat kriyas and their physiological effects. *[CO4 ; L2]*

**2.** Explain the role of yoga in stress management. *[CO2 ; L2]*

**3.** Classify the types of pranayama. *[CO3 ; L2]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

**1.** Define yoga. *[CO1 ; L1]*

**2.** List the eight limbs of Patanjali's yoga. *[CO1 ; L1]*

**3.** Name any two of the shat kriyas. *[CO4 ; L1]*

**4.** Define pranayama. *[CO3 ; L1]*

**5.** State two benefits of meditation. *[CO2 ; L1]*

**6.** Name the five koshas. *[CO1 ; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

**1.** A university student reports chronic stress, poor sleep, and mildly raised blood pressure. Apply the principles of yoga to design an integrated practice schedule for this student, justifying your selection. *[CO2 ; L3]*

**2.** Compare the philosophy and principles of Ayurveda and Naturopathy, and analyse their scope for integration with modern physiotherapy practice. *[CO1 ; L4]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

**1.** Describe the philosophy and basic principles of Ayurveda. *[CO1 ; L2]*

**2.** Apply the principles of yoga to describe a simple asana-based programme suitable for chronic low back pain. *[CO3 ; L3]*

**3.** Explain the philosophy and methods of Homeopathy. *[CO1 ; L2]*

**4.** Describe the principles and brief methodology of the Unani and Siddha systems of medicine. *[CO1 ; L2]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A patient with anxiety is advised to do slow, calming breathing practice. The most appropriate pranayama is: *[CO3 ; L3]*

(A) Bhastrika

(B) Kapalabhati

(C) Nadi shodhana (alternate-nostril breathing)

(D) Forced hyperventilation

**2.** For an individual with obesity and a sedentary lifestyle, yoga is advised primarily as a: *[CO2 ; L3]*

(A) Curative treatment only

(B) Preventive and health-promotive measure

(C) Form of emergency care

(D) Substitute for surgery

**3.** The eight limbs of yoga (Ashtanga) are described in the: *[CO1 ; L1]*

(A) Bhagavad Gita

(B) Patanjali's Yoga Sutras

(C) Charaka Samhita

(D) Rig Veda

**4.** Kapalabhati is classified as a: *[CO4 ; L1]*

(A) Asana

(B) Kriya / pranayama practice

(C) Bandha

(D) Mudra

**5.** Which of the following is NOT one of the Pancha Koshas? *[CO1 ; L2]*

(A) Annamaya kosha

(B) Pranamaya kosha

(C) Manomaya kosha

(D) Agnimaya kosha

**6.** Ayurveda is fundamentally based on the theory of: *[CO1 ; L1]*

(A) The three doshas (Tridosha)

(B) The four humours

(C) Yin and Yang

(D) Meridians

**7.** Naturopathy primarily emphasises: *[CO1 ; L1]*

(A) Synthetic drugs

(B) Natural healing and lifestyle correction

(C) Major surgery

(D) Radiation therapy

**8.** The Unani system of medicine is based on the theory of: *[CO1 ; L2]*

(A) Tridosha

(B) The four humours

(C) The chakras

(D) The meridians

**9.** Which of the following is a classic meditative asana? *[CO3 ; L1]*

(A) Padmasana

(B) Bhujangasana

(C) Halasana

(D) Dhanurasana

**10.** Regular practice of Savasana chiefly promotes: *[CO2 ; L2]*

(A) Muscle strength

(B) Relaxation and stress relief

(C) Flexibility only

(D) Movement speed

## QUESTION PAPER TEMPLATE FOR BPT 3rd YEAR

**INSTRUCTIONS FOR PAPER SETTERS FOR BPT YEAR 3:**

1. All questions must be framed in alignment with the NCAHP competency framework. Map each question to the relevant Course Outcome (CO) and NCAHP competency code (K / KH / SH / P) in the annotation column on the question paper master copy.
2. Every question must carry two mandatory annotations: **(a)** Course Outcome (CO): e.g., CO2, CO5; **(b)** Highest Bloom's Level Attained: e.g., L5. These must be written in brackets after the question text.
3. The Bloom's Taxonomy ceiling for BPT Year 3 is Level 5 - Synthesis. No question in this paper shall exceed this level. The paper setter must self-audit using the Bloom's reference table provided in this template.
4. Question distribution across Bloom's levels [L1 - Knowledge; L2 - Comprehension; L3 - Application; L4 - Analysis; and L5 - Synthesis] must be documented on the master copy. Recommended distribution for Year 3: **L1–L2: ~50–60%; L3–L4: ~40–50%; L5: ~10-20%.**
5. Avoid repetition of topics across sections. Q1, Q2, Q4, Q5 should collectively cover a minimum of 6 different system/topic areas to ensure adequate syllabus sampling.
6. All LAQs must carry sufficient internal scope. A 10-mark Long Answer Question should have 4–5 expected response components; a 15-mark Long Answer Question should have 6–8 components. These expected answers must be included in the model answer key submitted alongside the paper.
7. The paper setter must submit: (i) Question Paper with CO + Bloom's Level annotations; (ii) Model Answer Key with marking scheme. All documents are confidential and must be submitted in a sealed envelope to the Examination Cell.

**BPT Year 3: Question-Level Mapping Table**

| Q. No. | Section | Question Type | Bloom's Range Permitted | Case/Clinical Requirement |
|---|---|---|---|---|
| **Q1** | I | Long Answer (LAQ) | L1 – L4 | Optional |

| | | | | |
|---|---|---|---|---|
| **Q2** | I | Short Answer (SAQ) | L1 – L4 | Optional |
| **Q3** | I | Very Short Answer (VSAQ) | L1 – L2 only | Not applicable |
| **Q4** | II | Long Answer (LAQ) — Higher-Order | min L4, ideally L5 | Mandatory ≥1 case/vignette |
| **Q5** | II | Short Answer (SAQ) — Higher-Order | L3 – L5 | Mandatory clinical/applied (L3+) + ≥1 case/vignette |
| **Q6** | II | MCQs (10 items) | L1 – L4 | Mandatory ≥2 case-based |

**Question Paper Structure:**

**Subject Code** **Subject Abb.**

**BPT (Main/ Remanded) Examination Month /Year**

**Subject Name**

**Paper I**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, student shall be allowed to take only one supplementary copy along with one main answer book*
*(Any Question having parts should be answered as whole at one place only)*

*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

**SECTION I**

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Write question text here. *[CO: ____ ; L: ____ ]*
2. Write question text here. *[CO: ____ ; L: ____ ]*
3. Write question text here. *[CO: ____ ; L: ____ ]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Write question text here. *[CO: ____ ; L: ____ ]*
2. Write question text here. *[CO: ____ ; L: ____ ]*
3. Write question text here. *[CO: ____ ; L: ____ ]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

1. Write question text here. *[CO: ____ ; L: ____ ]*
2. Write question text here. *[CO: ____ ; L: ____ ]*
3. Write question text here. *[CO: ____ ; L: ____ ]*
4. Write question text here. *[CO: ____ ; L: ____ ]*
5. Write question text here. *[CO: ____ ; L: ____ ]*
6. Write question text here. *[CO: ____ ; L: ____ ]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

1. Write question text here. *[CO: ____ ; L: ____ ]*
2. Write question text here. *[CO: ____ ; L: ____ ]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

1. Write question text here. *[CO: ____ ; L: ____ ]*
2. Write question text here. *[CO: ____ ; L: ____ ]*
3. Write question text here. *[CO: ____ ; L: ____ ]*
4. Write question text here. *[CO: ____ ; L: ____ ]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** [Case-based] Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1
(B) Option 2
(C) Option 3
(D) Option 4

**2.** [Case-based] Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1
(B) Option 2

(C) Option 3

(D) Option 4

**3.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**4.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**5.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**6.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**7.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**8.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**9.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**10.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**BPT 3rd Year**

**BPT 301** **GMP**

**BPT (Main / Remanded) Examination Month / Year**

**General Medicine and Pediatrics**

**Paper I**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, student shall be allowed to take only one supplementary copy along with one main answer book*

*(Any Question having parts should be answered as whole at one place only)*

*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe the aetiology, pathophysiology, clinical features, diagnostic evaluation and medical management of bronchial asthma. *[CO1 ; L2]*

2. Explain the pathophysiology, clinical manifestations, chronic complications and medical management of Type 2 Diabetes Mellitus. *[CO1 ; L2]*

3. Compare ischaemic heart disease and rheumatic heart disease with respect to aetiology, clinical features, diagnostic findings and medical management. *[CO1 ; L4]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Describe the clinical features, diagnostic work-up and medical management of pulmonary tuberculosis. *[CO1 ; L2]*

2. Explain the role of vaccination in the prevention of communicable diseases with suitable examples. *[CO1 ; L2]*

3. Outline the medical management of obesity, integrating diet, exercise and pharmacological measures. *[CO1 ; L3]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6) 5 × 2 = 10**

1. Define anaemia and list its common morphological types. *[CO1 ; L1]*
2. Name four cyanotic congenital heart diseases. *[CO1 ; L1]*
3. List four chronic complications of diabetes mellitus. *[CO1 ; L1]*
4. Define nephrotic syndrome. *[CO1 ; L1]*
5. Enumerate four clinical features of hypothyroidism. *[CO1 ; L1]*
6. State four routes of spread of infection. *[CO1 ; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2) 1 × 15 = 15**

1. A 58-year-old chronic smoker presents with progressive breathlessness, chronic productive cough and reduced exercise tolerance. Post-bronchodilator spirometry shows an FEV1/FVC ratio of 0.62. *[CO6 ; L5]*

(a) Analyze the findings to arrive at the diagnosis and grade the severity.

(b) Formulate a comprehensive medical management plan covering pharmacological, non-pharmacological and preventive strategies, and explain how the prescribed drug therapy influences subsequent physiotherapy management.

2. A patient admitted with acute respiratory distress has an arterial blood gas report of pH 7.28, PaCO2 68 mmHg, PaO2 54 mmHg, HCO3 30 mEq/L. Construct a stepwise clinical reasoning to identify the acid-base disturbance, its degree of compensation and the type of respiratory failure, and justify the medical priorities of management. *[CO5 ; L5]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

1. A 7-year-old child develops migratory polyarthritis and carditis two weeks after a sore throat. Apply the modified Jones criteria to justify the likely diagnosis and outline the immediate medical management. *[CO1 ; L3]*

2. A chest radiograph shows a homogeneous opacity with a meniscus margin occupying the right lower zone. Interpret the finding, relate it to the underlying pathology and analyse its clinical implications. *[CO5 ; L4]*

3. A patient in asthmatic status requires urgent drug therapy. Apply the appropriate first-line pharmacological management and justify each agent chosen. *[CO6 ; L3]*

4. Distinguish between exudative and transudative pleural effusion using Light's criteria and appropriate clinical correlation. *[CO5 ; L4]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A 30-year-old presents with a cough of 3 weeks, evening pyrexia and weight loss; sputum smear is positive for acid-fast bacilli. The most appropriate first-line anti-tubercular regimen is: *[CO1; L3]*

(A) 2 months HRZE followed by 4 months HR

(B) 2 months HRZE followed by 7 months HR

(C) HRZE continuously for 9 months

(D) HR alone for 6 months

**2.** A neonate is deeply cyanosed with no improvement on oxygen; the chest film shows a boot-shaped heart. The most likely diagnosis is: *[CO1; L3]*

(A) Tetralogy of Fallot

(B) Atrial septal defect

(C) Isolated ventricular septal defect

(D) Patent ductus arteriosus

**3.** The most common causative organism of community-acquired lobar pneumonia is:

*[CO1; L1]*

(A) Klebsiella pneumoniae

(B) Staphylococcus aureus

(C) Streptococcus pneumoniae

(D) Mycoplasma pneumoniae

**4.** Kussmaul breathing is most characteristically associated with: *[CO1; L2]*

(A) Pleural effusion

(B) Diabetic ketoacidosis

(C) Left ventricular failure

(D) Bronchial asthma

**5.** The single most useful investigation to confirm heavy proteinuria in suspected nephrotic syndrome is: *[CO10; L2]*

(A) Serum creatinine

(B) Urine culture

(C) 24-hour urinary protein estimation

(D) Blood urea

**6.** Koplik's spots on the buccal mucosa are pathognomonic of: *[CO1; L1]*

(A) Rubella

(B) Measles

(C) Chickenpox

(D) Mumps

**7.** Deficiency of which vitamin classically produces night blindness? *[CO1; L1]*

(A) Vitamin K

(B) Vitamin C

(C) Vitamin A

(D) Vitamin D

**8.** A pansystolic murmur best heard at the apex and radiating to the axilla is most consistent with: *[CO4; L2]*

(A) Mitral stenosis

(B) Mitral regurgitation

(C) Pulmonary stenosis

(D) Aortic stenosis

**9.** In an infant, the 'setting sun' sign of the eyes is a recognised feature of: *[CO1; L2]*

(A) Cerebral palsy

(B) Erb's palsy

(C) Rickets

(D) Hydrocephalus

**10.** Which drug is a short-acting selective beta-2 adrenergic agonist used in acute asthma?

*[CO6; L1]*

(A) Prednisolone

(B) Ipratropium bromide

(C) Theophylline

(D) Salbutamol

**BPT 302** **GS**

**BPT (Main / Remanded) Examination Month / Year**

**General Surgery**

**Paper II**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, student shall be allowed to take only one supplementary copy along with one main answer book*

*(Any Question having parts should be answered as whole at one place only)*

*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe the phases of wound healing and discuss in detail the local and systemic factors that adversely affect healing, with their surgical implications. *[CO2 ; L2]*

2. Explain the effects of general anaesthesia on the respiratory and cardiovascular systems and describe the common post-operative pulmonary complications and their prevention. *[CO3 ; L2]*

3. Discuss the indications, operative principles and post-operative complications of Coronary Artery Bypass Grafting, and analyse their implications for physiotherapy clinical decision-making. *[CO4 ; L4]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Describe the classification of burns and the assessment of burn severity followed in a standard burn care unit. *[CO5 ; L2]*

2. Explain the principles of tendon transfer surgery, including indications and the factors governing a successful outcome. *[CO4 ; L2]*

3. Apply the principles of pre- and post-operative management to a patient scheduled for cholecystectomy and justify the key precautions. *[CO6 ; L3]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6) 5 × 2 = 10**

1. Define primary and secondary wound healing. *[CO2 ; L1]*
2. List four common abdominal surgical incisions. *[CO4 ; L1]*
3. Name four types of skin grafts. *[CO5 ; L1]*
4. State four indications for hysterectomy. *[CO15 ; L1]*
5. Enumerate four physiological changes during normal pregnancy. *[CO15 ; L1]*
6. Define uterine prolapse and state its degrees. *[CO15 ; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2) 1 × 15 = 15**

1. A 45-year-old woman undergoes an open abdominal hysterectomy under general anaesthesia. On the first post-operative day she has shallow breathing, a weak cough and reduced air entry at both bases. *[CO10 ; L5]*

(a) Analyse the factors predisposing her to post-operative pulmonary and vascular complications.

(b) Formulate a structured pre- and post-operative surgical and supportive management plan and justify how each element reduces her risk.

2. A patient with 30% mixed-depth flame burns is admitted to the burn unit. Construct a stepwise plan of medical and surgical management for the first 72 hours, including fluid resuscitation reasoning, wound care and the timing and role of skin grafting. *[CO5 ; L5]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

1. A young man sustains a deep flexor tendon laceration in zone II of the hand. Apply the appropriate surgical repair principles and outline the immediate post-operative precautions.

*[CO4 ; L3]*

2. A woman in her third trimester complains of low backache and pelvic girdle pain. Analyse the musculoskeletal changes of pregnancy responsible and relate them to management priorities. *[CO15 ; L4]*

3. Interpret the pre-operative significance of an elevated serum bilirubin and prolonged prothrombin time in a patient scheduled for surgery, and justify the precautions required.

*[CO12 ; L4]*

4. Apply the principles of stump and wound care to a patient in the early post-operative period following below-knee amputation, and justify each measure. *[CO6 ; L3]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A patient is 2 days post upper-abdominal surgery, febrile, with basal crepitations and reduced chest expansion on the right. The most likely post-operative complication is:

*[CO3; L3]*

(A) Paralytic ileus

(B) Wound dehiscence

(C) Deep vein thrombosis

(D) Basal atelectasis

**2.** A patient develops a hot, swollen, tender calf with a positive Homan's sign on the fourth post-operative day. The most probable diagnosis is: *[CO3; L3]*

(A) Compartment syndrome

(B) Deep vein thrombosis

(C) Cellulitis

(D) Superficial thrombophlebitis

**3.** The most common site of an inguinal hernia repair incision is the: *[CO4; L1]*

(A) Right hypochondrium

(B) Groin along the inguinal ligament

(C) Loin

(D) Midline sub-umbilical region

**4.** The 'rule of nines' is used to estimate: *[CO5; L1]*

(A) Total body surface area burned

(B) Depth of a burn

(C) Fluid deficit only

(D) Grade of shock

**5.** A split-thickness skin graft includes the epidermis and: *[CO5; L2]*

(A) Only the epidermis

(B) The full dermis with fat

(C) A variable part of the dermis

(D) The subcutaneous plane

**6.** Which incision is most commonly used for an open appendicectomy? *[CO4; L2]*

(A) Kocher's

(B) Midline sternotomy

(C) Pfannenstiel

(D) Gridiron (McBurney)

**7.** The most appropriate first step in the immediate management of a major burn is:

*[CO5; L3]*

(A) Ensuring a patent airway

(B) Immediate skin grafting

(C) Early escharotomy

(D) Antibiotic prophylaxis

**8.** Physiological anaemia of pregnancy is chiefly due to: *[CO15; L2]*

(A) Disproportionate rise in plasma volume

(B) Bone marrow suppression

(C) Folate deficiency

(D) Iron deficiency

**9.** The commonest position of the uterus in normal pregnancy is: *[CO15; L1]*

(A) Retroverted

(B) Laterally displaced

(C) Anteverted and anteflexed

(D) Retroflexed

**10.** A tendon transfer is best deferred until the transferred muscle demonstrates: *[CO4; L2]*

(A) Active infection at the site

(B) Grade 5 power with contracture

(C) Adequate power with a supple, mobile joint

(D) Fixed joint stiffness

**BPT 303** **OR**

**BPT (Main / Remanded) Examination Month / Year**

**Orthopedics**

**Paper III**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, student shall be allowed to take only one supplementary copy along with one main answer book*

*(Any Question having parts should be answered as whole at one place only)*

*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe the stages of fracture healing and discuss in detail the factors that influence union, together with the common complications of fractures. *[CO1 ; L2]*

2. Explain the mechanism of injury, clinical features, complications and management of a supracondylar fracture of the humerus. *[CO1 ; L2]*

3. Compare the mechanism of injury, clinical features and management of Colles' fracture and Smith's fracture. *[CO1 ; L4]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Describe the clinical features and principles of conservative and surgical management of an anterior dislocation of the shoulder. *[CO1 ; L2]*

2. Explain the classification, clinical features and complications of a fracture of the neck of the femur. *[CO1 ; L2]*

3. Apply the appropriate examination sequence to a patient with a suspected meniscal injury of the knee and justify the special tests selected. *[CO3 ; L3]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6) 5 × 2 = 10**

1. Define subluxation and dislocation. *[CO1 ; L1]*
2. List four complications of a fracture of the shaft of the femur. *[CO1 ; L1]*
3. Name four special tests used for cruciate ligament integrity of the knee. *[CO3 ; L1]*
4. State the components of a Monteggia fracture-dislocation. *[CO1 ; L1]*
5. Enumerate four radiological features assessed in a plain X-ray of a fracture. *[CO4 ; L1]*
6. Define a stress fracture and give one example. *[CO1 ; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2) 1 × 15 = 15**

1. A 68-year-old woman falls on her outstretched hand and presents with a painful, swollen wrist showing a 'dinner-fork' deformity; the radiograph confirms a fracture. *[CO1 ; L5]*

(a) Analyse the injury to establish the diagnosis, mechanism and expected radiological displacement.

(b) Formulate a complete management plan from reduction through immobilisation to the prevention and detection of complications, and justify the reasoning at each stage.

2. A young footballer sustains a twisting injury to the knee with an audible pop, immediate swelling and giving-way on turning. Construct a systematic clinical reasoning pathway that integrates history, special tests and radiological interpretation to differentiate the likely soft-tissue injuries and reach a working diagnosis. *[CO3 ; L5]*

**Q5. Short Answer Questions (Attempt any 3 out of 4) 3 × 5 = 15**

1. Radiographs of a wrist injury show a fracture line through the waist of the scaphoid. Apply the principles of management and analyse why this fracture is prone to avascular necrosis. *[CO4 ; L4]*

2. A patient presents with a posterior dislocation of the hip after a dashboard injury. Apply the relevant clinical assessment and outline the immediate management priorities. *[CO1 ; L3]*

3. Differentiate between a sprain, a strain and a contusion in terms of the tissue involved, mechanism and clinical features. *[CO1 ; L4]*

4. Interpret the radiological differences between a stable and an unstable ankle fracture and relate them to management decisions. *[CO4 ; L4]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A child falls on an outstretched hand and presents with an elbow deformity; there is loss of the radial pulse and inability to extend the fingers. The most feared complication to exclude is: *[CO1; L3]*

(A) Volkmann's ischaemic contracture

(B) Non-union

(C) Malunion

(D) Myositis ossificans

**2.** An elderly patient with a hip fracture presents with the limb shortened, adducted and externally rotated. The most likely diagnosis is: *[CO1; L3]*

(A) Fracture of the pubic ramus

(B) Anterior dislocation of the hip

(C) Fracture of the neck of the femur

(D) Central dislocation of the hip

**3.** The 'dinner-fork' deformity is characteristic of: *[CO1; L1]*

(A) Smith's fracture

(B) Bennett's fracture

(C) Colles' fracture

(D) Galeazzi fracture

**4.** The special test used to assess the anterior cruciate ligament is: *[CO3; L2]*

(A) McMurray's test

(B) Lachman test

(C) Apley's grinding test

(D) Thomas test

**5.** A Galeazzi fracture-dislocation involves: *[CO1; L2]*

(A) Radial shaft fracture with distal radio-ulnar joint dislocation

(B) Both-bone forearm fracture

(C) Ulnar shaft fracture with radial head dislocation

(D) Fracture of the scaphoid

**6.** The scaphoid is prone to avascular necrosis because its blood supply enters mainly:

*[CO1; L2]*

(A) Through the articular cartilage

(B) From the ulnar artery

(C) From the volar surface distally

(D) Proximally in a retrograde direction

**7.** Which fracture results from forced dorsiflexion and eversion of the ankle? *[CO1; L2]*

(A) Pott's fracture

(B) Bennett's fracture

(C) Jones fracture

(D) March fracture

**8.** A positive McMurray's test with a palpable click suggests injury to the: *[CO3; L3]*

(A) Medial collateral ligament

(B) Anterior cruciate ligament

(C) Patellar tendon

(D) Meniscus

**9.** The commonest direction of shoulder dislocation is: *[CO1; L1]*

(A) Posterior

(B) Superior

(C) Anterior

(D) Inferior (luxatio erecta)

**10.** A fracture that fails to unite within the expected time despite adequate treatment is termed:

*[CO1; L1]*

(A) Malunion

(B) Non-union

(C) Cross union

(D) Delayed union

**BPT 304** **PTMS**

**BPT (Main / Remanded) Examination Month / Year**

**Physiotherapy in Adult and Pediatric Medical and Surgical Conditions**

**Paper IV**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, student shall be allowed to take only one supplementary copy along with one main answer book*

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## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe the physiotherapy assessment and evidence-based management of a patient in the pre- and post-operative stages of upper abdominal surgery, with emphasis on prevention of pulmonary complications. *[CO4 ; L2]*

2. Explain the role of physiotherapy in the management of a patient with a healed skin graft, covering assessment, scar management and restoration of function. *[CO4 ; L2]*

3. Assess and plan an evidence-based physiotherapy programme for a patient with post-mastectomy lymphoedema of the upper limb, and analyse the rationale of each component. *[CO3 ; L4]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Describe the physiotherapy assessment and management of a patient with Benign Paroxysmal Positional Vertigo involving the posterior semicircular canal. *[CO2 ; L2]*

2. Explain the antenatal physiotherapy programme for a low-risk pregnant woman, including exercise precautions. *[CO2 ; L2]*

3. Apply appropriate physiotherapy management to an elderly patient with a recent history of falls and justify the intervention priorities. *[CO2 ; L3]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6) 5 × 2 = 10**

1. List four types of oedema. *[CO1 ; L1]*
2. Name four outcome measures used in post-operative physiotherapy. *[CO5 ; L1]*
3. State four aims of physiotherapy following skin grafting. *[CO4 ; L1]*
4. Enumerate four components of pelvic floor muscle training. *[CO2 ; L1]*
5. Define the six-minute walk test. *[CO5 ; L1]*
6. List four physiological changes of normal ageing relevant to physiotherapy. *[CO2 ; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2) 1 × 15 = 15**

1. A 60-year-old man is referred for physiotherapy on the second day after an open cholecystectomy. He is reluctant to move, breathing shallowly, has a weak cough and reduced air entry at the right base. *[CO4 ; L5]*

(a) Assess the impairments, activity limitations and participation restrictions present.

(b) Formulate a staged, evidence-based physiotherapy management plan with appropriate outcome measures, and justify the clinical reasoning behind the progression.

2. A woman is referred 6 weeks after modified radical mastectomy with reduced shoulder range, cording and early upper-limb lymphoedema. Construct a comprehensive physiotherapy management plan integrating assessment, decongestive strategies, shoulder rehabilitation and outcome measurement, and justify the sequencing of interventions. *[CO3 ; L5]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

1. An elderly diabetic patient with peripheral neuropathy is referred for care of an anaesthetic foot. Apply the principles of foot care and protective education, and justify each measure.

*[CO2 ; L3]*

2. A postnatal woman reports stress urinary incontinence. Apply an appropriate assessment and pelvic floor rehabilitation plan and analyse the reasoning behind progression. *[CO2 ; L4]*

3. Interpret a reduced six-minute walk distance in a post-thoracic-surgery patient and relate it to the selection of physiotherapy goals. *[CO5 ; L4]*

4. Apply an appropriate physiotherapy documentation format to record the assessment and plan for a post-operative surgical patient, and justify the value of each section. *[CO6 ; L3]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A patient is unable to cough effectively after upper-abdominal surgery and desaturates on effort. The most appropriate initial physiotherapy priority is: *[CO4; L3]*

(A) Passive stretching only

(B) Complete bed rest

(C) Airway clearance with supported huffing and positioning

(D) High-intensity aerobic training

**2.** An elderly woman with recurrent falls scores 40/56 on the Berg Balance Scale. The most appropriate interpretation is: *[CO5; L3]*

(A) No intervention needed

(B) Independent, no fall risk

(C) Immediate surgical referral

(D) Increased risk of falls requiring balance training

**3.** The Epley manoeuvre is used in the management of: *[CO2; L2]*

(A) Cervical vertigo

(B) Posterior canal BPPV

(C) Meniere's disease

(D) Bilateral vestibular loss

**4.** Manual lymphatic drainage in lymphoedema is directed: *[CO4; L2]*

(A) Proximally toward functioning lymphatics

(B) Distally away from the trunk

(C) Only over bony points

(D) In a random pattern

**5.** Which outcome measure best quantifies functional exercise capacity at the bedside?

*[CO5; L2]*

(A) Goniometry

(B) Six-minute walk test

(C) Visual analogue scale

(D) Manual muscle testing

**6.** Pelvic floor muscle training primarily targets the: *[CO2; L1]*

(A) Levator ani group

(B) Rectus abdominis

(C) Gluteus maximus

(D) Iliopsoas

**7.** Faradic foot baths are traditionally used in the management of: *[CO1; L2]*

(A) Hyperhidrosis

(B) Diabetic ketoacidosis

(C) Fracture healing

(D) Lymphangitis

**8.** The most appropriate breathing technique to re-expand basal lung segments post-operatively is: *[CO4; L2]*

(A) Rapid shallow breathing

(B) Breath-holding at low volume

(C) Pursed-lip breathing only

(D) Thoracic expansion exercises with inspiratory hold

**9.** A hallmark early change of normal ageing affecting balance is: *[CO2; L2]*

(A) Increased fast-twitch fibre mass

(B) Reduced postural reflex speed

(C) Increased proprioceptive acuity

(D) Improved reaction time

**10.** Scar management after skin grafting most appropriately includes: *[CO4; L3]*

(A) Immobilisation for several months

(B) Avoiding all moisturisation

(C) Pressure therapy and controlled mobilisation once healed

(D) Aggressive early friction over fresh grafts

**BPT 305** **PTO**

**BPT (Main / Remanded) Examination Month / Year**

**Physiotherapy in Adult and Pediatric Orthopedic Conditions**

**Paper V**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, student shall be allowed to take only one supplementary copy along with one main answer book*

*(Any Question having parts should be answered as whole at one place only)*

*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe the physiotherapy assessment and management of a patient during and after the immobilisation period of a fracture of the shaft of the femur treated conservatively.

*[CO3 ; L2]*

2. Explain the physiotherapy assessment and evidence-based management of a patient with osteoarthritis of the knee. *[CO3 ; L2]*

3. Analyse the physiotherapy management of a patient following total knee replacement across the immediate, early and late post-operative phases, justifying the progression criteria.

*[CO3 ; L4]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Describe the physiotherapy management of a patient with adhesive capsulitis. *[CO3 ; L2]*

2. Explain the pre- and post-prosthetic physiotherapy management of a patient with a trans-tibial amputation, with emphasis on stump care. *[CO3 ; L2]*

3. Apply an appropriate differential clinical examination to a patient with mechanical low back pain and justify the tests selected. *[CO2 ; L3]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6) 5 × 2 = 10**

1. List four short-term goals of physiotherapy during fracture immobilisation. *[CO3 ; L1]*

2. Name four special tests for shoulder impingement. *[CO2 ; L1]*

3. State four complications following prolonged immobilisation. *[CO1 ; L1]*

4. Enumerate four outcome measures used in musculoskeletal rehabilitation. *[CO4 ; L1]*

5. Define carpal tunnel syndrome. *[CO1 ; L1]*

6. List four congenital deformities of the lower limb. *[CO1 ; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2) 1 × 15 = 15**

1. A 55-year-old woman is referred for physiotherapy on the second day after a cemented total hip replacement performed through a posterior approach. *[CO3 ; L5]*

(a) Assess the impairments, activity limitations and precautions relevant to this approach.

(b) Formulate a phase-wise, evidence-based physiotherapy programme with appropriate outcome measures, and justify the clinical reasoning and progression criteria at each stage.

2. A recreational athlete presents 3 weeks after anterior cruciate ligament reconstruction with a hamstring graft. Construct a criterion-based rehabilitation plan from the early protective phase to return-to-sport, integrating assessment, progression milestones and outcome measures, and justify the sequencing. *[CO3 ; L5]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

1. A patient with a below-knee amputation has a bulbous, oedematous stump 10 days post-surgery. Apply appropriate stump management and bandaging principles and justify each measure. *[CO3 ; L3]*

2. A patient reports lateral elbow pain aggravated by gripping. Apply the relevant clinical tests to differentiate lateral epicondylalgia from other causes and analyse the findings.

*[CO2 ; L4]*

3. Interpret the significance of a positive Trendelenburg sign in a patient after hip surgery and relate it to the rehabilitation focus. *[CO2 ; L4]*

4. Apply an appropriate documentation format to record clinical decision-making and prognosis for a patient with a rotator cuff repair, and justify the components. *[CO5 ; L3]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A patient is 1 day post total hip replacement via a posterior approach. Which combined movement most endangers the prosthesis and must be avoided? *[CO3; L3]*

(A) Hip flexion beyond 90 degrees with adduction and internal rotation

(B) Hip abduction with slight extension

(C) Isometric quadriceps activation

(D) Ankle pumping

**2.** A patient 6 weeks after ACL reconstruction has good quadriceps control and full extension. The most appropriate progression is to: *[CO3; L3]*

(A) Immediate return to competitive sport

(B) Cease all loading

(C) Aggressive passive hyperextension

(D) Introduce controlled closed-kinetic-chain strengthening

**3.** The special test most specific for supraspinatus involvement is the: *[CO2; L2]*

(A) Speed's test

(B) Empty-can (Jobe) test

(C) Adson's test

(D) Yergason's test

**4.** A positive Trendelenburg sign indicates weakness of the: *[CO2; L2]*

(A) Hip adductors

(B) Hip flexors

(C) Hip abductors (gluteus medius)

(D) Hamstrings

**5.** The earliest goal of physiotherapy during fracture immobilisation is to: *[CO3; L2]*

(A) Achieve full weight-bearing at once

(B) Restore full joint range immediately

(C) Begin resisted strengthening of the injured segment

(D) Maintain circulation and prevent stiffness of free joints

**6.** CTEV (congenital talipes equinovarus) classically presents with the foot in: *[CO1; L2]*

(A) Neutral with flat arch

(B) Equinus, varus, adduction and cavus

(C) Calcaneovalgus

(D) Dorsiflexion and eversion

**7.** The Ober's test is used to assess tightness of the: *[CO2; L2]*

(A) Rectus femoris

(B) Gastrocnemius

(C) Hamstrings

(D) Iliotibial band

**8.** Following trans-tibial amputation, stump bandaging is applied to: *[CO3; L2]*

(A) Produce a conical, well-shaped stump

(B) Prevent all muscle activity

(C) Immobilise the knee permanently

(D) Increase distal oedema

**9.** Phalen's test is used in the clinical diagnosis of: *[CO2; L2]*

(A) Thoracic outlet syndrome

(B) Carpal tunnel syndrome

(C) Cubital tunnel syndrome

(D) De Quervain's tenosynovitis

**10.** In the McKenzie approach, centralisation of symptoms during repeated movements indicates: *[CO3; L3]*

(A) A poor prognosis

(B) The need for immediate surgery

(C) A favourable directional preference

(D) Nerve root avulsion

**BPT 306** **PFDP**

**BPT (Main / Remanded) Examination Month / Year**

**Physical & Functional Diagnosis & Prescription**

**Paper VI**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, student shall be allowed to take only one supplementary copy along with one main answer book*

*(Any Question having parts should be answered as whole at one place only)*

*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe the International Classification of Functioning, Disability and Health (ICF) framework and explain how it is used to generate a functional diagnosis of impairment, activity limitation and participation restriction. *[CO1 ; L2]*

2. Explain the subjective and objective assessment of pain, including the measurement tools used for its documentation. *[CO2 ; L2]*

3. Analyse the components of a systematic musculoskeletal examination of the shoulder and justify the choice of special tests for a suspected impingement. *[CO2 ; L4]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Describe the principles and normal versus abnormal patterns of electromyography at rest and on contraction. *[CO2 ; L2]*

2. Explain the assessment of cardiovascular and pulmonary dysfunction using the six-minute walk test and rate of perceived exertion. *[CO3 ; L2]*

3. Apply an appropriate balance assessment using the Berg Balance Scale to an elderly patient and justify its interpretation. *[CO3 ; L3]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6) 5 × 2 = 10**

1. Define end-feel and give two normal examples. *[CO2 ; L1]*
2. List four special tests for the lumbar spine. *[CO2 ; L1]*
3. Name four items assessed in the Glasgow Coma Scale. *[CO2 ; L1]*
4. State four components of the ICF model. *[CO1 ; L1]*
5. Enumerate four sub-maximal exercise testing protocols. *[CO3 ; L1]*
6. Define reliability and validity of an outcome measure. *[CO2 ; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2) 1 × 15 = 15**

1. A 52-year-old man attends with an eight-week history of neck pain radiating into the right arm with pins-and-needles in the thumb and index finger. *[CO4 ; L5]*

(a) Analyse the presentation using a structured neurological and musculoskeletal examination, including dermatomes, myotomes, reflexes and relevant special tests.

(b) Formulate an ICF-based functional diagnosis and justify the clinical reasoning that links your findings to the level of dysfunction.

2. Interpret the following investigation set for a 60-year-old patient with exertional breathlessness:

(a) an ECG showing ST-segment depression on exertion
(b) a PFT showing a reduced FEV1/FVC ratio
(c) a six-minute walk distance of 320 metres.

Construct an integrated functional diagnosis and justify how each finding shapes the assessment priorities.

*[CO2 ; L5]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

1. A patient presents with reduced shoulder elevation and a painful arc. Apply the relevant special tests to differentiate subacromial impingement from adhesive capsulitis and analyse the findings. *[CO3 ; L4]*

2. Interpret a chest radiograph showing increased cardiothoracic ratio and upper-lobe blood diversion, and relate the findings to the functional assessment plan. *[CO2 ; L4]*

3. Apply the Modified Ashworth Scale to grade spasticity in a neurological patient and justify the grading obtained. *[CO3 ; L3]*

4. Analyse the differences between a strength-duration curve of a normally innervated muscle and a denervated muscle, and relate them to the diagnosis. *[CO2 ; L4]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A patient with radiating arm pain has reduced sensation over the thumb, a weak biceps and a diminished biceps reflex. The most likely nerve root involved is: *[CO2; L3]*

(A) C6

(B) C5

(C) C7

(D) C8

**2.** An elderly patient scores 18/28 on the Dynamic Gait Index. The most appropriate interpretation is: *[CO3; L3]*

(A) Normal gait, no fall risk

(B) Indication for immediate surgery

(C) No further assessment required

(D) Predictive of increased fall risk

**3.** A capsular pattern of the shoulder classically shows the greatest limitation of: *[CO2; L2]*

(A) Internal rotation

(B) External rotation

(C) Adduction

(D) Extension

**4.** The Berg Balance Scale primarily assesses: *[CO3; L2]*

(A) Muscle power

(B) Functional static and dynamic balance

(C) Aerobic capacity

(D) Joint range of motion

**5.** A hard, abrupt end-feel encountered before the expected range suggests: *[CO2; L2]*

(A) Ligamentous laxity

(B) Normal soft-tissue approximation

(C) Muscle guarding

(D) Bony block or osteophyte

**6.** Fibrillation potentials at rest on EMG are characteristic of: *[CO2; L2]*

(A) Myotonia only

(B) Denervation

(C) Voluntary contraction

(D) Normal muscle

**7.** The Modified Ashworth Scale grade of 1+ indicates: *[CO3; L2]*

(A) Considerable increase, movement difficult

(B) Rigid in flexion or extension

(C) Slight catch followed by minimal resistance through remainder of range

(D) No increase in tone

**8.** The most appropriate scale to quantify pain intensity for documentation is the: *[CO2; L2]*

(A) Visual Analogue Scale

(B) Barthel Index

(C) Berg Balance Scale

(D) Glasgow Coma Scale

**9.** A cardiothoracic ratio greater than 0.5 on a PA chest film suggests: *[CO2; L2]*

(A) Pleural thickening

(B) Pneumothorax

(C) Normal heart size

(D) Cardiomegaly

**10.** The Barthel Index is used to measure: *[CO4; L1]*

(A) Spasticity

(B) Exercise tolerance

(C) Activities of daily living / functional independence

(D) Pain threshold

**BPT 307** **RMB**

**BPT (Main / Remanded) Examination Month / Year**

**Research Methodology, Biostatistics and Evidence Based Practice**

**Paper VII**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, student shall be allowed to take only one supplementary copy along with one main answer book*

*(Any Question having parts should be answered as whole at one place only)*

*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe the measures of central tendency (mean, median and mode), explaining their calculation for grouped data and the guidelines governing the choice among them.

*[CO5 ; L2]*

2. Explain the process of hypothesis testing, including the null and alternative hypotheses, level of significance, and Type I and Type II errors. *[CO5 ; L2]*

3. Compare parametric and non-parametric tests of significance, and analyse the criteria that determine the appropriate choice for a given data set. *[CO5 ; L4]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Describe the essential characteristics of a good research design and the basic principles underlying it. *[CO12 ; L2]*

2. Explain the steps in a sampling design and describe the common types of probability and non-probability sampling. *[CO13 ; L2]*

3. Apply the PICO framework to construct a well-built clinical question for an intervention study and justify each component. *[CO6 ; L3]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

1. Define descriptive and inferential statistics. *[CO1 ; L1]*
2. List the four scales of measurement. *[CO10 ; L1]*
3. Name four types of graphical representation of data. *[CO5 ; L1]*
4. State four levels of evidence in the evidence hierarchy. *[CO9 ; L1]*
5. Define null hypothesis and alternative hypothesis. *[CO11 ; L1]*
6. Define sensitivity and specificity of a diagnostic test. *[CO8 ; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

1. A physiotherapy researcher plans a randomised controlled trial comparing two exercise programmes for chronic low back pain. *[CO3 ; L5]*

(a) Analyze the key methodological elements required to minimise bias, including randomisation, blinding, sample-size justification and control of confounders.

(b) Formulate the appropriate statistical analysis plan and justify the choice of tests for the primary and secondary outcomes.

2. You retrieve a published systematic review as the basis for a clinical decision. Construct a structured critical appraisal of the review, analysing its search strategy, study selection, risk-of-bias assessment, heterogeneity and the interpretation of its pooled effect, and justify how each element influences the confidence you place in the conclusion. *[CO8 ; L5]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

1. A study reports a new balance test with a sensitivity of 92% and a specificity of 60%. Apply these values to interpret the clinical usefulness of the test for screening and confirmation, and justify your reasoning. *[CO8 ; L4]*

2. Apply the correct choice of statistical test to compare mean grip strength between three independent treatment groups with normally distributed data, and justify the selection.

*[CO5 ; L3]*

3. Interpret a reported p-value of 0.03 together with a 95% confidence interval that excludes the null value, and analyse what these convey about the result. *[CO5 ; L4]*

4. Apply an appropriate critical appraisal tool to a randomised controlled trial and justify the domains you would examine. *[CO8 ; L3]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A trial reports that an intervention reduced pain scores with a p-value of 0.04. The most appropriate interpretation at the 5% significance level is: *[CO5; L3]*

(A) The null hypothesis is proven true

(B) The result is statistically significant; reject the null hypothesis

(C) The result is definitely clinically important

(D) The study must be discarded

**2.** A researcher wishes to compare the mean outcome between two independent, normally distributed groups. The most appropriate test is: *[CO5; L3]*

(A) Wilcoxon signed-rank test

(B) Chi-square test

(C) ANOVA with three factors

(D) Independent samples t-test

**3.** Data recorded as 'mild, moderate, severe' represent which scale of measurement?

*[CO10; L2]*

(A) Ordinal

(B) Ratio

(C) Interval

(D) Nominal

**4.** The highest level of evidence for an intervention question is generally provided by:

*[CO9; L2]*

(A) A systematic review of randomised controlled trials

(B) A cross-sectional survey

(C) An expert opinion

(D) A case series

**5.** A Type I error occurs when the investigator: *[CO5; L2]*

(A) Increases the sample size

(B) Rejects a true null hypothesis

(C) Uses a non-parametric test

(D) Accepts a false null hypothesis

**6.** In the PICO format, the letter 'C' stands for: *[CO6; L1]*

(A) Condition

(B) Cohort

(C) Confounder

(D) Comparison / comparator

**7.** The measure of central tendency least affected by extreme values is the: *[CO5; L2]*

(A) Range

(B) Mean

(C) Standard deviation

(D) Median

**8.** A non-parametric alternative to the paired t-test is the: *[CO5; L2]*

(A) Pearson correlation

(B) One-way ANOVA

(C) Wilcoxon signed-rank test

(D) Independent t-test

**9.** The specificity of a diagnostic test refers to its ability to correctly identify those who:

*[CO8; L2]*

(A) Are lost to follow-up

(B) Do not have the disease

(C) Withdraw from the study

(D) Have the disease

**10.** A 95% confidence interval for a mean difference that includes zero indicates that the result is: *[CO5; L3]*

(A) Clinically important

(B) Highly statistically significant

(C) Not statistically significant at the 5% level

(D) Free of any bias

## QUESTION PAPER TEMPLATE FOR BPT 4th YEAR

**INSTRUCTIONS FOR PAPER SETTERS FOR BPT YEAR 4:**

1. All questions must be framed in alignment with the NCAHP competency framework. Map each question to the relevant Course Outcome (CO) and NCAHP competency code (K / KH / SH / P) in the annotation column on the question paper master copy.
2. Every question must carry two mandatory annotations: **(a)** Course Outcome (CO): e.g., CO2, CO5; **(b)** Highest Bloom's Level Attained: e.g., L6. These must be written in brackets after the question text.
3. The Bloom's Taxonomy ceiling for BPT Year 4 is Level 6 - Evaluation. No question in this paper shall exceed this level. The paper setter must self-audit using the Bloom's reference table provided in this template.
4. Question distribution across Bloom's levels [L1 - Knowledge; L2 - Comprehension; L3 - Application; L4 - Analysis; L5 - Synthesis; and L6 - Evaluation] must be documented on the master copy. Recommended distribution for Year 4: **L1–L2: ~50–60%; L3–L4: ~40–50%; L5-L6: ~10-20%.**
5. Avoid repetition of topics across sections. Q1, Q2, Q4, Q5 should collectively cover a minimum of 6 different system/topic areas to ensure adequate syllabus sampling.
6. All LAQs must carry sufficient internal scope. A 10-mark Long Answer Question should have 4–5 expected response components; a 15-mark Long Answer Question should have 6–8 components. These expected answers must be included in the model answer key submitted alongside the paper.
7. The paper setter must submit: (i) Question Paper with CO + Bloom's Level annotations; (ii) Model Answer Key with marking scheme. All documents are confidential and must be submitted in a sealed envelope to the Examination Cell.

**BPT Year 4: Question-Level Mapping Table**

| Q. No. | Section | Question Type | Bloom's Range Permitted | Case/Clinical Requirement |
|---|---|---|---|---|
| **Q1** | I | Long Answer (LAQ) | L1 – L5 | Optional |

| | | | | |
|---|---|---|---|---|
| **Q2** | I | Short Answer (SAQ) | L1 – L5 | Optional |
| **Q3** | I | Very Short Answer (VSAQ) | L1 – L2 only | Not applicable |
| **Q4** | II | Long Answer (LAQ) — Higher-Order | min L4, ideally L6 | Mandatory ≥1 case/vignette |
| **Q5** | II | Short Answer (SAQ) — Higher-Order | L3 – L6 | Mandatory clinical/applied (L3+) + ≥1 case/vignette |
| **Q6** | II | MCQs (10 items) | L1 – L5 | Mandatory ≥2 case-based |

**Question Paper Structure:**

**Subject Code** **Subject Abb.**

**BPT (Main/ Remanded) Examination Month /Year**

**Subject Name**

**Paper I**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, student shall be allowed to take only one supplementary copy along with one main answer book*
*(Any Question having parts should be answered as whole at one place only)*

*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Write question text here. *[CO: ____ ; L: ____ ]*
2. Write question text here. *[CO: ____ ; L: ____ ]*
3. Write question text here. *[CO: ____ ; L: ____ ]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Write question text here. *[CO: ____ ; L: ____ ]*
2. Write question text here. *[CO: ____ ; L: ____ ]*
3. Write question text here. *[CO: ____ ; L: ____ ]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

1. Write question text here. *[CO: ____ ; L: ____ ]*

2. Write question text here. *[CO: ____ ; L: ____ ]*

3. Write question text here. *[CO: ____ ; L: ____ ]*

4. Write question text here. *[CO: ____ ; L: ____ ]*

5. Write question text here. *[CO: ____ ; L: ____ ]*

6. Write question text here. *[CO: ____ ; L: ____ ]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

1. Write question text here. *[CO: ____ ; L: ____ ]*

2. Write question text here. *[CO: ____ ; L: ____ ]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

1. Write question text here. *[CO: ____ ; L: ____ ]*

2. Write question text here. *[CO: ____ ; L: ____ ]*

3. Write question text here. *[CO: ____ ; L: ____ ]*

4. Write question text here. *[CO: ____ ; L: ____ ]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** [Case-based] Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**2.** [Case-based] Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**3.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**4.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**5.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**6.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**7.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**8.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**9.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**10.** Write MCQ stem here. *[CO: ____; L: ____]*

(A) Option 1

(B) Option 2

(C) Option 3

(D) Option 4

**BPT 4th Year**

**BPT 401** **NPNS**

**BPT (Main / Remanded) Examination Month / Year**

**Neurology, Psychiatry and Neurosurgery (NPNS)**

**Paper I**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, students shall be allowed to take only one supplementary copy along with one main answer book.*

*(Any Question having parts should be answered as whole at one place only)*

*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe the aetiopathogenesis, classification, clinical features, investigations and medical management of ischaemic cerebrovascular accidents. *[CO1 ; L2]*
2. Explain the pathophysiology, clinical manifestations and medical management of Parkinson's disease, and outline the available surgical options. *[CO1 ; L2]*
3. Classify motor neuron diseases. Formulate a diagnostic work-up plan to differentiate amyotrophic lateral sclerosis from cervical compressive myelopathy. *[CO3 ; L5]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Describe the clinical features and investigations of Guillain–Barré syndrome. *[CO1 ; L2]*
2. Compare upper motor neuron and lower motor neuron lesions on clinical examination. *[CO2 ; L4]*

3. Explain the principles and clinical utility of nerve conduction velocity and electromyography studies. *[CO3 ; L2]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6) 5 × 2 = 10**

1. Define transient ischaemic attack. *[CO1 ; L1]*
2. List four cardinal features of Parkinson's disease. *[CO2 ; L1]*
3. Name the cranial nerves involved in the corneal reflex. *[CO2 ; L1]*
4. State two indications for lumbar puncture. *[CO3 ; L1]*
5. Define the Glasgow Coma Scale and state its range. *[CO2 ; L1]*
6. List two members of the neuro-rehabilitation team and one role of each. *[CO4 ; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2) 1 × 15 = 15**

1. A 58-year-old hypertensive man presents with sudden-onset right-sided weakness and expressive aphasia of three hours' duration. Analyse the likely site of lesion, justify the choice of neuroimaging, and evaluate the acute medical management options with their time-windows. *[CO3 ; L6]*
2. Critically evaluate the role of the multidisciplinary team in the diagnosis and long-term management of a patient with multiple sclerosis, justifying the contribution of each specialist. *[CO4 ; L6]*

**Q5. Short Answer Questions (Attempt any 3 out of 4) 3 × 5 = 15**

1. A 30-year-old woman reports diplopia and fatigable ptosis that worsens through the day. Apply your knowledge to identify the likely diagnosis and outline the confirmatory investigations. *[CO2 ; L3]*
2. A patient presents with foot-drop and sensory loss over the dorsum of the foot. Differentiate between common peroneal nerve palsy and L5 radiculopathy. *[CO2 ; L4]*
3. Apply the ASIA impairment scale to classify a spinal cord injury and explain its prognostic value. *[CO3 ; L3]*

4. Outline the psychiatric assessment of a patient with depression and its relevance to physiotherapy practice. *[CO1 ; L3]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A 65-year-old presents with contralateral hemiplegia, aphasia and homonymous hemianopia. Which artery is most likely occluded? *[CO3 ; L3 ]*

(A) Anterior cerebral artery

(B) Middle cerebral artery

(C) Posterior cerebral artery

(D) Basilar artery

**2.** A young adult develops ascending symmetrical weakness after a diarrhoeal illness, with albuminocytological dissociation in the CSF. The most likely diagnosis is: *[CO1 ; L3 ]*

(A) Poliomyelitis

(B) Myasthenia gravis

(C) Guillain–Barré syndrome

(D) Duchenne muscular dystrophy

**3.** The neurotransmitter chiefly deficient in Parkinson's disease is: *[CO1 ; L1 ]*

(A) Acetylcholine

(B) Dopamine

(C) GABA

(D) Serotonin

**4.** Kernig's sign is characteristically positive in: *[CO2 ; L1 ]*

(A) Meningeal irritation

(B) Cerebellar ataxia

(C) Radial nerve palsy

(D) Myopathy

**5.** The investigation of choice for acute intracerebral haemorrhage is: *[CO3 ; L2 ]*

(A) MRI brain

(B) Non-contrast CT brain

(C) EEG

(D) Carotid Doppler

**6.** Wilson's disease is associated with tissue deposition of: *[CO1 ; L1 ]*

(A) Iron

(B) Copper

(C) Calcium

(D) Amyloid

**7.** The hallmark of a lower motor neuron lesion is: *[CO2 ; L2 ]*

(A) Hypertonia

(B) Hyperreflexia

(C) Fasciculations and muscle wasting

(D) Extensor plantar response

**8.** Which scale is used to grade spasticity? *[CO2 ; L1 ]*

(A) Barthel Index

(B) Modified Ashworth Scale

(C) Berg Balance Scale

(D) Glasgow Coma Scale

**9.** Broca's (expressive) aphasia results from a lesion in the: *[CO1 ; L2 ]*

(A) Superior temporal gyrus

(B) Inferior frontal gyrus

(C) Occipital lobe

(D) Cerebellum

**10.** In myasthenia gravis, autoantibodies are directed against: *[CO1 ; L2 ]*

(A) Voltage-gated calcium channels

(B) Acetylcholine receptors

(C) Myelin basic protein

(D) Sodium channels

**BPT 402** **PTN**

**BPT (Main / Remanded) Examination Month / Year**

**Physiotherapy in Adult and Pediatric Neurological and Neurosurgical Conditions (PTN)**

**Paper II**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, students shall be allowed to take only one supplementary copy along with one main answer book.*

*(Any Question having parts should be answered as whole at one place only)*

*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe the physiotherapy assessment and management of a patient with hemiplegia following cerebrovascular accident, incorporating a suitable neurophysiological approach. *[CO1 ; L3]*
2. Explain the principles and application of Proprioceptive Neuromuscular Facilitation (PNF) and Neuro-Developmental Technique (NDT) in neurological rehabilitation. *[CO1 ; L2]*
3. Design a stage-wise physiotherapy rehabilitation programme for a patient with complete paraplegia (T10 level) following spinal cord injury. *[CO1 ; L5]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Outline the physiotherapy management of a child with spastic diplegic cerebral palsy. *[CO1 ; L3]*
2. Describe the assessment of balance and coordination in a patient with cerebellar ataxia.

*[CO2 ; L2]*

3. Explain the Motor Relearning Programme with its key components. *[CO1 ; L2]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6) 5 × 2 = 10**

1. List any four components assessed in the Berg Balance Scale. *[CO2 ; L1]*
2. Define spasticity. *[CO1 ; L1]*
3. Name two primitive (developmental) reflexes assessed in a neonate. *[CO2 ; L1]*
4. State two goals of physiotherapy in Parkinson's disease. *[CO1 ; L1]*
5. Define the Brunnstrom stages of motor recovery. *[CO1 ; L1]*
6. List two members of the stroke rehabilitation team and one role of each. *[CO4 ; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2) 1 × 15 = 15**

1. A 6-year-old with cerebral palsy presents with spasticity, poor trunk control and inability to walk independently. Analyse the impairments, formulate short- and long-term physiotherapy goals, and justify your choice of neurophysiological approaches. *[CO1 ; L6]*
2. Evaluate the role of task-oriented training versus conventional therapy in upper-limb recovery after stroke, defending your recommendation with clinical reasoning. *[CO1 ; L6]*

**Q5. Short Answer Questions (Attempt any 3 out of 4) 3 × 5 = 15**

1. A patient three weeks post Guillain–Barré syndrome is being weaned off ventilatory support. Plan the physiotherapy management for this recovery phase. *[CO1 ; L5]*
2. Apply the principles of Constraint-Induced Movement Therapy to a patient with post-stroke hand weakness, stating the patient selection criteria. *[CO1 ; L3]*
3. A patient demonstrates a foot-drop gait. Analyse the gait deviation and suggest suitable orthotic and exercise interventions. *[CO2 ; L4]*
4. Outline the physiotherapy assessment tools used to document recovery in a head-injury patient. *[CO3 ; L3]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A stroke patient shows 'flexor synergy present with no isolated joint movement' in the upper limb. This corresponds to which Brunnstrom stage? *[CO2 ; L3 ]*

(A) Stage 1

(B) Stage 2

(C) Stage 4

(D) Stage 6

**2.** A child cannot sit without support at 9 months and shows a persistent asymmetrical tonic neck reflex. This most likely indicates: *[CO2 ; L3 ]*

(A) Normal development

(B) Cerebral palsy

(C) Poliomyelitis

(D) Muscular dystrophy

**3.** A Modified Ashworth Scale grade of 1+ indicates: *[CO2 ; L2 ]*

(A) No increase in muscle tone

(B) Slight increase with a catch and minimal resistance through the remainder of range

(C) Considerable increase making passive movement difficult

(D) A rigid limb

**4.** The PNF technique 'rhythmic initiation' is most useful in patients with: *[CO1 ; L2 ]*

(A) Rigidity and akinesia

(B) Flaccidity only

(C) Cardiac limitation

(D) Peripheral oedema

**5.** Gower's sign is characteristic of: *[CO1 ; L1 ]*

(A) Cerebellar ataxia

(B) Duchenne muscular dystrophy

(C) Hemiplegia

(D) Parkinsonism

**6.** The Functional Independence Measure (FIM) assesses: *[CO2 ; L1 ]*

(A) Spasticity

(B) Functional independence in daily activities

(C) Coordination only

(D) Sensation only

**7.** A scissoring gait is typically seen in: *[CO2 ; L2 ]*

(A) Spastic diplegic cerebral palsy

(B) Radial nerve palsy

(C) Poliomyelitis

(D) Bell's palsy

**8.** In PNF, the 'hold-relax' technique is used mainly to: *[CO1 ; L2 ]*

(A) Increase strength

(B) Improve range of motion through muscle relaxation

(C) Improve cardiac endurance

(D) Reduce oedema

**9.** Rood's approach is primarily based on: *[CO1 ; L2 ]*

(A) Sensory stimulation to facilitate or inhibit a motor response

(B) Progressive weight training

(C) High-voltage electrotherapy

(D) Manual traction

**10.** The most appropriate measure to grade impairment in spinal cord injury is the: *[CO3 ; L2 ]*

(A) ASIA Impairment Scale

(B) Barthel Index

(C) Berg Balance Scale

(D) Mini-Mental State Examination

**BPT 403** **CTD**

**BPT (Main / Remanded) Examination Month / Year**

**Cardiothoracic Diseases (CTD)**

**Paper III**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, students shall be allowed to take only one supplementary copy along with one main answer book.*

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*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe the aetiopathogenesis, clinical features, investigations and management of ischaemic heart disease. *[CO2 ; L2]*
2. Explain the classification, clinical features and management of chronic obstructive pulmonary disease. *[CO2 ; L2]*
3. Formulate a pre- and post-operative physiotherapy-relevant care plan for a patient undergoing coronary artery bypass grafting, covering the key management priorities of each phase. *[CO4 ; L5]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Classify congenital heart diseases and briefly describe Fallot's tetralogy. *[CO2 ; L2]*
2. Describe the clinical features and management of bronchial asthma. *[CO2 ; L2]*
3. Differentiate between type I and type II respiratory failure with examples. *[CO3 ; L4]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

1. Define cardiac failure. *[CO2 ; L1]*
2. List two clinical signs of deep vein thrombosis. *[CO2 ; L1]*
3. State the normal range of arterial blood pH. *[CO1 ; L1]*
4. Name two acyanotic congenital heart diseases. *[CO2 ; L1]*
5. Define bronchiectasis. *[CO2 ; L1]*
6. List two clinical features of pulmonary tuberculosis. *[CO2 ; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

1. A 55-year-old smoker presents with progressive dyspnoea, chronic productive cough and a barrel-shaped chest. Analyse the likely diagnosis, interpret the expected pulmonary function and arterial blood gas findings, and evaluate the medical management. *[CO3 ; L6]*
2. A patient develops acute breathlessness, pleuritic chest pain and haemoptysis two days after hip surgery. Evaluate the differential diagnosis and justify the immediate investigations and management. *[CO5 ; L6]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

1. A patient is in the ICU on mechanical ventilation following cardiac surgery. Apply the principles of post-operative care to outline the priorities of management. *[CO4 ; L3]*
2. Interpret the following arterial blood gas and state the acid–base disturbance: pH 7.30, $PaCO_2$ 55 mmHg, $HCO_3^-$ 24 mmol/L. *[CO3 ; L3]*
3. Differentiate between obstructive and restrictive lung diseases on the basis of pulmonary function testing. *[CO3 ; L4]*
4. Apply the principles of resuscitation to describe the initial management (basic life support) of a patient in cardiac arrest. *[CO4 ; L3]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A child presents with a continuous 'machinery' murmur and a wide pulse pressure. The most likely diagnosis is: *[CO2 ; L3 ]*

(A) Ventricular septal defect

(B) Atrial septal defect

(C) Patent ductus arteriosus

(D) Tetralogy of Fallot

**2.** A patient develops sudden pleuritic chest pain, tachypnoea and hypoxia two days after surgery. The most likely diagnosis is: *[CO5 ; L3 ]*

(A) Pneumonia

(B) Pulmonary embolism

(C) Bronchial asthma

(D) Pleural effusion

**3.** The most common underlying cause of ischaemic heart disease is: *[CO2 ; L1 ]*

(A) Atherosclerosis

(B) Rheumatic fever

(C) Anaemia

(D) Hypotension

**4.** Fallot's tetralogy includes all of the following EXCEPT: *[CO2 ; L2 ]*

(A) Ventricular septal defect

(B) Overriding aorta

(C) Pulmonary stenosis

(D) Atrial septal defect

**5.** The normal resting arterial oxygen tension ($PaO_2$) is approximately: *[CO1 ; L1 ]*

(A) 40 mmHg

(B) 60 mmHg

(C) 80–100 mmHg

(D) 120 mmHg

**6.** The key investigations for confirming acute myocardial infarction are: *[CO3 ; L2 ]*

(A) Chest X-ray alone

(B) ECG and cardiac troponins

(C) Spirometry

(D) Echocardiography alone

**7.** Type II respiratory failure is characterised by: *[CO2 ; L2 ]*

(A) Low $PaO_2$ with normal or low $PaCO_2$

(B) Low $PaO_2$ with raised $PaCO_2$

(C) Normal $PaO_2$ and $PaCO_2$

(D) Raised $PaO_2$

**8.** Bronchial asthma is characterised by: *[CO2 ; L2 ]*

(A) Irreversible airway obstruction

(B) Reversible airway obstruction

(C) Alveolar consolidation

(D) Pleural fluid collection

**9.** Rheumatic heart disease most commonly affects which valve? *[CO2 ; L1 ]*

(A) Pulmonary

(B) Tricuspid

(C) Mitral

(D) Aortic only

**10.** A barrel-shaped chest is a characteristic feature of: *[CO3 ; L2 ]*

(A) Emphysema

(B) Pleural effusion

(C) Lobar pneumonia

(D) Pneumothorax

**BPT 404** **PTCT**

**BPT (Main / Remanded) Examination Month / Year**

**Physiotherapy in Adult and Pediatric Cardiorespiratory and Cardiothoracic Conditions (PTCT)**

**Paper IV**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

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## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe the physiotherapy assessment and management of a patient with chronic obstructive pulmonary disease. *[CO1 ; L3]*
2. Explain the airway clearance techniques used in respiratory physiotherapy, with their indications and precautions. *[CO2 ; L2]*
3. Design and justify an evidence-based physiotherapy protocol for a patient undergoing cardiac surgery, covering the pre-operative, ICU and ward phases of cardiac rehabilitation. *[CO8 ; L5]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Outline the physiotherapy techniques used to improve lung volume in a post-operative patient. *[CO2 ; L3]*

2. Describe the modifications of chest physiotherapy applied in the neonatal and paediatric population. *[CO7 ; L2]*

3. Explain the components and clinical utility of the six-minute walk test. *[CO3 ; L3]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6) 5 × 2 = 10**

1. List two airway clearance techniques. *[CO2 ; L1]*

2. Define postural drainage. *[CO2 ; L1]*

3. State two indications for incentive spirometry. *[CO2 ; L1]*

4. Name two outcome measures used in cardiorespiratory physiotherapy. *[CO4 ; L1]*

5. List two lines or tubes commonly encountered in the intensive care unit. *[CO7 ; L1]*

6. State two contraindications to chest percussion. *[CO2 ; L2]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2) 1 × 15 = 15**

1. A 62-year-old patient on post-operative day 2 following thoracotomy develops retained secretions, reduced air entry at the base and pain-limited breathing. Assess the physiotherapy problems, formulate a prioritised treatment plan, and justify your selection of techniques and outcome measures. *[CO1 ; L6]*

2. A ventilated patient in the ICU shows a rising $PaCO_2$ and reduced lung compliance. Evaluate the role of physiotherapy, integrating interpretation of ICU monitoring and the precautions to be observed during intervention. *[CO9 ; L6]*

**Q5. Short Answer Questions (Attempt any 3 out of 4) 3 × 5 = 15**

1. A neonate with respiratory distress requires chest physiotherapy. Plan a safe, modified physiotherapy approach and state the precautions to be taken. *[CO7 ; L5]*

2. Apply the principles of pulmonary rehabilitation to design a home exercise programme for a stable COPD patient. *[CO2 ; L3]*

3. Interpret the following and justify your physiotherapy modification: $SpO_2$ 88%, respiratory rate 30/min, with accessory muscle use. *[CO4 ; L4]*

4. Demonstrate how you would document assessment findings and clinical reasoning using the SOAP format. *[CO5 ; L3]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A patient with left lower lobe collapse would benefit most from postural drainage in which position? *[CO2 ; L3 ]*

(A) Supine flat

(B) Right side-lying with head tilted down

(C) Prone flat

(D) High Fowler's

**2.** A post-operative patient has $SpO_2$ 85% with shallow breathing. The most appropriate first physiotherapy measure is: *[CO1 ; L3 ]*

(A) Vigorous percussion

(B) Deep breathing exercises and positioning to improve ventilation

(C) Resisted limb exercise

(D) Manual traction

**3.** The Active Cycle of Breathing Technique includes all of the following EXCEPT: *[CO2 ; L2 ]*

(A) Breathing control

(B) Thoracic expansion exercises

(C) Forced expiration technique

(D) Valsalva manoeuvre

**4.** The normal range of resting oxygen saturation ($SpO_2$) is: *[CO4 ; L1 ]*

(A) 70–80%

(B) 80–90%

(C) 95–100%

(D) 100–110%

**5.** Incentive spirometry primarily improves: *[CO2 ; L2 ]*

(A) Airway secretion clearance

(B) Lung volume and inspiratory capacity

(C) Cardiac output

(D) Muscle strength

**6.** The six-minute walk test primarily measures: *[CO3 ; L2 ]*

(A) Muscle strength

(B) Functional exercise capacity

(C) Lung compliance

(D) Spasticity

**7.** Chest percussion is contraindicated in: *[CO2 ; L2 ]*

(A) Retained secretions

(B) Rib fracture or severe osteoporosis

(C) Productive cough

(D) Bronchiectasis

**8.** In the ICU, a central venous catheter is used to monitor: *[CO7 ; L2 ]*

(A) Airway pressure

(B) Central venous pressure

(C) Intracranial pressure

(D) Blood glucose

**9.** Pursed-lip breathing is most useful in: *[CO2 ; L2 ]*

(A) Chronic obstructive pulmonary disease

(B) Rib fracture

(C) Fractured femur

(D) Acute stroke

**10.** The most appropriate outcome measure to grade breathlessness is the: *[CO10 ; L1 ]*

(A) Borg / mMRC dyspnoea scale

(B) Berg Balance Scale

(C) Mini-Mental State Examination

(D) Glasgow Coma Scale

**BPT 405** **PTS**

**BPT (Main / Remanded) Examination Month / Year**

**Sports Physiotherapy and Rehabilitation (PTS)**

**Paper V**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

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## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe the types of sports injuries and the principles of management of acute soft-tissue injuries through the stages of tissue healing. *[CO3 ; L2]*
2. Explain the causes and risk factors of sports injuries and the principles of injury prevention in sports and physical activity. *[CO2 ; L2]*
3. Design a stage-wise rehabilitation programme for an athlete recovering from anterior cruciate ligament (ACL) reconstruction, including the return-to-sport criteria. *[CO4 ; L5]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Describe the components of physical fitness and the methods of assessing them. *[CO5 ; L2]*
2. Explain the principles and application of taping and bandaging in the management of sports injuries. *[CO4 ; L2]*
3. Outline the principles of on-field management of an injured player, including safe transfer of the casualty. *[CO4 ; L3]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

1. Define the PRICE principle of acute soft-tissue injury management. *[CO3 ; L1]*
2. List two contact and two non-contact sports. *[CO1 ; L1]*
3. State two health-related components of physical fitness. *[CO5 ; L1]*
4. Define Body Mass Index and state its formula. *[CO5 ; L1]*
5. Name two common overuse injuries encountered in athletes. *[CO3 ; L1]*
6. State the purpose of the Physical Activity Readiness Questionnaire (PAR-Q). *[CO2 ; L2]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

1. A 22-year-old footballer sustains a non-contact knee injury with an audible 'pop', immediate swelling and a sensation of giving-way. Analyse the likely structures injured, justify the on-field and clinical assessment, and evaluate the rehabilitation plan through to return to sport.

   *[CO3 ; L6]*

2. A recreational marathon runner presents with anterior shin pain that worsens with activity. Evaluate the differential diagnosis of the overuse injury and justify a graded management and prevention strategy. *[CO6 ; L6]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

1. A sprinter reports sudden posterior thigh pain during a race. Apply your knowledge to grade the hamstring strain and outline the acute management. *[CO3 ; L3]*
2. Differentiate between health-related and skill-related components of physical fitness, giving testing examples for each. *[CO5 ; L4]*
3. Explain the specific considerations and needs of the female athlete and the Paralympic athlete in sports participation. *[CO7 ; L3]*
4. Justify the use of warm-up and cool-down in injury prevention using physiological principles.

   *[CO6 ; L5]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A player with a lateral ankle sprain and a positive anterior drawer test has most likely injured the: *[CO3 ; L3 ]*

(A) Deltoid ligament

(B) Anterior talofibular ligament

(C) Anterior cruciate ligament

(D) Achilles tendon

**2.** An athlete collapses on the field, is unresponsive and not breathing. The immediate priority is to: *[CO4 ; L3 ]*

(A) Apply ice

(B) Commence cardiopulmonary resuscitation

(C) Apply taping

(D) Begin stretching

**3.** In the PRICE regimen, the 'R' stands for: *[CO3 ; L1 ]*

(A) Rehabilitation

(B) Rest

(C) Repair

(D) Resistance

**4.** The 'unhappy triad' of the knee involves the ACL, the medial meniscus and the: *[CO3 ; L2 ]*

(A) Posterior cruciate ligament

(B) Medial collateral ligament

(C) Lateral collateral ligament

(D) Patellar tendon

**5.** Body Mass Index is calculated as body weight (kg) divided by: *[CO5 ; L1 ]*

(A) Height in metres

(B) Height squared in metres$^2$

(C) Age in years

(D) Body surface area

**6.** A grade II ligament sprain indicates: *[CO3 ; L2 ]*

(A) No fibre tear

(B) Partial tear with some joint laxity

(C) Complete rupture

(D) Bony avulsion only

**7.** The primary purpose of a warm-up before activity is to: *[CO6 ; L2 ]*

(A) Induce fatigue

(B) Increase tissue temperature and prepare tissues for activity

(C) Reduce muscle strength

(D) Provoke injury

**8.** Delayed-onset muscle soreness (DOMS) typically peaks at: *[CO6 ; L2 ]*

(A) Immediately after exercise

(B) 24–72 hours after exercise

(C) One week after exercise

(D) Two weeks after exercise

**9.** The most appropriate imaging for a suspected stress fracture that is normal on plain X-ray is:

*[CO3 ; L2 ]*

(A) Ultrasound

(B) MRI

(C) ECG

(D) Spirometry

**10.** Paralympic classification of athletes is primarily based on: *[CO7 ; L2 ]*

(A) Age

(B) Type and degree of impairment

(C) Gender only

(D) Nationality

**BPT 406** **PTLM**

**BPT (Main / Remanded) Examination Month / Year**

**Ethics, Medico-Legal Aspects and Management in Physiotherapy (PTLM)**

**Paper VI**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, students shall be allowed to take only one supplementary copy along with one main answer book.*

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## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe the concepts of morality, ethics and legality, and discuss the common ethical issues encountered in physiotherapy practice. *[CO1 ; L2]*
2. Explain the principles and elements of management and their relevance to physiotherapy practice. *[CO3 ; L2]*
3. Formulate a quality-assurance framework for setting up a physiotherapy service unit. *[CO4 ; L5]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Explain informed consent and confidentiality with reference to physiotherapy practice. *[CO1 ; L2]*
2. Describe the salient features of the Helsinki Declaration and the ICMR ethical code for research on human subjects. *[CO2 ; L2]*

3. Differentiate the professional and legal obligations of a physiotherapist in referral relationships. *[CO2 ; L4]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

1. Define ethics. *[CO1 ; L1]*
2. Differentiate between morality and legality in one line each. *[CO1 ; L2]*
3. State two rights of a patient. *[CO1 ; L1]*
4. Define negligence. *[CO1 ; L1]*
5. Name two laws governing physiotherapy practice in India. *[CO2 ; L1]*
6. List two elements of management. *[CO3 ; L1]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

1. A physiotherapist treats a patient without explaining the risks, and the patient later alleges harm. Analyse the ethical and legal violations involved, and evaluate how informed consent, documentation and professional accountability could have prevented the situation. *[CO1 ; L6]*
2. Evaluate the principles of quality control and the skills required to run a physiotherapy clinic as an entrepreneur, justifying the key components of a business and quality plan. *[CO4 ; L6]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

1. A physiotherapy postgraduate wishes to publish research involving human subjects. Apply the relevant ethical principles that must be followed. *[CO2 ; L3]*
2. Apply the principles of the Consumer Protection Act to a scenario of alleged physiotherapy malpractice. *[CO2 ; L3]*
3. Analyse the barriers and key considerations involved in setting up a physiotherapy department. *[CO4 ; L4]*
4. Justify the need for professional accountability and confidentiality in clinical practice. *[CO1 ; L5]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A patient refuses treatment after being informed of the risks. The physiotherapist should:

*[CO1 ; L3 ]*

(A) Proceed with treatment anyway

(B) Respect the patient's autonomy and document the refusal

(C) Discharge the patient immediately

(D) Ignore the refusal

**2.** A physiotherapist discloses a patient's diagnosis to the patient's employer without consent. This primarily violates: *[CO1 ; L3 ]*

(A) Beneficence

(B) Confidentiality

(C) Justice

(D) Non-maleficence

**3.** The ethical principle of 'do no harm' is termed: *[CO1 ; L2 ]*

(A) Autonomy

(B) Beneficence

(C) Non-maleficence

(D) Justice

**4.** The Helsinki Declaration primarily deals with: *[CO2 ; L2 ]*

(A) Clinic finance

(B) The ethics of medical research involving human subjects

(C) Equipment safety standards

(D) Taxation of clinics

**5.** For consent to be valid, it must be: *[CO1 ; L2 ]*

(A) Verbal only

(B) Voluntary and informed

(C) Given by a relative in all cases

(D) Optional

**6.** Which body regulates allied and healthcare professions in India? *[CO2 ; L1 ]*

(A) National Commission for Allied and Healthcare Professions (NCAHP)

(B) World Health Organization

(C) Fédération Internationale

(D) Indian Council of Medical Research

**7.** Total Quality Management focuses on: *[CO4 ; L2 ]*

(A) A one-time inspection

(B) Continuous improvement of quality

(C) Cost reduction only

(D) Marketing only

**8.** 'Autonomy' in ethics refers to the: *[CO1 ; L2 ]*

(A) Patient's right to self-determination

(B) Physiotherapist's income

(C) Hospital hierarchy

(D) Insurance policy

**9.** A SWOT analysis in clinic management assesses: *[CO3 ; L2 ]*

(A) Only strengths

(B) Strengths, weaknesses, opportunities and threats

(C) Finances only

(D) Staff salaries only

**10.** A clinical audit is a component of: *[CO4 ; L2 ]*

(A) Marketing

(B) Quality assurance

(C) Recruitment

(D) Payroll management

**BPT 407** **CPTR**

**BPT (Main / Remanded) Examination Month / Year**

**Community Physiotherapy and Rehabilitation (CPTR)**

**Paper VII**

**(Section I & II)**

**Time: 3 hrs** **Maximum Marks: 80**

*Use a separate answer book for each Section. For each section, students shall be allowed to take only one supplementary copy along with one main answer book.*

*(Any Question having parts should be answered as whole at one place only)*

*Answers of MCQs are to be given on the OMR answer sheet. This OMR answer sheet will be collected from the examinees after 30 minutes of the commencement of the examination. Answers of MCQs, if written in the answer book, shall not be evaluated by the examiner.*

## SECTION I

**Q1. Long Answer Questions (Attempt any 2 out of 3)** **2 × 10 = 20**

1. Describe the conceptual framework of rehabilitation, emphasising the roles of the rehabilitation team members and the various models of rehabilitation. *[CO1 ; L2]*
2. Explain the concept, need and objectives of Community-Based Rehabilitation, and differentiate it from institution-based rehabilitation. *[CO3 ; L4]*
3. Describe the principles of orthotics and prosthetics, with region-wise indications, uses and fitting. *[CO4 ; L2]*

**Q2. Short Answer Questions (Attempt any 2 out of 3)** **2 × 5 = 10**

1. Explain the principles and practice of health education. *[CO8 ; L2]*
2. Describe the occupational health hazards in industry and the role of physiotherapy in ergonomics. *[CO12 ; L2]*
3. Differentiate between the qualitative and quantitative approaches used in disability evaluation. *[CO11 ; L4]*

**Q3. Very Short Answer Questions (Attempt any 5 out of 6)** **5 × 2 = 10**

1. Define Community-Based Rehabilitation. *[CO3 ; L1]*
2. List two members of the rehabilitation team. *[CO1 ; L1]*
3. State two indications for a lower-limb orthosis. *[CO4 ; L1]*
4. Name two international health organisations involved in rehabilitation. *[CO3 ; L1]*
5. Define impairment, disability and handicap in one line each. *[CO2 ; L1]*
6. List two activities of daily living (ADL). *[CO9 ; L2]*

## SECTION II

**Q4. Long Answer Question (Attempt any 1 out of 2)** **1 × 15 = 15**

1. A wheelchair-dependent person with paraplegia lives in a rural two-storey house and cannot access the toilet or workplace. Analyse the architectural and vocational barriers, and formulate a community-based rehabilitation plan including environmental modifications, assistive devices and vocational goals. *[CO10 ; L6]*
2. Evaluate the role of orthotics and prosthetics in the rehabilitation of a person with a lower-limb amputation, justifying the selection, check-out and training. *[CO5 ; L6]*

**Q5. Short Answer Questions (Attempt any 3 out of 4)** **3 × 5 = 15**

1. A child in a village is identified with an intellectual disability. Apply the principles of identification, assessment and community rehabilitation to plan the management. *[CO6 ; L3]*
2. Apply the principles of vocational rehabilitation to plan a return-to-work programme for a person with disability. *[CO7 ; L3]*
3. Design ergonomic modifications for a data-entry worker with recurrent neck and back pain. *[CO12 ; L5]*
4. Analyse the architectural barriers faced by a person with hemiplegia at home and suggest suitable modifications. *[CO10 ; L4]*

**Q6. Multiple Choice Questions** **10 × 1 = 10**

**1.** A stroke survivor is unable to climb the steps to enter the house. The most appropriate architectural modification is to: *[CO10 ; L3 ]*

(A) Remove all furniture

(B) Provide a ramp with handrails

(C) Add more steps

(D) Make no change

**2.** A below-knee amputee is being fitted with a prosthesis. The most important check-out parameter is: *[CO5 ; L3 ]*

(A) Colour of the prosthesis

(B) Fit, alignment and comfort

(C) Brand of the prosthesis

(D) Cost of the prosthesis

**3.** Community-Based Rehabilitation primarily aims to: *[CO3 ; L2 ]*

(A) Institutionalise all patients

(B) Rehabilitate persons with disability within the community using local resources

(C) Provide surgery only

(D) Replace all hospitals

**4.** An ankle-foot orthosis (AFO) is most commonly prescribed for: *[CO4 ; L2 ]*

(A) Shoulder subluxation

(B) Foot-drop

(C) Wrist-drop

(D) Scoliosis

**5.** 'Impairment' is best defined as: *[CO2 ; L2 ]*

(A) Any loss or abnormality of structure or function

(B) A social disadvantage

(C) An activity limitation only

(D) An environmental factor

**6.** Which Act protects the rights of persons with disability in India? *[CO2 ; L1 ]*

(A) Rights of Persons with Disabilities (RPwD) Act, 2016

(B) Factories Act

(C) Indian Contract Act

(D) Indian Penal Code

7. The WHO ICF framework classifies: *[CO2 ; L2 ]*

(A) Diseases only

(B) Functioning, disability and health

(C) Drugs

(D) Surgical procedures

**8.** Vocational rehabilitation primarily aims to: *[CO7 ; L2 ]*

(A) Provide a medical cure

(B) Enable gainful employment for a person with disability

(C) Provide an orthosis only

(D) Construct hospitals

**9.** Ergonomics is best described as the science of: *[CO12 ; L2 ]*

(A) Fitting the task and workplace to the worker

(B) Drug dosing

(C) Surgical technique

(D) Nutritional planning

**10.** The primary goal of health education is to: *[CO8 ; L2 ]*

(A) Sell health products

(B) Promote informed and healthy behaviour

(C) Diagnose disease

(D) Prescribe medication

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