Chapter 4
Curriculum
Bachelor of Physiotherapy
(5 years program)

4.0. Bachelor of Physiotherapy : Curriculum Background

4.0.1. 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.

4.0.2. 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;

4.0.3. All aspects of Physiotherapy have been considered in the development of this curriculum together with the identification of the roles expected for different levels of physiotherapists based on their qualification and experience. The need for connecting the dots between the education and employment practices has been the road map for devising this curriculum.

4.0.4. Foundation course has also been designed to bring all the students at the same level of understanding with respect to basic healthcare related norms before the start of a career as a healthcare professional.

4.1. Introduction to Bachelor of Physiotherapy Curriculum:

4.1.1. **Program outcomes**

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

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.

4.1.2. **Learning Objectives:** 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 able to execute all routine physiotherapeutic procedures as per the evaluation.

iii. Able to operate and maintain Physiotherapy equipment used in treatment of patient, 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.

4.2. Expectations from the future Physiotherapy graduates

4.2.1. 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.

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

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

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

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

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

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

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

4.2.9. 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.

4.2.10. 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 institute.

Table 4.1: Intended Program Outcomes and Broader Compentencies for Physiotherapists in diverse roles

Role/Domain	Intended Program Outcomes	Broader Competencies
I. Clinician / Physiotherapy Practitioner	Demonstrate competencies to provide quality care to individuals and populations to optimise their movement, function, and quality of life. 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. 2. Examine, assess, evaluate and treat various disorders, diseases and trauma conditions for physio- therapeutic interventions. 3. Prescribe physiotherapeutic modalities, therapeutic exercises, assistive devices, aid, appliances, support systems and home modifications 4. Prescribe and comprehend various diagnostic imaging, electro- physiological, hematological and biochemistry investigations for proper diagnosis and physiotherapeutic treatment 5. Design, implement, evaluate, and monitor patient-centered physio- therapy care based on the available evidence. 6. Involves patients, care givers, and related healthcare providers in holistic clinical decision making. 7. Evaluate the Physiotherapy intervention and modify as required. 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. 2. Demonstrate the knowledge of national, international, and professional association's policies and ethical standards. 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. 2. Demonstrate ability to document Physiotherapy assessment, plan of care, protocol modification, and evaluation as per the prescribed standards.

Role/Domain	Intended Program Outcomes	Broader Competencies
IV. Evidence-based practitioner and lifelong learner	Demonstrate competencies to integrate best available research evidence into clinical decision making and practice. Exhibits commitment towards continuous learning and scholarly activities.	1. Demonstrates competencies in acquiring, appraising, and applying research evidence. 2. Identifies need for continuing professional development.
V. Inter-professional teamwork	Demonstrate abilities to work effectively with Healthcare team in providing patient centred care	1. Contribute to effective team- work through comprehensive, collaborative, consultative, culturally responsive, and patient centred model of practice. 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 physio- therapy practice	1. Demonstrate knowledge in quality policies, procedures, process, and standards.

4.3. Eligibility for admission:

4.3.1. Selection Procedure:

4.3.1.1. He/she must have passed the Higher Secondary (10+2) or equivalent examination by recognised any Indian board or a duly constituted Board or National Open School with pass marks with minimum 50% in aggregate of physics, chemistry and biology (botany & zoology),

4.3.1.2. No candidate will be admitted on any ground unless he/she has appeared in the NEET examination.

4.3.1.3. Admission to Bachelor of Physiotherapy course shall be made on the basis of eligibility (minimum 50% with physics, chemistry and biology) and merit list based on 10+2 passing marks.

4.3.1.4. 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.

4.3.1.5. He/she should have attained the age of 17 years as on - current year, as on the date of admission.

4.3.1.6. 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

4.3.1.7. As per the Eligibility criteria described in Table 4.2, candidate 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. Candidate who fails 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 4.2: Eligibility criteria for 'Persons with Disabilities' (PwD) for admission to B.P.T.

Sr. No.	Disability Type	Benchmark Disabilities	Specified Disability	Eligible for Physiotherapy Course, Not Eligible for PH Quota	Eligible for Physiotherapy Course, Eligible for PH Quota	Not Eligible for Physiotherapy
1.	Physical Disabilities	A.Locomotor Disability including Condition (a-f)	a. Leprosy* cured person b. Cerebral Palsy** c. Dwarfism d. Muscular Dystrophy e. Acid attack victim f. Others*** such as Amputation, Poliomyelitis, etc.	Less than 40% disability	1. Lower Limb: 40-50% disability 2. Spine: 40-50% disability 3. Limbs &/Spine: 40-50% disability	• More than 50% for Lower Limb • Involvement of both Upper Limbs • Involvement of dominant Upper Limb • Involvement of Non-dominant Upper Limb • More than 50% for Spine • 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. ** Attention should be paid to impairment of vision, hearing, cognitive function etc. and corresponding recommendations be looked at. *** 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 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 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. @ Persons with hearing disability of more than 40% may be made eligible to pursue BPT 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. 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. 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 & Developmental aphasia)#	# 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 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.	More than 50% or severe nature or significant cognitive/ 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 extent of mental illness. However, the benefit of reservation/quota may be considered in future after developing better methods of disability assessment.	Equal to or more than 40% disability or if the person is unfit to perform his/her duties. 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	Less than 40% Disability	40-50% disability	More than 50%
			ii. Parkinsonism			
		b. Blood Disorder	i. Hemophilia	Less than 40% Disability	40-50% disability	More than 50%
			ii. Thalassemia			
			iii. Sickle cell disease			

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 any of the above, namely, Visual, Hearing, Speech & Language disability, Intellectual Disability, and Mental Illness as a component of Multiple Disability. Combining Formula as notified by the related Gazette Notification issued by the Govt. of India a+ [b(90-a)/90] (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.

4.4. Duration of the course:

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

4.4.2. Internship program**:** 01-year full time rotatory internship program.

4.5. Medium of instruction:

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

4.6. 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, videos can be utilized for enhancing learning experience.

4.7. Attendance:

i. 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.

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

4.8. Assessment:

4.8.1. The Continuous Internal Assessment (CIA) forms the Formative Assessment component of the evaluation system while the end year ex- amination as explained along with the formative assessment will become the summative assessment

4.8.2. 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. 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.

4.8.3. 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 4.3:

Table 4.3: The internal assessment weightage criteria

	% of the total marks of the internal assessment	
i) Written/Assignment/Project Work, attendance etc.	40%	
ii) Two Mid-term Tests/	60**%** (Best of two mid- term tests)	

4.9. Commencement of the course -

The course shall commence not later than 1st September of an academic year

4.10. Commencement of 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.

4.11. Promotion criteria

4.11.1. 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

4.11.2. Students can be permitted to next year only if the number of failed subjects is two or less than two and **Student must clear all the subjects before appearing for the final examination of next year**.

4.11.3. Only after passing all the subjects of all the four years, he/she will be allowed to undergo internship.

4.12. Review of answer papers of failed candidates -

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

4.13. Re-admission after break of study -

4.13.1. 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

4.13.2. 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

4.13.3. 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.

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

4.13.5. 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.

4.14. Maximum duration of the program -

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

4.14.2. **Discharge from the program –**

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

2. "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 decision on a case-to-case basis, based on individual merits.

3. "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 candidate to the University examinations only after their producing an undertaking (as per format given in students' manual) to this effect."

4.15. Migration/transfer of candidates –

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 concerned University.

4.16. Vacation -

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.

4.17. Internship -

4.17.1. 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.

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

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

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

4.17.5. 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.

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

4.17.7. 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.

4.18. Classification of successful candidates -

A successful candidate

4.18.1. 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;

4.18.2. 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';

4.18.3. 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

4.18.4. All other successful candidates shall be declared to have PASSED the examinations.

4.19. Scheme of examination

4.19.1. 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 4.4.

Table 4.4: Weightage of the Internal and External Exams

Year	Internal exam 20% weightage	Final 80 % weightage
Ist year	Internal 1	University exam 1
	Internal 2	
2nd year	Internal 1	University exam 2
	Internal 2	
3rd year	Internal 1	University exam 3
	Internal 2	
4th year	Internal 1	University exam 4
	Internal 2	

4.19.2. 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.

4.19.3. 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.

4.20. Designing of question paper

Designing of 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. Use 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.

4.21. Level Suggested Verbs

Verbs in various levels as per Bloom's taxonomy as seen in table 4.16.

4.22. Weightage of Levels of Taxonomy for effective learning experience of B.P.T. Graduates

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 hierarchial levels representing cognitive skills are depitcted with their weighted percentage for effective learning experience for a B.P.T. graduate in Table 4.5.

Table 4.5: Weightage of Levels of Taxonomy for effective learning experience for BPT Graudates

Level	Total
Knowledge	20%
Comprehension	20%
Application	20%
Analysis	10%
Synthesis	10%
Evaluation	10%

4.23. Practical/Clinical examination

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

4.23.2. 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.

4.23.3. 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.

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

4.24. Proposed Question Paper Style: BPT

4.24.1. Theory paper

i. **Duration: 3 Hours**

ii. **Total Marks: 80**

iii. **Format:**

a. Section-I

Que. 1 Long Answer 2 x 15 = 30 (Any 2 out of 3)

Que. 2 Short Answer 3 x 05 = 15 (Any 3 out of 4)

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

b. Section-II

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

4.24.2. Practical Examination

i. **Total Marks: 100**

ii. **Format:** On the basis of

a. OSPE / OSCE,

b. Viva,

c. Case presentation.

4.25. Credit and grading and Transcript

4.25.1. 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.

4.25.2. 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 (1 credit course = 30 hours)

iii. CR - One credit for every three hours of Clinical training/Clinical rotation/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.

4.26. Marks equivalence table Grades and Grade Points

Table 4.6: Equivalence Table for Marks, Grades and Grade Points

Letter Grade	Grade Point	Range of Marks *
O (Outstanding)	10	86-100
A+ (Excellent)	9	70-85
A (Very Good)	8	60 -69
B+ (Good)	7	55 -59
B (Average)	6	50- 54
C (Average)	5	45- 49
D (Below Average)	4	40 -44
Ab (Absent)		
NC- not completed	(F) FAIL: Below 50	

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

4.26.2. Annual Grade Point Average (AGPA): It is a measure of performance of work done in a year. It is 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.

4.26.3. Cumulative Grade Point Average (CGPA): It is a measure of overall cumulative performance of a student 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

4.26.4. **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 is shown in Table 4.7.

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 = ∑(Ci x Si) / ∑ 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 Illustriation of Computation of CGPA based on AGPA and Credit of respective years is shown in Table 4.8.

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

Table 4.7: 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		8	24
Course 2	4		7	28
Course 3	3		6	18
Course 4	3		10	30
Course 5	3		5	15
Course 6	4		6	24
Total	**20**			**139**
AGPA (Si) = Credit points/Total credit		**139/20 =6.95**		

iv. The CGPA shall be calculated as in Table 4.8, after deriving yearwise AGPA and rounded off to 2 decimal points and reported in the transcripts.

Table 4.8: Illustration for Computation of Cumulative Grade Point Average (**CGPA)**

	Total credit	AGPA	AGPA X CREDIT	Credit points
Year 1	55	6.9	55 X6.9 =	379.5
Year 2	56	7.8	56 X 7.8 =	436.8
Year 3	42	5.6	42 X5.6 =	235.2
Year 4	45	6	45 X6 =	270
Total	**198**			**1321.5**
CGPA = credit points/ total credit		**1321.5 /198=6.67**		
INTERNSHIP				
TOTAL	69			

4.27. Scheme of study [Minimum Hours]

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

4.27.2. Minimum Duration of year = 220 days

4.27.3. Max.Vacation per year- 30 days.

4.27.4. Minimum teaching hours per year = 1560

4.27.5. 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

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4.28. SCHEME OF STUDY : BACHELOR OF PHYSIOTHERAPY (B. P. T.):

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

Table 4.9: First Year B.P.T. 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	100	20	40	**200**	180	120	**300**	12	4	**16**
2	B.P.T -102 Human Physiology (HP)	20	20	100	20	40	**200**	180	120	**300**	12	4	**16**
3	B.P.T -103 Biochemistry (BC)	20		80			**100**	90		**90**	6		**6**
4	B.P.T -104 Fundamentals of exercise Modalities (FoEM)	20	20	100	20	40	**200**	120	60	**180**	8	2	**10**
5	B.P.T -105 Fundamentals of Electro Physical Agents (FoEA)	20	20	100	20	40	**200**	120	60	**180**	8	2	**10**
6	B.P.T -106 Psychology & Sociology (PS)	20		80			**100**	120		**120**	8		**8**
7	B.P.T -107 Fundamentals of Healthcare delivery System In India (FoHS)	20		80			**100**	120		**120**	8		**8**

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							
8	B.P.T -108 English (EG)			[NUES]				60		**60**	4		**4**
9	B.P.T -109 Information Technology (IT)			[NUES]				60		**60**	4		**4**
10	B.P.T- 110 Clinic Orientation (COr)								150	**150**		5	**5**
	Grand Total	140	80	640	80	160	**1100**	1050	510	**1560**	70	17	**87**

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

4.28.2. Second Year B. P. T. Examination [Annual Pattern]

Table 4.10: Second Year B.P.T. 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	B.P.T-201 Pathology & Microbiology (PM)	20		80			100	120		120	8		8
2	B.P.T-202 Pharmacology (PC)	20		80			100	90		90	6		8
3	B.P.T-203 Public Health & Health Promotion (PH)	20		80			100	120		120	8		8
4	B.P.T-204 Emergency Care and life support Skills (ECLS)	20		80			100	90	30	120	6	1	7
5	B.P.T205 Exercise therapy (ExT)	20	20	100	20	40	200	150	120	270	10	4	14
6	B.P.T -206 Electrotherapy (ET)	20	20	100	20	40	200	150	120	270	10	4	14
7	B.P.T-207 Biomechanics & Kinesiology (BK)	20		80			100	120	60	180	8	2	10

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							
8	B.P.T-208 Yoga and Systems of Medicine (YoG)	20	20	100	20	40	200	120	60	180	8	2	10
9	B.P.T.-209 Clinical Observation (COb)								210	210		7	7
	Grand Total	160	60	700	60	120	**1100**	960	600	**1560**	64	20	84

- N.B.-Setting Question Paper will be done as per the subjects in Annual Patten.

4.28.3. Third Year B. P. T. Examination [Annual Pattern]

Table 4.11: Third Year B.P.T. 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	B.P.T -301 General Medicine and Pediatrics (GMP)	20		80			100	90	30	120	6	1	7
2	B.P.T-302 General Surgery (GS)	20		80			100	90	30	120	6	1	7
3	B.P.T -303 Orthopedics (OR)	20		80			100	90	30	120	6	1	7
4	B.P.T -304 Physiotherapy in Adult and Pediatric Medical and Surgical Conditions (PTMS)	20	20	100	20	40	200	180	120	300	12	4	16

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							
5	B.P.T-305 Physiotherapy in Adult and Pediatric Orthopedics Conditions (PTO)	20	20	100	20	40	200	180	120	300	12	4	16
6	B.P.T-306 Physical & functional Diagnosis & Prescription (PFDP)	20	20	100	20	40	200	120	60	180	8	2	10
7	B.P.T-307 Research Methodology, Biostatistics and Evidence Based Practice (RMB)	20		80			100	120		120	8		
8	B.P.T-308 Clinical Education (CEd)								300	300		10	10
	Grand Total	140	60	620	60	120	1000	870	690	1560	58	23	81

- N.B. - Setting Question Paper will be done as per the subjects in Annual Patten.

4.28.4. Fourth Year B. P. T. Examination [Annual Pattern]

Table 4.12: Fourth Year B.P.T. Examination Scheme

S. No.	Subject	Internal Assessment		University Examination			Total Marks	Theory hours	Practical Hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
1	B.P.T -401 Neurology, Psychiatry and Neurosurgery (NPNS)	20		80			100	90	30	120	6	1	7
2	B.P.T-402 Physiotherapy in Adult and Pediatric Neurological and Neurosurgical conditions (PTN)	20	20	100	20	40	200	150	90	240	10	3	13
3	B.P.T-403 Cardiothoracic diseases and surgeries (CTD)	20		80			100	90	30	120		1	7
4	B.P.T-404 Physiotherapy in Adult and Pediatric Cardiothoracic conditions and Surgical Conditions (PTCT)	20	20	100	20	40	200	150	90	240	10	3	13
5	B.P.T-405 Sports Physiotherapy & Exercise Prescription (PTS)	20	20	100	20	40	200	150	90	240	10	3	13

S. No.	Subject	Internal Assessment		University Examination			Total Marks	Theory hours	Practical Hours	Total Hours	Credits Theory	Credits Practical	Credits Total
		Theory	Practical	Theory	Viva	Practical							
6	B.P.T-406 PT Ethics, Medico Legal aspects, Management &Administration (PTLM)	20		80			100	90		90	6		6
7	B.P.T-407 Community Physiotherapy & Rehabilitation (CPTR)	20		80			100	90	30	120	6	1	7
Project Work Orientation [NUES] (PW) B.P.T-408							0	90	0	90	6	0	6
CLINICAL ROTATION (CR) B.P.T-409									300	300		10	10
GRAND TOTAL							1000	900	660	1560	60	22	82

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

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4.28.5. B.P.T. INTERNSHIP GUIDELINES:

4.28.5.1. 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 patient, families, colleagues and the community.

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

4.28.5.2. 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.

4.28.5.3. Institution 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 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 Physiotherapist with sufficient clinical experience should manage the Physiotherapy departments in the Institutes/Hospitals.

4.28.5.4. 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.

4.28.5.5. **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).

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

4.28.5.7. **The title during placement of internship would be Physiotherapy intern/ B.P.T. Intern.**

4.28.5.8. 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.

4.28.5.9. During the internship candidate shall have to work full time average 7 hours per day (each working day) 6 day /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] (7X6X48)**

ii. Each candidate is allowed maximum of 12 holidays during entire Internship Programme and in case of any exigencies during which the candidate remains absent for a period more than 6 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 4.13.

Table 4.13: Duration of Department wise Rotatory posting during B.P.T. Internship

Sl. No.	Departments / 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

4.28.5.10. 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.

4.28.5.11. 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. Detail discussed in 4.29.

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.

4.28.5.12. 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.

4.28.5.13. Role of Hospital Administration in B.P.T. 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 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.

4.28.6. Assessment of B.P.T. Internship

4.28.6.1. 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**

4.28.6.2. **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 and etc. To make the student to have research mind and to facilitate for higher studies.

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

4.28.6.3. **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 so secured by them will be sent to University, criteria domain for which is depicted in Table 4.14 and 4.15.

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 transcript.

EVALUATION OF STUDENTS UNDER INTERNSHIP

Table 4.14: Criteria of Evaluation of Students during B.P.T. 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 4.15: Domain Criteria and Weightage for Evaluation of Students during B.P.T. Internship

Domains	% of total marks of the internal assessment
Attendance	10%
Log book	30%
Project	60%

4.29. SKILLS BASED OUTCOMES AND MONITORABLE INDICATORS FOR BACHELOR OF PHYSIOTHERAPY

4.29.1. 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 & establish 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 patient 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.

4.29.2. Guidelines for the implementation of the training procedure Discipline wise

4.29.2.1. **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.

4.29.2.2. **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

4.29.2.3. **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

4.29.2.4. **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 taping 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 emergency.

4.29.2.5. **Community Physiotherapy:** Goal- the aim of undergraduate student in community physiotherapy is to impart such knowledge and skills that may be 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 and individual and community in the context of primary health care.

4.29.2.6. **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.

4.29.2.7. **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.

4.29.3. The Intended Course Outcome with Competency Levels, Learning Methods and Assessment methods are depicted in Table 4.16.

Table 4.16: 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] KH – Knows How [Explain, Analyse, Identify, Recognise] S- Shows [Demonstrate] SH – Shows How [Demonstrate] P- Performs Independently [Perform]	• Lecture • Tutorial • Demonstration using models including digital • Flipped class • Dissection • panel discussion • field Visit • case study • Debate • Practical [Lab Work • Video Demonstration • Role Play • Hands On • Virtual Reality • Simulation • Case Discussion	• MCQs • Assignments • Short Essays • Long essay • Spotters • Viva Voice • Presentations • Debate

4.29.4. Skill based Learning Outcomes, knowledge and monitorable indicators to be ascertained after the study of B.P.T curriculum are mentioned in Table 4.17 after the B.P.T curriculum.

4.30. B.P.T curriculum

B.P.T 1ST YEAR SYLLABUS COURSE CODE - BPT -101

Course Title: B.P.T. Human Anatomy (HA): Lecture (L): Practical (P)

HA 1.0. Subject Description and instruction to teacher

Anatomy is the first language of medical science. It is important that students be provided with the basic information about the ways of learning the various terminologies and concepts. The course is designed to provide students with working knowledge of the structure of the human body which is essential foundation for their clinical studies. The musculoskeletal system should be taught in greater detail with emphasis on muscles joints, nerves and blood vessels of upper limb, lower limb and spine. A brief description of abdomen thorax and head and neck should be given so as to help in locating the surface land marks and identification of important structures.

HA 1.0.1. Course Outcomes: Course Anatomy

Intended Learning Outcome: Competency level

K – Knows

KH – Knows How

S- Show

SH – Shows How

P- Performs Independently

1. Describe common anatomical terms (K)
2. Describe the basic embryological development of structures (K)
3. Discuss the classifications of bones, their general features, structure, functions and the mechanism of displacement and common sites of fractures (KH)
4. Identify the skeletal muscles, their origin, insertion, nerve supply, actions, and main relations. (KH)
5. Describe Muscle Groups, their actions, nerve supply and effects of nerve injury. (K)
6. Discuss the joints of the body, their movements, and the muscles responsible for the movements. (KH)
7. Identify the borders of the named anatomical regions along with their associated fascia, ligaments, tendons, or cartilages. (KH)

8. Recognize anatomical structures and describe the topographic anatomy of the regions of abdomen, pelvis, perineum, thorax, and extremities. (KH)

9. Describe the anatomy of the components of organ systems of the body based on the anatomical region. (Thorax, abdomen, pelvis, and perineum). (K)

10. Describe the components nervous system, including the cerebrum, brainstem, cerebellum, spinal cord, peripheral nerves, sensory motor, and autonomic nervous system. (K)

11. Identify clinically relevant injuries, lesions and anatomical malformations including musculoskeletal and nervous system. (KH)

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HA 1.0.2. Teaching Learning Methods

1. Lecture
2. Tutorial
3. Demonstration using models including digital
4. Flipped class
5. Dissection

HA 1.0.3. Assessment Methods

1. MCQs
2. Short Essays
3. Spotters

Course Contents : B.P.T. HA 101 (L)

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: Musculo skeletal 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: Musculo Skeletal 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)

Practical: B.P.T. Human Anatomy 101 Practical : HA (P)

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.

Recommended Reference Books for HA

1. Gray's Anatomy: Descriptive and Applied. Longman
2. Snell RS. Neuroanatomy.
3. Singh V. Textbook of clinical neuroanatomy.
4. Romanes GJ. Cunningham's manual of practical anatomy
5. Mcminn’s Last’s Anatomy – Regional and applied, Churchill Livingstone.
6. Mcminn, et al - A Colour Atlas of Human Anatomy, Mosby.
7. Snell – Clinical Anatomy- Lippincott.

COURSE CODE BPT 102

Course Title : Human Physiology (HP): Lecture (L): Practical (P)

HP 1.0. Subject Description and instruction to teacher

The course in Physiology over the first year is designed to give the student an in-depth knowledge of fundamental reactions of living organisms, particularly in the human body. The major topics covered include the following: the cell; primary tissue; connective tissue; skin; muscle; nervous tissue; blood; lymphoid tissues; respiration; blood vessels; circulation; cardiac cycle; systemic circulation; gastrointestinal tract; kidneys; uterus; urinary tract; pregnancy; endocrine system. The emphasis should be given on physiological aspect of human movement and the effects thereof.

HP 1.0.1. Course Outcomes: Physiology

1. Describe the key physiological terms. (K)
2. Discuss the structure and functions of cell and tissue.(KH)
3. Discuss the mechanism of homeostasis (KH).
4. 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)
5. Explain the physiology of skeletal muscle contraction.(KH)
6. Explain the functions of cardio-vascular, respiratory, musculoskeletal and nervous systems including regulatory mechanism. (KH)
7. Describe the functions of digestive, renal and reproductive systems.(K)
8. Demonstrate competencies in performing common physiological and anthropological measurements. (SH)
9. Discuss the common physiological deviations of cardio-vascular, respiratory, musculoskeletal and nervous systems related to physiotherapy practice. (KH)
10. Explain normal physiological changes of various systems during exercise. (KH)
11. Discuss the physiological adaptions to exercise (KH)

HP 1.0.2. Teaching Learning Methods

1. Lecture
2. Tutorial
3. Demonstration using models including digital tools
4. Flipped class

HP 1.0.3. Assessment Methods

1. MCQs
2. Assignments
3. Short Essays
4. Long essay
5. Spotters

Course Contents : B.P.T. HP 102 (L)

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. Juxta-glomerular 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: Phoechromocytoma.

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 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 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

Practical: B.P.T. Human Physiology 102 Practical : HP (P)

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

Recommended Reference Books for HP

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

Best & Taylor's Physiological Basis of Medical Practice

West's Respiratory Physiology.

Nunn and Lumb's Applied Respiratory Physiology

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COURSE CODE BPT 103

Course Title: BIOCHEMISTRY (BC): Lecture (L)

BC 1.0. Subject Description and instruction to teacher

The course in Biochemistry is designed to give the student an introductory knowledge of biochemistry of living organisms and nutrition, particularly in the human body. The major topics covered include the following: carbohydrate, lipid, amino acids, enzymes, nucleic acid, vitamins, minerals hormones, nutrition and clinical biochemistry. The details of chemical structures should be avoided. the emphasis should be on understanding the process of metabolism and relative contribution of nutrients. the importance of clinical biochemistry in diagnosis and management of disorders need to be highlighted

BC 1.0.1 Course Outcomes:

After completion of this course the student shall be able to

1. Describe the structure, composition and functions of cell.(K)
2. Describe the structure and functions of cell membrane.(K)
3. Explain the metabolism of carbohydrates, Lipids, proteins and amino acids.(K)
4. Describe the types, composition and utilization of vitamins (K)
5. Explain the effect of exercise related biochemical changes and its application to exercise prescription (KH)

BC 1.0.2 Teaching Learning Methods:

1. Lecture
2. Tutorial
3. Demonstration using models including digital
4. Flipped class
5. Dissection

BC 1.0.3 Assessment Methods:

1. MCQs
2. Short Essays
3. Spotters

Course Contents: B.P.T. BC 103 (L)

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 effecting 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.

Recommended Reference books for BC

1. Drugs in Sports: David R. Mottram and Sally Gunnel E. &F.N.Span.
2. Normal and Therapeutic Nutrition Robison H. Cortinne et al;, Mac Millian Publish Company, New York.
3. Physiological Chemistry. By Harpar

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COURSE CODE BPT 104

Course Title: FUNDAMENTALS OF EXERCISE MODALITIES: FoEM: Theory (L) Practical (P)

FoEM 1.0. Subject Description and instruction to teacher

In this course, the students will learn the principles and effects of exercise as a therapeutic modality and will learn the techniques in the restoration of physical functions. After the course on exercise therapy student will be able to understand the different types of exercise for the benefit of patient in different situations and conditions both in health and disease or disorder. The emphasis should be giving hands on training on execution of various types of exercises and passive procedures. Besides lecture and demonstration, the emphasis should be placed on making the student capable to perform the exercise procedures independently using DOAP [demonstrate, observe, assist, perform] model of teaching learning

FoEM 1.0.1 Course Outcomes: Fundamentals of Exercise Modalities

1. Apply the principles of physics in describing movements (Force, inertia, Laws of motion) (KH)
2. Explain planes and axis of movements (KH)
3. Discuss the methods of measuring joint movements (KH)
4. Demonstrate joint movement measurements (Including electronic goniometer) (SH)
5. Demonstrate fundamental and derived positions and muscle actions (SH)
6. Demonstrate transfer techniques (SH)
7. Perform basic assessment techniques (Motor, sensory, coordination and balance) (SH)
8. Demonstrate knowledge and skills in prescribing basic movement aids (SH)

FoEM 1.0.2 Teaching Learning Methods:

1. Lecture
2. Flipped class
3. Video demonstration
4. Demonstration
5. Lab works

FoEM 1.0.3 Assessment Methods:

1. MCQs
2. Short Essay
3. Assignments
4. Viva Voce
5. OSPE

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 Unit 3: Measurement of Joint Range

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 joint. Technique of Goniometry.

FoEM 2.5 Perform ROM measurement of individual joint's using 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.

FoEM 5.4 Perform effleurage, stroking, kneading, petrissage, deep friction, vibration and shaking etc.

PRACTICAL B.P.T. Fundamentals of Exercise Modalities 104 Practical : FoEM (P)

The students of exercise therapy are to be trained in Practical Laboratory work for all the topics discussed in theory. List of practical (student shall be able to perform independently)

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 of the active mobilisation exercises of joints of upper limb and lower limb on 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.

Recommended reference books for FoEM

1. Therapeutic Exercises - Basmajian - Williams and Wilkins.
2. Licht SH, editor. Massage, manipulation, and traction. E. Licht;
3. World Health Organization; Global Strategy on Diet, Physical Activity and Health
4. McArdle WD, Katch FI, Katch VL. Exercise physiology: nutrition, energy, and human performance. Lippincott Williams & Wilkins; 2010.
5. Kennedy-Armbruster C, Yoke M. Methods of group exercise instruction. Human Kinetics; 2014.
6. ACSM's Guidelines for Exercise Testing and Prescription

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COURSE CODE BPT 105

Course Title: Fundamentals of Electro Physical Agents (FoEA): Theory (L) Practical (P)

FoEA 1.0. Subject Description and instruction to teacher

The aim of this course is to familiarize the students to the concept and basic principles of physics related electrotherapy. The student will be taught about physics related to electrotherapy and application on human body tissues. In this course the student will learn the Principles, Techniques, and Effects, Indication, Contra-Indication and the dosage parameter for various electro therapeutic modalities. The objective of this course is that after attending the lectures, demonstration, practical and clinics the student will be able to list the indications, contra indications, dosages of electro therapy modalities, demonstrates the different techniques, and describe their effects on various conditions

FoEA 1.0.1. **Course Outcomes**: **Fundamentals of Electro Physical Agents**

After completion of this course the student shall be able to

1. Explain fundamental principles of physics related to electricity production, its transmission.
2. Explain the production, physiological and therapeutic effects Biophysics, principles, therapeutic uses, indications, contraindications electrical stimulation agents
3. Demonstrate competencies in operational skills of equipment and patient preparation and techniques of application of electrical stimulation agents
4. Discuss the physiology and pathophysiology of pain.
5. Discuss theories of pain and its implications to physiotherapy clinical decision making.
6. Explain physiological effects, therapeutic uses, indications, contraindications and demonstrate practical/operational skills required Demonstrate competencies in equipment maintenance, care and safety- precautions

FoEA 1.0.2. **Teaching** learning methods

1. Lecture
2. Flipped class
3. Video demonstration
4. Demonstration
5. Lab works

FoEA 1.0.3. Assessment methods

1. MCQs
2. Short Essay
3. Viva Voce
4. OSPE

Course Contents: B.P.T. FoEA 105 Theory (L)

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 chose 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, contra-indications, operational skills of equipment and patient preparation.
2. **Faradic current:** Biophysics, principles, therapeutic uses, indications, contra-indications, 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.

PRACTICAL B.P.T. Fundamentals of Electro Physical Agents 105 Practical : FoEA (P)

The students of are to be trained in Practical Laboratory work for all the topics discussed in theory.

List of practical (student shall be able to perform independently)

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 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.

Recommended reference books for FoEA

1. Principles & Practice of Electrotherapy, Kahn, Churchill Livingstone
2. clinical electrotherapy Currier and nelson
3. Therapeutic Heat & Cold, Lehmann, Willians & Wilkins.

COURSE CODE-B.P.T -106

COURSE TITLE- PSYCHOLOGY AND SOCIOLOGY: (PSY) and (SOC) Theory (L)

SECTION A

Course Title: Psychology (PSY)

PSY 1.0. Subject Description and instruction to teacher

Human Psychology involves the study of various behavioral patterns of individuals, theories of development, normal and abnormal aspects of motor, social, emotional and language development, communication and interaction skills appropriate to various age groups. The study of these subjects will help the student to understand their clients while assessment and while planning appropriate treatment methods.

PSY 1.0.1. **Course Outcomes**: After completion of this course the student shall be able to General and Clinical Psychology

1. Describe the principles of psychology and it relationship to human behaviour (K)
2. Discuss the theories of psychology and its implications to health. (KH)
3. Discuss physiology of emotions and its applications in health care (KH)
4. Explain the theories of motivation (KH)
5. Discuss the theories, concepts, development and assessment of personality. (KH)
6. Explain the concepts of intelligence and its assessment(KH)
7. Describe the psychological concepts of frustration. (K)
8. Apply the principles of psychology in clinical decision making. (KH)

Course Contents: B.P.T. (PSY) 106 (L)

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;

Recommended reference books for PSY

1. Psychology Indian continent edition Raron RA mishra 2018
2. Abnormal Psychology Sarason IG Sarason BR Prentice Hall India
3. Introduction to psychology Atkinson RL Hilgard ER 2019
4. Development a lifespan approach Johnson ML 2020 Pearson education
5. Abnormal psychology an integrative approach Thomson brooks / Cole publishing
6. Theories of councelling and psychotherapy a case approach Murdock nl person education New Zealand
7. Theories of personality. Hall CS, Lindzey G Wiley and sons inc

SECTION B

Course Title: Sociology (SOC)

SOC 1.0. Subject Description and instruction to teacher

The purpose of this course is to introduce student to the basic sociology concepts, principles and social process, social institutions in relation to the individual, family and community. The student should be sensitized to the influences of various social factors in health and dis- ability. Besides class room Lecture the Case studies, Field visit, role play, debates and Panel discussions should be used to generate interest and make the subject meaningful.

SOC 1.0.1. Course Outcomes:

After completion of this course the student shall be able to Sociology

1. Discuss the sociological concepts in relations to health, healthcare, and disorders.(KH)
2. Explain social theories in relations to health and health care.(KH)
3. Discuss biomedical and biopsychosocial health models.(KH)
4. 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)
5. 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
6. Analyse the social cause for activity limitations and participatory restrictions caused by various disorders.(KH)

SOC 1.0.2. Teaching Learning Methods:

1. Lecture
2. Case studies
3. Field visit
4. Role play
5. Debate
6. Panel discussions

SOC 1.0.3. Assessment Methods:

1. Short Essay
2. Assignment
3. Presentations
4. Debate

Course Content: Course Contents: B.P.T. (SOC) 106 (L)

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 community.
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 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.

Recommended Reference Books for SOC

1. Sociology Anthony gidden
2. Sociology themes and perspectives Haralambos and holborn
3. Society an introductory analysis Maclaver and page
4. Rules of sociological methods emile durkeim
5. Essay on sociology max webber
6. Sociological imagination C wright mills

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COURSE CODE-B.P.T -107

COURSE TITLE- FUNDAMENTALS of Health care delivery System In India INTRODUCTION TO NATIONAL HEALTHCARE DELIVERY SYSTEM IN INDIA: (FoHC) : Theory (L)

FoHC 1.0. SUBJECT DESCRIPTION: The course provides the students a basic insight into the main features of Indian health care delivery system and how it compares with the other systems of the world. Topics to be covered under the subject are as follows:

Course Contents: B.P.T. FoHC 107 Theory

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.

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COURSE CODE- 108

COURSE TITLE - ENGLISH, COMMUNICATION AND SOFT SKILLS: (EG) : Theory (L)

EG 1.0. **Subject description**: The objective of this course is to enable the student to effectively communicate with patient, colleague and professional. The student will also be able to understand and implement the basic communication skills required for personal, hospital, and department management and interpersonal management.

EG 1.0.1. Course outcomes

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

Course Contents: B.P.T. EG 108 Theory

Major topics to be covered under Communication course –

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.

COURSE CODE- 109

COURSE TITLE- COMPUTERS AND INFORMATION SCIENCE : (IT): Theory (L), Practical (P)

IT 1.0. **SUBJECT DESCRIPTION**: The students will be able to appreciate the role of computer technology. The course has focus on computer organization, computer operating system and software, and MS windows, Word processing, Excel data worksheet and PowerPoint presentation.

IT 1.0.1. Course outcomes

1. To know the parts of computer
2. To have working knowledge of a computing system
3. Use computer for word processing and presentation and data management CO4 use the internet for personal and professional purpose
4. Understand the role of digital technology in the Health sciences

Course Contents: B.P.T. IT 109 Theory

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: : B.P.T. IT 109 (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

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Course Code: B.P.T 110: CLINIC ORIENTATION AND VISIT (Cor)

COr 1.0. 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.

COr 1.1. The community orientation and clinical visit will include visit to the entire chain of healthcare delivery system -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 including interaction and group discussion with village panchayat and front line health workers. Clinical visit to their respective professional department within the hospital

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2ND YEAR B.P.T.

Course Code: B.P.T-201

SUBJECT DESCRIPTION: COURSE TITLE - PATHOLOGY AND MICROBIOLOGY (PM): Theory (L) Practical (P)

PM 1.0. Subject Description and instruction to teacher

This subject follows the basic subjects of Anatomy, Physiology and Biochemistry and it forms a vital link between preclinical subjects and clinical subjects. Pathology involves the study of causes and mechanisms of diseases. Microbiology involves the study of common organisms causing diseases including nosocomial infections and precautionary measures to protect one from acquiring infections. The knowledge and understanding of Microbiology & Pathology of diseases is essential to institute appropriate treatment or suggest preventive measures to the patient. Particular effort is made in this course to avoid burdening the student.

PM 1.0.1. Course Outcomes: Course Pathology and Micro biology

1. Explain important pathological processes including cell death and injury, inflammation, thrombosis and neoplasia. (KH)
2. Discuss the relationship between pathological process and pathogenesis of musculoskeletal, cardio-vascular, neurological and oncological diseases. (KH)
3. Describe the predisposing factors, causes, pathogenesis, morphology, and complications of musculoskeletal, cardio-vascular, neurological, and oncological diseases. (K)
4. Discuss the clinical features in relation to causes and pathogenesis of the diseases. (KH)
5. Describe the classification and characteristics of microorganisms' cause's diseases.(K)
6. Describe the reproduction of common bacterial, fungal, viral pathogens. (K)
7. Discuss the mechanism of infectious disease and body's immune defense. (KH)
8. Explain infection control practices that prevent the spread of infection (KH)
9. Discuss the process of infection and mechanism create a sterile field in physiotherapy practice (KH)

PM 1.0.2. Teaching – Learning Methods

1. Lecture
2. Tutorial
3. Demonstration using models including digital tools
4. Flipped class

PM 1.0.3. Assessment Methods

1. MCQs
2. Assignments
3. Short Essays
4. Long essay

Course Contents: B.P.T. PM 201 (L)

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.

Recommended reference books for PM

1. Walter & Israel, General Pathology - - Churchill Livingstone.
2. Anderson Muirs Textbook of Pathology - - Edward Arnold Ltd.
3. Ackerman and Richards - Microbiology: An Introduction for the Health Sciences – W.B. Saunders

COURSE CODE BPT-202

Course Title- PHARMACOLOGY (PC): Theory (L)

PC 1.0. Subject Description and instruction to teacher

This course introduces the student to basic pharmacology of common drugs used, their importance in the overall treatment including Physiotherapy. The student after completing the course will be able to understand the general principles of drug action and the handling of drugs by the body. The student will be aware of the contribution of both drug and physiotherapy factors in the outcome of treatment. Details of chemistry of molecules should be avoided.

PC 1.0.1. Course Outcomes: Course Pharmacology

1. Describe the concepts of pharmacology (including pharmacokinetics and pharmacodynamics) of commonly used drugs.(K)
2. Discuss the effects of commonly used drugs on body function.(KH)
3. Discuss the therapeutic and adverse effects, contraindications, and precautions for commonly used drugs.(KH)
4. Discuss the pharmacological effects of drugs used in the management pain, inflammatory, cardio-vascular, respiratory, neurological and oncological disorders. (KH)
5. Explain the effect of commonly prescribed on exercise and movement.(KH)
6. Identify the red and yellow flags for physiotherapy prescription based on the pharmacological effect of commonly prescribed drugs. (KH)

PC 1.0.2. Teaching Learning Methods:

1. Lecture
2. Tutorial
3. Demonstration using models including digital tools
4. Flipped class

PC 1.0.3. Assessment Methods:

1. MCQs
2. Assignments
3. Short Essays
4. Long essay

Course Contents: B.P.T. PC 202 (L)

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, Beta-Blockers, 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;

Recommended reference books for PC

1. The Pharmacological basis of Therapeutics - Goodman and Gilman - MacMillan.
2. Satoskar RS, Rege N, Bhandarkar SD. Pharmacology and pharmacotherapeutics. Elsevier India; 2017

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Course Code: 203

Course Title: Public Health & Health Promotion (PH): Theory (L)

PH 1.0. Subject Description and instruction to teacher

This subject follows the basic science subjects to provide the knowledge about conditions the therapist would encounter in their practice in the community. The objective of this course is that after 60 hrs. of lectures and discussion the student will be able to demonstrate an understanding of various aspects of health and disease and the methods of health administration, and be able to appreciate role of health education and disease preventive measures in keeping the population healthy.

PH 1.0.1. Course Outcomes:

After completion of this course the student shall be able to

1. Discuss the determinants of health in relation to the local context
2. Discuss National health policy, programmes and its application to physiotherapy practice
3. Explain the health care delivery system of India.
4. Describe the role of individual, family and community on health
5. Discuss the levels of prevention and its application in health care delivery
6. Explain basic epidemiological principles of health
7. Discuss the prevention of communicable and non-communicable diseases.

Course Contents: B.P.T. PH 203 (L)

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: Cardio vascular 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 mental retardation.

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

Recommended reference books for PH

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

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COURSE CODE 204

Course Title: Basics of Emergency Care and Life Support Skills (ECLS): Theory (L) Practical (P)

ECLS 1.0. Subject Description and instruction to teacher

Basic life support (BLS) is the foundation for saving lives following cardiac arrest. Fundamental aspects of BLS include immediate recognition of sudden cardiac arrest (SCA) and activation of the emergency response system, early cardiopulmonary resuscitation (CPR), and rapid defibrillation with an auto- mated external defibrillator (AED). Initial recognition and response to heart attack and stroke are also considered part of BLS. The student is also expected to learn about basic emergency care including first aid and triage. The purpose of this course is to equip the students with the skill to save the life of a person in different emergency situation as first responder. The training should be provided using Mannequins and dummies and Videos presentations and Role plays should be also used to impart knowledge and skill besides the lecture - demonstrations.

ECLS 1.0.1. Course Outcomes:

After completion of this course the student shall be able to

1. Perform Opening and maintaining and patent airway: assessment and knowledge of airway maneuvers and adjuncts
2. Ventilate patients: Assessment and management of breathing with Mouth to mouth and mouth to mask
3. Administer basic life support skills including cardiopulmonary resuscitation
4. 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
5. 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)
6. Reassure patients and bystanders by working in a confident, efficient manner • Avoid mishandling and undue haste while working expeditiously to accomplish the task
7. Manage safe patient transport Entailing-Extrication of the victim, helmet removal and spine protection during transport.
8. Explain Roles, responsibilities and limitation of first responder.

Course Contents: B.P.T. ECLS 204 (L)

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

Practicals B.P.T. ECLS 204 (P)

Student should practice on Mannequins and dummies and should be able to

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 CODE BPT -205

Course Title: Exercise Therapy (ExT): Theory (L) Practical (P)

ExT 1.0. Subject Description and instruction to teacher

the purpose of this course is to provide detailed knowledge and skills about the advanced concepts and methods of exercise therapy - build over the fundamental concepts taught in the first year such as relaxation, suspension therapy, hydrotherapy, manual therapy, aerobic exercises functional re-education stretching etc. The basic idea is that after the completion of this course student acquires the skills and knowledge to apply the techniques of exercise therapy in patient care. The emphasis should be giving hands on training on execution of various types of exercises and passive procedures. Besides lecture and demonstration, the emphasis should be placed on making the student capable to perform the exercise procedures independently using DOAP [demonstrate, observe, assist, perform] model of teaching learning

ExT 1.0.1. Course Outcomes: Exercise Therapy

1. Explain the physiological effects of endurance, strengthening, balance and coordination effects on various systems. (KH)
2. Differentiate types of exercise based on the therapeutic effects. (SH)
3. 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
4. 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
5. Prescribe therapeutic exercise based on the assessment findings. (SH)

6. Demonstrate competencies in preparing and implementing evidence-based exercise protocol for movement impairments under supervision. (SH)
7. Demonstrate abilities to document the dosage and progression as per the prescribed format (SH)
8. Communicate the exercise protocol effectively to the stakeholders. (SH)

ExT 1.0.2. Teaching Learning Methods:

1. Lecture
2. Tutorials
3. Demonstration
4. Performance under supervisor
5. Lab work

ExT 1.0.3. Assessment Methods:

1. MCQs
2. Structured Essay
3. OSPE

Course Contents: B.P.T. ExT 205 (L)

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

ET 7.1. Identify different types of walking aids (Crutches, Canes, Frames)

ET 7.2. Discuss Principles of prescribing walking aids

PRACTICAL: B.P.T. ExT 205 (P)

The students of exercise therapy are to be trained in Practical Laboratory work for all the topics discussed in theory.

List of practicals

Student shall be able to perform independently on human model

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 conducts aerobic training programme

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.

Recommended Reference Books for ExT

1. Proprioceptive Neuromuscular Facilitation: Voss et al, Williams & Wilkins
2. Orthopedic Physical Therapy: Woods, Churchill Livingstone
3. Manual Examination and Treatment of Spine & Extremities: Wadsworth, Lippincott.
4. Motor Control: Theory and Practical Applications, Shumway Walcott-Lippincott
5. Therapeutic Exercises: Basmajian, Williams &Wilkins.

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COURSE CODE BPT 206

Course Title: Electrotherapy (ET): Theory (L) Practical (P)

ET 1.0. Subject Description and instruction to teacher

This course on electrotherapy is the extension of fundamentals of electrotherapy taught in the previous year. the purpose of this course is imparting the theoretical and practical knowledge on the various electro-physical agents commonly used in physiotherapy practice viz, therapeutic ultrasound, shortwave and microwave diathermy, LASER, cryotherapy, and intermittent compression therapy, it also intends to analyse the physiological response to heat gain and loss and understand the role of electro physical agents in various stages of tissue healing. An introduction to the principles of the advanced uses of electrical current in diagnosis of neuromuscular lesions shall be offered along with the conceptual introduction of the techniques of bio-feedback. The emphasis should be given on providing hands on training on the uses of various modalities with intension of making student able to analyse the underlying pathological process and make a rational selection of the modality for treatment.

ET 1.0.1. Course Outcomes: **Electrotherapy**

Electro Physical Agents

1. Explain pathophysiology of inflammation to tissue injury/healing. (KH)
2. Discuss the physiology and pathophysiology of pain. (KH)
3. Discuss theories of pain and its implications to physiotherapy clinical decision making. (KH)
4. Explain the production, physiological and therapeutic effects of **electro physical agents (KH)**
5. Discuss the indications, contraindications and precautions to be taken while applying **electro physical agents (KH)**
6. Demonstrate competencies in applying (selection, dosage calculation, progression) **electro physical agents**
7. Rationalize the use of electro physical agents as appropriate to the stage of healing (SH)
8. Demonstrate competencies in preparing and implementing evidence based electro physical agents' protocol for movement impairments under supervision. (SH)
9. Demonstrate abilities to document the dosage and progression as per the prescribed format (SH)
10. Demonstrate competencies in equipment maintenance, care and safety-precautions (SH)
11. Demonstrate competencies in communicating to the stakeholders effectively. (SH)

ET 1.0.2. Teaching Learning Methods Assessment

1. Demonstration
2. Performance under supervisor
3. Lab work

ET 1.0.3. Assessment Methods

1. OSPE
2. MCQs
3. Short and Long Essay
4. Assignment

Course Contents: B.P.T. ET 206 (L)

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.

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.

Recommended reference books for ET

1. Therapeutic Heat and Cold Lehman- Williams and Wilkins.
2. Electrotherapy: Clinics in Physical therapy- Wolf Churchill Livingstone.

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COURSE CODE BPT -207

Course Title: BIOMECHANICS & KINESIOLOGY- (BK): Theory (L)

BK 1.0. Subject Description and instruction to teacher

Biomechanics involves the study of basic concepts of human movement, and application of various biomechanical principles in the evaluation and treatment of disorders of musculoskeletal system. Students are taught to understand the various quantitative and qualitative methods of movement. Mechanical principles of various treatment methods are studied. Study of posture and gait are also included.

BK 1.0.1. Course Outcomes: Biomechanics and Kinesiology

After completion of this course the student shall be able to

1. Discuss the principles of physics and laws related to human movement. (KH)
2. Demonstrate understanding of functional movement (kinetics and kinematics) of human body. (SH)
3. Identify the relationship between structure, function, and mechanical properties of movement system (SH)
4. Analyse the components of human movement both in normal and pathological conditions. (SH)
5. Apply the principles of movement analysis in understanding normal and abnormal gait and posture. (SH)
6. Perform basic movement analysis to identify gait and postural abnormalities.(SH)
7. Apply the principles of biomechanics in designing physiotherapy protocols. (SH)
8. Interpret data obtained from movement analysis such as gait and postural analysis. (KH)

BK 1.0.2. Teaching Learning Methods :

1. Lecture
2. Flipped class
3. Video demonstration
4. Demonstration
5. Lab works

BK 1.0.3. Assessment Methods :

1. MCQs
2. Short Essay
3. Assignments
4. Viva Voce
5. OSCE

Course Contents: B.P.T. BK 207 (L)

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

PRACTICAL: B.P.T. BK 207 (P)

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. Demonstration may also be given as how to analyze posture and gait. The student shall be taught and demonstrated to analysis for 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 skeleton.

Recommended Text 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.

Recommended Reference Books For BK

1. 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;
2. Oatis CA. Kinesiology: the mechanics and pathomechanics of human movement. Lippincott Williams & Wilkins;2009.
3. Hamill J, Knutzen KM. Biomechanical basis of human movement. Lippincott Williams & Wilkins; 2006 Oct1.
4. 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.
5. Margareta Nordin: Basic Biomechanics of Musculoskeletal System, 4thEdition

COURSE CODE: 208

Course Title: Yoga & Systems of Medicine: (AYUS) Theory (L) Practical (P)

AYUS 1.0. Subject Description and instruction to teacher

Yoga and AYUSH is the ancient wisdom of our country that plays a vital role in keeping a person healthy. The purpose of this introductory course on yoga

and Ayush is to introduce the conceptual foundation of yoga and Ayush System and its role in maintaining the health of an individuals. The emphasis will be on learning the correct methods of performing basic *asanas*, and *pranayaam* and inculcate practice yoga in daily life routine

AYUS 1.0.1. Course Outcomes: **Yoga & Systems of Medicine**

After completion of this course the student shall be able to

1. understand the conceptual aspect of yoga and other Systems of Medicine.
2. appreciate the role of yoga in maintaining personal and societal health
3. perform basic asanas and pranayama
4. have an understanding of kriyas

Course Contents: B.P.T. AYUS 208 (L)

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].

PRACTICAL: B.P.T. AYUS 208 (P)

List of Practical / Demonstrations (30 hours)

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 Code: B.P.T. 209: Clinical observation (COb)

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.

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THIRD YEAR B.P.T

Course Code :301

Course Title : General Medicine and Pediatrics: (GMP) Theory (L)

GMP 1.0. **Subject Description and instruction to teacher**

This subject follows the basic science subjects to provide the knowledge about relevant aspects of general medicine. The student will have a general understanding of the diseases the therapist would encounter in their practice. The objective of this course is that after lectures and discussion and clinical demonstrations the student will be able to list the etiology, pathology, clinical features and treatment methods for various medical conditions and appreciate the role of physiotherapy in overall management of patient

GMP 1.0.1. **Course Outcomes**: **General Medicine and Pediatrics:**

After completion of this course the student shall be able to

1. Describe the aetiology, pathophysiology, clinical manifestations, diagnostic measures and management of patients with disorders of Communicable and infectious diseases Cardio-vascular system (Acquired, congenital and infective) Nervous system Acquired, congenital, infective and traumatic) Respiratory system (Infective, acquired, acute and chronic) Gastro-intestinal system Genito- Urinary system Integumentary system
2. Acquire skill of history taking and clinical examination of respiratory, cardio-vascular system as a part of clinical teaching
3. Demonstrate competencies in identifying common clinical signs of various disorders
4. Interpret auscultation findings related to respiratory and cardiac system
5. Interpret Chest X-ray, Blood gas analysis, Pulmonary Function Tests& Haematological studies relevant to cardiovascular, respiratory and general medical conditions
6. Acquire knowledge for drugs used in each condition to understand its effect influence on Physiotherapy management
7. Appreciate the role of different specialist in diagnosing and managing the disorders.

General Medicine

8. Describe the etiology, pathophysiology, clinical manifestations, diagnostic measures and management of patients with disorders of
    i. Communicable and infectious diseases
    ii. Cardio-vascular system (Acquired, congenital and infective)
    iii. Nervous system (Acquired, congenital, infective and traumatic)
    iv. Respiratory system (Infective, acquired, acute and chronic)

v. Gastro-intestinal system

vi. Genito- Urinary system

vii. Integumentary system

9. Demonstrate competencies in identifying common clinical signs of various disorders
10. Demonstrate knowledge in common diagnostic procedures used (Blood investigations, Radiologic procedures)
11. Appreciate the role of different specialist in diagnosing and managing the disorders.

GMP 1.0.2. **Teaching learning Methods**:

i. Lecture

ii. Tutorial

iii. Case discussion

iv. Clinical Observation

GMP 1.0.3. Learning Methods:

i. MCQs

ii. Structured Essays

iii. Viva-voce

Course Contents: B.P.T. GMP 301 (L)

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)

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.

Recommended reference books for GMP

1. Fauci, Braunwald, Kasper, Longo, Jameson, Loscalzo: Harrison's principles of internal medicine. Vol I & II, 17th Ed, McGraw Hill, New York, 2008.
2. McPhee, Papadakins, Tierncy: Current medical diagnosis and treatment. 46th Ed, McGraw Hill, New York, 2007.
3. Ogilvie & Evans: Chamberlain's symptoms and signs in clinical medicine – An introduction to medical diagnosis. 12th Ed, Butterworth Heinmann, oxford,
4. Douglas, Nicol & Robertson: Macleod's clinical examination. 11th Ed, Elsevier – Churchill Livingstone, Edinburgh, 2005

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Course Code: 302

Course Title: General Surgery: (GS) Theory (L)

GS 1.0. Subject Description and instruction to teacher

This subject follows the basic science subjects to provide the knowledge about relevant aspects of general surgery. The student will have a general understanding of the surgical conditions the therapist would encounter in their practice. The objective of this course is that after lectures and discussion and clinical demonstrations the student will be able to list the indications for surgery, etiology, clinical features and surgical methods for various conditions and appreciate the role of Physiotherapy in overall management of patient undergoing these surgical procedures

GS 1.0.1. **Course Outcomes**: General Surgery

1. Discuss the principles of general surgery and its implications to Physiotherapy practice. (KH)
2. Explain the pathophysiology of wound healing including the factors affecting healing. (KH)
3. Discuss the effects of general anesthesia on various system and postoperative complications. (KH)
4. Describe the indications, procedures and complications and their implications in Physiotherapy clinical decision making for common surgeries (K)
5. Discuss the common procedures used in plastic surgery and skin grafting. (KH)
6. Apply the basic surgical knowledge in Physiotherapy clinical decision making. (KH)

After completion of this course the student shall be able to

1. Discuss the principles of general surgery and its implications to Physiotherapy practice
2. Explain the pathophysiology of wound healing including the factors affecting healing.
3. Discuss the effects of general anesthesia on various system and postoperative complications.
4. Describe the indications, procedures and complications and their implications in Physiotherapy clinical decision making for common surgeries of Abdomen, Thorax, Nervous system, Pelvis and Vascular system
5. Apply the basic surgical knowledge in Physiotherapy clinical decision making.
6. Interpret pathological / biochemical studies pertaining to surgical pre and post op conditions

7. Acquire the skill of clinical examination of pelvic floor
8. Acquire the skill of clinical examination of pregnant woman
9. Describe the normal and abnormal physiological events during the puberty, labor, puerperium, post – natal stage and menopause. stage and various aspects of urogenital dysfunction and their management in brief

GS 1.0.2. Teaching Learning Methods:

i. Lecture
ii. Tutorial
iii. Case discussion

GS 1.0.3. Assessment Methods:

i. MCQs
ii. Essay
iii. Viva-voce

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.

Practical/ clinical

Long case/ short case/ viva voce : focusing on history taking clinical examination interpretation of bedside charts, OSPE for equipments

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

Recommended reference books for GS

1. Russell RCG, Williams NS, Bulstrode CJK: Bailey & Love's short practice of surgery. 24th Ed, Arnold, London, 2004.
2. Mowschenson PM: Aids to undergraduate surgery. 3rd Ed, Churchill Livingstone, Edinburgh,
3. Farquharson M & Moran B: Farquharson's textbook of operative general surgery. 9th Ed, Hodder Arnold, London, 2005.
4. Lumley JSP: Hamilton Bailey's demonstrations of physical signs in clinical surgery. Butterworth Heinman, Oxford,
5. Doherty MG: Current surgical diagnosis and treatment. 12th Ed, Lange medical books, New York, 2006.

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Since-2021

COURSE CODE BPT 303

Course Title: Orthopedics: (OR) Theory (L)

OR 1.0. Subject Description and instruction to teacher

This subject follows the basic science subjects to provide the knowledge about Orthopedic conditions the therapist would encounter in their practice. The objective of this course is that after completion of the lectures and discussion the student will be able to demonstrate an understanding of orthopedic conditions causing disability, list the etiology, clinical features and methods of investigations and management.

OR 1.0.1. **Course Outcomes**: **Orthopedics**

After completion of this course the student shall be able to

1. Describe the etiology, pathophysiology, clinical manifestations, diagnostic measures, conservative and surgical management of patients with disorders of (including trauma) Bones Joints Muscles Soft tissues
2. Demonstrate competencies in identifying common clinical signs of various musculoskeletal disorders
3. Demonstrate abilities in performing special tests to differentially diagnosing soft tissue injuries.
4. Demonstrate abilities to interpret radiological finding related to Physiotherapy practice.
5. Appreciate the role of different specialist in diagnosing and managing musculoskeletal disorders

Course Contents: Orthopedics: (OR) 303 (L)

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 of the following –
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 of tibia and fibula.
11. Dupuytren's fracture
12. Maisonneuve's 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 Jone'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 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 knee.
3. Medial and lateral collateral injuries of 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, Management- medical 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.

Practical / Clinical

Long /short case examination of patient focusing on history taking examination observation, palpation, special tests, identification of abnormalities in radiograph diagnosis differential diagnosis, OSPE on equipments

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

Recommended Reference Books for OR

1. Tureks Orthopaedics.
2. Cambells Operative Orthopaedics.

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COURSE CODE: B.P.T -304

Course Title: Physiotherapy in Adult and Paediatric General Medical and Surgical Conditions: (PTMS) Theory (L) Practical (P)

PTMS 1.0. Subject Description and instruction to teacher

This course follows the courses in exercise therapy and electrotherapy and intends to impart the knowledge and skill in using Physiotherapy techniques for the management of common medical and surgical conditions. The course is designed to provide knowledge in assessing and planning Physiotherapy interventions for various General, Medical and Surgical conditions. The student must be able to reassess the patient as necessary, to monitor the patient in regard to treatment, to monitor the patient's vital signs, student must know emergency drugs indication and contra-indication, and to provide appropriate interventions to the patient. Besides Lecture and Bed-side demonstration, case discussion and tutorial should be preferred teaching methods. The use of virtual reality based training and simulation to facilitate skill acquisition should be encouraged

PTMS 1.0.1. Course Outcomes: **Physiotherapy in Adult and Paediatric General Medical and Surgical Conditions**

After completion of this course the student shall be able to

1. Demonstrate competencies in assessing and identifying impairments, activity limitations and participatory restrictions caused by Acute and chronic infections Integumentary diseases Genito-Urinary diseases Gastro-intestinal diseases
2. Demonstrate competencies in planning and implementing evidence-based Physiotherapy protocols to manage impairments, activity limitations and participatory restrictions caused by Acute and chronic infections Integumentary diseases Genito-Urinary diseases Gastro-intestinal diseases
3. Demonstrate competencies in assessing and identifying impairments, activity limitations and participatory restrictions due to common surgical procedures of Abdomen Thorax Pelvis Tendon transfer Plastic and reconstructive Organ transfer
4. Demonstrate competencies in planning and implementing evidence based Physiotherapy protocols to manage impairments, activity limitations and participatory restriction due to common surgical psrocedures of Abdomen Thorax Pelvis Tendon transfer Plastic and reconstructive Organ transfer
5. Select and use appropriate outcome measures in postoperative care
6. Demonstrate competencies in documenting Physiotherapy assessment and management protocol in managing medical and surgical clients

Course Contents: B.P.T. PTMS Theory (L)

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)

PRACTICAL/ clinical –B.P.T. Physiotherapy in Adult and Paediatric General Medical and Surgical Conditions: 304 Practical : PTMS (P)

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. Physiothempy in Obstretrics and Gynaecology, Polden

Recommended reference books for PTMS

1. Women's Health – Sapsford
2. Geriatric Physical therapy- Andrew A. Guccione

CURSE CODE: B.P.T-305

Course Title: Physiotherapy in Adult and Paediatric Orthopedic Conditions: (PTO) Theory (L) Practical (P)

PTO 1.0. Subject Description and instruction to teacher

This course follows the courses in exercise therapy and electrotherapy and intends to impart the knowledge and skill in using Physiotherapy techniques for the management of common medical and surgical conditions affecting musculoskeletal system. The course is designed to provide knowledge in assessing and planning Physiotherapy interventions for various conditions affecting musculoskeletal system. The student must be able to reassess the patient as necessary, to monitor the patient in regard to treatment, to monitor the patient's vital signs, student must know emergency drugs indication and contraindication, and to provide appropriate interventions to the patient. The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify disabilities due to musculoskeletal dysfunction, plan and set treatment goals and apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore musculoskeletal function. Besides Lecture and Bed-side demonstration, case discussion and tutorial should be preferred teaching methods. The use of virtual reality based training and simulation to facilitate skill acquisition should be encouraged.

PTO 1.0.1. **Course Outcomes**: **Physiotherapy in Adult and Paediatric Orthopedic Conditions**

After completion of this course the student shall be able to

1. Demonstrate competencies in assessing and identifying Physiotherapy related problems due to (including trauma, infections and rheumatic disorders) Bones Joints Muscles Soft tissues Post-surgical conditions
2. Demonstrate competencies in differentially diagnosing various musculoskeletal disorders
3. Demonstrate competencies in developing and implementing evidence-based Physiotherapy protocol in managing (including trauma, infections and rheumatic disorders) Bones Joints Muscles Soft tissues Post-surgical conditions (Joint replacement and reconstructive surgeries
4. Demonstrate competencies in selecting and using appropriate outcome measures in managing clients with musculoskeletal disorders)
5. Document assessment findings, clinical decision making, PT protocol and prognosis as per the prescribe format.
6. Demonstrate competencies in communicating effectively to the stakeholders including Healthcare providers.

Course Contents: Physiotherapy in Adult and Paediatric Orthopedic Conditions: (PTO) 305 Theory (L)

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

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Section-B

Unit 3

Conservative and/peri-operative PT management. in

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 in

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 deficiencies- Amelia 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)

PRACTICAL – B.P.T Physiotherapy in Adult and Paediatric Orthopedic Conditions: 305 PTO Practical

PTO (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.

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

Recommended Reference Books for PTO

1. Apley's system of Orthopaedics and fractures -Louis Solomon, David J. Warwick Arnold Publishers, London
2. Turek's Orthopaedics: Principles and their Application, Weinstein SL and Buckwalter JA, Lippincott
3. Clinical Orthopaedic Rehabilitation, Brent Brotzman.
4. Peripheral Mobilisation – GD Maitlant, Butterworth
5. Vertebral Mobilisation – GD Maitland, Butterworth and Heinmann Publication.
6. Manual Therapy: Nags, Snags, MWMs, etc - 6th Edition Brian Mulligan
7. Neural tissue mobilization –Butler
8. Therapeutic Exercise: Moving Toward Function - Carrie M. Hall, Lori Thein Brody
9. Manual Mobilization of Extremity Joints-Kaltenborn
10. Clinical Orthopaedic rehabilitation- Broadsman

COURSE CODE: BPT-306

Course Title: Physical & Functional Diagnosis and Prescription: (PFDP) Theory (L) Practical (P)

PFDP 1.0. Subject Description and instruction to teacher

the aim of this course is to impart conceptual clarity on the process of identifying the problems of patient within the scope of Physiotherapy practice and equip the students with skills to evaluate the patient afflicted with the disorders of musculoskeletal, neuromuscular, cardiovascular-pulmonary and integumentary systems using valid and reliable measures while taking into account the setting in which patients/clients receive services, The teaching method should follow DOAP [demonstrate observe assist perform] model and should ensure that before attempting to perform the tests on patients the student should demonstrate the ability to safely perform the test on healthy human model .

PFDP 1.0.1. Course Outcomes:

After completion of this course the student shall be able to

1. Explain movement dysfunction and models used to evaluate function in ICICDH, ICF approach
2. Explain choice of appropriate tools/instruments of assessment in musculoskeletal, neurological and cardio-vascular and respiratory conditions
3. Demonstrate the skills for independent performance of various tests and procedures
4. Document evaluation finding of patient based on ICF model identifying structural impairments, functional impairments, participation, contextual factors, performance and capacity measurement

Course Contents: B.P.T. Physical & Functional Diagnosis and Prescription: 306 (PFDP) Theory (L)

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 T**ypes 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 extra-articular 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 Minutes 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

PRACTICAL B.P.T. Physical & Functional Diagnosis and Prescription 306 Practical : PFDP (P)

Student 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/

Recommended Reference Books for PFDP

1. Maitland‟s book on Manual therapy,
2. Mobilisation of Extremities – Kaltenborn
3. Clinical Electromyography–Kimura
4. Orthopaedic Physical therapy–Donnatelli
5. NAGS, SNAGS and MWMS – Brian Mulligan
6. Physical Dysfunction –Trombly Scoot
7. Infant Motor Development-Jan Piek
8. Neuro-developmental Therapy–Janett Howle
9. Textbook of Radiology and Imaging- David Sutton

COURSE CODE BPT 307

Course Title: Research Methodology, Biostatistics and Evidence Based Practice: : (RMB) Theory (L)

RMB 1.0. Subject Description and instruction to teacher

The objective of this course is to help the students understand the basic principles and methods of research used in health sciences so as to facilitate drawing inferences from the research findings and engage in evidence-based practice. The focus of the teaching should be to enable the student to read the research literature and draw inference. The derivation of the statistical tests and the detailed manual calculation should be avoided, rather the emphasis should on making students aware about the uses and interpretation of the tests results. The research papers and thesis reports using various designs of research should be shown to the students and small group discussion should be organized to facilitate understanding of the literature. Students should be encouraged to produce dummy research proposal.

RMB 1.0.1. **Course Outcomes**: Research methodology, biostatistics and evidence-based practice

1. Discuss the need for research in Physiotherapy practice
2. Explain the process of research.
3. Discuss the study designs with appropriate examples.
4. Discuss the methods of data collection in Physiotherapy research.
5. Discuss the components statistical analysis.
6. Explain the process of Evidence based Physiotherapy practice.
7. Demonstrate skills in literature search through primary and secondary database
8. Demonstrate skills in critically appraising the evidence
9. Discuss the importance of Evidence Based Practice.
10. Explain Introduction to Research methodology: which includes 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
11. Describe in details about terms of 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
12. Discuss meaning, need, features & basic principles of Research design.
13. Discuss about 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 de- sign

14. Discuss the aspects of 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.
15. Enumerate the Methods of data collection: collection of primary data, collection data through questionnaires & schedules, Difference between questionnaires & schedules
16. Discuss the Processing & analysis of data: coding of data, types of data, quantitative analysis qualitative analysis
17. Describe Format of scientific documents. (Structure of protocols, formats reporting in scientific journals, systematic reviews and meta-analysis)
18. Explain the Computer technology: Introduction to Computers, computer application in research, Introduction to data analysis software's

RMB 1.0.2. Teaching Learning Methods:

1. Lecture
2. Tutorial
3. Demonstration
4. Small group discussion

RMB 1.0.3. Assessment Methods:

1. MCQs
2. Assignment
3. Seminar
4. Presentations

Course Content: B.P.T **RMB 307 Theory (L)**

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 binominal distribution, the normal distribution, Divergence from normality – skew ness, 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 metanalysis, 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 binominal 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 involve 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.

Recommended Reference Books for RMB

1. Evidence Based Physical Therapy by Linda Fetters, Julie Tilson
2. Guide to Evidence-Based Physical Therapy Practice by Dianne V. Jewell
3. Bailey N.T.J. – Statistical methods in Biology. The English University Press, London.
4. Colton – Statistics in medicine. Little Brown Company, Boston
5. Goulden C.H. – Methods of Statistical Analysis. Asia Publishing House, New Delhi.
6. Snedecor G.W. – Statistical Methods. Allied Pacific Pvt. Ltd., London

Course Code: B.P.T 308: Clinical Education (CEd)

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.

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4TH YEAR B.P.T

COURSE CODE: B.P.T -401

Course Title: Neurology Including Psychiatry and Neurosurgery: (NPNS) Theory (L)

NPNS 1.0. **Subject Description**

This subject follows the basic science subjects to provide the knowledge about relevant aspects of neurology & psychiatry. The student will have a general understanding of the diseases the therapist would encounter in their practice. The objective of this course is that after lectures and demonstration the student will be able to list the etiology, pathology, clinical features and treatment methods for various neurological and psychiartic conditions and appreciate the role of Physiotherapy in overall management of patient.

NPNS 1.0.1. **Course Outcomes: Neurology Including Psychiatry and Neurosurgery**

After completion of this course the student shall be able to

1. Describe the aetiology, pathophysiology, clinical manifestations, diagnostic measures and management of patients with disorders of Central Nervous system Peripheral Nervous system and Neuro-Muscular system
2. Demonstrate competencies in identifying common clinical signs of various neurological disorders
3. Demonstrate knowledge in common diagnostic procedures used in differential diagnosis of neurological and psychiatric disorders (Blood investigations, Radiologic procedures
4. Appreciate the role of different specialist in diagnosing and managing the neurological and psychiatric disorders.

Course Contents: B.P.T Neurology Including Psychiatry and Neurosurgery 401 NPNS Theory (L)

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 function 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, Pant & 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 - **Mental retardation** attention deficit syndrome and behavioral disorders.

PRACTICAL / CLINICAL

LONG CASE SHORT CASE examination of neurological patients 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, 5thedition
3. Medicine and Neurology by Golewala.

Recommended Reference Books for NPNS

1. Brain's Diseases of the Nervous System - Nalton – ELBS.
2. Guided to clinical Neurology - Mohn&Gaectier - Churchill Livingstone. 3.Principles of Neurology - Victor – McGraw Hill International edition.
3. Neurological Rehabilitation - Darcy Umphred.

NATIONAL COMMISSION FOR ALLIED AND HEALTHCARE PROFESSIONS
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COURSE CODE: B.P.T-402

Course Title: Physiotherapy in Adult and Paediatric Neurological and Neurosurgical Conditions: (PTN) Theory (L) Practical (P)

PTN 1.0. Subject Description and instruction to teacher

This course follows the courses in exercise therapy and electrotherapy and intends to impart the knowledge and skill in using Physiotherapy techniques for the management of common medical and surgical conditions affecting nervous system encountered in clinical Physiotherapy practice. The course is designed to provide knowledge in assessing and planning Physiotherapy interventions for various conditions affecting nervous system. The student must be able to reassess the patient as necessary, to monitor the patient in regard to treatment, to monitor the patient's vital signs, student must know emergency drugs indication and contra-indication, care in intensive care unit (ICU) and to provide appropriate interventions to the patient. The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify disabilities due to neurological dysfunction, plan and set treatment goals and apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore neurological function. Besides Lecture and Bed-side demonstration, case discussion and tutorial should be preferred teaching methods. The use of virtual reality-based training and simulation to facilitate skill acquisition should be encouraged.

PTN 1.0.1. **Course Outcomes**: **Physiotherapy in Adult and Paediatric Neurological and Neurosurgical Conditions**

After completion of this course the student shall be able to

1. Describe the aetiology, pathophysiology, clinical manifestations, diagnostic measures and management of patients with disorders of Central Nervous System Peripheral Nervous system Neuro-Muscular system
2. Demonstrate competencies in identifying common clinical signs of various neurological disorders
3. Demonstrate knowledge in common diagnostic procedures used in differential diagnosis of neurological and psychiatric disorders (Blood investigations, Radiologic procedures)
4. Appreciate the role of different specialist in diagnosing and managing the neurological and psychiatric disorders.

Course Contents: B.P.T PTN 402 (L)

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, Brunnstorm 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

PRACTICAL: B.P.T PTN 402 (P)

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

Recommended Reference Books for PTN

1. Umphred D. Neurological rehabilitation. Saint Louis: Mosby/Elsevier;
2. Donaghy M. Brain's diseases of the nervous system. Oxford: Oxford University Press; 2009
3. Bobath B. Adult hemiplegia. Oxford (England): Heinemann Medical Books. Patricia M D. Right in the middle. Springer-Verlag

COURSE CODE BPT 403

Course Title - CARDIO THORACIC DISEASES AND SURGERIES : (CTD) Theory (L)

Course Content: B.P.T CTD 403 (L)

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 Endocarditic - 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 Post-extubation 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 and
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.

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. Wya
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

स्वास्थ्यम् सर्वार्थसाधनम्
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COURSE CODE: B.P.T 404

Course Title: Physiotherapy in Adult and Paediatric Cardiothoracic Conditions and Surgical Conditions: (PTCT) Theory (L) Practical (P)

PTCT 1.0. **Subject Description and instruction to teacher**

This course follows the courses in exercise therapy and electrotherapy and intends to impart the knowledge and skill in using Physiotherapy techniques for the management of common medical and surgical conditions affecting cardio respiratory system. The course is designed to provide knowledge in assessing and planning Physiotherapy interventions for various conditions affecting cardiorespiratory system. The student must be able to reassess the patient as necessary, to monitor the patient in regard to treatment, to monitor the patient's vital signs, student must know emergency drugs indication and contraindication, care in intensive care unit (ICU) and to provide appropriate interventions to the patient. Besides Lecture and Bed-side demonstration, case discussion and tutorial should be preferred teaching methods. The use of virtual-reality based training and simulation to facilitate skill acquisition should be encouraged.

PTCT 1.0.1 **Course Outcomes**: **Physiotherapy in Adult and Paediatric Cardio-thoracic disease and Surgical Conditions**

After completion of this course the student shall be able to

1. 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
2. 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
3. Demonstrate competencies in performing clinical exercise testing as part of clinical decision making
4. Demonstrate competencies in selecting and using appropriate outcome measures in managing clients with cardio-respiratory disorders)
5. Document assessment findings, clinical decision making, PT protocol and prognosis as per the prescribe format.
6. Demonstrate competencies in communicating effectively to the stakeholders including Healthcare providers.

PT in Cardio- Respiratory conditions

7. 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
    6. Lung and cardiac transplantation
8. 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
    7. Lung and cardiac transplantation
9. Demonstrate competencies in performing clinical exercise testing as part of clinical decision making. (SH)
10. Demonstrate competencies in selecting and using appropriate outcome measures in managing clients with cardio-respiratory disorders (SH)
11. Document assessment findings, clinical decision making, PT protocol and prognosis as per the prescribe format. (SH)
12. Demonstrate competencies in communicating effectively to the stakeholders including Healthcare providers. (SH)

PTCT 1.0.2 **Teaching Learning Methods:**

1. Lecture
2. Tutorial
3. Case discussion
4. Virtual reality-based training
5. Simulation

PTCT 1.0.3 **Asse**ssment Methods:

1. MCQs
2. OSCE, OSPE, OSLER
3. DOPS
4. Portfolio

Course Contents: B.P.T PTCT 404 Theory (L) and Practical (P)

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 cardio-respiratory 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 and

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

   and

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

   and

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 undergone pulmonary surgeries and
2. Demonstrate skills in providing Physiotherapy care for the identified problems in clients undergone pulmonary surgeries for
    1. Lung volume reduction
    2. Lung transplantation
    3. 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

and

2. Demonstrate skills in providing physiotherapy care for the identified problems in clients undergone cardiac surgeries like
   1. CABG
   2. Valve repair and replacement surgeries
   3. Cardiac pacemaker insertion
   4. 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

   and

2. Demonstrate skills in providing physiotherapy care for the identified problems in clients with cardiac disorders
   1. IHD
   2. Cardiac Failure
   3. 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

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

RECOMMENDED REFERENCE BOOKS for PTCT

1. Exercise & the Heart –Wenger
2. ECG – P.J. Mehta
3. Cardiopulmonary Physical Therapy -- IrwinScott
4. Essential of cardio pulmonary physical therapy –Hillgass and Sodosky
5. Exercise physiology, energy, nutrition and human performance –M'cardle
6. Exercise testing and prescription - Skinner 8. Exercise in health and disease-Pollock

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COURSE CODE: B.P.T-405

Course Title: Sports Physiotherapy and Exercise Prescription: (PTS) Theory (L) Practical (P)

PTS 1.0. **Subject Description and instruction to teacher**:

Involvement of Physiotherapist in sports is a recent phenomenon. The purpose of this course is to sensitize the students on the importance of sports and physical activities in health promotion, and provides skills to ensure safe participation in sports. It prepares the students to offer primary and secondary care to the sports persons. Health risks, screening, and assessment considering epidemiological principles are emphasized. Risk reduction strategies for primary and secondary prevention, including programs for special populations are covered. Besides lectures and demonstration exposure of students to the real sports situation in sports fields should be arranged. Use of simulation and dummies to acquire basic skills should be encouraged.

PTS 1.0.1. **Course Outcomes**: **Sports Physiotherapy and Exercise Prescription:** After completion of this course the student shall be able to

1. Understand the importance of sports and physical activities in health promotion
2. Describe the methods for safe participation in sports and physical activities
3. Identify, evaluate, analyse and discuss the common acute and overuse injuries encountered in sports and plan initial management
4. Demonstrate the techniques used in the area of sports Physiotherapy
5. Execute physical fitness testing of healthy population
6. Apply theoretical basis of physiological effects and best available evidence on effectiveness, efficacy and safe application of management guide- lines
7. Understand the needs of specific population participating in sports

Course Contents: B.P.T PTS 405 (L)

SECTION -A

Unit I

PTS 1.1. **Introduction to Sports:** importance of sports in health promotion, types of sports- contact, 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 Sub-acromial 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 and

PTS 2.10. Topics for Exercise Prescription for Populations with Other Chronic Diseases and Health Conditions, Overweight and Obesity

Practicals: B.P.T PTS 405 (P)

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

Recommended Reference Books for PTS

1. Morris B. Mellion: Office Sports Medicine, Hanley & Belfus.
2. Bartlett R. Introduction to sports biomechanics: Analysing human movement patterns. Routledge;2007 Oct25.
3. William D. McArdle, Frank I. Katch, Victor L. KatchAstrand, P.-O. and Rodahl, K. Text book of Work Physiology Physiological basis of exercise
4. Fu and Stone: Sports Injuries: Mechanism, Prevention and Treatment, Williams andWilkins.
5. Kulund: The Injured Athlete, Lippincott.

COURSE CODE BPT 406

Course Title: Physiotherapy Ethics, Medico Legal aspects, Management and Administration : (PTLM) Theory (L)

PTLM 1.0. Subject Description and instruction to teacher

Legal and ethical and management considerations are firmly believed to be an integral part of medical practice in planning patient care. Advances in medical sciences, growing sophistication of the modern society's legal framework, increasing awareness of human rights and changing moral principles of the community at large, now result in frequent occurrences of healthcare professionals being caught in dilemmas over aspects arising from daily practice. Medical/ Physiotherapy ethics has developed into a well based discipline which acts as a "bridge" between theoretical bioethics and the bedside. The goal is to improve the quality of patient care by identifying, analyzing, and attempting to resolve the ethical problems that arise in practice. Clinicians are bound by, not just moral obligations, but also by laws and official regulations that form the legal framework to regulate medical practice. The use of management principles in Physiotherapy practice not only ensures quality of care but also provide insights into running a successful self-sustaining business model. The purpose of this course is to sensitize the students to various principles of ethics law and management in order to ascertain that they become a considerate, compassionate practitioner and successful entrepreneur.

PTLM 1.0.1. **Course Outcomes**: **Physiotherapy Ethics, Medico Legal aspects, Management and Administration**

After completion of this course the student shall be able to

1. Compare and contrast the concept of morality ethics and legality and discuss the ethical issues pertaining to Physiotherapy practice
2. Discuss the concept of professionalism and code of professional ethics and describe the salient features of national and international code of ethics related to health sciences as well as discuss the legal frame work of Physiotherapy practice
3. Discuss the principles, elements of management and its relevance to Physiotherapy practice
4. Discuss the principles and methods of quality control and skill necessary to run a physiotherapy clinic as entrepreneur

Course Contents: B.P.T PTLM 406 (L)

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 - AHCPCA. Consumer protection law, People with Disability Act 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

Recommended Reference Books for PTLM

1. Hébert, P. C., & Rosen, W. (2009). Doing right: a practical guide to ethics for
2. medical trainees and physicians (p. 352). Don Mills, ON: Oxford University Press. American Medical Association, & New York Academy of Medicine. (1848).
3. Code of medical ethics. H. Ludwig &Company
4. Blackburn, S. (2003). Ethics: A very short introduction (Vol. 80). Oxford University Press.
5. Joydeep Das Gupta Hospital Administration and Management: A Comprehensive Guide jaypee brothers

COURSE CODE: B.P.T - 407

Course Title: Community Physiotherapy and Rehabilitation : (CPTR) Theory (L) Practical (P)

CPTR 1.0. Subject Description and instruction to teacher

The subject serves to integrate the knowledge gained by the students in community medicine and other areas with skills to apply these in clinical situations of health and disease and its prevention. The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify rehabilitation methods to prevent disabilities and dysfunctions due to various disease conditions and plan and set treatment goals and apply the skills gained in rehabilitating and restoring functions.

CPTR 1.0.1. **Course Outcomes**: **Community Physiotherapy and Rehabilitation**

After completion of this course the student shall be able to

1. Describe conceptual framework of rehabilitation with emphasis on roles of rehabilitation team members and various models of rehabilitation
2. Describe the concept and methods of epidemiology with emphasis on locomotor disability
3. Describe the concept of community-based rehabilitation and outreach programme to rehabilitate persons with disabilities living in rural areas
4. Explain the principles of orthotics along with region wise uses and fitting
5. Describe Principles of prosthetics along with region wise uses and fitting
6. Describe the identification, and explain the process of rehabilitation of speech and hearing disability, visual disability, intellectual disability
7. Explain the principles of vocational rehabilitation including evaluation & vocational goals for people with disability
8. Apply the concept of Health Education
9. Understand about occupational therapy and importance of Activities of Daily Living and training of wheel chair activities, bed activities, transfer activities, locomotor activities and self-care activities
10. Discuss about architectural barrier and possible modifications with reference to common disabling conditions
11. Outline the principles of disability evaluation
12. Discuss the principles of **Occupational health** & Ergonomics

Course Contents: B.P.T CPTR 407 (L)

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, Handicap 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 handicapped. PWD Act 1995 and Rights of person with Disability Act 2016, National Trust Act (Note whereever 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 Rehabilitation of the mentally subnormal, 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 the mentally subnormal, including 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

PRACTICAL demonstration: B.P.T CPTR 407 (P)

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.

Recommended Reference Books for CPTR

1. Status of Disabled in India -2000-RCI publication
2. Legal Rights of disabled in India- Gautam Bannerjee
3. ICF –WHO Health Organisation 2001 publication
4. Training in the Community for the people with disability – Hallender Padmini
5. Mendes
6. Disabled Village Children—David Werner
7. Chorin C& M Desai, C Gonsalves, Women & the Law, Vol. I & II Socio - legal Information Centre Mumbai
8. Hand Splinting – Wilson – W. B. Saunders.
9. Atlas of Limb Orthotics and Limb Prosthetics American Academy of Orthopedic Surgeons – Mosby.
10. Krusens Handbook of Physical Medicine and Rehabilitation.

Course Code B.P.T 408 Project Work

Course Title: Project Work: (PW)

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 code: B.P.T 409 : CLINICAL Rotation (CLRo)

CLRo 1.Students will be posted in rotation in the following areas/wards. The students will be clinically trained to provide physio- therapy 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 & CTS ICU
7. Developmental Pediatrics & Child Guidance Clinic
8. OBG
9. Geriatric – Old Age Homes
10. Industrial Visits - Ergonomics

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4.29.4. Skill Based Outcomes And Monitor Able Indicators For Bachelor Of Physiotherapy

Bachelor of Physiotherapy Competency Statements are mentioned on 4.29. The skill based learning outcomes, knowledge and monitorable indicators to be ascertained after studying the B.P.T curriculum are indicated in Table 4.17.

Table 4.17: The Skill based Learning Outcomes, Knowledge and monitorable indicators:

Sl. No.	Learning Outcomes	Knowledge/ Comprehension	Application/Synthesis/ Evaluation
1.	Consults with the client to obtain information about his/her health, associated history, previous health interventions, and associated outcomes	i. Able to Collect and review back-ground information relevant to the client's health. ii. Understands the client's expectations related to Physiotherapy services. iii. Able to Collect and review health information about the client from other sources (e.g., other sources may include previous health records, other Healthcare practitioners, professional col-leagues, or family). iv. Identify client's prior functional abilities, physical performance, and participation. v. Identifies the client's personal	a. Develop rapport to obtain history and current health status b. Use interviewing skills appropriate to the patient/client c. Obtain a relevant history and current health status. d. Interpret the patient's/client's verbal and non-verbal responses. e. Determines the personality traits. f. Analyze how the differences in personality influence approach
2.	Collects assessment data relevant to the client's needs and physiotherapy practice.	i. Informs the client of the nature and purpose of assessment as well as any associated significant risk.	a. Perform patient assessment technique which includes to know the condition and to gather in- formation about his/her ailment. b. Monitors the client's health status for significant changes during the course of assessment and takes appropriate actions as required. c. Perform assessment procedure safely and accurately, taking into account client consent, known indications, guidelines, limitations and risk benefit considerations.

Sl. No.	Learning Outcomes	Knowledge/ Comprehension	Application/Synthesis/ Evaluation
3.	Be able to conduct the patient evaluation and assessment as per condition.	i. Be familiar with different assessment techniques. ii. Able to examine higher motor functions, cranial nerves, ROM, MMT, Muscle tightness, muscle tone, myotome, sensory evaluation, balance, co-ordination, hand function, functional outcome measures, Physical fitness, cardio- respiratory evaluation, posture & gait. iii. Be familiar with special tests. iv. Basic knowledge on radiological findings & other investigations. v. Demonstrate clinical reasoning with choice of assessment and examination procedure	a. Safely and accurately examines and reexamines a patient using standardized measures. b. Apply pertinent tests and measurements. c. Interpret all assessment findings to allow for identification of the patients/client's impairments, activity limitations and participation restrictions.
4.	Analyzing assessment findings & establish a physiotherapy diagnosis and prognosis.	i. Identifies the nature and extent of the client's impairments, activity limitations and participation restrictions within the context of the client's needs. ii. Identifies environmental and personal supports and barriers relevant to the patients. iii. Determines the relationship among the assessment findings.	a. Interpret findings and reach a differential diagnosis b. Establishes a diagnosis for Physiotherapy, identifies risks of care, and makes appropriate clinical decisions based upon the examination, evaluation and current available evidence. c. Formulates a Physiotherapy diagnosis based on the analysis of patient's assessment findings. d. Discusses Physiotherapy diagnosis and prognosis with the patient & care givers

Sl. No.	Learning Outcomes	Knowledge/ Comprehension	Application/Synthesis/ Evaluation
5.	Develops and recommends an intervention strategy.	i. Establishes and prioritizes, with the patient, expected outcomes based on the assessment findings and evidence-informed practice. ii. Recommends a service approach consistent with the client's needs, goals and all available resources. iii. Discuss the current patient condi-tion among multi- disciplinary team	a. Establishes goals that are specific, measurable, action oriented, realistic, and time-specific. b. Selects interventions that are evidence based and consistent with the client's goals, general health status, functional needs, and assessment findings. c. Identifies when Physiotherapy services are not required or indicated and refers for other services as appropriate.
6.	Be able to prepare the patient (physically and emotionally) and as well as the equipment to be used as per treatment plan	i. Know the patient mental and physical condition	a. Operate the most appropriate equipment for the individual patient within the context of the protocol.
7.	Implements intervention	i. Orients the client to the practice setting and provides information about relevant service/ policies (e.g., lo- cation, duration, frequency, cost; introduce client to all staff involved in their care; expected completion of service).	a. Performs physiotherapy interventions in accordance with client consent and in a safe and effective manner. b. Educates the client about health promotion, self-management, and relevant services with respect to his/her unique condition.
8.	Be able to accurately explain the treatment plans and able to demonstrate and teach self exercises	i. Discuss the importance of exercises and how it should be carried out ii. Be familiar with the treatment plans for all patients on the treatment unit iii. Identify the comorbidities that will impact on patient condition iv. Recognize if any adverse reactions is occurring	a. Interpret the treatment plan and use the equipment accordingly b. Teach patients the exercise procedures and methods of doing them. c. Evaluate the patient's general condition prior to commencing the exercises. d. Analyze the information and integrate to define the optimal patient condition

Sl. No.	Learning Outcomes	Knowledge/ Comprehension	Application/Synthesis/ Evaluation
9.	Advise patient on appropriate nutrition, exercises, rest, relaxation other issues	Explain the impact of exercise and nutritional status of patient during treatment	a. Assess the patient's status after exercise and proper diet.
10.	Evaluates the effectiveness of interventions.	i. Discuss with the client, the nature, purpose and results of ongoing assessment and outcome evaluations. ii. Consults with the patient to redefine goals and modifies or discontinues intervention strategies as necessary.	a. Monitors client responses and changes in status during the interventions and modifies intervention accordingly. b. Evaluates effectiveness of the intervention strategy on an ongoing basis using appropriate outcome measures. c. Assesses client status prior to the completion of physiotherapy service and compares with initial assessment findings. d. Communicates with the client about service completion & recommends self-management option.
11.	Be able to complete accurate treatment documentation.	i. Recognize the importance of accurate transfer of information to allow for accurate treatment set-up according to the treatment plan and prescription. ii. Know what should be included & whom or where the documentation and information should be sent. iii. Be aware of the ethical issues relating to documentation	a. Ensure that the ethical and legal requirements of documentation are completed. b. Ensure legible, accurate and timely records are maintained. c. Ensure statistical information is recorded and accessible.
12.	Develops, builds, and maintains rapport, trust, and ethical professional relationships through effective communication.	i. Be familiar with the psychological status of the patient. ii. Knowledge of few counseling procedures.	a. Demonstrates sensitivity to the uniqueness of others. b. Listens effectively and facilitates discussion to ensure reciprocal exchange of information. c. Demonstrates an awareness of self behaviours and the responses of others and adapts communications appropriately. d. Able to assess psychological status of patient.

Sl. No.	Learning Outcomes	Knowledge/ Comprehension	Application/Synthesis/ Evaluation
13.	Establishes and maintains inter professional relationships, which foster effective client-centered collaboration.	i. Integrates knowledge and understanding of the physiotherapist role and the roles of others in pro- viding client-centred care. ii. Consults and shares relevant information with clients, other health professionals, and all relevant individuals or groups in a timely manner.	a. Demonstrates an understanding of and respects the roles, responsibilities and differing perspectives of team members. b. Practice in accordance with legislation regulations and ethical guidelines. c. Fosters collaboration with relevant others.
14.	Understand the principles of continuous quality improvement	i. Identify the components of a quality plan. ii. Discuss the role of quality assurance such as principles of an accreditation/audit programme iii. Undertake peer review and self-evaluation	a. Modify and adapt professional practice in response to evaluation and/or feedback from the patient/client, peer, supervisor Contribute to inservice activities b. Reflect on the outcomes of interventions and modify practice accordingly
15.	Be able to carry out the daily/ weekly Quality Control (QC) checks	i. Explain Quality Management System (QMS), Quality Assurance (QA) and Quality Control (QC)	a. Perform the daily / weekly/ monthly QC procedures
16.	Be able to review the literature	i. Define search terms for specific treatment sites	a. Identify the appropriate literature in the area of interest. b. Identifying research gap.
17.	Be able to suggest implementation of research findings	i. Identify relevant sources of Research	a. Evaluate research with b. respect to current departmental practice
18.	Be able to suggest/ initiate topics for Physiotherapy research	i. Identify literature to support research proposal ii. Define the necessary steps in preparing and carrying out research	a. Review the literature in the area. b. Formulate a research question. c. Conducts research systematically.
19.	Be able to interpret, apply and disseminate information as a member of the Physiotherapy team	i. Define and explain the data that must be disseminated	a. Identify the appropriate personnel to whom specific information should be disseminated. b. Communicate the correct, relevant and appropriate information

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