ATAL BIHARI VAJPAYEE MEDICAL UNIVERSITY
LUCKNOW

ORDINANCES & REGULATIONS

FOR

Masters in Physiotherapy (M.P.T.)

(2 years programs)

From Academic Year 2021-2022 Onwards

SHORT TITLE AND COMMENCEMENT

These regulations shall be called the regulations for Master of Physiotherapy (M.P.T) Degree courses.

They shall come into force from the academic year 2021-2022 session onwards till amended.

Programs/Specialties :

1. **M.P.T** (Orthopaedics)
2. **M.P.T** (Cardio Pulmonary)
3. **M.P.T** (Neurology)
4. **M.P.T** (Sports)
5. **M.P.T** (Obstetrics and Gynecology)

INFRASTRUCTURE AND FUNCTIONAL REQUIREMENTS :

(1) Space: In addition to the undergraduate functional, facilities, the following physical facilities shall be made available to start a post-graduate training program namely:- (a) a minimum of 1250 sq ft. area for each specialty in the clinic. The area of the clinic shall be in accordance with the number of physiotherapy beds required to be placed in the department.

(2) Equipment: Each department shall have adequate number of standard equipments available in the market as approved by the ISI. The details of equipments specialty wise is annexed as Schedule -VII to these regulations.

Nature: Regular and Full Time

Candidates shall be required to register himself/herself as a postgraduate student before admission to the course.

Candidates shall not be enrolled in any other university or any other course during the period he/she is enrolled for the M.P.T Programs.

Duration: Two academic years for each specialty designated as

First Year - M.P.T.

Second Year- M.P.T.

Pattern: Annual System

Examination for the degree of Master of Physiotherapy shall be held at the end of each academic year.

Medium of Instructions and Examination:

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

Eligibility Criteria for Admission

Professional Qualification- A candidate seeking admission to degree in M.P.T must have taken the degree of Bachelor of Bachelor of Physiotherapy with 6 months compulsory internship from any recognized Institute or University in India or a degree of a foreign university recognized as equivalent with at least 50% marks in aggregate.

Admission to Masters of Physiotherapy course shall be made on the basis of eligibility and an entrance test to be conducted for the purpose. No candidate will be admitted on any ground unless he/she has appeared in the admission test and interview. The interview board will include the Head of the Department of Physiotherapy (Chairman of the Board) along with the senior medical doctor apart from other nominees, whose recommendations shall be final for the selection of the students.

e. The name of the student(s) who remain(s) absent from classes for more than 15 days at a stretch after joining the said course will be struck off from the college rolls without giving any notice

Mode of Admission: On merit based on entrance examination and interview basis

i) Total Seats : 15 seats in each Specialty

ii) Span Period: Not more than four years

Minimum Qualification for teachers for teaching MPT students: Recommended speciality faculty with qualification as per University norms(as per annexure) and from core subjects (incorporated in curriculum & syllabus). All teaching faculty should be duly approved by the University for teaching MPT Course. It is recommended that a faculty and student ratio of 1:3 for MPT course. Qualification of the guide should be minimum 5 years of research work in Physiotherapy with minimum 3 years of teaching experience.

Total number of minimum faculty for all the two years will be as follows -:

Dean/Principal	-	01
Each Speciality		
Professor	-	01
Associate Professor	-	02
Assistant Professor	-	06

A model check list for evaluation of teaching skills is annexed at Schedule-IV of these regulations. Note: All the regular teaching faculty shall be full time. The University will conduct regular faculty development programs as refresher courses, orientation programs, induction programs for developing the teaching and research skills of faculty.

Institutional Research Committee (R.C)

The institutional body which will consider the research proposals for degree of M.P.T shall be called the Institutional research committee (IRC). Following shall be the composition of the (IRC).

(i) Principal of the Physiotherapy college.

(ii) One Professor/ Assoc. Prof of each specialty as external expert (to be nominated by the Vice-Chancellor, ABVM University and who will be eligible to serve in the research committee for a period of two years.)

(iii) One Professor/Assoc. Prof from the College (Convener).

Learning Objectives: At the completion of this course, the student should be -

1. Able to execute all routine physiotherapeutic procedures with evidence based practice.

2. Able to be a prominent member of the multidisciplinary physiotherapy team and treat all the conditions which need physiotherapeutic procedures.

3. Able to provide adequate knowledge about the treatment procedures and its benefits.

4. Able to transfer knowledge and skills to students as well as young professionals.

5. Able to perform independent physiotherapy assessment and treatment for patients.

6. Able to undertake independent research in the field of physiotherapy.

7. Learn multidisciplinary practice skills.

8. On successful completion of M.P.T programme, the Physiotherapist professional will be able to take up physiotherapy teaching assignments independently for undergraduate teaching programme. He / She will be able to prepare project proposal with selected research design and interpret the evaluated outcome measures (using sound data processing techniques and statistical methods). He/she will be able to practice in his / her specialty area with advanced knowledge and skills.

Expectation from the future graduate in the providing patient care.

1. Course work includes exercise physiology, principles of physiotherapy practice, electrophysiology and electives (during 2nd year of MPT). The student will be skilled in treatment planning, management, administration of physiotherapy treatment and provision of patient support.

2. Acquire in-depth knowledge of structure and function of human body related to the respective branch of specialty.

3. Acquire the in-depth knowledge of movement dysfunction of human body, cause thereof principles underlying the use of physiotherapeutic interventions for restoring movement dysfunction towards normalcy.

4. Demonstrate skill in Physical & Functional diagnosis pertaining to patient under his/her care.

5. Demonstrate ability to critically appraise recent physiotherapeutic and related literature from journals & adopt diagnostic & therapeutic procedures based on it.

6. The student will also perform independent research within the department and help the department and the team for treatment planning of the patient.

7. PT post-graduate is encouraged to pursue further qualification to attain senior position in the professional field, also to keep abreast with the advance and new technology the professional should opt for continuous professional education credits offered by national and international institutes.

8. Employment opportunities can be found in hospitals in both private and public sectors as well as in independent physiotherapy clinics and as well as teaching institutes.

9. Demonstrate ability to make clinical decisions (based on evaluation) regarding Physiotherapy strategy techniques and select appropriate outcome measures based on the comprehensive knowledge of specialty.

10. Demonstrate an expertise in evidence-based skill in the management disorders including movement dysfunction in concerned specialty.

11. Demonstrate an expertise in health promotion, early identification and intervention for quality restoration of function.

12. Planning and implementation of treatment programme adequately and appropriately for all clinical conditions common as well as rare related to respective specialty in acute and chronic stage, in intensive care, indoor, outdoor and institutional care, independent practice, on fields of sports and community and during disaster situations.

13. Demonstrate proficiency in creating awareness using newer technology, at various levels in community for healthcare & professional awareness.

14. Demonstrate leadership, managerial, administrative & communication skills.

15. Demonstrate the knowledge of legislation applicable to compensation for functional disability welfare schemes & rights of the disabled, laws related to industrial workers & disabled & appropriate certification.

16. Demonstrate proficiency in classroom and clinical teaching using newer and appropriate technology.

Student Learning time (SLT) for M.P.T Course:

The total student learning time (SLT) for M.P.T course should be minimum 3240 hrs for a duration of 2 years which includes Lectures, seminars, Practical's, demonstrations, Clinical discussions, clinical case presentations, Journal club, Classroom teaching, Online teaching, Guest Lectures ,Clinical training, synopsis and dissertation work, community camps. Field visits, participation in workshops and conferences. The departments shall encourage guest talks in the required areas and integrated lectures by multi-disciplinary teams on selected topics, to strengthen the training programs.

MINIMUM NUMBER OF CLINCIAL CASES (YEAR WISE)

Category	I year MPT	II year MPT
O	20 Cases	20 Cases
A	20 Cases	30 Cases
PA	100 Cases	60 Cases
PI	20 Cases	50 Cases

Key: O - Observes, A - Assisted a more senior Physiotherapist, PA - Performed procedure under the direct supervision of a senior specialist. PI – Performed Independently. The clinical cases should be recorded in a work diary.

Work diary

Every candidate shall maintain a work diary and record his/her participation in the training programmers conducted by the department such as journal reviews, seminars etc.

Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate. The work diary shall be scrutinized and certified by the Head of the Department and Head of the Institution and presented in the university examination.

Periodic tests

The College may conduct periodic tests. The test may include written theory papers, practical, viva voce and clinical in the pattern of university examination. Records and marks obtained in such tests will be maintained by the Head of Department and sent to the University, when called for.

The assessment will be comprised of Formative and Summative assessments comprising of -

1. Internal Theory Exams

2. Inter-departmental meeting: To encourage integration among various specialities, there shall be interdepartmental meeting chaired by the Dean/Principal with all heads of post-graduate departments at least once a month.
3. Practical, clinical rounds and bed side evaluation & application: Each trainee shall work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases, A model check list for evaluation of clinical postings is annexed at Schedule-III of these regulations. To bring in more

integration among the specialties and allied fields, each department shall workout a program to rotate the trainees in related disciplines.

4. Journal club: The journal review meetings shall be held at least once a week. All trainees, associate and staff associated with the post-graduate programmes are expected to participate actively and enter relevant details in the logbook. The trainee shall make presentations from the allotted journals of selected articles. A model check list for the evaluation of journal review presentation is annexed at Schedule-I of these regulations.
5. Dissertation
6. Symposium/Open discussion: It is recommended to hold symposium on topics covering multiple disciplines
7. Seminars: The seminars shall be held at least twice a year in each department. All trainees are expected to participate actively and enter relevant details in logbook. A model check list for the evaluation of seminar presentation is annexed at Schedule-II of these regulations.

8. Case presentation and discussion: Each department shall organise physiotherapy education program on regular basis involving other institutions. The trainees shall also be encouraged to attend such programmes conducted outside their university or institute. subjects only)

All the students of the speciality departments shall complete the minimum quota for the teaching and learning activities, as follows:- (a) Journal Clubs : 5 in a year (b) Seminars : 2 in a year (c) Clinical Case Presentations : 2 in a year (d) Lectures taken for undergraduates : 1 in a year (e) Scientific Paper / Poster Presentations : 1 papers/posters during In State / National Level Conferences / two years of training workshop period (f) Clinical Conferences : 2 presentations during two years of training period (g) Scientific Publications (optional) : one publication in any indexed scientific journal

Category I:	Original Research/Study approved by I.C.M.R/Similar Govt. Bodies. (1) Journals Indexed to Pubmed - Medline Please see- www.ncbi.nlm.nih.gov/pubmed
Category II:	(1) Journals published by Government Health Universities (2) (2) Journals published by Indian/Global Physiotherapy Associations.
Category III:	(1) Journals published by Deemed Universities / Physiotherapy Institutions

h) Submission of Synopsis : one synopsis within six months from the date of commencement of the course (i) Submission of Dissertation : one dissertation three months before appearing for the 2nd year university examination (j) Submission of Pilot Study: : one pilot within 8 months from the date of commencement of the course

STIPEND: The post-graduate students shall be paid stipend only for duration of two years of the course, as may be fixed by the Central Government/State Government/Union territory Administration or such authority as the respective government/administration may authorize. Where any dispute arises regarding any such stipend, including, quantum of stipend, it shall be considered and decided by the Central Government/respective State Government/Union territory Administration at its own level and its decision shall be final.

MIGRATION: Under no circumstances, the migration or the transfer of students undergoing post-graduate Degree/Diploma shall not be permitted by the university or the authority. No inter-change of the speciality in the same institution or in any other institution shall be permitted after the date of the commencement of session.

DISSERTATION & RESEARCH PROJECT:

The candidate eligible for admission in Master of Physiotherapy (M.P.T) shall submit a detailed synopsis (3 copies) signed by the guide and by the candidate:

1. The evidence of his/her qualification
2. The topic of same specialty for M.P.T
3. The subject of the proposed research and dissertation
4. The outline of the proposed research work.
5. The place/Institution where he/she proposes to carry on his/her research work.
6. The name of the guide under whom he/she proposes to carry on his/her research work.

Note: A person shall not be appointed Guide to supervise his/her relatives (son, daughter, husband, wife, sister, brother and relative in law)

Once the candidate is registered and enrolled for the admission in Master of Physiotherapy, The trainees shall prepare a dissertation based on the clinical or experimental work or any other study conducted by them under the supervision of the

guide. A model check list for evaluation of dissertation presentation and continuous evaluation of dissertation work by guide / co-guide is annexed at Schedule-V of these regulations. A model overall assessment sheet to be filled by all the trainees undergoing post-graduate course is annexed at Schedule-VI of these regulations.

To consider the synopsis submitted for MPT programs of the University for Approval the University shall look into the following matters:

i) That the candidate possesses the requisite qualifications.

ii) Affidavit from the Management of the College that adequate and appropriate faculty and facilities exist at the place of research for the proposed work.

If the proposed research work entails experimental work on humans or work in the animal laboratory, the application shall be accompanied by a certificate from the Principal that clearance has been obtained from concerned Govt. approved Ethics Committee.

If the experimental study involves clinical trial (RCT), then the study should be registered with CTRI (Clinical Trials Registry of India).

External guide from outside Institution/place of clinical posting will be allowed to guide and supervise the research work of the candidate provided the external guide satisfies qualification as per norms.

The candidate shall meet and discuss with the guide the plans and progress of his/her research work when the guide asks him/her to do so.

The candidate shall submit the plans and progress of his/her research in a prescribed format once in 6 months. The progress reports will be reviewed by the Research Committee.

The candidate should publish at least one article in any indexed journal and it should be annexed in the dissertation.

When the dissertation is ready for submission to the university, the student shall also certify that the work presented in the dissertation is the candidate's own work and shall submit the draft thesis for plagiarism check in the University. The University will perform plagiarism checks of research work through an University approved software and only when it is satisfied that the research work is free of plagiarism shall the thesis work be accepted for submission for award of marks.

Documents to be submitted at the time of submission of the Dissertation

_a. The dissertation shall be submitted three months prior to the final examination and approval of dissertation after plagiarism check will be the pre-requisite condition for the final examination eligibility.

b. The candidate shall submit three copies of his/her dissertation in a format prescribed by the University with 1 research publication in indexed journal as annexure.

c. Certificate from the guide to the effect that:-(i) The dissertation embodies the work of the candidate himself/ herself.

e. A Certificate from the Principal of the College to the effect that -The candidate has worked for the period prescribed under the ordinance and has put in the required attendance during that period at the place/s of research and no dues are pending against the candidate.

Appointment of Examiners:

The Examiners shall be appointed by the University from amongst a panel of three external experts in Physiotherapy profession according to each specialty who must hold at least Assistant Professor position in the department with a minimum of 5 years teaching and research experience or must be known Scientists in the related area from established Scientific organization/ Institute/ Department. On receipt of the dissertation, the dissertation shall be sent to one examiner of each specialty appointed by the Vice – Chancellor.

Evaluation of Dissertation

. A model check list for evaluation of dissertation presentation and continuous evaluation of dissertation work by guide / co-guide is annexed at Schedule-V of these regulations. A model overall assessment sheet to be filled by all the trainees undergoing post-graduate course is annexed at Schedule-VI of these regulations.

The examiners shall examine the dissertation and submit their detail report and send final recommendation which shall be in the following form:

a. The dissertation and any other contribution to the study of the subject of the candidate shall be evaluated by the examiners appointed by the University. The candidate shall be required to present him/herself at specified time and place to be tested orally or by means of written or practical or both.

b. A dissertation shall be treated as having been accepted on the recommendation of the examiners stating that the dissertation and research work carried out by the candidate is to their satisfaction.

c. If the examiner recommends revision, the candidate shall be permitted to submit the dissertation in a revised form within the time specified by the University.

Note: The copy of the dissertation in the library of the university and the library of the concerned college shall be kept.

Certificate of Supervisor/ Guide

This is to certify that work embodied in this dissertation entitled..... has been carried out by..... under my/our supervision and guidance.

No part of this dissertation has been submitted for any other degree. The work included in this dissertation is original and is own work of the candidate.

Attendance

a. All students must attend every lecture/ practical / demonstration/ held in each subject. However, to account for late joining or other such contingencies, the attendance requirement for appearing in the examination shall be a minimum of 75% of the classes held from the date of admission.

b. A student with less than 75% attendance in theory and practical separately of each subject in an academic year shall be detained from appearing in the Annual Examination of the subject(s) in which the attendance is short. However, the Dean of the Faculty may consider to condone off attendance upto 5% after recommendation of the Principal on account of sickness or any other extenuating circumstances, provided the application to condone attendance is duly certified by a Registered Medical Practitioner, supported by documentary evidence has been submitted within seven days from recovery.

INTERNAL ASSESSMENTS

A. Theory Examination

a. Internal assessment shall be conducted by the concerned teacher for the theory exam.

b. Tests shall be held towards each subject in the academic year.

c. Tests shall be taken by the concerned teacher which includes written tests, seminars, quizzes, assignments, group discussions etc.

d. The marks of the test would be displayed on the notice board within ten days of completion of the exam.

e. The Head shall display a copy of the complied sheets of Internal Assessment marks of all the theory papers before forwarding it to the University at the conclusion of the session.

B. Practical Examination

a. Internal Assessment of the Practical exam is based on the monthly report of the clinical posting obtained from the student, case discussions held from time to time and the report of clinical posting as obtained from time to time from the concerned Head where the student is undergoing his/her clinical practice.

b. The promoted / ex-student who has to re-appear in the examination will retain Internal Assessment marks of the previous year.

C. Oral Exam

Marks of the Internal Assessment will be given on the basis of the oral exam conducted during the Major tests.

D. **Marks distribution:** of the Internal Assessment is mentioned under Syllabus.

ANNUAL EXAMINATION

THEORY PAPERS: First and Second Year.

Mode	:	Written only
Duration	:	03 hours each
Examiner university)	:	01 (external) from the panel of Examiners from

PRACTICAL

First Year

Mode	:	Long case assessment, short case, written, Demonstration, investigations and Viva.
Duration	:	Up to 10 candidates per day
Examiner	:	02 (one internal and one external from the Panel of examiners from university)

Second Year

Mode	:	Long case and short case assessment, Investigations, written demonstrations and Viva Voce
Duration	:	Up to 10 candidates per day.
Examiner	:	02 (one internal and one external from the Panel of examiners from university)

ORAL EXAM

First year and Second year

Duration	:	Up to 30 minutes per candidate
Examiner	:	02 (one internal and one external from the Panel of examiners from university)

Second year – Dissertation (Specialty wise)

Mode	:	Presentation and Viva Voce
Duration	:	Up to 45 minutes
Examiner	:	02 (one internal and one external from the Panel of examiners from university)

MINIMUM PASS MARKS

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

PROMOTION

First Year:

a) A candidate will be promoted from First to Second year if he/she has passed in each paper of theory and practical examination/Viva separately.

b) The candidate may carry over a maximum of two theory paper to the second year. He/she will have to clear the theory papers in the next Annual Examination (along with his/her second year papers) or subsequent examinations.

c) If the candidate fails in two or more theory papers he/she will have to re-appear in all papers of the first year as an ex-student.

d) The candidate may carry over a maximum of one viva to the second year. He / she will have to clear the same in the next Annual Examination (along with his / her second year papers). Failing which his/her admission will be cancelled.

Second Year:

a) A candidate shall be declared to have passed Second year, if he/she has passed in each of theory and practical examination / viva separately.

b) The candidate may carry over two theory papers. He/she will have to clear the same theory/ papers in the next Annual Examination, as an ex-student failing which his/her admission will be cancelled or he/she may seek re-admission.

c) If the candidate fails in the practical/viva only, he/she will have to reappear in the same practical/viva only in the next Annual Examination/s as an ex-student.

CLINICAL TRAINING

The candidate has to undergo the compulsory clinical training over the span of two years from a minimum 100 bedded Hospital. A certificate will be provided by the Hospital that the student has undergone clinical training in the Hospital.

AWARD OF DEGREE

The candidate shall be awarded a Degree Certificate by the University only on successful completion of the course and the submission and approval of the dissertation.

CLASSIFICATION OF SUCCESSFUL CANDIDATE

The result of the successful candidate shall be classified at the end of the II year examination on the basis of the aggregate of all subjects (theory and practical) secured by the candidate in the I year and II year examination as indicated below:

First Division	:	60% and above
Second Division	:	50% and above, but less then 60%

Students securing 75% or above marks in any course (s) and who have passed the entire examination in the first attempt shall be declared to have obtained Distinction in that course(s).

SPAN PERIOD

a. The student must pass the first year examination within two years of their first admission/re-admission to the program, otherwise the admission of the candidate shall be deemed cancelled.

b. The student must pass the second year examination within four years of their first admission/ re-admission.

c. The student must finish their entire course within a period of four years from the date of their first admission.

Skills based outcomes and monitorable indicators for Master of Physiotherapy

Competency Statements

1. Analyse and discuss the biomedical, behavioural and social science bases of physiotherapy and integrate the bases into physiotherapy practice.

2. Collects assessment data relevant to the client's needs and physiotherapy practice.

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

4. Assess , analyse, and plan physiotherapy management.

5. Apply and evaluate physiotherapy management.

6. Advise patient on appropriate nutrition, exercises, rest, relaxation other issues

7. Demonstrate professional practice.

8. Demonstrate autonomous physiotherapy practice.

9. Demonstrate the ability to search and retrieve scientific literature

10. Demonstrate an understanding of research methods.

11. Demonstrate the ability to critically analyse scientific literature

12. Prepare Report findings of critical analysis in a scientific format.

The Pedagogy of Education will be based on developing and refining the following:

1. Learning Outcomes,
2. Knowledge
3. Comprehension
4. Application

5. Synthesis,

6. Evaluation.

S. no.	Learning outcomes	Knowledge/comprehension	Applications / synthesis /evaluation
1.	Analyse and discuss the biomedical, behavioural and social science bases of physiotherapy and integrate the bases into physiotherapy practice	• Be familiar with normal & abnormal patterns of human development and movement. • Understand the anatomical framework of the human body including major systems and aspects of the social, cultural, psychological, environmental, spiritual and belief systems influencing human development. • Able to understand the concept of health & its contribution to wellness.	• Analyse normal and abnormal patterns of human development and movement.. • Demonstrate understanding of structural and functional anatomy. • Identify anatomical structure from surface landmarks. • Describe the normal physiological process and the changes throughout the life span. • Analyse basic human movement. • Evaluate the significance of healthy lifestyles for patients/clients
2	Collects assessment data relevant to the client's needs and physiotherapy practice.	• Informs the client of the nature and purpose of assessment as well as any associated significant risk.	• Perform patient assessment technique which includes to know the condition and to gather information about his/her ailment. • Monitors the client's health status for significant changes during the course of assessment and takes appropriate actions as required. • Perform assessment procedure safely and accurately , taking into account client consent, known indications, guidelines, limitations and risk-benefit considerations.

S. no.	Learning outcomes	Knowledge/comprehension	Applications / synthesis /evaluation
3.	Be able to conduct the patient evaluation and assessment as per condition.	• Be familiar with different assessment techniques. • 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. • Be familiar with special tests. • Basic knowledge on radiological findings & other investigations. • Demonstrate clinical reasoning with choice of assessment and examination procedures	• Perform patient assessment technique to know the condition and to gather information about his/her ailment. • Safely and accurately examines and re-examines a patient using standardized measures. • Apply pertinent tests and measurements. • Interpret all assessment findings to allow for identification of the patient's/client's impairments, activity limitations and participation restrictions. • Interpret findings and reach a differential diagnosis • Establishes a diagnosis for physiotherapy, identifies risks of care, and makes appropriate clinical decisions based upon the examination, evaluation and current available evidence.
4	Assess, analyse, and plan physiotherapy management	• Identify the principles of assessment, clinical reasoning, problem identification, goal setting, treatment planning. • Be familiar with different assessment techniques and protocols. • Know the protocols used in the department. • Justify treatment choices with a sound pathophysiological rationale'	• Develop rapport to obtain history, current health status and previous functional abilities. • Interpret the patient's/client's verbal and non verbal responses. • Determines the personality traits and Analyze how the differences in personality influence approach • Perform patient assessment technique which includes to know the condition and to gather information about his/her ailment.
5.	Apply and evaluate physiotherapy management	• Know the protocols used in the department. • Understand and Prevent/minimise risks and hazards during physiotherapy interventions • Establish equipment is within safety check time frames. • Demonstrate knowledge of emergency procedures	• Demonstrate safe, effective and efficient interventions. • Evaluate the effectiveness of the Interventions
6	Advise patient on appropriate nutrition,	Explain the impact of exercise and nutritional status of patient	Assess the patient's status after exercise and proper diet.

S. no.	Learning outcomes	Knowledge/comprehension	Applications / synthesis /evaluation
	exercises, rest, relaxation other issues	during treatment	
7.	Demonstrate professional Practice.	• Demonstrate attitudes and behavior acceptable to society and the profession • Practise in accordance with the Standards of Ethical Conduct • Explain the health and safety issues for patients and staff • Able to deliver safe, effective and timely physiotherapy interventions • Recognizes risk & hazards which can happen during intervention. • Ability to reflect and evaluate own practice • Modify and adapt professional practice in response to evaluation	• Demonstrate professional behavior. • Demonstrate safe Practice Plan and show evidence of Professional development.
8.	Demonstrate autonomous physiotherapy practice	• Recognize the critical conditions of patients • Be familiar with current literature and evidence based best practice	• Independently assess and treat patients with single or multiple problems which needs physiotherapeutic intervention. • Demonstrate an ability to refer to other health professionals when beyond the scope of physiotherapy
9.	Demonstrate the ability to search and retrieve scientific literature	• Define search terms Knowledge on available data search resources Identify relevant sources of Research	• Develop and modify search strategies appropriately complete searches using relevant and available resources such as electronic data bases. • Discuss different methods of statistical analysis in relation to different research designs. • Discuss the possible ethical implications and requirements in health research
10.	Demonstrate an understanding of research methods.	• Have a basic understanding of the value of different research paradigms to physiotherapy research. • Demonstrate a basic understanding of research processes. • Understand the ethics of the	• Describe appropriate research methodologies that may be used to examine a variety of research questions. • Describe the key elements of research design. • Describe different methods of data Collection. • Demonstrate knowledge of basic

S. no.	Learning outcomes	Knowledge/comprehension	Applications / synthesis /evaluation
		research process including plagiarism and consent	biomedical statistics
11	Demonstrate the ability to critically analyse scientific literature	• Identify appropriate criteria to assess quality of different types of literature.	• Demonstrate an understanding of the process of critical review. • Demonstrate the use of an appropriate critiquing tool to guide interpretation. • Critically analyse an appropriate selection of scientific papers
12	Prepare Report findings of critical analysis in a scientific format	• Be familiar with different writing format depending on the research methodology. • Be familiar with different referencing styles. • Knowledge on presentation methods. • Integrate the current literature into physiotherapy practice	• Use standardized writing format • Cite references using a recognized scientific method • Demonstrate an ability to synthesise information from several resources • Demonstrate the ability to communicate research findings using a variety of presentation methods. • Critique current physiotherapy practice with reference to contemporary research literature

SCHEDULE – I

MODEL CHECKLIST FOR EVALUATION OF JOURNAL REVIEW PRESENTATIONS.

Name of the Trainee : Date :

Name of the Faculty / Observer :

Sl. No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Article chosen was					
2.	Extent of understanding of scope and objectives of the paper by the candidate.					
3.	Whether cross-references have been consulted.					
4.	Whether other relevant publications consulted.					
5.	Ability to respond to questions on the paper / subject.					
6.	Audio – Visual aids used.					
7.	Ability to defend the paper.					
8.	Clarity of presentation.					
9.	Any other observation.					
	Total Score					

SCHEDULE-II

MODEL CHECK LIST FOR EVALUATION OF SEMINAR PRESENTATIONS

Name of the Trainee : Date :

Name of the Faculty / Observer:

Sl. No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Completeness & Preparation.					
2.	Clarity of presentation.					
3.	Understanding of subject.					
4.	Whether other relevant publications consulted.					
5.	Whether cross-references have been consulted.					
6.	Ability to answer the questions.					
7.	Time scheduling.					
8.	Appropriate use of audio – visual aids.					
9.	Overall performance.					
10.	Any other observation.					
	Total Score					

SCHEDULE-III

(a) MODEL CHECK LIST FOR EVALUATION OF CLINICAL WORK IN Outpatient Department

(To be completed once a month by respective unit heads including posting in other department)

Name of the Trainee : Date :

Name of the Unit Head :

Sl. No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Regularity of attendance.					
2.	Punctuality.					
3.	Interaction with colleagues and supportive staff.					
4.	Maintenance of case records.					
5.	Presentation of cases.					
6.	Investigations work up.					
7.	Chair-side manners.					
8.	Rapport with patients.					
9.	Over all quality of clinical work.					
	Total Score					

(b) EVALUATION OF CLINICAL CASE PRESENTATION

Name of the Trainee : Date :

Name of the Faculty / Observer:

Sl. No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Completeness of history.					
2.	Whether all relevant points elicited.					
3.	Clarity of presentation.					
4.	Logical order.					
5.	Mentioned all positive and negative points					
6.	Accuracy of general physical examination.					
7.	Diagnosis: Whether it follows logically from history and findings.					
8.	Investigations required.					
	Complete list.					
	Relevant order.					
	Interpretation of investigations.					
9.	Ability to react to questioning Whether it follows logically from history and findings.					
10.	Ability to defend diagnosis.					
11.	Ability to justify differential diagnosis.					
12.	Others.					
	Grand Total					

Note: Please use a separate sheet for each faculty member.

SCHEDULE-IV

MODEL CHECKLIST FOR EVALUATION OF TEACHING SKILL

Name of the Trainee : Date :

Name of the Faculty / Observer :

Sl. No	Items for observation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Communication of the purpose of the talk					
2.	Evokes audience interest in the subject.					
3.	The introduction.					
4.	The sequence of ideas.					
5	The use of practical examples and / or illustrations.					
6.	Specking style (enjoyable, monotonous, etc. specify)					
7	Attempts audience participation.					
8.	Summary of the main points at the end.					
9.	Asks questions.					
10.	Answers questions asked by the audience.					
11.	Rapport of speaker with his audience.					
12.	Effectiveness of the talk.					
13.	Uses audio-visual aids appropriately.					

SCHEDULE-V

(a) MODEL CHECKLIST FOR DISSERTATION PRESENTATION

Name of the Trainee : Date :

Name of the Faculty / Observer:

Sl. No.	Prints to be considered.	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1	Interest shown in selecting topic.					
2	Appropriate review.					
3	Discussion with guide and other faculty.					
4	Quality of protocol.					
5	Preparation of proforma					
	Total Score					

(b) CONTINUOUS EVALUATION OF DISSERTATION WORK BY GUIDE / CO-GUIDE

Name of the Trainee : Date :

Name of the Faculty / Observer:

Sl. No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1	Periodic consultation with guide / co-guide.					
2	Regular collection of case material					
3	Depth of analysis / discussion.					
4	Quality of final output.					
5	Others					
	Total Score					

SCHEDULE-VI

OVERALL ASSESSMENT SHEET

Date :

Sl. No.	Faculty Member	Name of Trainee and Mean Score									
		A	B	C	D	E	F	G	H	I	J
1											
2											
3											

Signature of Department In-charge

Signature of Principal

Note: The overall assessment sheet used along with the logbook shall form the basis for certifying satisfactory completion of course of study, in addition to the attendance required.

SCHEDULE-VII

EQUIPMENTS

The institution should have all following equipments for MPT course (in addition to equipments as per BPT regulations).

Orthoapedic Physiotherapy Laboratory:

- Back Leg Chest Dynamometer
- Laser Therapy
- Microwave Diathermy
- Hand Evaluation kit.
- Biofeedback unit with facility EMG unit with integrated analysis software provided.
- Video camera and player for movement analysis.
- Desirable: Attachment to a centre having Isokinetic Unit, Motion Analysis Unit.
- Mobile physiotherapy Van.

Neuro-physiotherapy Laboratory :

- Hand Dynamometer
- 2 channel EMG with nerve-conduction testing facility
- Biofeedback unit with the facility to do quantitative analysis and therapy.
- Sensory Integration kits
- Balance boards
- Video camera and player for movement analysis.
- Balance master.
- Desirable: Attachment to a centre having Isokinetic Unit, Motion Analysis Unit.
- Mobile physiotherapy Van.

Cardio-Pulmonary Laboratory :

- Ergometer (Treadmill/ Bicycle with arm and leg Unit)
- Spirometer Portable
- Peak Flow meters.
- Mannequin for CPR training.
- Body Composition Analyser.
- Energy consumption analyzer.

Sports Physiotherapy :

- Manual Muscle Tester (Digital)
- Lactate Analyser
- Sports Timers

- Skin fold Calipers
- Fitness measurement instrumentation
- Desirable: Attachment to a centre having Isokinetic Unit, Motion Analysis Unit.
- Access to sports centre/gym
- Tie up with a sports teams.

Obstetric & Gynae Physiotherapy Laboratory :

- Well Equipped Exercise room with mats
- Sensory integration kit
- Gym balls
- Positioning devices
- Vaginal Cones
- Vaginal Positioning devices
- Biofeedback Unit
- Pelvic Floor Stimulator

Clinical Facilities:

- The institution must provide in house facility for clinical training as a preferred choice. In the absence of this a Memorandum Of Understanding (MOU) with access to hands-on clinical training should be made with speciality hospitals and institutions in each of the areas of Musculoskeletal/ Trauma Units, Neurology/Neurosurgery, Cardio-pulmonary unit with Intensive care facilities, Obstetrics & Gynae Physiotherapy and Sports unit. In either case it is strongly recommended that each teaching unit accommodate a maximum of six PG Students only. The student to patient ratio in the hospital/institution should be 1:3.

Syllabus

For

Master of Physiotherapy (ORTHOPEDICS)

Atal Bihari Vajpayee Medical University Lucknow, U.P., India
From session 2021-2022

M.P.T (ORTHOPAEDICS)

FIRST YEAR

Paper Code.	Title	Total Hours	Hours/ week	Yearly Credits	IA Marks	UE Marks	Total Marks
MPT101	Basic Medical Science and Musculoskeletal Disorders	100	4	8	25	75	100
MPT 102	Orthopaedic Bio-mechanics	100	4	8	25	75	100
MPT 103	Orthopaedic Physiotherapy Assessment and Equipments	50	2	4	25	75	100
MPT 104	Advance Orthopaedic Physiotherapy Management	100	4	8	25	75	100
MPT 105P	*Practical- I* Orthopaedic Bio-mechanics	60	2	2	25	75	100
MPT 106P	*Practical- II* – Orthopaedic Physiotherapy Assessment and Equipments	50	2	2	25	75	100
MPT 107P	*Practical – III- Advance Ortho Physiotherapy*	100	4	4	25	75	100
	Total	**560**	**22**	**36**	**175**	**525**	**700**
MPT 108	Clinics & Seminars Presentations	500	12	12	50	50	100
	Grand Total	**1060**	**34**	**48**	**225**	**575**	**800**

- IA= INTERNAL ASSESSMENT
- UE=University Examination

SECOND Year

Paper Code.	Title	Total Hours	Hours/ week	Credits	IA Marks	UE Marks	Total Marks
MPT 601	Pedagogy in Physiotherapy Education	80	3	6	25	75	100
MPT 602	Management, Administration and Ethical Issues	80	3	6	25	75	100
MPT 603	Exercise Physiology & Electrophysiology	50	2	4	25	75	100
MPT 604	Functional Rehabilitation & Ergonomics	80	3	6	25	75	100
MPT 605	Research Methodology, Biostatistics & Evidence Based Practice	100	4	8	25	75	100
MPT 606P	*Practical- I Exercise physiology and Electrophysiology*	50	2	2	25	75	100
MPT 607P	Practical II Dissertation	200	12	12	25	75	100
	Total	**640**	**29**	**44**	**175**	**525**	**700**
MPT 608	Clinics & Seminars Presentations	500	12	12	50	50	100
	Grand Total	**1140**	**41**	**56**	**225**	**575**	**800**

- IA= INTERNAL ASSESSMENT
- UE=University Examination

MPT (ORTHOPAEDICS)
FIRST YEAR
PAPER 101 - BASIC MEDICAL SCIENCE AND MUSCULOSKELETAL DISORDERS

Course Description: The course covers topics related to basic science and epidemiology, patho-mechanics, clinical manifestation, conservative and surgical management of Orthopaedic diseases, disorders & trauma.
Course Objective: The course should enable the student to develop a detailed concept about different Orthopaedic diseases & disorders and its medical and surgical management.
Course Outcome: The Students will be able to use this information in planning and tailoring effective, specific, safe Physiotherapy treatment programmes.

ANATOMY AND PHYSIOLOGY

- Micro structure for various soft tissue structures like Ligaments, Muscle, bone, cartilage, articular cartilage tendon and disc.
- Embryology (ossification of various bones)
- Musculoskeletal anatomy of the human body.
- Joints and Its Classification.
- Cell and its function.
- Muscle Physiology, Contraction of skeletal muscle.
- Effects of ageing.

PHARMACOLOGY AND RADIOLOGY

- NSAIDS & Opioids
- Drugs used in Arthritis and Gout.
- DMRD'S
- Muscle Relaxant
- Chemotherapy and Antibiotics in Orthopedics
- Nutritional supplements

Basics of Imaging Techniques in Orthopaedic conditions

- Ultrasonography
- X-rays
- CT Scan
- MRI scanning
- Bone Scan
- Dexa Scan
- Arthroscopy

GENERAL ORTHOPAEDICS

- Metabolic Disorders of the Bone and Joints.
- Infections of the Bone and Joints.
- Congenital Disorders of the Bone and Joints.
- Inflammatory Disorders of the Bone and Joints.
- Myopathies.
- Neurological Disorders.
- Bone and Joint Tumours.
- Complex Regional Pain Syndromes.

REGIONAL ORTHOPAEDICS

- Disorders of Upper Limb
- Disorders of Lower Limb
- Disorders of the Spine

TRAUMATOLOGY

- Trauma of the Upper Limb
- Trauma of the Lower Limb
- Trauma of the Spine
- Trauma of the Peripheral Nerves

MISCELLANEOUS:

- Myopathies
- Amputation

PAPER 102 - ORTHOPAEDIC BIOMECHANICS

Course Description: the course covers the understanding of Biomechanics and kinesiology of body movement.

Course Objective: the course should enable the student to acquire in depth knowledge in understanding the biomechanics and kinesiology.

Course Outcome: On completion of the study of this Course the student should be able to identify and apply the principles of biomechanics and kinesiology in understanding the normal functioning of the human body. To identify and apply the principles of biomechanics in understanding pathomechanics of various conditions. To use these principles in managing various clinical conditions.

MOVEMENT PATTERNS – the essence of ortho biomechanics: Introduction, Defining human movements, Some fundamental movements, Movement patterns, Comparison of qualitative and quantitative movement analysis, Summary, Study tasks, important terms.

QUALITATIVE ANALYSIS OF BODY MOVEMENTS: Introduction, A structured analysis framework, Preparation stage – knowing what and how to observe, Observation stage – observing reliably Evaluation and diagnosis stage – analysing what's right and wrong in a movement, Intervention stage – providing appropriate feedback, Identifying critical features of a movement.

THE GEOMETRY OF MOTION: Introduction, Movement patterns revisited, Fundamentals of movement Linear motion and the centre of mass, The geometry of angular motion, The coordination of joint rotations.

QUANTITATIVE ANALYSIS OF MOVEMENT: Introduction, The use of videography in recording body movements, Recording the movement, Experimental procedures, Data processing,Projectile motion, Linear velocities and accelerations caused by rotation, Rotation in three-dimensional space.

CAUSES OF MOVEMENT – FORCES AND TORQUES: Introduction, Forces in movements, Combinations of forces on the performer, Momentum and the laws of linear motion, Force–time graphs as movement patterns, Determination of the centre of mass of the human body, Fundamentals of angular kinetics, Generation and control of angular momentum, Measurement of force, Measurement of pressure.

ELECTROMYOGRAPHY – WHAT MUSCLES DO: Experimental procedures in electromyography, EMG data processing and interpretation.

ISOKINETIC DYNAMOMETRY:

BONE MECHANICS

Structure & composition of bone Stress Strain Modulus of rigidity & modulus of elasticity Poisson's effect Strain energy Static & cyclic load behaviors Load Mechanical properties of trabecular bone Mechanical properties of cortical bone Bone remodeling Response of the bone to aging & exercise & immobilization Mechanisms to prevent fracture present in bone Fracture prediction Behavior of bone under load. Use of Universal testing machine to study bone behavoiur under load. Clinical applications Failure criteria

MUSCLE MECHANICS

Structure & composition of muscle Fiber length & cross section area Mechanical properties EMG changes during fatigue & contraction Changes in mechanical properties because of aging and exercised & immobilization Clinical applications

LIGAMENT & TENDON MECHANICS

Structure and composition Mechanical properties Cross sectional area measurements Muscle tendon properties Temperature sensitivity Changes in mechanical properties because of aging exercise and immobilization Mechanoreceptors Clinical applications

JOINT MECHANICS

Joint Design Joint categories Joint functions Arthrokinematics Osteokinematics Kinematics chains Joint forces, equilibrium & distribution of these forces Joint stability & its mechanism Articular Cartilage Mechanics. Testing of articular cartilage under load.Clinical applications

MECHANICAL ENERGY, WORK AND POWER

Definitions Positive and Negative work of muscle Muscle of mechanical power Causes of inefficient movement Co-contraction Isometric contraction Energy generation at one joint and absorption at another Energy flow Energy storage

APPLICATION OF BONE AND JOINT MECHANICS

Load sharing & load transfer Prosthetic design criteria Bio-mechanical analysis of implants internal fixations Degenerative changes in weight bearing joints & compensatory actions.

GAIT

Gait parameter Kinetics Kinematic Time- Space determinants Pathological gait Biomechanics of Stair climbing Changes in gait following various surgeries/ diseases/ disorders

ORTHOSIS & PROSTHESIS

Orthosis of spine Orthosis of upper limb Orthosis of lower limb Prescriptions checkouts & proper fittings Bio-mechanical principles governing them Aids used in management of disability.

PAPER -103 ORTHOPAEDIC PHYSIOTHERAPY ASSESSMENT AND EQUIPMENTS

Course Description: The course covers topics related to orthopaedic physiotherapy assessment, diagnostic procedure interpretation, measurement and therapeutic equipments use in managing different disorders affecting musculoskeletal systems.

Course Objective: The course should equip the student to acquire in-depth knowledge in different physiotherapy assessment, measurement and therapeutic equipment used in management of different disorders affecting musculoskeletal system.

Course outcome: The student should be able to:

1. To perform a comprehensive and complete Physiotherapy assessment of various orthopaedic patients.
2. To document systematic, meaningful, accurate written records of the patient.
3. To assess and eventually design individualized treatment strategies and measure outcome of intervention on measurement equipment for the orthopaedic patients.

BASIC CONCEPTS IN ORTHOPAEDIC PHYSIOTHERAPY

- Properties of Dense connective tissues and tissue healing.
- Basic concepts of physiotherapy assessment and management in different stages of soft tissue healing
- ICF (International classification of function) model for injury, lesion and disease or disorders
- Language of ICF model
- Effects of therapeutic modalities in different stages of traumatic and non traumatic condition
- Recent advances in PT assessment and management of orthopaedic disorders and trauma.
- Introduction to evidence based practice in musculoskeletal rehabilitation.

BASIC CONCEPT OF PHYSIOTHERAPY ASSESSMENT IN ORTHOPAEDICS

- Examination, Assessment, Evaluation, Functional assessment, Diagnosis,PT diagnosis

- Prognosis, Intervention, Outcome measures, Reassessment
- Physical impression or problem of list on the basis of ICF model.
- POMR and SOAP Notes, Documentation

DIAGNOSTIC PROCEDURE AND INTERPRETATION

- Laboratory study, Imaging study
- Electrodiagnosis
- Diagnostic findings and correlation with physical findings

MUSCULOSKELETAL EXAMINATION OF THE UPPER QUADRANT:

- The subject will include musculoskeletal examination, involving the shoulder, elbow, wrist and hand (Traumatic Non traumatic)
- Neurological and Functional Screening
- Classes will include lecture, laboratory and clinical experiences

MUSCULOSKELETAL EXAMINATION OF LOWER QUADRANT:

- The subject will include musculoskeletal examination, involving the Hip, Knee, ankle and foot (Traumatic Non traumatic)
- Neurological and Functional Screening
- Classes will include lecture, laboratory and clinical experiences

MUSCULOSKELETAL EXAMINATION OF PELVIC AND SPINE:

- The subject will include musculoskeletal examination, Cervical , Thoraco lumbar, Lumbo sacral and Pelvis (Traumatic Non traumatic)
- Neurological and Functional Screening
- Classes will include lecture, laboratory and clinical experiences

PAIN AND MUSCLE PERFORMANCE ASSESSMENT

Pain Physiology, Theories of pain, Pain pathways, Causes of clinical pain, Sensitization, Plasticity, Pain analysis.

Muscle Power,Muscle Strength and Muscle endurance assessment

Muscle flexibility assessment

MEASUREMENT INSTRUMENTS

Goniometer, Accelerometer,Photo optical devices,Pressure transducers and force plates, Gait analyzer,Isokinetic device,EMG -Electro physiology of muscle contraction,Recording,Processing,Relationship between EMG and bio-mechanical variables.

MEASUREMENT SCALE:

VAS,NPRS,DASH,SPADI,OMAC,Michigan Hand Outcome Questionnaire, Arthritis Impact Measure, ASWARTH,NDI

Functional scale of upper limb and lower limb. Conversion of Scales in vernacular languages.

Disability Evaluation. Disablement and Enablement Concepts for Physiotherapy Research and Practice, Traditional model, Consequences of disease model, NAGI model. International Classification of Impairments Disability and Handicap Model (ICIDH

– 1), International Classification of Functioning, Disability and Health (ICF / ICIDH - 2), ICF Coding, History and development of the ICF, The ICF and the WHO family of international classifications, Components of the ICF, ICF coding, Benefits of Using ICF

PAPER -104 ADVANCED ORTHOPAEDIC PHYSIOTHERAPY MANAGEMENT

Course Description:
The course covers topics on various school of thoughts of joint, muscle and neural tissue manual therapy techniques and physiotherapy intervention in various types of orthopaedic disease disorders. The course aims to provide a more functional and comprehensive approach based on manual therapy to manage a range of neuromusculoskeletal conditions. Emphasis will be made on clinical decision making and integrating manual therapy skills within the overall plan of care for the patient. Class will include lecture, laboratory and clinical experiences.
Course Objective: The course should enable the student to acquire in-depth understanding and skill in managing musculoskeletal conditions by using Manual therapy and various type of physiotherapeutic techniques.
Course Outcome: The student should be able to compare & contrast the outcome of various manual and mechanical therapy approaches.

Therapeutic Exercise
Principles Types of following exercises with reference to their therapeutic effects, indications and contraindications and the specific uses, Dosimetry in specific disorders and traumatic condition

- Isometric,Isotonic,Isokinetic
- Concentric,Eccentric
- CKC,OKC
- Flexibility,ROM exercises Proprioceptive,Postural exercises

Manual Therapy techniques
Principles Types of manual therapy with reference to their therapeutic effects, indications and contraindications and the specific uses, Dosimetry in specific disorders and traumatic condition

Manipulation and Mobilization Techniques
Principles of various schools of thought in manual therapy –Definition – Mobilization, Manipulation, indications, limitations, contraindications and precautions, applications of Mobilization technique to various joints. Principles of Maitland, Mulligan and McKenzie, Kaltenborn, Cyriax joint mobilization and manipulation techniques. Pilates-school of thought, Chiropractic school of thought, Osteopathic school of thought.

Soft tissue techniques
a) Butler
b) Positional release
c) MET

d) Myofascial release

Stretching
1. Concept &Types
2. Advantages & disadvantages
3. Various techniques
4. Muscle specific technique

Soft Tissue Mobilization
1) General overview of Soft Tissue Mobilization
2) Principles of various techniques of Soft tissue mobilization

Taping Techniques
Kinesio-taping and Rigid Taping techniques in Orthopaedic Conditions

TREATMENT INSTRUMENTS

Therapeutic modalities
Principles underlying application of following modalities with reference to their production, biophysical and therapeutic effects, indications and contraindications and the specific uses,Dosimetry in specific disorders and traumatic condition

- Superficial and deep heat therapy
- Cryotherapy
- Various types of current
- Pneumatic compression devices
- Low high and medium frequency currents
- EMG
- LASER
- Shockwave
- Recent advancement in therapeutic modalities

SPECIAL AND INTEGRATED TECHNIQUES
Special and integrated techniques use in orthopaedic physiotherapy

MANAGEMENT OF REGIONAL ORTHOPEDIC CONDITIONS OF UPPER QUADRANT: Treatment of the regional and traumatic, post surgical Orthopedics conditions of Upper quadrant. musculoskeletal conditions involving the shoulder complex, elbow, wrist and hand.

MANAGEMENT OF REGIONAL ORTHOPEDIC CONDITIONS OF LOWER QUADRANT: Treatment of the regional orthopedic and traumatic post surgical conditions of Lower quadrant musculoskeletal conditions involving the hip, knee, ankle and foot.

MANAGEMENT OF REGIONAL ORTHOPEDIC CONDITIONS OF CERVICAL AND THORACIC SPINE: Treatment of the regional and traumatic post surgical orthopedic

conditions of cervical and thoracic spine musculoskeletal conditions involving the cervical spine, the thoracic spine and rib cage.

MANAGEMENT OF REGIONAL ORTHOPEDIC CONDITIONS OF LUMBOPELVIC SPINE: Treatment of the regional and traumatic, post surgical orthopaedic conditions of lumbopelvic spine musculoskeletal conditions involving the lumbopelvic complex, including the hip joint.

MANAGEMENT OF RHEUMATOLOGICAL AND NERVE INJURY CASES

RA,AS,Gout,Psoriatic arthropathy, Spondyloarthropathy, Undifferentiated spondyloarthropathy. Nerve injury of Upper limb and lower limb. Entrapment neuropathy of upper and lower limb

PRACTICAL

PAPER 105P- ORTHOPAEDIC BIOMECHANICS

This involves application of topics in PAPER 3 via demonstrations, field visits and case presentations. Use of Universal testing machine to study bone behavior under load and articular cartilage under load.

MPT 106P ORTHOPAEDIC PHYSIOTHERAPY ASSESSMENT AND EQUIPMENTS

Students will be instructed via demonstration, hands on assessment, field visits and case conference on specific techniques used in the assessment of patients with musculoskeletal disorders and trauma. Students will draw on their experiences at the clinical postings to formulate a treatment plan for cases presented at the case conference.

The demonstrations and practicals should be in line with the theory topics.

PRACTICAL.

MPT 107P ADVANCED ORTHO PHYSIOTHERAPY

Students will be instructed via demonstration, hands on techniques, field visits and case conferences on specific techniques used in the management of patients with musculoskeletal disorders. Students will draw on their experiences at the clinical postings to formulate a treatment plan for cases presented at the case conference. The demonstrations and practicals should be in line with the theory topics covered in Advanced Ortho Physiotherapy.

PAPER 108 CLINICAL & SEMINARS PRESENTATIONS

Students will engage in clinical practice in the Department of Orthopedics and Physiotherapy setting to enhance their clinical skills and apply theoretical knowledge gained during teaching sessions. Seminars: These will serve as a platform for students to integrate components of patient management. Students will give presentations on topics provided to them. Poster presentation by student in a conference.

MPT (ORTHOPAEDICS)
SECOND YEAR

PAPER 601 PEDAGOGY OF PHYSIOTHERAPY EDUCATION

Course Description: The course covers topics related to education theory and practical of teaching.

Course Objective: On completion of the course the student should be able to understand the dynamics of teaching & learning, plan effective teaching sessions in physiotherapy.

Course Outcome: The student should be able to demonstrate adequate knowledge and skill in physiotherapy pedagogy and learn ways to effectively teach.

Following are the topics to be included but not limited to:

1. Philosophy of educational and emerging issues in Education meaning, functions and aims of education.
    - Formal, informal and non- formal education.
    - Agencies of education
    - Current issues and trends in higher education
    - Issues of quality in higher education, autonomy and accountability, privatization, professional development of teachers, education of persons with disabilities.
    - Need for education philosophy
    - Some major philosophies, Idealism, Naturalism, Pragmatism and their implications for Education.
2. Concept of teaching and learning
    - Meaning scope of educational psychology
    - Meaning and relationship between teaching and learning
    - Learning theories
    - Dynamics of behaviour
    - Individual differences
3. Curriculum
    - Meaning and concept
    - Basis of curriculum formulation and development
    - Framing objectives for curriculum

    Process of curriculum development and factors affecting curriculum
    Development evaluation of curriculum
4. Method and techniques of teaching
    - Lecture, Demonstration
    - Discussion, Seminar, Assignment, Project and Case Study.
5. Planning for Teaching
    - Bloom's Taxonomy of Instructional Objectives, Writing Instructional Objectives in Behavioural terms, Unit Planning and Lesson Planning.
6. Teaching Aids
    - Types of teaching aides
    - Principles of selection, preparation, and Use of Audio –Visual aids.

7. Measurement and evaluation
    - Nature of Educational Measurement : Meaning, Process, Types of tests.
    - Construction of an achievement test and analysis standardized test.
    - Introduction of some standardized tools, important tests of intelligence, Aptitude, Personality.
    - Continuous and Comprehensive Evaluation.
8. Guidance and Counseling
    - Meaning and Concepts of Guidance and Counseling
    - Principles
    - Guidance and Counseling services of students and faculty members
    - Faculty development and development of personnel for P.T. Services
9. Clinical Education
    - Awareness and Guidance to the Common people about Health and Diseases and Available professional Services
    - Patient Education
    - Education of the Practitioners

Microteaching and its benefits

PAPER 602 MANAGEMENT, ADMINISTRATION AND ETHICAL ISSUES

Course Description: The course covers topics related to physiotherapy clinic, department management, managing a chain of clinics, multiple departments, allied health clinics management.

Course Objective: On completion of the course the student should be able to understand the basic issues of physiotherapy management & administration and practice as an informed professional on Legal & ethical issues.

Course Outcome: The student should be able to demonstrate adequate knowledge and skill in physiotherapy, clinic and department management. Possses adequate knowledge of ethics and demonstrate ethical behaviors in practice.

MANAGEMENT

1. Functions of management,
2. Evaluation of management through scientific management theory,
   Classical theory
   System approach
   Contingency approach
3. Management process
   Planning, Organization, direction, controlling (decision making)
4. Introduction to personnel management
   Staffing recruitment, selection, performance appraisal, collective bargaining, discipline, job satisfaction.
5. Quantitative methods of management
   Relevance of statistical and/or techniques in management.
6. Marketing
   Market segmentation, marketing research production planning pricing, channels of distribution, promotion, consumer behaviour, licenser.

1. Total quality management
   Basis of quality management – acid for quality control quality assurance program in hospitals, medical audit, and international quality system.

ADMINISTRATION

1. **Hospital as an organization** Functions and types of hospitals selected clinical supportive ancillary services of a hospital, emergency department, nursing, physical medicine & rehabilitation, clinical supportive and ancillary services of a hospital, emergency department nursing physical medicine & rehabilitation, clinical laboratory, pharmacy and dietary dept.
2. Roles of Physiotherapist, Physiotherapy Director, Physiotherapy supervisor, Physiotherapy assistant, Physiotherapy aide, Occupational Therapist, Home health side, Volunteer.
3. Directed care and referral relationship and confidentiality.

LEGAL PROFESSIONAL ETHICAL ISSUES

1. Physical therapy: Definition and development
2. The implications & confirmation to the rules of professional conduct
3. Legal responsibility for their actions in the professional context and understanding the physiotherapist liability and obligations in the case of medical legal action.
4. Code of ethics: A wider knowledge of ethics relating to current social and medical policy in the provisions of health care.
5. Functions of the relevant professional associations education body and trade union.
6. The role of the international health agencies such as the world health organizations.
7. Standards of practice for physical therapies.
8. Acts & Statutes relating to Physiotherapy.
9. Current issues

PAPER 603 - EXERCISE PHYSIOLOGY & ELECTRO PHYSIOLOGY

Course description: This course aims to deliver scientifically based standards on exercise and its effects on various systems of the body. It prepares students through the process of selecting and administering therapeutic exercises and electrotherapeutic agents, using exercise guidelines to interpret results, and drafting an physiotherapy interventional prescription that is in line with exercise guidelines parameters.

Course Objective: This course should deliver the concepts in exercise physiology, electrophysiology and prepare students to test and prescribe suitable exercises and electrotherapeutic agents to different groups of the population and conditions.

Course Outcome: On completion of the study of this Course the student should be able to select and administer using exercise guidelines to interpret results, and drafting an therapeutic exercise and electrotherapeutic agents prescription to different populations and conditions.

This course provides the student the required knowledge and skills on exercise and its effects on various systems of the body. The student shall also gain knowledge and skills on the various therapeutic exercises targeted for different conditions. The student shall learn the knowledge and skills on various electrotherapeutic agents, advanced techniques and physiological responses of nerve and muscle in diagnostic and therapeutic electro-agents.

Energy Transfer for Physical Activity:
a. Energy transfer in Body.
b. Energy transfer in exercise.
c. Energy expenditure during various activities.
d. Fatigue.
e. Biochemical responses to endurance training.

Cardio Vascular System and Exercise:
a. Athletes Heart.
b. Cardio Vascular adaptations to sustained aerobic exercises.
c. Lipids and sports, protection from coronary heart disease, exercise and optimization of lipid profile.
d. Sudden cardiac death in sports. Regulation of circulation during exercise. Exercise and vascular system-cardiovascular adaptation to sustained aerobic exercises, exercise and optimization of lipid profile, regulation of circulation during exercise

Exercise and nervous system - neural adaptation with exercises, cerebral perfusion and exercises, exercise for mood enhancement and anxiety.

Exercise and cell biology - effect of exercise on various cell activities, adaptation of organelles with exercise, exercise and aging-physiology changes of aging

Exercise and Respiratory System:
a. Second Wind.
b. Oxygen Debt.
c. Breath Holding, High Pressure Ventilation. Scuba Diving.
d. Regulation of Respiration during exercise.

Skeletal System:
a. Growth and Exercise.
b. Repair and adaptation during exercise. Delayed Onset Muscle Soreness (DOMS)
c. Exercise prescription for chronic low back pain
d. Training for Muscular Strength and Endurance.
e. Muscle fibre typing and significance.

Gastrointestinal Tract and Endocrine system:
a. Effect of Sports on GIT and Liver.
b. Hormone regulation of fluid and electrolytes during exercise.
c. Exercise and Menstrual Cycle.

d. Stress Hormones in Exercise.

Exercise and endocrine system-
Hormonal regulation of fluid and electrolytes during exercise and menstrual cycle, stress hormone in various activities, effect of exercise on various hormones in exercise, effect of exercise on GIT and liver, Opioids, Runners High. exercise addiction.

Exercise and Common Pulmonary Conditions
a. Exercise induced bronchial obstruction
b. Exercise in chronic airway obstruction
c. Air pollution and exercise

Exercise and Cardiac Conditions
a. Exercise prescription for heart disease
b. Exercise in primary prevention in ischemic heart disease
c. Exercise for secondary prevention of ischemic heart disease
d. Exercise induced Asthma;
e. Exercise Stress Testing for Diagnosis of CHD.

Exercise testing: incremental shuttle walk test, endurance shuttle walk test, six minute walk test, Step test, treadmill tests.(i.e. Balke, Bruce, Noughton, Modified Bruce protocol), interval bike test, sub maximal GXT, symptom limited GXT, exercise testing using cycle ergometer, oxygen uptake (VO2)

Doping in Sports
a. Banned drugs
b. Procedure of dope testing
c. Control of doping abuse

Diabetes and Exercise
a. Exercise in diabetic patients
b. Exercise as a method of control of diabetes

Exercises for special categories
a. Child and adolescent athlete's problems
b. Special problems of older athletes
c. Special concerns for differently abled athletes

Female Specific Problems:
1. Sports Amenorrhoea.
2. Injury to female reproductive tract.
3. Menstrual Synchrony.
4. Sex determination.
5. Exercise and pregnancy.
6. Eating disorders in athletes.

Rheumatology & Geriatric Disorder:

1. Rheumatoid arthritis, SLE and Juvenile Rheumatoid Arthritis.
2. Ankylosing Spondylitis.
3. Osteoarthrosis and other geriatric conditions.
4. Cost and benefits of exercise prescription in Osteoporosis.

Temperature Regulation

a. Heat Balance.
b. Methods of Assessing Heat Balance.
c. Effects of Climate.
d. Effects of Exercise on Temperature Regulation.
e. Limit of Tolerance of Heat.
f. Acclimatisation.
g. Avoidance in Heat illness during exercise.
h. Exercises in the cold.

Physiological Basis and Principles of Training and Conditioning

a. Principles of endurance and strength training i. Recovery training intensities in heart rate ii. Manipulation of training principles iii. Training sub–phases
b. Fundamentals that aid training and performance i. Warm up and Cool down ii. Flexibility and stretching
iii. Missing workouts iv. Overtraining
c. Analysis of Training

Misc. Topics

High Altitude Training, Sports Diving, Hazards of underwater environment. Special Aids to Athletic Performance:– MORA, Oxygen Inhalation, Sleep.,Sex and performance. Assessment of Age. Muscle tissue fibre typing and its significance. Exercise for mood enhancement & anxiety.

Obesity and related problems

a. Dietary recommendation for healthy individuals.
b. Obesity – epidemiology, classification of causes, complications and treatment.
c. Paediatric obesity- Regulation of food consumption, complications and prevention.

Stress Management

a. Introduction i. The history and definition of "stress" ii. The characteristics of stressors iii. Clinical implications of stress iv. Coping with stress – styles of coping, recruiting resources for coping
b. Self management
c. Tools for stress management

Hazards of Smoking

a. The physiological, psychological and behavioral impact of cigarette smoking
b. Evidence based possibilities for treatment
c. Treatment for smoking cessation

Sleep Medicine

a. Acquaintance with basic concepts in sleep medicine, the structure and physiology of sleep
b. Classification of sleep disorders
c. Clinical implications of sleep disturbance
d. Physiotherapeutic measures for sleep deprivation

Yoga

a. Important Pranayamas and strengthening and rejuvenating asanas.
b. Methods, advantages and contraindications.

Nutrition & Dietetics

1. Six nutrient classes: carbohydrates, fats, proteins, Vitamins, minerals and water. water & electrolyte balance
2. Body weight; body composition
   - Body build, body size & body composition
   - Assessing body composition
   - Body composition & sport performance
   - Weight standards
   - Achieving optimal weight
3. Diet & fitness products
4. Exercise & diet programme to gain weight
   - Gaining body fat
   - gaining muscle mass
5. Guidelines for healthy diet

c. Optimal Nutrition for exercise. Nutrition for Physical Performance. Pre–Game meal, Carbohydrate loading. f. Alcohol, Mega Vitamin Therapy.g. Food for various athletes of different disciplines.h. Fluid and energy replacement in prolonged exercise. i. AHA Dietary guidelines for Heart diseases

SECTION – II ELECTRO PHYSIOLOGY

Diagnostic Electrophysiology

1. Anatomy and Physiology of: Motor unit, action potential, excitability of nerve and
2. muscle, neuromuscular junction.
3. Technique of nerve conduction velocity and electromyography: Instrument, techniques, interpretations in terms of neuromuscular function and bio-feedback technique.
4. Nerve conduction studies, normal/abnormal nerve conduction, its relevance in muscle function.
5. Concepts of normal & abnormal EMG studies.
6. Late responses

7. Concepts of electro physiological studies in neuro muscular diseases as a diagnostic and therapeutic tool.
8. Electrical stimulation and its effects on various systems.
9. Evoked potentials – VEP, SSEP, MEP, BAEP

Therapeutic Electrophysiology
Physiological mechanism of action of electrotherapeutic modalities, Critical Analysis of Electrotherapeutic Modalities- IFT, TENS, MS, SWD, LASER, MWD, Pulsed SWD, Mechanical Traction etc.
Plasticity in response to Electrical stimulation.

Recent Advancement and Evidence based practice in Electrotherapy
Extracorporeal Shock Wave Therapy, tDCS, Long wave diathermy, Electro-Cupping and Vacuum, NMES, FES
Practicals:
The student will undergo laboratory and on–field training in Exercise physiology and Electrophysiology.

PAPER 604 - FUNCTIONAL REHABILITATION AND ERGONOMICS

I. Introduction to Physiotherapy Assessment
- Purpose and need for Physiotherapy assessment
- Historical perspective
- Physiotherapy versus medical model of practice
- Various categories for movement dysfunction
- Preferred practice patterns in Physiotherapy.
- Today's health care model

II. Influence of Psychological Factors
- Psychological adaptation
- Personality and coping styles
- Common defense reactions to disability
- Anxiety
- Acute stress disorder and post traumatic stress disorder
- Depression
- Substance abuse
- Agitation and violence
- Hypersexuality
- Psychosocial wellness
- Wellness in rehabilitation
- Integrating psychosocial factors into rehabilitation
- Suggestions for rehabilitative interventions

III. Influence of Values on Patient Care; Foundation for Physiotherapy assessment
- Process of assessment
- Values and valuing
- Code of ethics

- The values of patient as a factor in care
- The influence of the values on the primary goal of patient care
- Value – Laden situation in rehabilitation

IV. Examination of Functional Status and Activity Level

- A conceptual framework
- Examination of function
- Response formats
- Interpreting test results
- Selected instruments assessing physical function
- Multidimensional functional assessment instruments

V. Examination of Environment

- Purpose
- Examination strategies
- Patient – Home environment relationship: Overview of access, usability and safety
- Adaptive equipment
- Assistive technology
- Examination of the workplace
- Community access
- Documentation
- Funding for environmental modifications
- Legislation

VI. Guideline for Physiotherapy Documentation

- Introduction
- Documenting the examination
- Documenting the evaluation
- Documenting the plan of care
- Application of documentation skills

PAPER 605 - RESEARCH METHODOLOGY, BIOSTATISTICS & EVIDENCE BASED PRACTICE

Course Description: The course covers the concept of research methodology, Evidence based practice and biostatistics related to physical therapy

Course Objective: The course aims to introduce the principles of research, methods of research and analysing the research studies using Biostatistics.

Course Outcome: On completion of the study of this Course the student should be able to understand the methods of research process and design so as to effectively plan a research.
To understand the statistical measures used in the analysis and interpretation of research data.
To acquire skills of critically reviewing the literature.

RESEARCH METHODOLOGY

SECTION – 1

Research in physiotherapy

a. Introduction
b. Research for Physiotherapist: Why? How? When?
c. Research – Definition, concept, purpose, approaches
d. Internet sites for Physiotherapists.

Research fundamentals

a. Define measurement
b. Measurement framework
c. Sca es of measurement
d. Pi ot Study
e. Types of variables
f. Reliability & Validity
g. Drawing Tables, Graphs, Master chart

Writing a research proposal

a. Defining a problem
b. Review of Literature
c. Formulating a question, Operational Definition
d. Inclusion & Exclusion criteria
e. Methodology- Forming groups Data collection & method for analysis
f. Informed Consent Steps of documentation – Title to Scope of study

Research ethics

a. Importance of Ethics in Research
b. Main ethical issues in human subjects" research
c. Main ethical principles that govern research with human subjects
d. Components of an ethically valid informed consent for research.

Overview of study designs

a. Observational ,Descriptive-Case study/ series, Cross sectional, Normative, Correlational ii. Analytical; case control, cohort
b. Experimental- True & quasi experimental

Sampling

a. Random and non-random sampling.
b. Various methods of sampling – simple random, stratified,systematic, cluster and multistage. Sampling and non-sampling errors and methods of minimizing these errors.

Plagiarism

Definition of Plagiarism, types, Avoiding plagiarism , software methods to detect plagiarism.

Evidence Based Practice
1. Introduction to evidence– based complementary medicine
2. Evidence–based health care
3.Evidence–based practices 4. Evidence–based decision making and management
Types of evidence:
a. Definition of evidence
b. Forms of evidence : Case–control studies
c. Cohort studies
d. Randomized controlled trials
e. Systematic Reviews.

Importance of Hierarchy of Evidence

Key element of scientific writing.

Structure, formulation and implementation of thesis, Structure, formulation and implementation of original research report ,Structure, formulation and implementation of systematic review/meta –analysis, How to read and critique research,Review of an indexed refereed research paper, - Evaluating paper scientific merit, Providing constructive feedback to the author, typical review formats for reviewing a paper ,Reasons for rejection

Presenting Research: Writing and submitting papers
(a) Strategies of paper writing
(b) Design of paper writing
(c) Tactics of paper writing - Where to publish

SECTION – II BIOSTATISTICS
Introduction
Descriptive and Inferential statistics
Types of data: Qualitative and Quantitative, Parametric and Non- Parametric tests
Which tests to use.
Tests of significance

a. Basics of testing of hypothesis – Null and alternate hypothesis, type I and type II errors, level of significance and power of the test, p value.
b. Tests of significance (parametric) - t – test (paired and unpaired), Chi square test and test of proportion, one way analysis of variance.
c. Repeated measures analysis of variance.
d. Tests of significance (non-parametric)-Mann-Whitney **u** test, Wilcoxon test, e. Kruskal-Wallis analysis of variance. Friedman"s analysis of variance.

Correlation and regression
Simple correlation – Pearson"s and Spearman"s; testing the significance of correlation coefficient, linear and multiple regressions. Interpretation of r.

Basic probability distributions and sampling Distributions
a. Concept of probability and probability distribution.

b. Normal, Poisson and Binomial distributions, parameters and application.
c. Concept of sampling distributions.
d. Standard error and confidence intervals.
e. Skewness and Kurtosis

Graphical Presentation
Frequency distributions, Describing data with Graphs, Describing data with Averages Mode Median Mean, Describing variability Variance, Standard deviation, etc. Normal Distributions

Role of Computers in Research
Basic of computers – Hardware and Software
Basic of Computer Applications – Windows, MS word, Power Point, etc.
Simple statistical Analysis using SPSS software.
Tabulation, Calculation of central tendency and dispersion, Using software packages, Analysis, Presentation of data in diagrammatic & Graphic form
Artificial Intelligence and its application in physiotherapy
Robotics and its application in physiotherapy
Information technology and its application in physiotherapy

PRACTICALS
PRACTICAL
PAPER 606P EXERCISE PHYSIOLOGY & ELECTROPHYSIOLOGY
The demonstrations and practicals should be inline with the theory topics covered in Exercise physiology and electrophysiology

PRACTICAL
PAPER 607P - DISSERTATION
As part of the requirement for the Master's degree the student is required to undertake a research study under the guidance of a guide. Oral Presentations at Conferences/Seminars - Preparing presentation,- Duration of presentation,- What to present. Students must publish/present at least one research paper at a National Level Conference/ International Level Journal. The student needs to publish at least one research paper in any indexed journal.

PAPER 608 – CLINICS & SEMINARS PRESENTATIONS
These will serve as a platform for students to integrate various components of patient management. Students will give presentations on topics provided to them.

Students will engage in clinical Orthopaedic Physiotherapy Department to enhance their clinical skills and apply theoretical knowledge gained during teaching sessions.

List of Recommended Books for MPT (ORTHOPAEDICS)		
S.N	Author	Title
1	Brotzman,S. Brent	Clinical Orthopaedic Rehabilitation
2	Mckee,PAT	Orthotics in rehabilitation
3	Kotwal,Orakash	Text book of Orthopaedics
4	Maitland,Geoff	Maitland's Vertebral Manipulation
5	Lett, Ann	Reflex zone therapy for health
6	Dixon,M.W	Myofascial Massage
7	Edmond,Susan J	Joint Mobilization Manipulation
8	Ebnezar,John	Essential of orthopaedics for physiotherapists
9	Magee,D.J	Orthopedic physical assessment
10	Dutton,Mark	Orthopaedic Examination Evaluation
11	Joshi,Jayant	Essentials Of Orthopaedics
12	Weinsrein,S.L	Turek's Orthopaedic principles
13	Hoppenfeld,S	Orthopaedic Neurology
14	Golyakovsky V	Operative Manual of Ilizarov Technique
15	Natarajan, Mayil Vahanan	Textbook of Orthopaedics & Traumatology
16	Jiri Dvorak	Manual medicine Therapy
17	Tidswell	Cash's T.B of Orthopaedic Physiotherapy
18	Fortunato, N	Plastic and reconstructive surgery

19	Kulkarni,G.S	Recent Advanced Orthopaedics 2
20	Chaitow,Leon	Muscle Energy Techniques
21	Moore,Keith L	Clinical Oriented Anatomy
22	Donatelli,R.A	Orthopaedic Physical Therapy
23	Downie,P.A	Cash's text book of orthopaedics and rheumatology for physiotherapists
24	Chaitow,Leon	Positional Release Techniques
25	Duthie,R.B	Mercer's Orthopaedic Surgery
26	Ebnezar,John	Step by Step Injection techniques in orthopaedics
27	Starkey Chand	Examination of Orthopedic and Athletic Injuries
28	Wright,John M	Review Questions in orthopaedics
29	Singh, Parminder J	100 Cases in Orthopaedics and Rheumatology
30	Imhof, H	Direct Diagnosis in Radiology Spinal Imaging
31	Boyling,J.D	Grieve's Modern Manual Therapy
32	Culloch,J.M	Macnab's Backache
33	Demeter,S.L	Disability Evaluation
34	Hamblen,David L	Adams's Outline of Fractures
35	Kelly,M.J	Orthopedic Therapy of the Shoulder
36	Donatelli,R.A	Physical Therapy of the Shoulder
37	Kitchen,Sheila	Electrotherapy Evidence Based
38	Aggarwal,A.L	Clinical practice of acupuncture
39	Hopwood Val	Acupuncture in Physiotherapy
40	Jull	Segmental Stabilization of Spine

Exercise Physiology and Electrophysiology		
S.N	Author	Title
1	Katch	Exercise Physiology
2	Skinner,J.S	Exercise Testing & Exercise Prescription For Special Cases
3	Khandpur, R.S	Hand book of Biomedical Instrumentation
4	Glaser,Roland	Biophysics
5	Prentice William	Therapeutic Modalities in Rehabilitation
6	Robinson,A.J	Clinical Electrophysiology
7	Gersh,M.R	Electrotherapy in Rehabilitation
8	Robertson Val	Electrotherapy Explained principle and practice
9	Nelson ,Roger M	Clinical Electrotherapy
10	Kimura, Jun	Electrodiagnosis in Diseases of Nerve & Muscle: Principles & Practice
11	Stokes, Maria	Physical Management in Neurological Rehabilitation
12	Michlovitz,S.L	Modalities for Therapeutic Intervention
Biomechanics		
S.N	Author	Title
1	Ackland Timolthy	Applied Anatomy and Biomechanics in Sports
2	Bell,Frank	Principles of Mechanics & Biomechanics
3	Raj Kumar,R.V	Biomechanics the Nucleus of Physiotherapy
4	Koley,S	Textbook of Biomechanics
5	Nordin, Margareta	Basic Biomechanics of the Musculoskeletal system

6	Griffith's IW	Principles of Biomechanics & Motion Analysis
7	Hall,Susan J	Basic Biomechanics
8	Smith, Laura K.	Brunnstrom's Clinical Kinesiology
9	Thompson,D.L	Hands Heal Communication,Documentation
10	Kapandji, I.A	The Physiology of The Joint Vol-1
11	Kapandji, I.A	The Physiology of The Joint Vol-2
12	Kapandji, I.A	The Physiology of The Joint Vol-3
13	Norkin C.C	Joint Structure and Function
14	Mathur, D.S	Elements of Properties of Matter
15	Mow,V.C	Basic Orthopaedic Biomechanics

Management Administration and Ethics

S.N	Author	Title
1	Bhardwaj,Pradeep	Opportunities in Hospital & Health care Administration
2	Gupta,Jaydeep Das	Hospital Administration & Management A Comprehensive Guide
3	Francis,C.M	Hospital Administration
4	George,M.A	The Hospital Administration
5	Gupta,Shakti	Hospital store Management
6	Gupta,Shakti	Hospital and Health care Administration
7	Joshi,D.C	Hospital Administration
8	Kulkarni,G.R	Financial Management for Hospital Administration
9	Sakharkar,B.M	Principles of Hospital Administration & Planning
10	Jand,SS	Sphy The Beginning Ignite Yourself for Success

11	Joshi,S.K	Quality Management in Hospitals
12	Wolpert, Lewis	Health care Administration
13	Khan,S.M	Sana's Guidelines for Hospital infection control
14	Tabish,Syed	Hospital and Nurshing Homes Planning Organisations and Management
15	Dave,P.K	Emergency Medical Services & Disaster Management
16	Golwalia, Aspi F.	Medical Informatic 20/20
17	Bhuiyan, S.P	The Art of Teaching Medical Students
18	Franil, P	People Manipulation A Positive Ppracah
19	Mogli,G.D	Medical records organization and Management
20	Raja, Kavitha	Ethical Issues : Perspectives for the Physiotherapists
21	Levoy,BOB	222 Secrets of Hiring Managing and Retaining Great Employees in Healthcare Practices
22	Thompson,D.L	Hands Heal Communication,Documentation
23	Dimiond,Bridgit	Legal Aspects of Physiotherapy
24	Wolfe, Brent D	Team Building Activities for the Digital Age
25	Francis,C.M	Medical Ethics
26	Wood, David	Communication for Doctors
27	Gupta,Shakti	Modern trend in Planning and Designing of Hospitals
Research Methodology		
1	Kothari, C.R.	Research Methodology Methods and Techniques
2	Singh, Sunita	Synopsis of Biostatistics
3	Prasad,S	Elements of Biostatistics
4	Pitney W.A	Qualitative Research in Physical Activity

5	Jewell,D.V	Guide to Evidence Based Physical Therapists Practice
6	Herbert,Rob	Practical Evidence Based Physiotherapy
7	Bhandri,Mohit	Clinical Research made Easy
8	Verma, B.L	Biostatistics
9	Campbell,M.J	Medical statistics

Pedagogy in Physiotherapy Education		
S.N	Author	Title
1	Ram,C.S	Pedagogy Physiotherapy Education
2	Grechus, Marilyn	Innovative Tools for Health Education
3	Mohanty S	Golden 1000 MCQ for Physiotherapy Vol-1

Syllabus

For

Master of Physiotherapy (NEUROLOGY)

Atal Bihari Vajpayee Medical University Lucknow, U.P., India
From session 2021-2022

MPT (NEURO)

FIRST YEAR

Paper Code	Title	Total Hours	Hours/ week	Yearly Credits	IA Marks	UE Marks	Total Marks
MPT201	Basic Medical Science and Neurological Disorders	100	4	8	25	75	100
MPT202	Neuro Bio-mechanics	100	4	8	25	75	100
MPT203	Neuro Physiotherapy Assessment and Equipments	50	2	4	25	75	100
MPT204	Advance Physiotherapy in Neurological Conditions	100	4	8	25	75	100
MPT205 P	*Practical- I* Neuro Bio-mechanics	60	2	2	25	75	100
MPT206 P	*Practical- II* – Neuro Physiotherapy Assessment and Equipments	50	2	2	25	75	100
MPT207 P	*Practical – III-* Advance Neuro Physiotherapy	100	4	4	25	75	100
Total		**560**	**22**	**36**	**175**	**525**	**700**
MPT208	Clinics & Seminars Presentations	500	12	12	50	50	100
Total		**1060**	**34**	**48**	**225**	**575**	**800**

- IA= INTERNAL ASSESSMENT
- UE=University Examination

SECOND YEAR

Paper Code	Title	Total Hours	Hours/ week	Yearly Credits	IA Marks	UE Marks	Total Marks
MPT 601	Pedagogy in Physiotherapy Education	80	3	6	25	75	100
MPT 602	Management, Administration and Ethical Issues	80	3	6	25	75	100
MPT 603	Exercise Physiology & Electro physiology	50	2	4	25	75	100
MPT 604	Functional Rehabilitation & Ergonomics	80	3	6	25	75	100
MPT 605	Research Methodology, Biostatistics & Evidence Based Practice	100	4	8	25	75	100
MPT 606P	Practical-I- Exercise Physiology & Electrophysiology	50	2	2	25	75	100
MPT 607P	Dissertation	200	12	12	25	75	100
	Total	**640**	**29**	**44**	**175**	**525**	**700**
MPT608	Clinics & Seminars Presentations	500	12	12	50	50	100
	GRAND Total	**1140**	**41**	**56**	**225**	**575**	**800**

- IA= INTERNAL ASSESSMENT
- UE=University Examination

MPT (NEUROLOGY)

FIRST YEAR

PAPER 201 – Basic Medical Science and Neurological Disorders

Course Description: The course covers topics related to basic science and epidemiology, patho-mechanics, clinical manifestation, conservative and surgical management of neurological diseases,disorders & trauma.

Course Objective: The course should enable the student to develop a detailed concept about different neurologica diseases & disorders and its medical and surgical management.

Course Outcome: The Students will be able to use this information in planning and tailoring effective, specific, safe Physiotherapy treatment programmes.

ANATOMY

1. Introduction to Nervous system and its subdivisions
2. Anatomy of the Neuron
3. Anatomy of the Reflex Arc
4. Structure of spinal cord with a detailed study of ascending and descending Tracts
5. Anatomy of cerebrum and Brodman's classification.
6. Blood Supply of the Brain
7. Anatomy of Cerebellum, Brainstem and Basal Ganglia
8. Limbic system

PHYSIOLOGY

1. Synapse and its transmission
2. Sensory Receptors and Their Basic Mechanisms of Action
3. Physiology of Muscle tone and study of spasticity
4. Physiology of Muscle contraction
5. Neural Plasticity
6. Neural transmitters and their functions

PATHOLOGY

1. Introduction to inflammation and immune system.

2. Infections like meningitis and encephalitis

3. Alzheimer's disease

4. Multiple Sclerosis

5. Parkinson's Disease

6. Stroke

7. Response of Peripheral Nerves to Injury

PHARMACOLOGY

1. Anti depressant drugs

2. Anti-Parkinson drugs

3. Skeletal muscle relaxants

4. Anti-Convulsants

5. Local and General Anaesthetics

6. Drugs affecting ANS.

7. Antihypertensives and Anticoagulants.

8.Hypnotics and Sedatives

9. Drugs used in spasticity.

10. Chemotherapy and antibiotics used in Neurology.

RADIOLOGY

Basics of Imaging and laboratory Techniques in Neurological conditions

1. Lumbar puncture

2. EMG and NCV

3. Electroencephalography

4. C. T, MRI and PET

5. Evoked Potentials

6. Nerve and muscle biopsy

APPROACH TO SIGNS AND SYMPTOMS

a) The neurologic history and examination b) Dizziness

c) Paresthesias d) Pain, Headache

NEUROVASCULAR DISORDERS

a) Stroke, Stroke in pregnancy (including pre-eclampsia and eclampsia)

b) Arteriovenous malformations

c) Spinal cord disease and stroke

Dementia and amnestic disorders

c. Alzheimer's disease, Overview of dementia (epidemiology, differential diagnosis, diagnostic testing),

b) Multi-infarct dementia and Subcortical dementias,

c) Transient global amnesia and other amnestic disorders

Movement disorders

a) Parkinson's disease, Parkinson plus syndromes

b) Dystonia, Choreoathetosis, Tremors and Hemibalissmus

c) Ataxia

d) Multiple sclerosis and other demyelinating diseases

Trauma

a) Traumatic brain injury.

b) Subdural and epidural hematomas.

c) Traumatic spinal cord injury.

Epilepsy

a) Etiology, types and manifestations.

b) Status epilepticus and treatment.

Infectious disorders

a) Meningitis b) Encephalitis

b) Brain abscess

d) Transverse myelitis

e) TBM

Neuromuscular disorders

a) Myasthenia gravis

b) Motor neuron diseases

Peripheral neuropathies & Cranial neuropathies

a) Guillain-Barre syndrome & other acute neuropathies

b) Diabetic neuropathies

c) Mononeuritis Multiplex

d) Mononeuropathies and plexopathies (Brachial and Lumbar)

e) Bell's palsy and other involvements of facial nerve

Developmental disorders

a) Spina bifida b) Chiari malformation

c) Hydrocephalus

d) CP

Hereditary disorders

Disorders of Peripheral Nerves

Disorders of Muscle

Cerebellar disorders

Disorders of the Vestibular system

Extrapyramidal disorders

NEURO SURGERY

Surgical Management indications, contra-indications for surgery, precautions after Surgery. Also included:

- General Principles of neurosurgery
- Tumours
- Intracranial abscess
- Hydrocephalus
- Stereotactic surgery

- Cerebral Malformations
- Operations on the discs-cervical Or Lumbar disc operation
- Malformation of the spine and spinal cord
- Lumbar and cisternal puncture technique and complications
- Peripheral nerve surgery
- ICU Management of the neurologically impaired patients

PAPER 202 – BIOMECHANICS IN NEUROLOGICAL CONDITIONS

Course Description: the course covers the understanding of Neuro Biomechanics and kinesiology of body movement.

Course Objective: the course should enable the student to acquire in depth knowledge in understanding the biomechanics and kinesiology.

Course Outcome: On completion of the study of this Course the student should be able to identify and apply the principles of Neuro biomechanics and kinesiology in understanding the normal functioning of the human body. To identify and apply the principles of Neuro biomechanics in understanding pathomechanics of various conditions. To use these principles in managing various neurological clinical conditions.

MOVEMENT PATTERNS – the essence of neuro biomechanics: Introduction, Defining human movements, Some fundamental movements, Movement patterns, Comparison of qualitative and quantitative movement analysis, Summary, Study tasks, important terms.

QUALITATIVE ANALYSIS OF VOLUNTARY AND INVOLUNTARY MOVEMENTS: Introduction, A structured analysis framework, Preparation stage – knowing what and how to observe, Observation stage – observing reliably Evaluation and diagnosis stage – analysing what's right and wrong in a movement, Intervention stage – providing appropriate feedback, Identifying critical features of a movement.

THE GEOMETRY OF MOTION: Introduction, Movement patterns revisited, Fundamentals of movement Linear motion and the centre of mass, The geometry of angular motion, The coordination of joint rotations.

QUANTITATIVE ANALYSIS OF MOVEMENT: Introduction, The use of videography in recording voluntary and involuntary movements, Recording the movement, Experimental procedures, Data processing,Projectile motion, Linear velocities and accelerations caused by rotation, Rotation in three-dimensional space.

CAUSES OF MOVEMENT – FORCES AND TORQUES: Introduction, Forces in voluntary and involuntary movements, Combinations of forces on the performer, Momentum and the laws of

linear motion, Force–time graphs as movement patterns, Determination of the centre of mass of the human body, Fundamentals of angular kinetics, Generation and control of angular momentum, Measurement of force, Measurement of pressure.

ELECTROMYOGRAPHY – WHAT MUSCLES DO: Experimental procedures in electromyography, EMG data processing and interpretation.

ISOKINETIC DYNAMOMETRY:

GAIT ANALYSIS

1. Biomechanical analysis of Pathological gaits
2. Biomechanics of Stair climbing
3. Biomechanics of Fall, Trip, Stumble.
4. Changes in gait following various surgeries/ diseases/ disorders

ORTHOSIS & PROSTHESIS

1. Orthoses of spine
2. Orthoses of upper limb
3. Orthoses of lower limb
4. Prescriptions checkouts & proper fittings
5. Bio-mechanical principles governing them
6. Aids used in management of disability.

PAPER 203 – NEURO PHYSIOTHERAPY ASSESSMENT AND EQUIPMENTS

Course Description: The course covers topics related to neuro physiotherapy assessment, diagnostic procedure interpretation, measurement and therapeutic equipments used in managing different disorders affecting neurological systems.

Course Objective: The course should equip the student to acquire in-depth knowledge in different physiotherapy assessment, measurement and therapeutic equipment used in management of different disorders affecting neurological system.

Course outcome: The student should be able to:

d. To perform a comprehensive and complete Physiotherapy assessment of various

neurologic patients.

2. To document systematic, meaningful, accurate written records of the patient.

3. To assess and eventually design individualized treatment strategies and measure outcome of intervention on measurement equipment for the neurologic patients.

BASIC CONCEPTS IN NEURO PHYSIOTHERAPY

Basic concepts of physiotherapy assessment and management in different stages of neurological disorders and trauma

ICF (International classification of function) model for injury, lesion and disease or disorders

Language of ICF model

Effects of therapeutic modalities in different stages of traumatic and non traumatic neurological condition

Recent advances in PT assessment and management of Neurological disorders and trauma.

Introduction to evidence based practice in Neurological rehabilitation.

BASIC CONCEPT OF PHYSIOTHERAPY ASSESSMENT IN Neurological disorders and trauma

Examination, Assessment, Evaluation, Functional assessment, Diagnosis, PT diagnosis

Prognosis, Intervention, Outcome measures, Reassessment

Gait analysis, posture and balance disorders in neurological conditions

Assessment in: Acute care, wards/ Rehab units, OPD and community

Physical impression or problem of list on the basis of ICF model.

POMR and SOAP Notes, Documentation

PAIN AND SENSORY MOTOR EXAMINATION

Review of anatomy and physiology of neurological system, Pain Physiology, Theories of pain, Pain pathways, Causes of clinical pain, Sensitization, Plasticity, Pain measurement. Role of biofeedback and pain management in nervous system disorders. Superficial sensation, Deep sensation Examination

Two Point discrimination, Proprioception, Graphesthesia, Stereognosis Examination

Dermatome, Muscle tone, Myotome, Superficial and deep reflexes Examination

DIAGNOSTIC PROCEDURE AND INTERPRETATION

Laboratory study, Imaging study

Electrodiagnosis

Diagnostic findings and correlation with physical findings

UNDERSTANDING MOTOR PERFORMANCE IN CHILDREN

1. The Child's Development of Functional Movement

2. Musculoskeletal Development and Adaptation

3. Developmental Coordination Disorder.

4. Physical Fitness during Childhood.

5. Clinical Decision making in pediatric physical therapy

6. Cerebral Palsy & Myelodysplasia

UNDERSTANDING MOTOR PERFORMANCE IN GERIATRICS

1. Health and wellness issues in Geriatrics.

2. Ageing with dignity and chronic impairments.

3. Intervention for depression and fear of fall.

4. Balance and Coordination training in Geriatrics.

5. Cognitive & perceptual dysfunctions and their impact on Geriatrics rehabilitation.

PHYSIOTHERAPY ASSESSMENT IN NEUROLOGICAL DISORDERS

1. Disorders of cerebral circulation

a. Stroke

2. Movement Disorders

a. Parkinson's Disease

b. Multiple system atrophy

c. Dystonia d. dysphagia

3. Disorders of cerebellum

a. Genetic

b. Acquired

4. Disorders of peripheral & cranial nerves

a. Demyelinating neuropathies

b. Diabetic neuropathies

c. Trigeminal neuralgia

d. Bell's and Facial palsy

e. other cranial nerves

5. Demyelinating disorders of central nervous system

a. Multiple sclerosis

6. Myelopathy

a. Traumatic myelopathy

b. Infections

7. Neuropathies

a. Motor neuron diseases

b. Amyotrophic lateral sclerosis

8. Degenerative disorders

a. Dementia

b. Alzheimer's disease

9. Disorders of Muscles

a. Adult onset genetic myopathies

b. Inflammatory

10. Infectious disorders

a. Bacterial

b. Viral

11. Nervous system malformation

a. Spina bifida

b. cranio vertebral junction anomalies

12. Traumatic brain injury

13. Vestibular disorders

MEASUREMENT INSTRUMENTS

Goniometer, Accelerometer, Photo optical devices, Pressure transducers and force plates, Gait analyzer, Sensory testing tools, Isokinetic device, EMG –Electro physiology of muscle contraction, Recording, Processing, Relationship between EMG and biomechanical variables, NCV, Coordination analyzer, Balance analyzer

OUTCOME MEASUREMENT SCALE:

VAS,NPRS,DASH,SPADI,OMAC,OSWARTH,NDI

Functional scale of upper limb and lower limb, Infant neural developmental scale, MOPS, Multiple sclerosis impact scale, Berg balance, Ashworth, Barthel index, Glasgow coma, MMS and other reliable and valid neurological scale, Scales used in Parkinsonism, Vertigo, Illingworth scale, MAS, HAAD, GPS.

Disability Evaluation. Disablement and Enablement Concepts for Physiotherapy Research and Practice, Traditional model, Consequences of disease model, NAGI model. International Classification of Impairments Disability and Handicap Model (ICIDH – 1), International Classification of Functioning, Disability and Health (ICF / ICIDH – 2), ICF Coding, History and development of the ICF, The ICF and the WHO family of international classifications, Components of the ICF, ICF coding, Benefits of Using ICF

PAPER 204 – ADVANCED PHYSIOTHERAPY IN NEUROLOGICAL CONDITIONS

Course Description: The course covers topics on various school of thoughts of neurological therapy techniques and physiotherapy intervention in various types of neurologic disease disorders. The course aims to provide a more functional and comprehensive approach based on manual therapy to manage a range of neurologicall conditions.

Course Objective: The course should enable the student to acquire in-depth understanding and skill in managing neurological conditions by using Neurological therapy and various type of physiotherapeutic techniques.

Course Outcome: The student should be able to compare & contrast the outcome of various neurological therapy approaches.

THEORETICAL FOUNDATIONS FOR CLINICAL PRACTICE

Foundations for Clinical Practice, Movement Development across the LifeSpan, The Limbic System: Influence over Motor Control and Learning, Psycho-social aspects of Adaptation and Adjustment during various phases of neurological Disability, Interventions for Neurological Disabilities, Documentation of Neurological conditions.

THEORETICAL FRAMEWORK:

Motor Control: Issues and Theories, Motor Learning and Recovery of Function, Physiology of Motor Control, Neuroplasticity: Physiological Basis of Motor Learning and Recovery of function, Constraints on Motor Control, A Conceptual Framework for Clinical Practice.

POSTURAL CONTROL:

Normal Postural Control, Development of Postural Control, Aging and Postural Control Abnormal Postural Control, Clinical Management of the Patient with a Postural Control Disorder

MOBILITY FUNCTION:

Control of Normal Mobility, A Life Span Perspective of Mobility (a) Development of locomotion (b) Locomotion in Older Adults, Abnormal Mobility, Clinical Management of the Patient with a Mobility Disorder.

REACH, GRASP, AND MANIPULATION: Normal Reach, Grasp, and Manipulation, Reach, Grasp, and Manipulation: Changes Across the Life Span a. Early development of reach grasp and manipulation b. Changes in older adults, Abnormal Reach, Grasp, and Manipulation, Clinical Management of the Patient With Reach, Grasp, and Manipulation Disorders

FUNDAMENTALS OF THERAPEUTIC APPROACHES

1. Proprioceptive Neuromuscular Facilitation (PNF)
2. Neurodevelopmental therapy (NDT)
3. Sensory integration Technique (SIT)
4. Motor Relearning Program (MRP)
5. Constraint Induced Movement Therapy (CIMT)
6. Roods approach
7. Vojta Therapy 8. Mental imagery technique
8. Neural mobilization
9. Sexual rehabilitation techniques in Neurological disorders and disability.

ASSISTIVE TECHNOLOGY IN NEUROLOGICAL POPULATION:

Body weight support treadmill training (BWST), Biofeedback, Assistive Technology in neurological population with special focus on 1. Spinal cord injury. 2. Motor Neuron diseases. 3. Muscular dystrophies. 4. Hemiplegia. 5. Traumatic brain injury

SPECIAL SETTINGS AND SPECIAL CONSIDERATIONS

1. Neurological and neurosurgical ICUs
2. Early Intervention Services
3. Assistive Technology
4. The Special Care Nursery

5. Neuro – Development of a child, Neurodevelopmental Screening

6. Hand assessment and rehabilitation: condition wise assessment tools for hand like jamar dynamometer, pinch dynamometer, monofilament, assessment of power grip and pinch grip. Assessment and management of hand conditions

ALTERNATIVE AND COMPLEMENTARY THERAPIES:

Beyond traditional approaches to intervention in neurological diseases, syndromes and disorders-Tai Chi, Cranio sacral therapy, Electroacupuncture, Biofeedback

PHYSIOTHERAPY MANAGEMENT OF THE FOLLOWING NEUROLOGICAL DISORDERS

1. Disorders of cerebral circulation

a. Stroke

2. Movement Disorders

a. Parkinson's Disease

b. Multiple system atrophy

c. Dystonia d. dysphagia

3. Disorders of cerebellum

a. Genetic

b. Acquired

4. Disorders of peripheral &cranial nerves

a. Demyelinating neuropathies

b. Diabetic neuropathies

c. Trigeminal neuralgia

d. Bell's and Facial palsy

e. other cranial nerves

5. Demyelinating disorders of central nervous system

a. Mutilpe sclerosis

6. Myelopathy

a. Traumatic myelopathy

b. Infections

7. Neuropathies

a. Motor neuron diseases

b. Amyotrophic lateral sclerosis

8. Degenerative disorders

a. Dementia

b. Alzheimer's disease

9. Disorders of Muscles

a. Adult onset genetic myopathies

b. Inflammatory

10. Infectious disorders

a. Bacterial

b. Viral

11. Nervous system malformation

a. Spina bifida

b. cranio vertebral junction anomalies

12. Traumatic brain injury

13. Vestibular disorders

PRACTICALS

PAPER 205P – NEURO BIOMECHANICS

This involves application of topics in PAPER 3 via demonstrations, field visits and case presentations.

PAPER 206P – NEURO PHYSIOTHERAPY ASSESSMENT AND EQUIPMENTS

Students will be instructed via demonstration, hands on assessment, field visits and case conference on specific techniques used in the assessment of patients with Neurological disorders and trauma. Students will draw on their experiences at the clinical postings to formulate a treatment plan for cases presented at the case conference

The demonstrations and practicals should be inline with the theory topics covered in Neuro PHYSIOTHERAPY ASSESSMENT AND EQUIPMENTs.

PAPER 207P – ADVANCE NEURO PHYSIOTHERAPY

Students will be instructed via demonstration, hands on techniques, field visits and case conferences on specific techniques used in the management of patients with Neurological disorders. Students will draw on their experiences at the clinical postings to formulate a treatment plan for cases presented at the case conference.

The demonstrations and practicals should be inline with the theory topics covered in Advanced Neuro Physiotherapy.

MPT 208 CLINICS & SEMINARS PRESENTATIONS

Students will engage in clinical practice in the Department of Neurology, Neurosurgery and Physiotherapy setting to enhance their clinical skills and apply theoretical knowledge gained during teaching sessions.
Seminars: These will serve as a platform for students to integrate components of patient management. Students will give presentations on topics provided to them.

Poster presentation of a research paper

MPT (NEURO)
SECOND YEAR

PAPER 601 PEDAGOGY OF PHYSIOTHERAPY EDUCATION

Course Description: The course covers topics related to physiotherapy ethicst and theory of teaching.

Course Objective: On completion of the course the student should be able to understand the dynamics of teaching & learning, plan effective teaching sessions in physiotherapy..

Course Outcome: The student should be able to demonstrate adequate knowledge and skill in physiotherapy Ethics and learn ways to effectively teaching.

Following are the topics to be included but not limited to:

1. Philosophy of educational and emerging issues in Education meaning, functions and aims of education.
    - Formal, informal and non- formal education.
    - Agencies of education
    - Current issues and trends in higher education
    - Issues of quality in higher education, autonomy and accountability, privatization, professional development of teachers, education of persons with disabilities.
    - Need for education philosophy
    - Some major philosophies, Idealism, Naturalism, Pragmatism and their implications for Education.
2. Concept of teaching and learning
    - Meaning scope of educational psychology
    - Meaning and relationship between teaching and learning
    - Learning theories
    - Dynamics of 47nalyzin
    - Individual differences
3. Curriculum
    - Meaning and concept
    - Basis of curriculum formulation development
    - Framing objectives for curriculum

    Process of curriculum development and factors affecting curriculum

    Development evaluation of curriculum
4. Method and techniques of teaching
    - Lecture, Demonstration
    - Discussion, Seminar, Assignment, Project and Case Study.
5. Planning for Teaching

- Bloom's Taxonomy of Instructional Objectives, Writing Instructional Objectives in Behavioural terms, Unit Planning and Lesson Planning.

6. Teaching Aids
   - Types of teaching aides
   - Principles of selection, preparation, and Use of Audio –Visual aids.
7. Measurement and evaluation
   - Nature of Educational Measurement : Meaning, Process, Types of tests.
   - Construction of an achievement test and analysis standardized test.
   - Introduction of some standardized tools, important tests of intelligence, Aptitude, Personality.
   - Continuous and Comprehensive Evaluation.
8. Guidance and Counseling
   - Meaning and Concepts of Guidance and Counseling
   - Principles
   - Guidance and Counseling services of students and faculty members
   - Faculty development and development of personnel for P.T. Services
9. Clinical Education
   - Awareness and Guidance to the Common people about Health and Diseases and Available professional Services
   - Patient Education
   - Education of the Practitioners

PAPER 602 MANAGEMENT, ADMINISTRATION AND ETHICAL ISSUES

Course Description: The course covers topics related to physiotherapy clinic and department

management.

Course Objective: On completion of the course the student should be able to understand, the basicissues of physiotherapy management & administration and practice as an informed professional on Legal & ethical issues.

Course Outcome: The student should be able to demonstrate adequate knowledge and skill in physiotherapy Ethics, clinic and department management.

MANAGEMENT

1. Functions of management,
2. Evaluation of management through scientific management theory,
   Classical theory

   System approach

   Contingency approach
3. Management process

Planning, Organization, direction, controlling (decision making)

4. Introduction to personnel management
   Staffing recruitment selection, performance appraisal, collective bargaining,

   discipline, job satisfaction.

e. Quantitative methods of management

   Relevance of statistical and/or techniques in management.

f. Marketing

   Market segmentation, marketing research production planning pricing, channels

   of distribution, promotion, consumer 49nalyzin, licenser.

1. Total quality management
   Basis of quality management – acid for quality control quality assurance program in hospitals, medical audit, and international quality system.

ADMINISTRATION

1. **Hospital as an organization** Functions and types of hospitals selected clinical supportive ancillary services of a hospital, emergency department, nursing, physical medicine & rehabilitation, clinical supportive and ancillary services of a hospital, emergency department nursing physical medicine & rehabilitation, clinical laboratory, pharmacy and dietary dept.
2. Roles of Physiotherapist, Physiotherapy Director, Physiotherapy supervisor, Physiotherapy assistant, Physiotherapy aide, Occupational Therapist, Home health side, Volunteer.
3. Directed care and referral relationship and confidentially.

LEGAL PROFESSIONAL ETHICAL ISSUES

1. Physical therapy: Definition and development
2. The implications & confirmation to the rules of professional conduct
3. Legal responsibility for their actions in the professional context and understanding the physiotherapist liability and obligations in the case of medical legal action.
4. Code of ethics A wider knowledge of ethics relating to current social and medical policy in the provisions of health care.
5. Functions of the relevant professional associations education body and trade union.
6. The role of the international health agencies such as the world health organizations.
7. Standards of practice for physical therapies.

8. Acts & Statutes relating to Physiotherapy.
9. Current issues

PAPER 603 – Exercise Physiology & Electrophysiology

Course description: This course aims to deliver scientifically based standards on exercise and its effects on various systems of the body. It prepares students through the process of selecting and administering therapeutic exercises and electrotherapeutic agents, using Guidelines to interpret results, and drafting an physiotherapy interventional prescription that is in line with Guidelines parameters.

Course Objective: this course should deliver the concepts in exercise physiology, electrophysiology and prepare students to test and prescribe suitable exercises and electrotherapeutic agents to different groups of the population and conditions.

Course Outcome: On completion of the study of this Course the student should be able to select and administer using Guidelines to interpret results, and drafting an therapeutic exercise and electrotherapeutic agents prescription to different populations and conditions.

Energy Transfer for Physical Activity:
a. Energy transfer in Body.
b. Energy transfer in exercise.
c. Energy expenditure during various activities.
d. Fatigue.
e. Biochemical responses to endurance training.

Cardio Vascular System and Exercise:
a. Athletes Heart.
b. Cardio Vascular adaptations to sustained aerobic exercises.
c. Lipids and sports, protection from coronary heart disease, exercise and optimization of lipid profile.
d. Sudden cardiac death in sports. Regulation of circulation during exercise. Exercise and vascular system-cardiovascular adaptation to sustained aerobic exercises, exercise and optimization of lipid profile, regulation of circulation during exercise

Exercise and nervous system – neural adaptation with exercises, cerebral perfusion and exercises, exercise for mood enhancement and anxiety.

Exercise and cell biology – effect of exercise on various cell activities, adaptation of organelles with exercise, exercise and aging-physiology changes of aging

Exercise and Respiratory System:
a. Second Wind.
b. Oxygen Debt.
c. Breath Holding, High Pressure Ventilation. Scuba Diving.

d. Regulation of Respiration during exercise.

Skeletal System:
a. Growth and Exercise.
b. Repair and adaptation during exercise. Delayed Onset Muscle Soreness (DOMS)
c. Exercise prescription for chronic low back pain
d. Training for Muscular Strength and Endurance.
e. Muscle fibre typing and significance.

Gastrointestinal Tract and Endocrine system:
a. Effect of Sports on GIT and Liver.
b. Hormone regulation of fluid and electrolytes during exercise.
c. Exercise and Menstrual Cycle.
d. Stress Hormones in Exercise.

Exercise and endocrine system-
Hormonal regulation of fluid and electrolytes during exercise and menstrual cycle, stress hormone in various activities, effect of exercise on various hormones in exercise, effect of exercise on GIT and liver, Opioids, Runners High. Exercise addiction.

Exercise and Common Pulmonary Conditions
a. Exercise induced bronchial obstruction
b. Exercise in chronic airway obstruction
c. Air pollution and exercise

Exercise and Cardiac Conditions
a. Exercise prescription for heart disease
b. Exercise in primary prevention in ischemic heart disease
c. Exercise for secondary prevention of ischemic heart disease
d. Exercise induced Asthma;
e. Exercise Stress Testing for Diagnosis of CHD.

Exercise testing: incremental shuttle walk test, endurance shuttle walk test, six minute walk test, Step test, treadmill tests.(i.e. Balke, Bruce, Noughton, Modified Bruce protocol), interval bike test, sub maximal GXT, symptom limited GXT, exercise testing using cycle ergometer, oxygen uptake (VO2)

Doping in Sports
a. Banned drugs
b. Procedure of dope testing
c. Control of doping abuse

Diabetes and Exercise
a. Exercise in diabetic patients
b. Exercise as a method of control of diabetes

Exercises for special categories
a. Child and adolescent athlete's problems
b. Special problems of older athletes
c. Special concerns for differently abled athletes

Female Specific Problems:
1. Sports Amenorrhoea.
2. Injury to female reproductive tract.
3. Menstrual Synchrony.
4. Sex determination.
5. Exercise and pregnancy.
6. Eating disorders in athletes.

Rheumatology & Geriatric Disorder:
1. Rheumatoid arthritis, SLE and Juvenile Rheumatoid Arthritis.
2. Ankylosing Spondylitis.
3. Osteoarthrosis and other geriatric conditions.
4. Cost and benefits of exercise prescription in Osteoporosis.

Temperature Regulation
a. Heat Balance.
b. Methods of Assessing Heat Balance.
c. Effects of Climate.
d. Effects of Exercise on Temperature Regulation.
e. Limit of Tolerance of Heat.
f. Acclimatisation.
g. Avoidance in Heat illness during exercise.
h. Exercises in the cold.

Physiological Basis and Principles of Training and Conditioning
a. Principles of endurance and strength training i. Recovery training intensities in heart rate ii. Manipulation of training principles iii. Training sub–phases
b. Fundamentals that aid training and performance i. Warm up and Cool down ii. Flexibility and stretching
iii. Missing workouts iv. Overtraining
g. Analysis of Training

Misc. Topics
High Altitude Training, Sports Diving, Hazards of underwater environment. Special Aids to Athletic Performance:– MORA, Oxygen Inhalation, Sleep.,Sex and performance. Assessment of Age. Muscle tissue fibre typing and its significance. Exercise for mood enhancement & anxiety.

Obesity and related problems
a. Dietary recommendation for healthy individuals.
b. Obesity – epidemiology, classification of causes, complications and treatment.

c. Paediatric obesity- Regulation of food consumption, complications and prevention.

Stress Management

h. Introduction i. The history and definition of "stress" ii. The characteristics of stressors iii. Clinical implications of stress iv. Coping with stress – styles of coping, recruiting resources for coping

b. Self management

c. Tools for stress management

Hazards of Smoking

a. The physiological, psychological and behavioral impact of cigarette smoking

b. Evidence based possibilities for treatment

c. Treatment for smoking cessation

Sleep Medicine

a. Acquaintance with basic concepts in sleep medicine, the structure and physiology of sleep

b. Classification of sleep disorders

c. Clinical implications of sleep disturbance

d. Physiotherapeutic measures for sleep deprivation

Yoga

a. Important Pranayamas and strengthening and rejuvenating asanas.

b. Methods, advantages and contraindications.

Nutrition & Dietetics

six nutrient classes a. carbohydrates, fats, proteins.b. Vitamins, minerals and water. Water & electrolyte balance

Body weight; body composition

- Body build, body size & body composition
- Assessing body composition
- Body composition & sport performance
- Weight standards
- Achieving optimal weight

3. Diet & fitness products
4. Exercise & diet programme to gain weight
   - Gaining body fat
   - gaining muscle mass

i. Guidelines for healthy diet

j. Optimal Nutrition for exercise. Nutrition for Physical Performance. Pre–Game meal, Carbohydrate loading. F. Alcohol, Mega Vitamin Therapy.g. Food for various

athletes of different disciplines.h. Fluid and energy replacement in prolonged exercise. i. AHA Dietary guidelines for Heart diseases

SECTION – II ELECTRO PHYSIOLOGY

Diagnostic Electrophysiology

10. Anatomy and Physiology of: Motor unit, action potential, excitability of nerve and
11. muscle, neuromuscular junction.
12. Technique of nerve conduction velocity and electromyography: Instrument, techniques, interpretations in terms of neuromuscular function and bio-feedback technique.
13. Nerve conduction studies, normal/abnormal nerve conduction, its relevance in muscle function.
14. Concepts of normal & abnormal EMG studies.
15. Late responses
16. Concepts of electro physiological studies in neuro muscular diseases as a diagnostic and therapeutic tool.
17. Electrical stimulation and its effects on various systems.
18. Evoked potentials – VEP, SSEP, MEP, BAEP

Therapeutic Electrophysiology

Physiological mechanism of action of electrotherapeutic modalities, Critical Analysis of Electrotherapeutic Modalities- IFT, TENS, MS, SWD, LASER, MWD, Pulsed SWD, Mechanical Traction etc.
Plasticity in response to Electrical stimulation.

Recent Advancement and Evidence based practice in Electrotherapy

Extracorporeal Shock Wave Therapy, tDCS, Long wave diathermy, Electro-Cupping and Vaccume, NMES, FES

Practicals:

The student will undergo laboratory and on–field training in Exercise physiology and Electrophysiology.

PAPER 604 – FUNCTIONAL REHABILITATION AND ERGONOMICS

Course Description: The course covers topics related to physiotherapy ergonomic and functional assessment used in managing, preventing different disorders. It also covers the

assessment and management of occupational and functional problems. It gives a brief

overview of lifestyle and occupational medicine.

Course Objective: The course should enable the student to acquire in-depth knowledge in different physiotherapy ergonomic and functional assessment used in

managing, preventing different disorders. It should equip the student to add the ergonomic advice and functional rehabilitation in physiotherapy prescription. It should provide the student with a brief overview of lifestyle and occupational medicine.

Course outcome: The student should be able to:

1. To perform a comprehensive and complete ergonomic and functional assessment in various disease disorders and dysfunction .

2. To document systematic, meaningful, accurate written records of the patient.

3. To assess and eventually design individualized treatment strategies for the disease disorders and dysfunction..

4. To develop an overview of the concept of Lifestyle medicine and Occupational medicine.

k. Introduction to Physiotherapy Assessment

- Purpose and need for Physiotherapy assessment
- Historical perspective
- Physiotherapy versus medical model of practice
- Various categories for movement dysfunction
- Preferred practice patterns in Physiotherapy.

- Today's health care model

II. Influence of Psychological Factors

- Psychological adaptation
- Personality and coping styles
- Common defense reactions to disability
- Anxiety
- Acute stress disorder and post traumatic stress disorder
- Depression
- Substance abuse
- Agitation and violence
- Hypersexuality
- Psychosocial wellness
- Wellness in rehabilitation
- Integrating psychosocial factors into rehabilitation
- Suggestions for rehabilitative interventions

III. Influence of Values on Patient Care; Foundation for Physiotherapy assessment

- Process of assessment
- Values and valuing
  - Code of ethics

- The values of patient as a factor in care
- The influence of the values on the primary goal of patient care
- Value – Laden situation in rehabilitation

IV. Examination of Functional Status and Activity Level

- A conceptual framework
- Examination of function
- Response formats
- Interpreting test results
- Selected instruments assessing physical function
- Multidimensional functional assessment instruments

V. Examination of Environment

- Purpose
- Examination strategies
- Patient – Home environment relationship: Overview of access, usability and safety
- Adaptive equipment
- Assistive technology
- Examination of the workplace
- Community access
- Documentation
- Funding for environmental modifications
- Legislation

VI. Guideline for Physiotherapy Documentation

- Introduction
- Documenting the examination
- Documenting the evaluation
- Documenting the plan of care
- Application of documentation skills

PAPER 605 – RESEARCH METHODOLOGY, BIOSTATISTICS & EVIDENCE BASED PRACTICE

Course Description: The course covers the concept of research methodology, Evidence based practice and biostatistics related to physical therapy

Course Objective: The course aims to introduce the principles of research, methods of research and 56nalyzing the research studies using Biostatistics.

Course Outcome: On completion of the study of this Course the student should be able to understand the methods of research process and design so as to effectively plan a research.
To understand the statistical measures used in the analysis and interpretation of research data.
To acquire skills of critically reviewing the literature.

RESEARCH METHODOLOGY

SECTION – 1

Research in physiotherapy

a. Introduction
b. Research for Physiotherapist: Why? How? When?
c. Research – Definition, concept, purpose, approaches
d. Internet sites for Physiotherapists.

Research fundamentals

a. Define measurement
b. Measurement framework
c. Scales of measurement
d. Pilot Study
e. Types of variables
f. Reliability & Validity
g. Drawing Tables, Graphs, Master chart

Writing a research proposal

a. Defining a problem
b. Review of Literature
c. Formulating a question, Operational Definition
d. Inclusion & Exclusion criteria
e. Methodology- Forming groups Data collection & method for analysis
f. Informed Consent Steps of documentation – Title to Scope of study

Research ethics

a. Importance of Ethics in Research
b. Main ethical issues in human subjects" research
c. Main ethical principles that govern research with human subjects
d. Components of an ethically valid informed consent for research.

Overview of study designs

l. Observational ,Descriptive-Case study/ series, Cross sectional, Normative, Correlational ii. Analytical; case control, cohort
m. Experimental- True & quasi experimental

Sampling

a. Random and non-random sampling.
b. Various methods of sampling – simple random, stratified,systematic, cluster and multistage. Sampling and non-sampling errors and methods of minimizing these errors.

Plagiarism

Definition of Plagiarism, types, Avoiding plagiarism , software methods to detect plagiarism.

Evidence Based Practice

1. Introduction to evidence– based complementary medicine
2. Evidence–based health care
3.Evidence–based practices 4. Evidence–based decision making and management

Types of evidence:

a. Definition of evidence
b. Forms of evidence : Case–control studies
c. Cohort studies
d. Randomized controlled trials
e. Systematic Reviews.

Importance of Hierarchy of Evidence

Key element of scientific writing.

Structure, formulation and implementation of thesis, Structure, formulation and implementation of original research report ,Structure, formulation and implementation of systematic review/meta –analysis, How to read and critique research,Review of an indexed refereed research paper, - Evaluating paper scientific merit, Providing constructive feedback to the author, typical review formats for reviewing a paper ,Reasons for rejection

Presenting Research: Writing and submitting papers

(a) Strategies of paper writing
(b) Design of paper writing
I Tactics of paper writing – Where to publish

SECTION – II BIOSTATISTICS

Introduction

Descriptive and Inferential statistics
Types of data: Qualitative and Quantitative, Parametric and Non- Parametric tests
Which tests to use.

Tests of significance

e. Basics of testing of hypothesis – Null and alternate hypothesis, type I and type II errors, level of significance and power of the test, p value.
f. Tests of significance (parametric) – t – test (paired and unpaired), Chi square test and test of proportion, one way analysis of variance.
g. Repeated measures analysis of variance.
h. Tests of significance (non-parametric)-Mann-Whitney u test, Wilcoxon test, e. Kruskal-Wallis analysis of variance. Friedman"s analysis of variance.

Correlation and regression

Simple correlation – Pearson"s and Spearman"s; testing the significance of correlation coefficient, linear and multiple regressions. Interpretation of r.

Basic probability distributions and sampling Distributions

a. Concept of probability and probability distribution.

b. Normal, Poisson and Binomial distributions, parameters and application.
c. Concept of sampling distributions.
d. Standard error and confidence intervals.
e. Skewness and Kurtosis

Graphical Presentation
Frequency distributions, Describing data with Graphs, Describing data with Averages Mode Median Mean, Describing variability Variance, Standard deviation, etc. Normal Distributions

Role of Computers in Research
Basic of computers – Hardware and Software
Basic of Computer Applications – Windows, MS word, Power Point, etc.
Simple statistical Analysis using SPSS software.
Tabulation, Calculation of central tendency and dispersion, Using software packages, Analysis, Presentation of data in diagrammatic & Graphic form
Artificial Intelligence and its application in physiotherapy
Robotics and its application in physiotherapy
Information technology and its application in physiotherapy

PRACTICALS

PAPER 606P EXERCISE PHYSIOLOGY & ELECTROPHYSIOLOGY

The demonstrations and practicals should be inline with the theory topics covered in Exercise physiology and electrophysiology

PAPER 607P - DISSERTATION

As part of the requirement for the Master's degree the student is required to undertake a research study under the guidance of a guide. Oral Presentations at Conferences/Seminars – Preparing presentation,- Duration of presentation,- What to present. Students must publish/present at least one research paper at a National Level Conference/ International Level Journal.

PAPER 608 – CLINICS & SEMINARS PRESENTATIONS

These will serve as a platform for students to integrate various components of patient management. Students will give presentations on topics provided to them.

Students will engage in the clinical Neurology, Neurosurgery and Physiotherapy Department to enhance their clinical skills and apply theoretical knowledge gained during teaching sessions.

Neurology		
S.N	Author	Title
1	Adler S.S	PNF in Practice an Illustrated
2	Campbell,M	Rehabilitation for Traumatic Brain Injury
3	Bobath,Berta	Adult Hemiplegia
4	Burns,Yvonne	Physiotherapy and the Growing Child
5	Campbell,WW	Dejongs the Neurologic Examination
6	Shumway,Anne	Motrol Control Translating Research into Clinical Practice
7	Downie,P.A	Cash's text book of Neurology for physiotherapists
8	Levitt	Treatment of Cerebral,Palsy and Motor delay
9	Raj,G.S	Physiotherapy in Neuro-Conditions
10	Herdman, S.J	Vestibular, Rehabilitation
11	Snell, Richards	Clinical Neuroanatomy for Medical Students
12	Webers,David O	Hand book of stroke
13	Jain, Shalu	Text book of Neuro Physiotherapy
14	Harvey, Lisa	Management of Spinal Cord Injuries: A Guide for Physiotherapists
15	Kliegman,R.M	Nelson Essential of Pediatrics
16	Mardsen,CD	Movement disorders vol-3
17	Pitt-Brooke	Rehabilitation of movement
18	Misra U.K	Clinical Neurophysiology
19	Bromley, Ida	Tetraplkegia and Paraplegia: A Guide for Physiotherapists

20	Cole,Beverley	Physical Rehabilitation outcome measure
21	Pierson,F.M	Principles andTechiniques of Practice
22	Davies,P.M	Right in the Middle
23	Mehrotra,T.N	Parkinson's Disease and Movement Disorders
24	Patten,John	Neurological Differential Diagnosis
25	Taly,A.B	Neurorehabilitation Principes & Practice
26	Weiss,Susan	Hand Rehabilitation
27	Bertoti,D.B	Functional Neurorehabilitation
28	Umphrea,D.A	Neurological Rehabilitation
29	Carr, J	Neurological Rehabilitation
30	Edwards,Susan	Neurological physiotherapy
31	Cooper, RA	Whellchair Selection & Configuration
32	Mardsen,CD	Movement disorders vol-1&2
33	Potturi GS	Physiotherapy in Neurological Conditions

Electrotheraphy

S.N	Author	Title
1	Khandpur, R.S	Hand book of Biomedical Instrumentation
2	Glaser,Roland	Biophysics
3	Prentice William	Therapeutic Modalities in Rehabilitation
4	Robinson,A.J	Clinical Electrophysiology
5	Gersh,M.R	Electrotherapy in Rehabilitation
6	Robertson Val	Electrotherapy Explained principle and practice

7	Nelson ,Roger M	Clinical Electrotherapy
8	Kimura, Jun	Electrodiagnosis in Diseases of Nerve & Muscle: Principles & Practice
9	Stokes, Maria	Physical Management in Neurological Rehabilitation
10	Michlovitz,S.L	Modalities for Therapeutic Intervention

Biomechanics

S.N	Author	Title
1	Ackland Timolthy	Applied Anatomy and Biomechanics in Sports
2	Bell,Frank	Principles of Mechanics & Biomechanics
3	Raj Kumar,R.V	Biomechanics the Nucleus of Physiotherapy
4	Koley,S	Textbook of Biomechanics
5	Nordin, Margareta	Basic Biomechanics of the Musculoskeletal system
6	Griffith's IW	Principles of Biomechanics & Motion Analysis
7	Hall,Susan J	Basic Biomechanics
8	Smith, Laura K.	Brunnstrom's Clinical Kinesiology
9	Oatis,C.A	Kinesiology
10	Kapandji, I.A	The Physiology of The Joint Vol-1
11	Kapandji, I.A	The Physiology of The Joint Vol-2
12	Kapandji, I.A	The Physiology of The Joint Vol-3
13	Norkin C.C	Joint Structure and Function
14	Dvir,Zeevi	Isokinetics Muscle testing interpretation and clinical application
15	Mow,V.C	Basic Orthopaedic Biomechanics

Research Methodology & Biostatistics		
S.N	Author	Title
1	Kothari, C.R.	Research Methodology Methods and Techniques
2	Singh, Sunita	Synopsis of Biostatistics
3	Prasad,S	Elements of Biostatistics
4	Pitney W.A	Qualitative Research in Physical Activity
5	Jewell,D.V	Guide to Evidence Based Physical Therapists Practice
6	Herbert,Rob	Practical Evidence Based Physiotherapy
7	Bhandri,Mohit	Clinical Research made Easy
8	Verma, B.L	Biostatistics
9	Campbell,M.J	Medical statistics

Exercise Physiology & Electrophysiology		
S.N	Author	Title
1	Koley,S	Textbook of Kinanthropometry
2	Nix, Staci	Williams' Basic Nutrition and Diet Therapy
3	Karageorghis C.I	Inside Sports Physiology
4	Sivaram,C	Principles of Exercise in Physiotherapy
5	American College of sports Medicine	ACSM'S Resource Manual for Guidenes for exercise testing
6	Mcardle W.D	Exercise Physiology
7	Woods,Ron	Energy Every Day
8	Skinner,J.S	Exercise Testing & Exercise Prescription For Special Cases
9	Wasserman, Karlman	Principles of Exercise Testing & Interpretation
10	Robinson,A.J	Clinical Electrophysiology
11	Kimura, Jun	Electrodiagnosis in Diseases of Nerve & Muscle: Principles & Practice

Syllabus

For

Master of Physiotherapy (CARDIOPULMONARY)

Atal Bihari Vajpayee Medical University Lucknow, U.P., India
From session 2021-2022

MPT (CARDIO)

FIRST YEAR

Paper Code	Title	Total Hours	Hours / week	Credits	IA Marks	UE Marks	Total Marks
MPT 301	Basic science and Cardio Pulmonary disorders	100	4	8	25	75	100
MPT302	Cardio Thoracic Bio-mechanics	100	4	8	25	75	100
MPT303	Cardio Physiotherapy Assessment and Equipments	50	2	4	25	75	100
MPT304	Advance Cardio Physiotherapy	100	4	8	25	75	100
MPT305	*Practical- I* Cardio Thoracic Bio-mechanics	80	3	6	25	75	100
MPT 306P	Practical – II – Cardio Physiotherapy Assessment and Equipments	50	2	2	25	75	100
MPT 307 P	Practical – III- Advance Cardio Physiotherapy	100	4	4	25	75	100
Total		**580**	**23**	**40**	**175**	**525**	**700**
MPT 108	Clinics & Seminars Presentations	500	12	12	50	50	100
		1080	**37**	**52**	**225**	**575**	**800**

- IA= INTERNAL ASSESSMENT
- UE=University Examination

SECOND Year

Paper Code	Title	Total Hours	Hours / week	Credits	IA Marks	UE Marks	Total Marks
MPT601	Pedagogy in physiotherapy Education	80	3	6	25	75	100
MPT602	Management, Administration and Ethical Issues	80	3	6	25	75	100
MPT603	Exercise Physiology & Electrophysiology	50	2	4	25	75	100
MPT604	*Functional Rehabilitation & Ergonomics*	80	3	6	25	75	100
MPT605	Research Methodology, Biostatistics & Evidence Based Practice	100	4	8	25	75	100
MPT 606P	Practical I-Exercise Physiology and ElectroPhysiology	50	2	2	25	75	100
MPT 607P	*Practical- II* Dissertation	200	12	12	25	75	100
Total		**640**	**29**	**44**	**175**	**525**	**700**
MPT608	Clinics & Seminars Presentations	500	12	12	50	50	100
Grand Total		**1140**	**41**	**56**	**225**	**575**	**800**

- IA= INTERNAL ASSESSMENT
- UE=University Examination

PAPER 301 BASIC MEDICAL SCIENCE AND CARDIO PULMONARY DISORDERS

Course Description: The course covers topics related to basic science and epidemiology, patho-mechanics, clinical manifestation, conservative and surgical management of cardiopulmonary diseases,disorders & trauma.

Course Objective: The course should enable the student to develop a detailed concept about different cardiopulmonary diseases & disorders and its medical and surgical management.

Course Outcome: The Students will be able to use this information in planning and tailoring effective, specific, safe Physiotherapy treatment programmes.

ANATOMY

1. Coronary Circulation 2. Structure of the Myocardium 3. Nerve Supply of the Heart. 4. Anatomy of the Upper and Lower Respiratory Tract 5. Bronchopulmonary Segments. 6. Major arteries and Veins. 7.Lymphatic system. 8.Pulmonary circulation 9.Systemic circulation. 10. Hepatic circulation. 11. Muscles of Respiration. 12. Thoracic cage.

PHYSIOLOGY

1. Cardiac Physiology and Circulation a) Physiology of Cardiac Muscle b) Cardiac Cycle c) Rhythmic Excitation of the Heart d) Blood Pressure e) Heart Sounds f) Mechanism of regulation of blood pressure and factors affecting. g) Hematology h) Endocrine Physiology

2. Respiration a) Pulmonary Volumes and Capacities b) Principles of Gas Exchange c) Regulation of respiration d) Mechanisms of Respiration

3. Body Fluids and Kidney a) Oedema b) Capillary Dynamics

PATHOLOGY

1. CVS-Diseases of CVS
2. Hematological System

a) Blood transfusion
b) PVD

3. Respiratory System

a) Restrictive Lung Disease
b) Obstructive Lung disease
c) Environmental and Occupational Disease

PHARMACOLOGY

1. Anti-Anaemic 3. Anti-Coagulants 4. Thrombolytic Agents 5. CV Drugs 6. Drugs Used in Respiratory diseases.

RADIOLOGY

Basics of Imaging Techniques in Cardiopulmonary conditions

1.Ultrasonography 2. X-rays 3. CT Scan

4. MRI scanning 5. Bone Scan 6. Dexa Scan 7. 2-D Echocardiography 8. 12 Lead ECG 9. TMT 10. Angiogram.11. ESR 12. CBP 13. Plethysmography.

CARDIOVASCULAR DISORDERS

- Coronary Artery Disease: Acute Coronary Syndromes, Angina Pectoris, Coronary artery vasospasm, Myocardial Infarction, complications of Myocardial infarction
- Hypertensive heart disease
- Cardiac arrest
- Myocardial disease and cardiomyopathies: cardiac cirrhosis, cardiogenic shock, cardiomyopathy(Alcoholic,cocaine,dilated,hypertrophic,peripartum,restrictive),cor pulmonale, heart failure, myocarditis
- Pericardial disease: cardiac tamponade pericardial effusion, pericarditis (Acute, constrictive, constrictive-effusive)
- Rheumatic heart disease
- Infective endocarditis
- Valvular Heart disease: Aortic Regurgitation, Aortic stenosis, mitral stenosis, mitral valve prolapse, pulmonic regurgitation, pulmonic stenosis, tricuspid atresia, tricuspid regurgitation, tricuspid stenosis.
- Congenital Heart disease: Aortic Coarctation, Atrial septal defect, Ebstein anomaly, eisenmenger syndrome, patent ductus arteriosus, patent foramen ovale, tetralogy of fallot, ventricular septal defect
- Peripheral vascular disease: Aortic dissection, aortitis, deep vein thrombosis, subclavian artery thrombosis, subclavian vein thrombosis, varicose veins, thrombophlebitis, Raynaud's phenomenon, chronic venous insufficiency, buerger's disease (thromboangiitis obliterans),atherosclerosis, thoracic aortic aneurysm
- Heart disease in pregnancy (a) Pre existing cardiovascular conditions-congenital heart disease-Atrial septal defect (ASD) and ventricular septal defects (VSD) and patent ductus arteriosus (PDA), valve disease, arrhythmias, aortic disease (b) cardiovascular diseases that may develop during pregnancy, peripartum cardiomyopathy, hypertension, heart murmur.
- Cardiac tumors

Pulmonary disorders

- Obstructive lung disease: chronic bronchitis, emphysema, asthma, bronchiectasis, bronchiolitis, chronic obstructive pulmonary disease
- Neuromuscular and skeletal disorders leading to global hypoventilation
- Infectious conditions of the lungs: Tuberculosis (TB), severe acute respiratory syndrome (SARS), lung abscess, pneumonia (bacterial, fungal, viral), upper respiratory tract infection, ventilator-associated pneumonia
- Interstitial and infiltrative pulmonary disease: Sarcoidosis, pulmonary fibrosis, silicosis, berylliosis, hypersensitivity pneumonitis-reaction from inhaling animal proteins; interstitial lung fibrosis
- Occupational lung disease: asbestosis, chemical worker's lung, coal worker's pneumoconiosis, farmer's lung, silicosis, silo filler's disease, tobacco worker's lung
- Pulmonary hypertension (primary, secondary)
- Diseases of pleura: empyema, pleural effusion, pneumothorax, pleurisy (pleural inflammation)
- Atelectasis
- Respiratory failure (types I and II)
- Pulmonary embolism
- Pulmonary tumors

Diseases of newborns and children

- Risk factors for the neonate: related to the mother, related to the mother, related to pregnancy, related to labor and delivery
- Transient tachypnea of the newborn
- Acute respiratory distress syndrome
- Bronchopulmonary dysplasia
- Sudden infant death syndrome
- Neuromuscular diseases

- Assessment of the neonates and children: vital signs, physical assessment, complete blood counts, electrolytes, arterial blood gases, transcutaneous blood gases, chest x-rays and transillumination, APGAR scoring, new Ballard Scoring, Silverman scoring, pneumographs, pulmonary functions

Cardiovascular surgeries- pre and post operative assessment and management.

- Haemodynamic performance of CTVS patients
- AV shunts
- Procedures on sternum, chest wall, diaphragm, mediastinum, esophagus
- Cardiopulmonary bypass
- CTVS procedures: Outline & definition of procedures, differences in open & close heart surgery, recent advance like MIDCAB, OPCAB, heart port
- Incisions
- Extracorporeal circulation techniques
- Cardiopulmonary bypass & OPCAB
- Vascular surgeries (Aortic dissection, subclavian artery thrombosis, subclavian vein thrombosis, thoracic aortic aneurysm)
- Emergencies in CTVS
- Trauma- blunt chest trauma, esophageal rupture, hemothorax, penetrating chest trauma, pneumothorax, ventricular assist devices
- Heart transplant
- Complications of cardiac surgery (thrombo-embolism in brain, lungs, and distal vessels, phrenic nerve injuries, unstable sternum & implication of procedures like omentoplasty etc)
- Lung surgeries (Wedge Resection, lobectomy, pneumonectomy, video-assisted thoracic surgery)
- Sleep apnoea

PAPER 302 CARDIO THORACIC BIOMECHANICS

Course Description: the course covers the understanding of Cardiac Biomechanics and kinesiology of body movement.

Course Objective: the course should enable the student to acquire in depth knowledge in understanding biomechanics and kinesiology.

Course Outcome: On completion of the study of this Course the student should be able to identify and apply the principles of biomechanics and kinesiology in understanding the normal functioning of the human body. To identify and apply the principles of biomechanics in understanding pathomechanics of various conditions. To use these principles in managing various clinical conditions.

Cardio respiratory anatomy & physiology

(a) Anatomy, physiology, biomechanics, pathomechanics & applied anatomy related to Cardiovascular & Pulmonary System

- Development of the Cardio Vascular, Pulmonary systems and deviations from the normal development. Age related changes in Cardiovascular & Pulmonary System
- Physiology of microvascular circulation and edema
- Body positioning and various systemic changes.
- Normal and abnormal responses of Cardiovascular & Pulmonary System during exercise
- **Applied cardiac anatomy**: Anatomy of the heart, pericardium, conducting systems.
- **Applied cardiac physiology**: Cardiac cycle, Nervous control of the heart, Cardiac rhythm, haemodynamics, blood pressure.
- **Applied respiratory anatomy**: Anatomy of upper and lower airways, lungs, pleura, surface marking of the lungs, broncho pulmonary segments, muscles of respiration and their Nerve control.
- **Applied respiratory physiology**: Cough reflex, nervous and chemical control of respiration, lungs and capacities, neonatal and pediatric cardio respiratory anatomy and physiology. Basic vitals and their significance. Difference between adult and pediatric cardiopulmonary system. Respiratory muscle physiology, fatigue and training

- Surface anatomy of cardiovascular and pulmonary system

(b) Biomechanics in Cardiorespiratory physiology

Cardiac mechanics-

- **Energetic of muscle:** Chemical energy for muscle contraction, generation of chemical energy for muscle contraction, muscle efficiency, glycolysis and oxidative metabolism, fenn's effect, heat liberation of active muscle, the hill equation.

- **Structure of heart:** Contractile proteins and cytoskeleton, properties of cardiac muscles, mechanism and Control of cardiac contractile process, length-tension relationship and force-velocity relationship.

- **Work of heart:** Cardiac cycle, Internal and external work of the heart, cardiac ion channels, Cardiac action potential, conduction system of the heart, myocardial contractility and lusitrophy, determinants of ejection and filling, neurohumoral response of the heart and haemodynamic defense reaction.

- **Flow Mechanics:**
  Various parameters explaining the flow and fluid mechanics , Various laws governing the flow of fluids, the volume of fluids, the pressure of fluids, energy of fluids,
- **Clinical application of Fluid Mechanics** : Vascular Biomechanics , Haemodynamics: Velocity of blood stream, relationship between velocity and pressure, relationship between pressure and flow, resistance to flow, laminar and turbulent flow, shear stress on vessel wall, dispensability of blood vessels, determinants of mean arterial pressure, rheological properties of blood, coronary circulation.
- **Mechanics of Lymph circulation**: Flow of Lymph, Channels, Pressure in Lymphatic vessels, Effect of manual lymph drainage.

- **Pulmonary mechanics-**

- **Thoracic Cage:** Kinematics and kinetics of thoracic cage, pressure and volume relationship of lung and thoracic cage, compliance-static and dynamic, principles of measurement of lung volumes and compliance.

- **Mechanics of Postural Drainage-** Mechanics of postural drainiage from each lobe of the lung.

- **Airways Resistance:** Tissue resistance, flow resistance, factors determining airways resistance, measurements of airway resistance, dynamic compression of airways, closing volumes.

Pulmonary circulation: Pulmonary blood volume, pulmonary blood flow, pulmonary vascular pressure, pulmonary vascular resistance, principles of measurements of pulmonary circulation, diffusion of oxygen, carbon dioxide and inert gases, alvelocapillary permability, oxygen kinetics.

PAPER 303 CARDIO PHYSIOTHERAPY ASSESSMENT AND EQUIPMENTS

Course Description: The course covers topics related to cardiopulmonary physiotherapy assessment, diagnostic procedure interpretation,measurement and therapeutic equipments use in managing different disorders affecting cardiopulmonary systems.

Course Objective: The course should equip the student to acquire in-depth knowledge in different physiotherapy assessment,measurement and therapeutic equipment used in management of different disorders affecting the cardiopulmonary system.

Course outcome: The student should be able to:

1. To perform a comprehensive and complete Physiotherapy assessment of various

cardiopulmonary patients.

2. To document systematic, meaningful, accurate written records of the patient.

3. To assess and eventually design individualized treatment strategies and measure outcome of intervention on measurement equipment for the cardiopulmonary patients.

BASIC CONCEPT OF PHYSIOTHERAPY ASSESSMENT IN CARDIOPULMONARY

Examination,Assessment,Evaluation,Functional assessment,Diagnosis,PT diagnosis

Prognosis,Intervention,Outcome measures, Reassessment

Physical impression or problem of list on the basis of ICF model.

POMR and SOAP Notes,Documentation

ASSESSMENT OF PULMONARY SYSTEM AND DISEASES

1. History taking

a. General appearance of the patient

b. Physical examination of chest

c. Topographical and anatomical landmarks

d. Visual inspection

e. Analysis of chest shape and dimensions

f. Posture or preferred positioning

g. Breathing pattern

h. Chest mobility

i. Tracheal deviation

2. Inspection- Chest wall deformities, respiratory pattern, cyanosis, clubbing, palpation

a. Chest wall pain

b. Mediastinal shift

c. Mediated percussion

d. Auscultation of breath sounds

e. Cough and cough production

3. Assessment of functional status:

a. Generic questionnaires

b. Disease specific questionnaires

c. Performance-based tests

ASSESSMENT OF CARDIAC SYSTEM AND DISEASES

1. Determination of chief complaint
2. Review of patient history
3. Physical examination
4. Observation
5. Inspection and palpation
6. Auscultation of the heart: heart sounds, normal & abnormal
7. Assessment of Fatigability
8. Laboratory investigations
9. Physiological tests

ASSESSMENT OF PATIENTS WITH CARDIOTHORACIC SURGERIES

1. Chief complaints
2. History taking
3. Associated comorbidities
4. Investigation

a. Chest x-ray

b. ECG: Lead placement, tracing, recording, interpretation of normal & abnormal stress testing.

c. Electrocardiography

d. Auscultation

5. Operative procedure

a. Incision line

b. Type of surgery

c. Any special event

d. Medication

6. ADL + Functional evaluation in cardiac patients
7. Exercise testing

a) Low level/submaximal/maximal.

b) Procedure of testing, Contraindications & precautions in adults and Paediatrics

c) Exercise testing and prescription, METS in stress testing.

ASSESSMENT OF PERIPHERAL VASCULAR DISEASES

1. Personal information from patient
2. Duration of onset of problem
3. Medical/ social history
4. Medications
5. Allergic history
6. Cursive assessment

a) Pain assessment

b) Wound history

7. Other objective tests

a) Temperature

b) Girth

c) Volumetric

d) Pulse

e) Bruits

f) Percussion test

g) Trendelenburg test

h) Cuff test

i) Doppler index

j) Rubor of dependency

k) Venous filling time

l) Claudication time

m) Semmes-Weinstein monofilament testing

n) Other findings

THERAPEUTIC PRINCIPLES AND PRACTICE IN

PULMONARY REHABILITATION

1. Oxygen therapy

2. Humidity and aerosol therapy including drug inhalation

3. Assessment of pulmonary function test

4. Functional performance assessment

5. Exercise testing: incremental shuttle walk test, endurance shuttle walk test, six minute walk test, Step test, treadmill tests.(i.e. Balke, Bruce, Noughton, Modified Bruce protocol), interval bike test, sub maximal GXT, symptom limited GXT, exercise testing using cycle ergometer, oxygen uptake (VO2)

Measurement Scale: Scales used in pulmonary rehabilitation: Becks Depression Inventory (BDI) and Hamilton Anxiety Scale (HAS);mni- mental state examination, SGRQ,CRQ,SF 36,CAT,Activities-specific balance scale (ABC) etc.

PULMONARY REHABILITATION

1. Overview of pulmonary rehabilitation
2. Assessment of the pulmonary rehabilitation patient
3. Outcome measures in pulmonary rehabilitation
4. Patient education and skill training
5. Exercise assessment and training
6. Disease-specific approaches in pulmonary rehabilitation
7. Program management

1. DIAGNOSTIC

- Auscultations of breath and heart sounds
- Percussion
- Hematology and biochemistry
- Arterial blood gas analysis
- Bronchoscopy
- Invasive and non-invasive techniques
- Pulmonary function testing.
- Electrocardiography
- Echocardiography
- Cardiac catheterization
- Radio nuclide scanning
- Ventilation perfusion scan
- Ultrasound
- Pressure monitoring-CVP
- Standardized evaluation scales relevant to cardiopulmonary conditions-dyspnea assessment scale, quality of life assessment
- Spirometry
- Respiratory Therapy Equipment and Adjuncts to Cardiopulmonary Therapy
- Haemodynamic Monitoring
- Intra arterial line.
- Pulmonary artery balloon floatation catheters.
- Measurement of CVP.
- Intra aortic balloon counter pulsation device.
- Measurement of ICP.
- Ankle Brachial Index
- Imaging-plain X-Ray, Computed tomography, magnetic resonance imaging, doppler test

THERAPEUTIC INSTRUMENTS

1. Chest tube drainage and fluid collection system.
2. Ventilator
   - Mode of ventilator.
   - Type of ventilator.
   - Physiological principle of ventilator.
   - Weaning from the ventilator.
3. Care of Artificial Airway.
4. PEEP.
5. BiPAP
6. CPAP
7. Oxygen Therapy.
   - High flow system.
   - Low flow system
   - Complication of oxygen therapy.
   - Hyperbaric oxygen therapy
8. Endotracheal tube.
9. Cuff Inflation pressure.
10. Suctioning-Indication, Contraindication, complication
11. Suction catheters.
12. Suction pressure.
13. Flutter.
14. Mechanical chest vibrator.
15. Peak flow meter
16. Humidification.
    - Types of humidifier.
17. Nebulizer.

PAPER 304 ADVANCED CARDIO PHYSIOTHERAPY MANAGEMENT

Course Description:

The course covers topics on various cardiopulmonary techniques and physiotherapy intervention in various types of orthopaedic disease disorders. The course aims to provide a more functional and comprehensive approach based on cardiopulmonary advance technique to manage a range of cardiopulmonary conditions.

Course Objective: The course should enable the student to acquire in-depth understanding and skill in managing cardiopulmonary conditions by using cardiopulmonary advance techniques.

Course Outcome: The student should be able to compare & contrast the outcome of various cardiopulmonary therapy approaches

Physiotherapeutic principle and techniques in intensive care

1. Extracorporeal membrane oxygenation (ECMO)
2. Mobilization of critically ill patients

3. Intensive care unit-acquired weakness (ICUAW)
4. Continuous rotational therapy
5. Management of Airway Secretions Mechanically ventilated patients in the ICU
6. Intrapulmonary percussive ventilation (IPV)
7. Positive expiratory pressure (PEP)
8. Manual hyperinflation (MHI)
9. Ventilator hyperinflation (VHI)
10. Insufflation-exsufflation
11. Neurophysiological stimulation of Respiration(NPF)
12. PNF in Respiration.

Intensive care for critically ill patients

1. Assessment of critically ill patient: introduction, medical and chart interview with patients and family, physical examination, neurological system; cardiovascular system; respiratory system; renal system; haematological/ immunological system; gastrointestinal system; musculoskeletal system
2. Treatment of acute respiratory conditions: airway clearance techniques; weaning from mechanical ventilation; positioning; breathing exercises; patient education; paediatric consideration.
3. Non-invasive ventilation: berating sleep and respiratory failure; indication for non invasive ventilation; practical issues in the application of non invasive ventilation; non-invasive ventilation in children
4. Physiotherapy intervention during non-invasive ventilation
5. Implication for physiotherapy in mechanically ventilated patients: intubation weaning
6. Musculoskeletal problems
7. Patient groups with specific needs: e.g. systemic inflammatory syndrome, sepsis, ARDS, inhalation burn, trauma, neurological conditions requiring intensive care
8. Physiotherapy techniques used in intensive care: gravity assisted, manual or mechanical hyperinflation, suctioning of intubated patients, manual techniques, intermittent positive pressure berating, periodic continuous positive pressure ventilation
9. Defibrillators & Cardiopulmonary resuscitations

Cardiovascular physio and Rehab

I. Overview: major manifestations of heart disease & cardiac rehabilitation
- Coronary heart disease
- Valvular heart disease
- Peripheral vascular disease
- Definition of cardiac rehabilitation
- Phases of cardiac rehabilitation
- Outcome measures in cardiac rehabilitation

II. Development, intervention, and prevention of coronary artery disease.
- Efficacy of Secondary Prevention and Risk Factor Reduction
- Psychosocial Issues and Strategies
- Role of Exercise in heart disease

III. Exercise and the coronary heart disease connection
- Cardio-respiratory fitness and coronary death
- Exercise training in established coronary disease
- Risks of acute exercise
- Potential mechanisms of exercise benefit

IV. Exercise prescription for cardiac rehabilitation
- General guidelines and preliminary Considerations
- Phase I: Inpatient cardiac rehabilitation
- Phase II: Outpatient cardiac rehabilitation
- Phase III and IV: community-based cardiac rehabilitation program
- Considerations for special populations

V. Patient education: guidelines in cardiac rehabilitation
VI. Outcome measures in cardiac rehabilitation
VII. Special Considerations
- Older patients
- Hypertension
- Diabetes Mellitus
- Chronic Heart Failure
- Heart Transplantation
- Patient Compliance
- Drug Effects
- Women
- Young Adults

a. Revascularization and valve surgery
b. Ventricular arrhythmias, pacemakers and ICDs
c. Patients with Left Ventricular Assist devices
d. Pulmonary disease
e. Peripheral arterial disease.

Fitness, definition, aspects and parameters for testing.

2. Scientific basis for exercise programs
3. Exercise and the Human Condition
4. Exercise Planning and Prescription
5. Fitness Business and Entrepreneurship
6. Personal Training
7. Fitness Appraisal and Testing
8. Advanced Exercise Techniques
9. Stress modifications by exercise
10. Fitness for cardiac patients normal and abnormal cardiac activity and effects on cardio vascular system
11. Fitness for pulmonary patients normal and abnormal lung function and effects on cardio respiratory system.
12. Exercise testing - principles of testing and prescription for individuals
13. Effects of various exercise regimen on body
14. Functional Anatomy and Injury Prevention

15. Advance Concepts in Nutrition

Airway Clearance Techniques: physiological basis, Procedure, Indications, Contraindications,procedure, Physiological effects, Mechanism of action of the following.

a) Percussion, Vibration, Shaking
b) Postural Drainage
c) Huffing and coughing
d) Active Cycle of Breathing Technique
e) Autogenic Drainage

2. Airway Clearance Technologies: Procedure, Indications, Contraindications, procedure, Physiological effects, Mechanism of action of the following.
a) Vibratory PEP Devices: Acapella, Flutter,
b) Non-Vibratory PEP Devices: Thera PEP
c) High- Frequency chest wall oscillation
d) PNF respiration

3. Breathing Exercises and Ventilator Training
a) Diaphragmatic Breathing Exercise
b) Segmental breathing exercise
c) Pursed lip breathing
d) Respiratory resistance training
e) Glossopharyngeal Breathing
f) Relaxation positions to control dyspnoea

4. Exercises to Mobilize Chest
a) To mobilize one side of chest
b) To mobilize upper chest and stretch the pectoralis muscles
c) To mobilize upper chest and thorax

5. Ventilatory facilitatory techniques
a) Positioning concerns
b) Ventilatory and movement strategies
c) Manual facilitation techniques
d) Enhancing phonation skills

6. Exercise testing and training for cardiopulmonary dysfunctions
a) Primary cardiopulmonary dysfunctions
b) Secondary cardiopulmonary dysfunctions

7. Mobilisation and exercise
a) Hazards of bed rest
b) Oxygen transport and metabolic demand of patient
c) Effects of mobilisation and exercise on oxygen transport
d) Acute and long term effect of prescription of mobilization and exercise

e) Mobilisation testing, monitoring and prescription

8. Body positioning

a) Prescriptive versus routine body positioning
b) Physiological effects of various body positions
c) Physiological effects of frequent changes in body position
d) Prescription of therapeutic body positions and body position changes
e) Mechanical body positioning

9. Heart rate variability: introduction, Measurement of heart rate variability: time domain method; frequency domain methods, stability & reproducibility of HRV measurements, recording requirements, physiological correlate of HRV, clinical use of HRV, changes of HRV
related to specific pathologies.

10. Heart rate recovery: methods of recording heart rate recovery after various exercise, interpretation and clinical use.

PHYSIOTHERAPY IN CRITICAL CARE

- Effect of positioning and mobilization
- Intensive care for the critically ill adults and pediatrics.
- Mechanical ventilation- indications, modes, complications, weaning, non conventional modes and alternative modes of ventilation.
- Management of patients with neurological disorders- spinal cord injury, head injury, muscular dystrophy.
- Effects of physical training and cardiac rehabilitation
- Pulmonary rehabilitation
- Cardiac rehabilitation

RECENT TRENDS IN CARDIOPULMONARY PHYSICAL THERAPY

- Respiratory muscle stretch gymnastics
- Intrapulmonary percussive ventilation
- Non invasive ventilation
- Role of talk test for exercise prescription
- Thrombolytic therapy
- Flutter
- Mechanical insufflation exsufflation
- Anabolic hormone supplementation in patients with copd
- Exercise training and remodeling in patients left ventricular dysfunction and chronic heart failure.
- Long term oxygen therapy and copd
- Technology and self care in cardiology
- Nutrition and Cardiac Rehabilitation
- Healthy lifestyle and Cardiac rehabilitation.
- Occupational Lung Diseases and Pulmonary Rehabilitation

- Activities for increasing functional abilities
- Breast cancer and lymphedema
- Special cases in exercise prescription:
  - Diabetes
  - Asthma
  - Chronic obstructive pulmonary diseases
  - Cystic fibrosis
  - Coronary heart diseases
  - Hypertension
  - Children with heart disease
  - Valvular and congenital heart diseases in adults
  - End-stage renal diseases
  - Pregnancy
  - Sleep-related disorders
  - Haemodialysis patient

PRACTICAL

PAPER 606P – CARDIO THORACIC BIOMECHANICS

This involves application of topics in PAPER 3 via demonstrations, field visits and case presentations.

PAPER 306P – CARDIOPULMONARY PHYSIOTHERAPY ASSESSMENT AND EQUIPMENTS

Students will be instructed via demonstration, hands on assessment, field visits and case conference on specific techniques used in the assessment of patients with Neurological disorders and trauma. Students will draw on their experiences at the clinical postings to formulate a treatment plan for cases presented at the case conference

The demonstrations and practicals should be inline with the theory topics covered in Cardiopulmonary PHYSIOTHERAPY ASSESSMENT AND EQUIPMENTSs.

PAPER 307 P ADVANCED CARDIO PHYSIOTHERAPY PRACTICALS

Course description: This course involves a description of the assessment, skill development and treatment of patients with cardiopulmonary conditions.

urse objective: The students will be able to conduct a safe and effective evaluation and physiotherapy treatment of patients with cardiopulmonary conditions.

Course Outcomes: By the end of this course students will be able to conduct screening of a patient with various cardiovascular and/or pulmonary conditions. They will be able to critically evaluate a chronic condition; identify the role of exercise in

ameliorating the chronic condition and determine safe and effective exercise assessment(s) and exercise prescription. They will acquire proficiency in heart and lung sounds/auscultation, blood pressure measurements, arterial blood gas analysis, oxygen saturation, evaluation and interpretation of normal and abnormal ECG rhythms. Furthermore, they will be competent in spirometry readings and interpretation, heart rate recovery and heart rate variability analysis in various cardiopulmonary disorders.

Section-1

Activity -1 : The students will be shown patients of relevant disease and disorders for: History taking of the cardiovascular and pulmonary conditions of patients. All the basic Physiotherapeutic intervention pertaining to the Courses. Evaluation and physiotherapy treatment: its presentation and documentation of all the techniques listed in Theory paper.
Activity-2 : Demonstration , application and interpretation of ECG lead placement, tracing, recording, interpretation of normal & abnormal ECG
Activity-3 : Interpretation of arterial blood gas disorders
Activity-4 : Demonstration , application and interpretation of pulmonary function test
Activity-5 : Demonstration interpretation and application of chest X-ray
Activity-6: Demonstration and interpretation of auscultation: breath sounds added sounds, vocal resonance, heart sounds.
Activity-7 : Demonstration and application of airway clearance techniques
Activity-8 : Demonstration and application of airway clearance devices
Activity-9 : Demonstration and application techniques of breathing exercises
Activity-10 : Demonstration and application of ventilatory facilitatory techniques
Activity-11 : Demonstrations and practice of various cardiopulmonary exercise testing
Activity-12 : Demonstration and application of mobilization and exercise
Activity-13 : Demonstration and application of heart rate variability
Activity-14 : Demonstration and application of heart rate recovery.

SECTION – 2
Activity 1: Demonstration and practice of pulmonary rehabilitation physiotherapy evaluation and documentation.
Activity 2: Demonstration and practice of pulmonary function testing interpretation severity classification for chronic respiratory disease
Activity 3: Demonstration and practice of measurement of exertion dyspnoea :Baseline Dyspnoea Index/Transition Dyspnoea Index (BDI/TDI), Medical Research Council (MRC) Scale, Borg-Scale (CR-10)
Activity 4: Demonstration and practice of measurement of health related quality of life (QoL)St. George's Respiratory Questionnaire (SGRQ), Chronic Respiratory Disease Questionnaire (CRQ), Medical Outcomes Study Short Form- 36 (SF-36)
Activity 5: Demonstration and practice of measurement of inspiratory muscle strength and training.
Activity 6: Demonstration and practice of field tests to determine exercise capacity in chronic respiratory disease (6-minute walk test, shuttle walk test)

Activity 7: Demonstration and practice of oximetry testing to determine oxygen requirement during rest and activity.
Activity 8: Demonstration and practice of laboratory tests to assess exercise capacity in chronic respiratory disease (bicycle ergometer, treadmill)
Activity 9: Demonstration and practice of assessment of activity levels in chronic respiratory disease.
Activity 10: Demonstration and practice of aerobic exercise prescription and training to various chronic respiratory conditions.
Activity 11: Demonstration and practice of assessment of peripheral muscle strength and exercise prescription for resistance exercise in chronic respiratory disease.
Activity 12: Demonstration and practice of exercise prescription and training of interval endurance training in chronic respiratory disease patients.
Activity 13: Demonstration and practice of exercise prescription and training of neuromuscular electrical stimulation chronic respiratory disease.
Activity 14: Demonstration and practice of breathing exercise for obstructive and restrictive disease patients.
Activity 15: Demonstration and practice of humidification and nebulisation for chronic respiratory disease.
Activity 16: Demonstration and practice of airway clearance technique and technologies for chronic respiratory disease patients Activity 17. Demonstration and practice of management of patients with acute exacerbations.

PAPER 308 CLINICAL & SEMINARS PRESENTATIONS
Students will engage in clinical practice in Department of Sports Physiotherapy setting to enhance their clinical skills and apply theoretical knowledge gained during teaching sessions. Seminars: These will serve as a platform for students to integrate components of patient management. Students will give presentations on topics provide to them.

Poster presentation of a research paper

SECOND YEAR

PAPER 601 PEDAGOGY OF PHYSIOTHERAPY EDUCATION

Course Description: The course covers topics related to physiotherapy ethics and theory of teaching.

Course Objective: On completion of the course the student should be able to understand the dynamics of teaching & learning, plan effective teaching sessions in physiotherapy

Course Outcome: The student should be able to demonstrate adequate knowledge and skill in physiotherapy Ethics and learn ways to effectively teaching.

This course will be provided students information on improving their teaching skills in the classroom and clinical setting

Following are the topics to be included but not limited to:

1. Philosophy of educational and emerging issues in Education meaning, functions and aims of education.
    - Formal, informal and non- formal education.
    - Agencies of education
    - Current issues and trends in higher education
    - Issues of quality in higher education, autonomy and accountability, privatization, professional development of teachers, education of persons with disabilities.
    - Need for education philosophy
    - Some major philosophies, Idealism, Naturalism, Pragmatism and their implications for Education.
2. Concept of teaching and learning
    - Meaning scope of educational psychology
    - Meaning and relationship between teaching and learning
    - Learning theories
    - Dynamics of behaviour
    - Individual differences
3. Curriculum
    - Meaning and concept
    - Basis of curriculum formulation development
    - Framing objectives for curriculum

    Process of curriculum development and factors affecting curriculum

    Development evaluation of curriculum

4. Method and techniques of teaching
    - Lecture, Demonstration
    - Discussion, Seminar, Assignment, Project and Case Study.

5. Planning for Teaching
    - Bloom's Taxonomy of Instructional Objectives, Writing Instructional Objectives in Behavioural terms, Unit Planning and Lesson Planning.
6. Teaching Aids
    - Types of teaching aides
    - Principles of selection, preparation, and Use of Audio –Visual aids.
7. Measurement and evaluation
    - Nature of Educational Measurement : Meaning, Process, Types of tests.
    - Construction of an achievement test and analysis standardized test.
    - Introduction of some standardized tools, important tests of intelligence, Aptitude, Personality.
    - Continuous and Comprehensive Evaluation.
8. Guidance and Counseling
    - Meaning and Concepts of Guidance and Counseling
    - Principles
    - Guidance and Counseling services of students and faculty members
    - Faculty development and development of personnel for P.T. Services
9. Clinical Education
    - Awareness and Guidance to the Common people about Health and Diseases and Available professional Services
    - Patient Education
    - Education of the Practitioners

PAPER 602 MANAGEMENT, ADMINISTRATION AND ETHICAL ISSUES

Course Description: The course covers topics related to physiotherapy clinic and department management.

Course Objective: On completion of the course the student should be able to understand, the basic issues of physiotherapy management & administration and practice as an informed professional on Legal & ethical issues.

Course Outcome: The student should be able to demonstrate adequate knowledge and skill in physiotherapy Ethics, clinic and department management.

This course deals with issues of management to assist the practitioner in efficiently addressing issues related to the organization and administration of a Physiotherapy Department following are the topics to be included but limited to:

MANAGEMENT

1. Functions of management,
2. Evaluation of management through scientific management theory, Classical theory

   System approach

Contingency approach

3. Management process
   Planning, Organization, direction, controlling (decision making)

4. Introduction to personnel management
   Staffing recruitment selection, performance appraisal, collective bargaining,

   discipline, job satisfaction.

5. Quantitative methods of management

   Relevance of statistical and/or techniques in management.

6. Marketing

   Market segmentation, marketing research production planning pricing, channels

   of distribution, promotion, consumer behaviour, licenser.

1. Total quality management
   Basis of quality management – acid for quality control quality assurance program in hospitals, medical audit, and international quality system.

ADMINISTRATION

1. **Hospital as an organization**
   Functions and types of hospitals selected clinical supportive ancillary services of a hospital, emergency department, nursing, physical medicine & rehabilitation, clinical supportive and ancillary services of a hospital, emergency department nursing physical medicine & rehabilitation, clinical laboratory, pharmacy and dietary dept.

2. Roles of Physiotherapist, Physiotherapy Director, Physiotherapy supervisor, Physiotherapy assistant, Physiotherapy aide, Occupational Therapist, Home health side, Volunteer.

3. Directed care and referral relationship and confidentiality.

LEGAL PROFESSIONAL ETHICAL ISSUES

1. Physical therapy: Definition and development
2. The implications & confirmation to the rules of professional conduct.
3. Legal responsibility for their actions in the professional context and understanding the physiotherapist liability and obligations in the case of medical legal action.

4. Code of ethics. A wider knowledge of ethics relating to current social and medical policy in the provisions of health care.
5. Functions of the relevant professional associations education body and trade union.
6. The role of the international health agencies such as the world health organizations.
7. Standards of practice for physical therapies.
8. Acts & Statutes relating to Physiotherapy

Current issues-

PAPER 603 - EXERCISE PHYSIOLOGY & ELECTRO PHYSIOLOGY

Course description: This course aims to deliver scientifically based standards on exercise and its effects on various systems of the body. It prepares students through the process of selecting and administering therapeutic exercises and electrotherapeutic agents, using Guidelines to interpret results, and drafting an physiotherapy interventional prescription that is in line with Guidelines parameters.

Course Objective: this course should deliver the concepts in exercise physiology, electrophysiology and prepare students to test and prescribe suitable exercises and electrotherapeutic agents to different groups of the population and conditions.

Course Outcome: On completion of the study of this Course the student should be able to select and administer using Guidelines to interpret results, and drafting an therapeutic exercise and electrotherapeutic agents prescription to different populations and conditions.

This course provides the student the required knowledge and skills on exercise and its effects on various systems of the body. The student shall also gain knowledge and skills on the various therapeutic exercises targeted for different conditions. The student shall learn the knowledge and skills on various electrotherapeutic agents, advanced techniques and physiological responses of nerve and muscle in diagnostic and therapeutic electro-agents.

Energy Transfer for Physical Activity:

a. Energy transfer in Body.
b. Energy transfer in exercise.
c. Energy expenditure during various activities.
d. Fatigue.
e. Biochemical responses to endurance training.

Cardiovascular System and Exercise:

a. Athlete's Heart.
b. Cardiovascular adaptations to sustained aerobic exercises.
c. Lipids and sports, protection from coronary heart disease, exercise and optimization of lipid profile.

d. Sudden cardiac death in sports. Regulation of circulation during exercise. Exercise and vascular system-cardiovascular adaptation to sustained aerobic exercises, exercise and optimization of lipid profile, regulation of circulation during exercise

Exercise and nervous system - neural adaptation with exercises, cerebral perfusion and exercises, exercise for mood enhancement and anxiety.

Exercise and cell biology - effect of exercise on various cell activities, adaptation of organelles with exercise, exercise and aging-physiology changes of aging

Exercise and Respiratory System:
a. Second Wind.
b. Oxygen Debt.
c. Breath Holding, High Pressure Ventilation. Scuba Diving.
d. Regulation of Respiration during exercise.

Skeletal System:
a. Growth and Exercise.
b. Repair and adaptation during exercise. Delayed Onset Muscle Soreness (DOMS)
c. Exercise prescription for chronic low back pain
d. Training for Muscular Strength and Endurance.
e. Muscle fibre typing and significance.

Gastrointestinal Tract and Endocrine system:
a. Effect of Sports on GIT and Liver.
b. Hormone regulation of fluid and electrolytes during exercise.
c. Exercise and Menstrual Cycle.
d. Stress Hormones in Exercise.

Exercise and endocrine system-
Hormonal regulation of fluid and electrolytes during exercise and menstrual cycle, stress hormone in various activities, effect of exercise on various hormones in exercise, effect of exercise on GIT and liver, Opioids, Runners High. exercise addiction.

Exercise and Common Pulmonary Conditions
a. Exercise induced bronchial obstruction
b. Exercise in chronic airway obstruction
c. Air pollution and exercise

Exercise and Cardiac Conditions
a. Exercise prescription for heart disease
b. Exercise in primary prevention in ischemic heart disease
c. Exercise for secondary prevention of ischemic heart disease
d. Exercise induced Asthma;
e. Exercise Stress Testing for Diagnosis of CHD.

Exercise testing: incremental shuttle walk test, endurance shuttle walk test, six minute walk test, Step test, treadmill tests.(i.e. Balke, Bruce, Noughton, Modified Bruce protocol), interval bike test, sub maximal GXT, symptom limited GXT, exercise testing using cycle ergometer, oxygen uptake (VO2)

Doping in Sports
a. Banned drugs
b. Procedure of dope testing
c. Control of doping abuse

Diabetes and Exercise
a. Exercise in diabetic patients
b. Exercise as a method of control of diabetes

Exercises for special categories
a. Child and adolescent athlete's problems
b. Special problems of older athletes
c. Special concerns for differently abled athletes

Female Specific Problems:
1. Sports Amenorrhoea.
2. Injury to female reproductive tract.
3. Menstrual Synchrony.
4. Sex determination.
5. Exercise and pregnancy.
6. Eating disorders in athletes.

Rheumatology & Geriatric Disorder:
1. Rheumatoid arthritis, SLE and Juvenile Rheumatoid Arthritis.
2. Ankylosing Spondylitis.
3. Osteoarthrosis and other geriatric conditions.
4. Cost and benefits of exercise prescription in Osteoporosis.

Temperature Regulation
a. Heat Balance.
b. Methods of Assessing Heat Balance.
c. Effects of Climate.
d. Effects of Exercise on Temperature Regulation.
e. Limit of Tolerance of Heat.
f. Acclimatisation.
g. Avoidance in Heat illness during exercise.
h. Exercises in cold.

Physiological Basis and Principles of Training and Conditioning
a. Principles of endurance and strength training i. Recovery training intensities in heart rate ii. Manipulation of training principles iii. Training sub–phases

b. Fundamentals that aid training and performance i. Warm up and Cool down ii. Flexibility and stretching
iii. Missing workouts iv. Overtraining
c. Analysis of Training

Misc. Topics
High Altitude Training, Sports Diving, Hazards of underwater environment. Special Aids to Athletic Performance:– MORA, Oxygen Inhalation, Sleep.,Sex and performance. Assessment of Age. Muscle tissue fibre typing and its significance. Exercise for mood enhancement & anxiety.

Obesity and related problems
a. Dietary recommendation for healthy individuals.
b. Obesity – epidemiology, classification of causes, complications and treatment.
c. Paediatric obesity- Regulation of food consumption, complications and prevention.

Stress Management
a. Introduction i. The history and definition of "stress" ii. The characteristics of stressors iii. Clinical implications of stress iv. Coping with stress – styles of coping, recruiting resources for coping
b. Self management
c. Tools for stress management

Hazards of Smoking
a. The physiological, psychological and behavioral impact of cigarette smoking
b. Evidence based possibilities for treatment
c. Treatment for smoking cessation

Sleep Medicine
a. Acquaintance with basic concepts in sleep medicine, the structure and physiology of sleep
b. Classification of sleep disorders
c. Clinical implications of sleep disturbance
d. Physiotherapeutic measures for sleep deprivation

Yoga
a. Important Pranayamas and strengthening and rejuvenating asanas.
b. Methods, advantages and contraindications.

Nutrition & Dietetics

six nutrient classes a. carbohydrates, fats, proteins.b. Vitamins, minerals and water. water & electrolyte balance
Body weight; body composition

- Body build, body size & body composition

- Assessing body composition
- Body composition & sport performance
- Weight standards
- Achieving optimal weight

3. Diet & fitness products
4. Exercise & diet programme to gain weight
   - Gaining body fat
   - gaining muscle mass
5. Guidelines for healthy diet

c. Optimal Nutrition for exercise. Nutrition for Physical Performance. Pre–Game meal, Carbohydrate loading. f. Alcohol, Mega Vitamin Therapy.g. Food for various athletes of different disciplines.h. Fluid and energy replacement in prolonged exercise. i. AHA Dietary guidelines for Heart diseases

SECTION – II ELECTRO PHYSIOLOGY

Diagnostic Electrophysiology

19. Anatomy and Physiology of: Motor unit, action potential, excitability of nerve and
20. muscle, neuromuscular junction.
21. Technique of nerve conduction velocity and electromyography: Instrument, techniques, interpretations in terms of neuromuscular function and bio-feedback technique.
22. Nerve conduction studies, normal/abnormal nerve conduction, its relevance in muscle function.
23. Concepts of normal & abnormal EMG studies.
24. Late responses
25. Concepts of electro physiological studies in neuro muscular diseases as a diagnostic and therapeutic tool.
26. Electrical stimulation and its effects on various systems.
27. Evoked potentials – VEP, SSEP, MEP, BAEP

Therapeutic Electrophysiology

Physiological mechanism of action of electrotherapeutic modalities, Critical Analysis of Electrotherapeutic Modalities- IFT, TENS, MS, SWD, LASER, MWD, Pulsed SWD, Mechanical Traction etc.
Plasticity in response to Electrical stimulation.

Recent Advancement and Evidence based practice in Electrotherapy

Extracorporeal Shock Wave Therapy, tDCS, Long wave diathermy, Electro-Cupping and Vaccume, NMES, FES

Practicals:

The student will undergo laboratory and on–field training in Exercise physiology and Electrophysiology.

PAPER 604 - FUNCTIONAL REHABILITATION & ERGONOMICS

Course Description: The course covers topics related to physiotherapy ergonomic and functional assessment used in managing, preventing different disorders. It also covers the
assessment and management of occupational and functional problems. It gives a brief overview of lifestyle and occupational medicine.

Course Objective: The course should enable the student to acquire in-depth knowledge in different physiotherapy ergonomic and functional assessment used in managing, preventing different disorders. It should equip the student to add the ergonomic advice and functional rehabilitation in physiotherapy prescription. It should provide the student with a brief overview of lifestyle and occupational medicine.

Course outcome: The student should be able to:

1. To perform a comprehensive and complete ergonomic and functional assessment in various disease disorders and dysfunction .
2. To document systematic, meaningful, accurate written records of the patient.
3. To assess and eventually design individualized treatment strategies for the disease disorders and dysfunction..
4. To develop an overview of the concept of Lifestyle medicine and Occupational medicine.

I. Introduction to Physiotherapy Assessment

- Purpose and need for Physiotherapy assessment
- Historical perspective
- Physiotherapy versus medical model of practice
- Various categories for movement dysfunction
- Preferred practice patterns in Physiotherapy.
- Today's health care model

II. Influence of Psychological Factors

- Psychological adaptation
- Personality and coping styles
- Common defense reactions to disability
- Anxiety
- Acute stress disorder and post traumatic stress disorder
- Depression
- Substance abuse
- Agitation and violence
- Hypersexuality
- Psychosocial wellness
- Wellness in rehabilitation
- Integrating psychosocial factors into rehabilitation
- Suggestions for rehabilitative interventions

III. Influence of Values on Patient Care; Foundation for Physiotherapy assessment

- Process of assessment
- Values and valuing
- Code of ethics
- The values of patient as a factor in care
- The influence of the values on the primary goal of patient care
- Value – Laden situation in rehabilitation

IV. Examination of Functional Status and Activity Level

- A conceptual framework
- Examination of function
- Response formats
- Interpreting test results
- Selected instruments assessing physical function
- Multidimensional functional assessment instruments

V. Examination of Environment

- Purpose
- Examination strategies
- Patient – Home environment relationship: Overview of access, usability and safety
- Adaptive equipment
- Assistive technology
- Examination of the workplace
- Community access
- Documentation
- Funding for environmental modifications
- Legislation

VI. Guideline for Physiotherapy Documentation

- Introduction
- Documenting the examination
- Documenting the evaluation
- Documenting the plan of care
- Application of documentation skills

PAPER 605 - RESEARCH METHODOLOGY, BIOSTATISTICS & EVIDENCE BASED PRACTICE

Course Description: The course covers the concept of research methodology, Evidence based practice and biostatistics related to physical therapy

Course Objective: The course aims to introduce the principles of research, methods of research and analysing the research studies using Biostatistics.

Course Outcome: On completion of the study of this Course the student should be able to understand the methods of research process and design so as to effectively plan a research.

To understand the statistical measures used in the analysis and interpretation of research data. To acquire skills of critically reviewing the literature.

RESEARCH METHODOLOGY

SECTION – 1

Research in physiotherapy

a. Introduction
b. Research for Physiotherapist: Why? How? When?
c. Research – Definition, concept, purpose, approaches
d. Internet sites for Physiotherapists.

Research fundamentals

a. Define measurement
b. Measurement framework
c. Scales of measurement
d. Pilot Study
e. Types of variables
f. Reliability & Va idity
g. Drawing Tables, Graphs, Master chart

Writing a research proposal

a. Defining a problem
b. Review of Literature
c. Formulating a question, Operational Definition
d. Inclusion & Exclusion criteria
e. Methodology- Forming groups Data collection & method for analysis
f. Informed Consent Steps of documentation – Title to Scope of study

Research ethics

a. Importance of Ethics in Research
b. Main ethical issues in human subjects" research
c. Main ethical principles that govern research with human subjects
d. Components of an ethically valid informed consent for research.

Overview of study designs

a. Observational ,Descriptive-Case study/ series, Cross sectional, Normative, Correlational ii. Analytical; case control, cohort
b. Experimental- True & quasi experimental

Sampling

a. Random and non-random sampling.
b. Various methods of sampling – simple random, stratified,systematic, cluster and multistage. Sampling and non-sampling errors and methods of minimizing these errors.

Plagiarism

Definition of Plagiarism, types, Avoiding plagiarism , software methods to detect plagiarism.

Evidence Based Practice

1. Introduction to evidence– based complementary medicine
2. Evidence–based health care
3.Evidence–based practices 4. Evidence–based decision making and management

Types of evidence:

a. Definition of evidence
b. Forms of evidence : Case–control studies
c. Cohort studies
d. Randomized controlled trials
e. Systematic Reviews.

Importance of Hierarchy of Evidence

Key element of scientific writing.

Structure, formulation and implementation of thesis, Structure, formulation and implementation of original research report ,Structure, formulation and implementation of systematic review/meta –analysis, How to read and critique research,Review of an indexed refereed research paper, - Evaluating paper scientific merit, Providing constructive feedback to the author, typical review formats for reviewing a paper ,Reasons for rejection

Presenting Research: Writing and submitting papers

(a) Strategies of paper writing
(b) Design of paper writing
(c) Tactics of paper writing - Where to publish

SECTION – II BIOSTATISTICS

Introduction

Descriptive and Inferential statistics
Types of data: Qualitative and Quantitative, Parametric and Non- Parametric tests
Which tests to use.

Tests of significance

i. Basics of testing of hypothesis – Null and alternate hypothesis, type I and type II errors, level of significance and power of the test, p value.
j. Tests of significance (parametric) - t – test (paired and unpaired), Chi square test and test of proportion, one way analysis of variance.
k. Repeated measures analysis of variance.
l. Tests of significance (non-parametric)-Mann-Whitney u test, Wilcoxon test, e. Kruskal-Wallis analysis of variance. Friedman"s analysis of variance.

Correlation and regression

Simple correlation – Pearson"s and Spearman"s; testing the significance of correlation coefficient, linear and multiple regressions. Interpretation of r.

Basic probability distributions and sampling Distributions

a. Concept of probability and probability distribution.

b. Normal, Poisson and Binomial distributions, parameters and application.
c. Concept of sampling distributions.
d. Standard error and confidence intervals.
e. Skewness and Kurtosis

Graphical Presentation
Frequency distributions, Describing data with Graphs, Describing data with Averages Mode Median Mean, Describing variability Variance, Standard deviation, etc. Normal Distributions

Role of Computers in Research
Basic of computers – Hardware and Software
Basic of Computer Applications – Windows, MS word, Power Point, etc.
Simple statistical Analysis using SPSS software.
Tabulation, Calculation of central tendency and dispersion, Using software packages, Analysis, Presentation of data in diagrammatic & Graphic form
Artificial Intelligence and its application in physiotherapy
Robotics and its application in physiotherapy
Information technology and its application in physiotherapy

PAPER 606P EXERCISE PHYSIOLOGY & ELECTROPHYSIOLOGY
The demonstrations and practicals should be inline with the theory topics covered in Exercise physiology and electrophysiology

PAPER 607P - DISSERTATION

As part of the requirement for the Master's degree the student is required to undertake a research study under the guidance of a guide. Oral Presentations at Conferences/Seminars - Preparing presentation,- Duration of presentation,- What to present. Student must publish/present atleast one research paper at a National Level Conference/ International Level Journal.

PAPER 608 – CLINICS & SEMINARS PRESENTATIONS

These will serve as a platform for students to integrate various components of patient management. Students will give presentations on topics provided to them.

Students will engage in the clinical Cardiology, Pulmonary Medicine, CCU,ICU,NICU, General Medicine, General Surgery, T.B.Ward and Physiotherapy Department to enhance their clinical skills and apply theoretical knowledge gained during teaching sessions.

LIST OF BOOKS RECOMMENDED FOR MPT CARDIO		
S.N	Author	Title
1	West,John B	Respiratory physiology the essentials
2	Deepak, S	Clinical Notes in Respiratory
3	Main,E	Cardiorespiratory Physiotherapy : Adults and Paediatrics
4	Smith, Mandy	Cash's Text book of Cardiovascular Respiratory Physiotherapy
5	Mitra,P.K	Hand book of practical chest physiotherapy
6	Pryor, J.A	Physiotherapy for respiratory and cardiac problems
7	Fardy,P.S	Cardiac Rehabilitation adult Fitness and exercise testing
8	Burns, SM	AACN Essentials of Critical Care Nursing
9	Corne,Jonathan	Chest X Ray Made Easy
10	Lilly,L.S	Braunwald's Heart Disease Review & Assessment
11	Sharis,Peter J	Evidence based cardiology
12	Goldberger, A.L	Clinical Electrocardiography
13	Hampton J.R	The ECG in Practice
14	John, Hampton	150 ECG Cases
15	Ketai L.H	Fundamentals of Chest Radiology
16	Irwin,Scot	Cardiopulmonary Physical Therapy
17	Mitra P.K	Hand book of Practical Chest Physiotherapy
18	Park, MK	How to read pediatric ECGs
19	Khilani, Praveen	Pediatric & Neonatal mechanical ventilation
20	Claussen,C.D.	Direct Diagnosis in Radiology Cardiac Imaging
21	Ruppel,G.L	Manual of Pulmonary Function Testing
22	Irwin, Richard S.	Procedures, Techniques and Minimally Invasive Monitoring in Intensive Care Medicine

23	Tecklin,Jans	Pediatric physical therapy
24	Pryor, J.A	Physiotherapy for respiratory and cardiac problems
25	Downie,P.A	Cash's text book of chest,heart and vascular disorders,for physiotherapists
26	Frownfelter,D	Cardiovascular and pulmonary physical therapy
27	Hillegass, E.A	Essentials of Cardiopulmonary Physical Therapy
28	Malone, TR	Imaging in Rehabilitation
29	Brown,E.M	Heart sound made easy
30	MacIntyre, Neil	Machanical Ventilation
31	Satpathy,M	Clinical diagnosis of congenital heart disease
32	Cross,Jane	Respiratory Physiotherapy Pocketbook : An On -Call Survival Guide
33	Burg,F.D	Current Pediatric Therapy

Electrotherapy

S. N	Author	Title
1	Khandpur, R.S	Hand book of Biomedical Instrumentation
2	Glaser,Roland	Biophysics
3	Prentice William	Therapeutic Modalities in Rehabilitation
4	Robinson,A.J	Clinical Electrophysiology
5	Gersh,M.R	Electrotherapy in Rehabilitation
6	Robertson Val	Electrotherapy Explained principle and practice
7	Nelson ,Roger M	Clinical Electrotherapy
8	Kimura, Jun	Electrodiagnosis in Diseases of Nerve & Muscle: Principles & Practice
9	Stokes, Maria	Physical Management in Neurological Rehabilitation
10	Michlovitz,S.L	Modalities for Therapeutic Intervention

Cardio Biomechanics		
S.N	Author	Title
1	Ackland Timolthy	Applied Anatomy and Biomechanics in Sports
2	Bell,Frank	Principles of Mechanics & Biomechanics
3	Raj Kumar,R.V	Biomechanics the Nucleus of Physiotherapy
4	Koley,S	Textbook of Biomechanics
5	Nordin, Margareta	Basic Biomechanics of the Musculoskeletal system
6	Griffith's IW	Principles of Biomechanics & Motion Analysis
7	Hall,Susan J	Basic Biomechanics
8	Smith, Laura K.	Brunnstrom's Clinical Kinesiology
9	Oatis,C.A	Kinesiology
10	Kapandji, I.A	The Physiology of The Joint Vol-1
11	Kapandji, I.A	The Physiology of The Joint Vol-2
12	Kapandji, I.A	The Physiology of The Joint Vol-3
13	Norkin C.C	Joint Structure and Function
14	Dvir,Zeevi	Isokinetics Muscle testing interpretation and clinical application
15	Mow,V.C	Basic Orthopaedic Biomechanics

Research Methodology & Biostatistics		
S.N	Author	Title
1	Kothari, C.R.	Research Methodology Methods and Techniques
2	Singh, Sunita	Synopsis of Biostatistics
3	Prasad,S	Elements of Biostatistics
4	Pitney W.A	Qualitative Research in Physical Activity
5	Jewell,D.V	Guide to Evidence Based Physical Therapists Practice
6	Herbert,Rob	Practical Evidence Based Physiotherapy
7	Bhandri,Mohit	Clinical Research made Easy

8	Verma, B.L	Biostatistics
9	Campbell,M.J	Medical statistics

Exercise Physiology & Electrophysiology		
S.N	Author	Title
1	Koley,S	Textbook of Kinanthropometry
2	Nix, Staci	Williams' Basic Nutrition and Diet Therapy
3	Karageorghis C.I	Inside Sports Physiology
4	Sivaram,C	Principles of Exercise in Physiotherapy
5	American College of sports Medicine	ACSM'S Resource Manual for Guidenes for exercise testing
6	Mcardle W.D	Exercise Physiology
7	Woods,Ron	Energy Every Day
8	Skinner,J.S	Exercise Testing & Exercise Prescription For Special Cases
9	Wasserman, Karlman	Principles of Exercise Testing & Interpretation
10	Robinson,A.J	Clinical Electrophysiology
11	Kimura, Jun	Electrodiagnosis in Diseases of Nerve & Muscle: Principles & Practice

Syllabus

For

Master of Physiotherapy (SPORTS)

Atal Bihari Vajpayee Medical University Lucknow, U.P., India
From session 2021-2022

MPT (SPORTS)

FIRST YEAR

Paper Code	Title	Total Hours	Hours/ week	Yearly Credits	IA Marks	UE Marks	Total Marks
MPT401	Basic science and MedicalSurgical Disorders in Sports	100	4	8	25	75	100
MPT402	Bio-mechanics	100	4	8	25	75	100
MPT403	Sports Physiotherapy Assessment and Equipments	50	2	4	25	75	100
MPT404	Advance Physiotherapy in Sports	100	4	8	25	75	100
MPT405 P	*Practical- I* Sport Bio-mechanics	60	2	2	25	75	100
MPT 406P	*Practical- II* – Sports Physiotherapy Assessment and Equipments	50	2	2	25	75	100
MPT 407P	*Practical – III-* Advance Physiotherapy in Sports	100	4	4	25	75	100
Total		**560**	**22**	**36**	**175**	**525**	**700**
MPT408	Clinics & Seminars Presentations	500	12	12	50	50	100
Total		**1060**	**34**	**46**	**225**	**575**	**800**

- IA= INTERNAL ASSESSMENT
- UE=University Examination

SECOND YEAR

Paper Code	Title	Total Hours	Hours/ week	Yearly Credits	IA Marks	UE Marks	Total Marks
MPT601	Pedagogy in Physiotherapy Education	80	3	6	25	75	100
MPT602	Management, Administration and Ethical Issues	80	3	6	25	75	100
MPT603	Exercise Physiology & Electro Physiology	50	2	4	25	75	100
MPT604	Sports Psychology	80	3	6	25	75	100
MPT605	Research Methodology, Biostatistics & Evidence Based Practice	100	4	8	25	75	100
MPT606P	Practical -I- Exercise physiology and Electrophysiology	50	2	2	25	75	100
MPT607P	*Practical- II* Dissertation	200	12	12	25	75	100
	Total	**640**	**29**	**44**	**175**	**525**	**700**
MPT608	Clinics & Seminars Presentations	500	12	12	50	50	100
GRAND Total		**1140**	**41**	**56**	**225**	**575**	**800**

- IA= INTERNAL ASSESSMENT
- UE=University Examination

v

MPT (SPORTS)
FIRST YEAR

PAPER 401 – BASIC MEDICAL SCIENCE AND SPORTS DISORDERS

Course Description: The course covers topics related to pathophysiology, clinical manifestation, medical and surgical management of sport related diseases and disorders in athletes.

Course Objective: The course should enable the student to develop a detailed concept about different sport related diseases and disorders in athletes.

Course Outcome: The students should be able to demonstrate adequate knowledge about management of athletes with sport injuries.

ANATOMY:

- Bone,Cartilage
- Ligaments,Muscle,Tendon
- Nerve and vessels
- Anatomical Angle

PHYSIOLOGY

- Blood
- Cardiovascular system
- Neuromuscular System
- Respiratory System
- Temperature regulation
- Endocrine System

PATHOLOGY

- Immune system: Immune response, immunology and exercise, autoimmune
- diseases, isoimmune diseases.
- Oncology.
- Response to trauma, specific tissue injury.
- Metabolic disorders.
- Osteoporosis.
- Inflammation of the bursa and tendon

PHARMACOLOGY

- Pharmacokinetics and Pharmacodynamics.
- Anti-Anemic.
- Hormones.
- Insulin
- Steroids
- Diuretics.
- NSAIDS
- Muscle Relaxant

RADIOLOGY

- Basics of radiology including Ultrasonography CT & MRI scanning

- Imaging of the head and neck.
- Imaging of spine.
- Imaging of pelvis, hip and thigh.
- Imaging of Patello Femoral Joint & Knee joint.
- Imaging of the lower leg, foot and ankle.

Trauma Management
Cardio Pulmonary Resuscitation (CPR)with practical hands on training(basic and advanced); Shock management, Internal and External bleeding, Splinting, Stretcher use- Handling and transfer, Management of Cardiac arrest, Epilepsy, Drowning, Burn, Medical management of mass participation. Heat stroke and Heat illness.

Sports specific injuries, with special emphasis on the specific risk factor, nature of sports, kind of medical intervention anticipated and prevention with respect to individual sports- Individual events: Field & Track, Team events: Hockey, Cricket, Football & other sports.

Contact and Non-contact sports, Water sports

Chest and abdominal injuries: Rib fractures, abdominal wall contusions, sports hernia etc.

Injuries in Upper extremities:
Acromioclavicular joint dislocation, anterior shoulder dislocation, biceps rupture, frozen shoulder, impingement syndrome, rotator cuff tears, Labral lesions, Lateral epicondylitis, medial epicondylitis, stress fractures of radial epiphysis, Carpal tunnel syndrome, fractures and dislocations of hand and wrist etc.

Injuries to Lower extremities and Spine:
Hip joint labral tears, soft tissue ruptures involving rectus femoris, groin pain, nerve entrapment, stress fractures of femoral neck, knee ligament injuries, patellar injuries and dislocations, ITB friction syndrome, Muscle strains, ankle sprains, nerve entrapments at ankle, rupture of achillis tendon, stress fractures etc. soft tissue injuries, Spinal deformities and fractures of thoracic and lumbosacral spine etc.

Emergency Medical Planning And Cover For Sports Events
Emergency Situations, Primary and secondary emergency assessment, emergency plan, transportation of an injured student,Treatment of collapsed athlete- Severe head injury, Athlete with spinal injury,,hypothermia, Causes of Collapse
Protective Equipment in sports
Principles of protective equipment, Protective Equipment for: Head & Face, Upper & Lower Extremity

Female Athlete

Female Athlete and their Concerns, Sports Amenorrhea,Injury to female reproductive tract, Menstrual Synchrony, Sex determination, Exercise and pregnancy, Eating disorders in athletes

Disabled Athlete

Wheel chair skills, type advantages & disadvantages, Various skills of wheel chair for effective rehabilitation.

Infections And Other Medical Conditions

Diagnosis and management of skin conditions of Athletes, Bacterial infections, Fungal infections, Viral infections, boils and cellulitis, Venereal Diseases, Common Cold, Diarrhea, Dysentery, Typhoid, Cholera, Amoebiasis, Food Poisoning, Tuberculosis, Malaria, Hepatitis, AIDS.Hypertension, Urine abnormalities; Anemia, Diabetes mellitus,

Head Injuries

Skull fracture, epidural hematoma, subdural hematoma, subdural hematoma, cerebral contusions, Concussion: Classification system, post concussion syndrome and its management, Punch drunk syndrome, Post concussion syndrome, Maxillofacial Region Airway Management in Head Injuries, Soft tissue injuries of head, Lacerations and its types, Ocular and facial injuries: Lefort Classification.

PAPER 402 – SPORTS BIOMECHANICS

Course Description: the course covers the understanding of Sports Biomechanics and Sports kinesiology of body movement.

Course Objective: the course should enable the student to acquire in depth knowledge in understanding Sports biomechanics and Sports kinesiology.

Course Outcome: On completion of the study of this Course the student should be able to identify and apply the principles of Sports biomechanics and kinesiology in understanding the functioning of the human body in sports. To identify and apply the principles of biomechanics in understanding pathomechanics of various conditions. To use these principles in managing various sports conditions.

MOVEMENT PATTERNS – the essence of sports biomechanics: Introduction, Defining human movements, Some fundamental movements, Movement patterns, Comparison of qualitative and quantitative movement analysis, Summary, Study tasks, important terms.

QUALITATIVE ANALYSIS OF SPORTS MOVEMENTS: Introduction, A structured analysis framework, Preparation stage – knowing what and how to observe, Observation stage – observing reliably Evaluation and diagnosis stage – analysing what's right and wrong in a

movement, Intervention stage – providing appropriate feedback, Identifying critical features of a movement.

THE GEOMETRY OF MOTION: Introduction, Movement patterns revisited, Fundamentals of movement Linear motion and the centre of mass, The geometry of angular motion, The coordination of joint rotations.
QUANTITATIVE ANALYSIS OF MOVEMENT: Introduction, The use of videography in recording sports movements, Recording the movement, Experimental procedures, Data processing,Projectile motion, Linear velocities and accelerations caused by rotation, Rotation in three-dimensional space.

CAUSES OF MOVEMENT – FORCES AND TORQUES: Introduction, Forces in sport, Combinations of forces on the sports performer, Momentum and the laws of linear motion, Force–time graphs as movement patterns, Determination of the centre of mass of the human body, Fundamentals of angular kinetics, Generation and control of angular momentum, Measurement of force, Measurement of pressure.

ELECTROMYOGRAPHY – WHAT MUSCLES DO: Experimental procedures in electromyography, EMG data processing and interpretation.

ISOKINETIC DYNAMOMETRY:

SPORTS TECHNIQUES

Basic principles of biomechanics are reinforced with added emphasis on the changes in biomechanical function and their subsequent effect on the potential and influence on overuse injuries. scientific basis for analyzing the various sports techniques used in baseball, basketball, football, golf, gymnastics, softball, swimming, and track and field's running, jumping, and throwing.
Biomechanics of Running
Biomechanics of Throwing
Biomechanics of Jumping,
Biomechanics of Swimming
Biomechanics of Cricket Bowling
Biomechanics of Football
Biomechanics of Running with prosthesis
The student to analyze, explain and correct abnormal human movement of the above Sports Biomechanics using a variety of evaluative techniques and computerized tools.

SPORTS ORTHOSIS & PROSTHESIS

Sports Orthotic and Prosthesis of Upper Limb
Sports Orthotic and Prosthesis of Lower Limb
Sports Wheelchairs

PAPER 403 – SPORTS PHYSIOTHERAPY ASSESSMENT AND EQUIPMENTS

Course Description: The course covers topics related to Sport physiotherapy assessment, diagnostic procedure interpretation,measurement and therapeutic equipments use in managing different disorders affecting sports.

Course Objective: The course should equip the student to acquire in-depth knowledge in different physiotherapy assessment,measurement and therapeutic equipment used in management of different disorders affecting sports.

Course outcome: The student should be able to:

1. To perform a comprehensive and complete Physiotherapy assessment of various Sport injury patients.
2. To document systematic, meaningful, accurate written records of the patient.
3. To assess and eventually design individualized treatment strategies and measure outcome of intervention on measurement equipment for the sport injury patients.

EVALUATION & EXAMINATION:

Evaluation Process in Rehabilitation

1. Importance of evaluation & assessment.
2. Methods of evaluation- interview, clinical examination, field test, reliability & validity of each test & investigative procedure
3. Evaluation of physical fitness 4. Musculoskeletal screening
5. Pre-participation Exam 6. On-Field and Off-Field Evaluation Process

BASIC CONCEPT OF PHYSIOTHERAPY ASSESSMENT IN SPORTS

- Examination,Assessment,Evaluation,Functional assessment,Diagnosis,PT diagnosis
- Prognosis,Intervention,Outcome measures, Reassessment
- Physical impression or problem of list
- POMR and SOAP Notes,Documentation

DIAGNOSTIC PROCEDURE AND INTERPRETATION

- Laboratory study,Imaging study
- Electrodiagnosis
- Diagnostic findings and correlation with physical findings

SPORTS ERGONOMICS & ON-FIELD GEARS

A study of the sporting environment and its effect on injury mechanism, prevention and rehabilitation. The principles of injury pathomechanics, tissue responses to loading and the role of sports equipment in sports injury prevention and rehabilitation. The following specific areas will be studied:

1. Mechanical support to the body - taping, splinting, braces, orthotics.
2. Protective equipment - body padding, mouthguards, helmets, headgear,etc.,
3. Sport-specific problems.
4. Shoe-surface interaction (Athletic Shoes) - footwear design, surface characteristics,

traction, various modifications and adaptations in shoes for specific situations and conditions. The evaluation of shoes and shoe prescription

.

KINANTHROPOMETRY IN SPORTS

1. Introduction to kin anthropometry 2. Evaluation techniques
3. Body composition 4. Somatotyping

ERGOGENIC AIDS & DOPING AGENTS

1. Doping, 2. Types of doping,
3. TUEC, 4. Blood Doping.
5. Gene Doping

SPORTS NUTRITION AND SUPPLEMENTS

1. Introduction to sports nutrition
2. Special considerations for competitive athletes & Energy needs of the athlete
3. Pre-competition meals
4. Content of pre-competition meals, Glucose and insulin responses of pre-competition meals.
5. Glycogen loading (super compensation)

MEASUREMENT INSTRUMENTS

Goniometer, Accelerometer,Photo optical devices,Pressure transducers and force plates, Gait analyzer,Isokinetic device,EMG -Electro physiology of muscle contraction,Recording,Processing,Relationship between EMG and bio-mechanical variables. Distance measuring devices, optical timers.

MEASUREMENT SCALE:

VAS,NPRS,DASH,SPADI,OMAC,OSWARTH,NDI
Functional sale of upper limb and lower limb

TREATMENT INSTRUMENTS

Therapeutic modalities

Principles underlying application of following modalities with reference to their production, biophysical and therapeutic effects, indications and contraindications and the specific uses,Dosimetry in specific disorders and traumatic condition

- Superficial and deep heat therapy
- Cryotherapy
- Various types of current
- Pneumatic compression devices
- Low high and medium frequency currents
- EMG
- LASER
- Shockwave
- Traction

- Recent advancement in therapeutic modalities

Therapeutic Exercise
Principles Types of following exercises with reference to their therapeutic effects, indications and contraindications and the specific uses,Dosimetry in specific disorders and traumatic condition

- Isometric,Isotonic,Isokinetic
- Concentric,Eccentric
- CKC,OKC
- Flexibility,ROM exercises
- Plyometric exercises
- Proprioceptive,Postural exercises

Manual Therapy techniques
Principles Types of manual therapy with reference to their therapeutic effects, indications and contraindications and the specific uses,Dosimetry in specific disorders and traumatic condition

SPECIAL AND INTEGRATED TECHNIQUES
Special and integrated techniques use in sport physiotherapy

ON-FIELD MANAGEMENT OF SPORTS INJURIES
Use of First Aid Kit, AED, CPR , Stretchers, Kinesiotaping, Protective gears used in different sports.

PAPER 404 – ADVANCED PHYSIOTHERAPY IN SPORTS

Course Description:
The course covers topics on various physiotherapy intervention in various types of sports injury. The course aims to provide a more functional and comprehensive approach to manage a range of sports injurt conditions.
Course Objective: The course should enable the student to acquire in-depth understanding and skill in managing sports injury condition by using varoious type of physiotherapeutic techniques.
Course Outcome: The student should be able to compare & contrast the outcome of various interventional sports related physiotherapy approaches.

Subject Objectives
Generic
On completion of the subject, students will have had the opportunity to develop the following generic skills. Make clinical decisions and plan for effective treatment. Evaluate and analyse the physiological aspects of physical rehabilitation. Identify and recognize the importance of monitoring vital signs. Plan strategies for management of various problems and in various medical and surgical conditions.

Specific
In this course, the student will learn the comprehensive management of physical ailments to develop independent professional knowledge and skill.
Description

Clinical Decision Making - Planning Effective Treatment. Collection and documentation of data. Analysis of data and identifying the problems. Setting goals,Formulation and implementation of treatment plan including evaluation of treatment outcome. Clinical decision making models. Foundation for clinical decision making.

Section 1: TOPICS: PHYSIOTHERAPY MANAGEMENT IN SPORTS SPECIFIC CONDITIONS AS IN PAPER 1.
Section-A
1. Define Rehabilitation, Goals and Objectives of Rehabilitation in Sports, Clinical Evaluation phases of rehabilitation. (multidisciplinary approach)
2. Prehabilitation
3. Modern concepts in rehabilitation.
4. Factors affecting the joint range of motion prevention of stiffness, methods of joint mobilization.
a. Testing for tightness and contracture of soft–tissue structures.
b. Techniques of mobilizing the various joints of the body.
Section-B
1. Definition, details of effects and uses of therapeutic exercises.
c. Dynamic Exercises
d. Plyometric Exercises
e. Isokinetic Exercises
f. Manipulative Techniques
g. Kinetic chain exercises
h. Aquatic therapy in sports.
i. Neuromuscular Training: Neuromuscular control, methods for improving neuromuscular control, proprioception and Kinesthetic sensation following different sport injuries.

2. Principles and application of neuromuscular facilitation techniques including PNF in sports.
3. Health club & fitness: Concept, group therapy

1. Pre–participation examination
2. Causes & Mechanism of Sports Injuries, prevention of sports injuries, 1. Sporting emergencies & first aid
2. Cardio pulmonary Resuscitation; Shock management, Internal and External bleeding, Splinting, Stretcher use–Handling and transfer, Management of Cardiac arrest, Acute asthma, epilepsy, drowning, burn, Medical management of mass participation. Heat stroke and Heat illness.

NON CONTACT SPORTS INJURIES

Physiotherapy assessment and management of injuries related to specific sports: This includes the application of the above two sections to specific sports like the following:

1. Injuries related to Cricket
2. Injuries related to Running
3. Injuries related to Swimming
4. Injuries related to Volleyball
5. Injuries related to Tennis
6. Injuries related to Badminton
7. Injuries related to Gymnastics.

LIMITED CONTACT SPORTS INJURIES

Physiotherapy Assessment and management of injuries related to specific sports: This includes the application of the above two sections to specific sports like the following:

1. Injuries related to Football
2. Injuries related to Baseball
3. Injuries related to Basket ball
4. Injuries related to Hockey
5. Injuries related to Cycling

SEMI CONTACT SPORTS INJURIES

1. Injuries related to Karate
2. Injuries related to Kick Boxing
3. Injuries related to Chinese Martial Arts
4. Injuries related to Kalari Payattu
5. Injuries related to Judo

FULL CONTACT SPORTS INJURIES

1. Injuries related to Kabbadi
2. Injuries related to Handball
3. Injuries related to Australian Rules football
4. Injuries related to Taekwondo
5. Injuries related to Wrestling
6. Injuries related to Sumo
7. Injuries related to Boxing

CURRENT ISSUES IN SPORTS PHYSICAL THERAPY

Presentation and discussion of current topics in sports physical therapy. Each specific topic, area or problem which is not adequately covered in the curriculum as determined by the needs of the students is covered in depth

1. Dry needling
2. K taping.
3. Tai-Chi and Power Yoga
4. Soft Tissue Manipulations in Sports.
5. Other Recent methods in sports Rehabilitation

Section 2: Sports Training

Periodization
Planning: Principles, need and importance of planning, Types of plan (training conception, macro, micro, meso and training session plan), Annual Training Program, phases and characteristics, psychological supercompensation, Periodization of strength training, speed and endurance, Periodization for Injury Prevention and Surveillance.

Peaking for Competitions, Factors facilitating peaking during competition,

Technical preparation:
Definition and meaning of technique, skill and style, Technique training & its implication in various phases; methods employed for technique training, causes of technical fault and their correction, Definition and meaning of tactics, aim of tactics according to sport.

Long Term Athlete Development: Stages of Athletic Development: Generalized and Specialized training, Olympic Cycle: classification of Olympic cycle plan and compiling an Olympic cycle Plan Talent Identification: Methods, Criteria, Factors and Phases of Talent Identification

Precision Heart Rate Training

Heart rate monitoring and training, Training in heart zones, Precision heart rate training for specific sports, Multi Activity training, Monitoring of training effects

PRACTICAL
PAPER 405P - SPORTS BIOMECHANICS
This involves application of topics in PAPER 603 via demonstrations, field visits and case presentations.

PRACTICAL
MPT 406P SPORTS PHYSIOTHERAPY ASSESSMENT AND EQUIPMENTSS
Students will be instructed via demonstration, hands on assessment, field visits and case conference on specific techniques used in the assessment of patients with sports injury. Students will draw on their experiences at the clinical postings to formulate a treatment plan for cases presented at the case conference.The demonstrations and practicals should be inline with the theory topics covered in Sports PHYSIOTHERAPY ASSESSMENT AND EQUIPMENTSs.

PRACTICAL.
MPT 407P ADVANCED SPORTS PHYSIOTHERAPY
Students will be instructed via demonstration, hands on techniques, field visits and case conferences on specific techniques used in the management of patients with sports injury. Students will draw on their experiences at the clinical postings to formulate a treatment plan for cases presented at the case conference.The demonstrations and practicals should be inline with the theory topics covered in Advanced Sports Physiotherapy

PAPER 408 CLINICAL & SEMINARS PRESENTATIONS

Students will engage in clinical practice in Department of Sports Physiotherapy setting to enhance their clinical skills and apply theoretical knowledge gained during teaching sessions.

Seminars: These will serve as a platform for students to integrate components of patient management. Students will give presentations on topics provide to them.

Poster presentation of a research paper

MPT (SPORTS)

Course Description: The course covers topics related to physiotherapy ethics and theory of teaching.

Course Objective: On completion of the course the student should be able to understand the dynamics of teaching & learning, plan effective teaching sessions in physiotherapy..

Course Outcome: The student should be able to demonstrate adequate knowledge and skill in physiotherapy Ethics and learn ways to effectively teaching.

SECOND YEAR

PAPER 601 - PEDAGOGY OF PHYSIOTHERAPY EDUCATION

This course will be provided students information on improving their teaching skills in the classroom and clinical setting

Following are the topics to be included but not limited to:

1. Philosophy of educational and emerging issues in Education meaning, functions and aims of education.
    - Formal, informal and non- formal education
    - Agencies of education
    - Current issues and trends in higher education
    - Issues of quality in higher education, autonomy and accountability, privatization,
    - professional development of teachers, education of persons with disabilities.
    - Need for education philosophy
    - Some major philosophies, Idealism Naturalism, Pragmatism and their implications for Education.

2. Philosophy of educational and emerging issues in Education meaning, functions and aims of education.
    - Formal, informal and non- formal education.
    - Agencies of education
    - Current issues and trends in higher education

- Issues of quality in higher education, autonomy and accountability, privatization, professional development of teachers, education of persons with disabilities.
- Need for education philosophy
- Some major philosophies, Idealism Naturalism, Pragmatism and their implications for Education.

3. Concept of teaching and learning
Meaning scope of educational psychology
Meaning and relationship between teaching and learning
Learning theories
Dynamics of behaviour
Individual differences

Curriculum

- Meaning and concept
- Basis of curriculum formulation development
- Framing objectives for curriculum
- Process of curriculum development and factors affecting curriculum
- Development evaluation of curriculum

4. Method and techniques of teaching
- Lecture, Demonstration
- Discussion, Seminar, Assignment, Project and Case Study.

5. Planning for Teaching
- Bloom's Taxonomy of Instructional Objectives, Writing Instructional Objectives in Behavioural terms, Unit Planning and Lesson Planning.

6. Teaching Aids
- Types of teaching aides
- Principles of selection, preparation, and Use of Audio –Visual aids.

7. Measurement and evaluation
- Nature of Educational Measurement : Meaning, Process, Types of tests.
- Construction of an achievement test and analysis standardized test.
- Introduction of some standardized tools, important tests of intelligence, Aptitude, Personality.
- Continuous and Comprehensive Evaluation.

8. Guidance and Counseling
- Meaning and Concepts of Guidance and Counseling
- Principles
- Guidance and Counseling services of students and faculty members

- Faculty development and development of personnel for P.T. Services

9. Clinical Education
- Awareness and Guidance to the Common people about Health and Diseases and Available professional Services
- Patient Education
- Education of the Practitioners

PAPER 602 - MANAGEMENT, ADMINISTRATION AND ETHICAL ISSUES

Course Description: The course covers topics related to physiotherapy clinic and department management.

Course Objective: On completion of the course the student should be able to understand, the basic issues of physiotherapy management & administration and practice as an informed professional on Legal & ethical issues.

Course Outcome: The student should be able to demonstrate adequate knowledge and skill in physiotherapy Ethics, clinic and department management.

This course deals with issues of management to assist the practitioner in efficiently addressing issues related to the organization and administration of a Physiotherapy Department following are the topics to be included but limited to:

MANAGEMENT

1. Functions of management,
2. Evaluation of management through scientific management theory,
   Classical theory
   System approach
   Contingency approach
3. Management process
   Planning, Organization, direction, controlling (decision making)
4. Introduction to personnel management
   Staffing recruitment selection, performance appraisal, collective bargaining, discipline, job satisfaction.
5. Quantitative methods of management
   Relevance of statistical and/or techniques in management.
6. Marketing
   Market segmentation, marketing research production planning pricing, channels of distribution, promotion, consumer behaviour, licenser.
1. Total quality management
   Basis of quality management – acid for quality control quality assurance program in hospitals, medical audit, and international quality system.

ADMINISTRATION

1. **Hospital as an organization**
   Functions and types of hospitals selected clinical supportive ancillary services of a hospital, emergency department, nursing, physical medicine & rehabilitation, clinical supportive and ancillary services of a hospital, emergency department

nursing physical medicine & rehabilitation, clinical laboratory, pharmacy and dietary dept.

2. Roles of Physiotherapist, Physiotherapy Director, Physiotherapy supervisor, Physiotherapy assistant, Physiotherapy aide, Occupational Therapist, Home health side, Volunteer.
3. Directed care and referral relationship and confidentially.

LEGAL PROFESSIONAL ETHICAL ISSUES

1. Physical therapy: Definition and development
2. The implications & confirmation to the rules of professional conduct.
3. Legal responsibility for their actions in the professional context and understanding the physiotherapist liability and obligations in the case of medical legal action.
4. Code of ethics. A wider knowledge of ethics relating to current social and medical policy in the provisions of health care.
5. Functions of the relevant professional associations education body and trade union.
6. The role of the international health agencies such as the world health organizations.
7. Standards of practice for physical therapies.
8. Acts & Statutes relating to Physiotherapy
9. Current issues.

PAPER 603 - EXERCISE PHYSIOLOGY & ELECTRO PHYSIOLOGY

Course description: This course aims to deliver scientifically based standards on exercise and its effects on various systems of the body. It prepares students through the process of selecting and administering therapeutic exercises and electrotherapeutic agents, using Guidelines to interpret results, and drafting an physiotherapy interventional prescription that is in line with Guidelines parameters.

Course Objective: this course should deliver the concepts in exercise physiology, electrophysiology and prepare students to test and prescribe suitable exercises and electrotherapeutic agents to different groups of the population and conditions.

Course Outcome: On completion of the study of this Course the student should be able to select and administer using Guidelines to interpret results, and drafting an therapeutic exercise and electrotherapeutic agents prescription to different populations and conditions.

This course provides the student the required knowledge and skills on exercise and its effects on various systems of the body. The student shall also gain knowledge and skills on the various therapeutic exercises targeted for different conditions. The student shall learn the knowledge and skills on various electrotherapeutic agents, advanced techniques and physiological responses of nerve and muscle in diagnostic and therapeutic electro-agents.

Energy Transfer for Physical Activity:
a. Energy transfer in Body.
b. Energy transfer in exercise.
c. Energy expenditure during various activities.
d. Fatigue.
e. Biochemical responses to endurance training.

Cardio Vascular System and Exercise:
a. Athletes Heart.
b. Cardio Vascular adaptations to sustained aerobic exercises.
c. Lipids and sports, protection from coronary heart disease, exercise and optimization of lipid profile.
d. Sudden cardiac death in sports. Regulation of circulation during exercise. Exercise and vascular system-cardiovascular adaptation to sustained aerobic exercises, exercise and optimization of lipid profile, regulation of circulation during exercise

Exercise and nervous system - neural adaptation with exercises, cerebral perfusion and exercises, exercise for mood enhancement and anxiety.

Exercise and cell biology - effect of exercise on various cell activities, adaptation of organelles with exercise, exercise and aging-physiology changes of aging

Exercise and Respiratory System:
a. Second Wind.
b. Oxygen Debt.
c. Breath Holding, High Pressure Ventilation. Scuba Diving.
d. Regulation of Respiration during exercise.

Skeletal System:
a. Growth and Exercise.
b. Repair and adaptation during exercise. Delayed Onset Muscle Soreness (DOMS)
c. Exercise prescription for chronic low back pain
d. Training for Muscular Strength and Endurance.
e. Muscle fibre typing and significance.

Gastrointestinal Tract and Endocrine system:
a. Effect of Sports on GIT and Liver.
b. Hormone regulation of fluid and electrolytes during exercise.
c. Exercise and Menstrual Cycle.
d. Stress Hormones in Exercise.

Exercise and endocrine system-
Hormonal regulation of fluid and electrolytes during exercise and menstrual cycle, stress hormone in various activity, effect of exercise on various hormones in exercise, effect of exercise on GIT and liver, Opiods, Runners High. exercise addiction.

Exercise and Common Pulmonary Conditions
a. Exercise induced bronchial obstruction
b. Exercise in chronic airway obstruction
c. Air pollution and exercise

Exercise and Cardiac Conditions
a. Exercise prescription for heart disease
b. Exercise in primary prevention in ischemic heart disease
c. Exercise for secondary prevention of ischemic heart disease
d. Exercise induced Asthma;
e. Exercise Stress Testing for Diagnosis of CHD.

Exercise testing: incremental shuttle walk test, endurance shuttle walk test, six minute walk test, Step test, treadmill tests.(i.e. Balke, Bruce, Noughton, Modified Bruce protocol), interval bike test, sub maximal GXT, symptom limited GXT, exercise testing using cycle ergometer, oxygen uptake (VO2)

Doping in Sports
a. Banned drugs
b. Procedure of dope testing
c. Control of doping abuse

Diabetes and Exercise
a. Exercise in diabetic patients
b. Exercise as a method of control of diabetes

Exercises for special categories
a. Child and adolescent athlete's problems
b. Special problems of older athletes
c. Special concerns for differently abled athletes

Female Specific Problems:
1. Sports Amenorrhoea.
2. Injury to female reproductive tract.
3. Menstrual Synchrony.
4. Sex determination.
5. Exercise and pregnancy.
6. Eating disorders in athletes.

Rheumatology & Geriatric Disorder:
1. Rheumatoid arthritis, SLE and Juvenile Rheumatoid Arthritis.
2. Ankylosing Spondylitis.
3. Osteoarthrosis and other geriatric conditions.
4. Cost and benefits of exercise prescription in Osteoporosis.

Temperature Regulation

a. Heat Balance.
b. Methods of Assessing Heat Balance.
c. Effects of Climate.
d. Effects of Exercise on Temperature Regulation.
e. Limit of Tolerance of Heat.
f. Acclimatisation.
g. Avoidance in Heat illness during exercise.
h. Exercises in cold.

Physiological Basis and Principles of Training and Conditioning

a. Principles of endurance and strength training i. Recovery training intensities in heart rate ii. Manipulation of training principles iii. Training sub–phases
b. Fundamentals that aid training and performance i. Warm up and Cool down ii. Flexibility and stretching
iii. Missing workouts iv. Overtraining
c. Analysis of Training

Misc. Topics

High Altitude Training, Sports Diving, Hazards of underwater environment. Special Aids to Athletic Performance:– MORA, Oxygen Inhalation, Sleep.,Sex and performance. Assessment of Age. Muscle tissue fibre typing and its significance. Exercise for mood enhancement & anxiety.

Obesity and related problems

a. Dietary recommendation for healthy individual.
b. Obesity – epidemiology, classification of causes, complications and treatment.
c. Paediatric obesity- Regulation of food consumption, complications and prevention.

Stress Management

a. Introduction i. The history and definition of "stress" ii. The characteristics of stressors iii. Clinical implications of stress iv. Coping with stress – styles of coping, recruiting res ources for coping
b. Self management
c. Tools for stress management

Hazards of Smoking

a. The physiological, psychological and behavioral impact of cigarette smoking
b. Evidence based possibilities for treatment
c. Treatment for smoking cessation

Sleep Medicine

a. Acquaintance with basic concepts in sleep medicine, the structure and physiology of sleep
b. Classification of sleep disorders
c. Clinical implications of sleep disturbance

d. Physiotherapeutic measures for sleep deprivation

Yoga

a. Important Pranayamas and strengthening and rejuvenating asanas.
b. Methods, advantages and contraindications.

Nutrition & Dietetics

six nutrient classes a. carbohydrates, fats, proteins.b. Vitamins, minerals and water. water & electrolyte balance
Body weight; body composition

- Body build, body size & body composition
- Assessing body composition
- Body composition & sport performance
- Weight standards
- Achieving optimal weight

3. Diet & fitness products
4. Exercise & diet programme to gain weight
   - Gaining body fat
   - gaining muscle mass
5. Guidelines for healthy diet

c. Optimal Nutrition for exercise. Nutrition for Physical Performance. Pre–Game meal, Carbohydrate loading. f. Alcohol, Mega Vitamin Therapy.g. Food for various athletes of different disciplines.h. Fluid and energy replacement in prolonged exercise. i. AHA Dietary guidelines for Heart diseases

SECTION – II ELECTRO PHYSIOLOGY

Diagnostic Electrophysiology

1. Anatomy and Physiology of: Motor unit, action potential, excitability of nerve and
2. muscle, neuromuscular junction.
3. Technique of nerve conduction velocity and electromyography: Instrument, techniques, interpretations in terms of neuromuscular function and bio-feedback technique.
4. Nerve conduction studies, normal/abnormal nerve conduction, its relevance in muscle function.
5. Concepts of normal & abnormal EMG studies.
6. Late responses
7. Concepts of electro physiological studies in neuro muscular diseases as a diagnostic and therapeutic tool.
8. Electrical stimulation and its effects on various systems.

9. Evoked potentials – VEP, SSEP, MEP, BAEP

Therapeutic Electrophysiology
Physiological mechanism of action of electrotherapeutic modalities, Critical Analysis of Electrotherapeutic Modalities- IFT, TENS, MS, SWD, LASER, MWD, Pulsed SWD, Mechanical Traction etc.
Plasticity in response to Electrical stimulation.

Recent Advancement and Evidence based practice in Electrotherapy
Extracorporeal Shock Wave Therapy, tDCS, Long wave diathermy, Electro-Cupping and Vaccume, NMES, FES
Practicals:
The student will undergo laboratory and on–field training in Exercise physiology and Electrophysiology.

PAPER 604 – SPORTS PSYCHOLOGY

Course Description: The course covers topics related to sports psychological basis of athletic training and injury management.
Course Objective: The course should enable the student to acquire in-depth knowledge in different sports psychological basis of athletic training and injury management.
Course Outcome: The student should be able to demonstrate adequate knowledge and skill in different sport sports psychological basis of athletic training and injury management.

Introduction to sport psychology: What is sport psychology,A brief history of sport psychology What is a sport psychologist? Action-Theory Approach to Applied Sport Psychology

Personality and sport : Introduction, Trait theories, Eysenck's theory. Cattell's theory. Other measurable personality variables-Sensation seeking, Telic dominance. Applying trait and narrow-band theories to sport: Distinguishing athletes from non-athletes, Distinguishing successful from unsuccessful athletes, Personality and choice of sport, Evaluation of the trait and narrow-band approaches. Situational and interactional approaches. Applying the interactional model to sport-Profiling moods, Evaluation of the interactional approach, Social learning theory. Applying social learning theory to sport-Patterns of sport-related behavior, Athletes as role models, Acquiring love of sport, Evaluation of social learning theory.

Attitudes to sport: The nature of attitudes-The functional approach, The structural approach, Applications of the structural approach to sport. Measuring attitudes- Likert scales, Semantic differential scales, Thurstone scales. The formation of attitudes to sport- Personality, genetics and attitudes. Social learning of attitudes. Attitudes to competition- Direct experience and attitudes, What are children's attitudes to sport?

Attitudes to sport and sporting behavior- Evaluation of the TRA. Changing people's attitudes to sport-Cognitive dissonance, Evaluation of cognitive dissonance theory, Self-perception theory, Evaluation of self-perception theory

Aggression in sport: Defining aggression-Hostile aggression, instrumental aggression and assertiveness. Sanctioned and unsanctioned aggression. The link between aggression and performance. Theories of aggression- Instinct theories, Evaluation of the instinct approach, Social learning theory, Evaluation of social learning theory, The frustration-aggression hypothesis, Evaluation of the frustration-aggression hypothesis. Conclusions. Situational factors affecting aggression in sport. Does sport increase or reduce aggression? Effects on spectators.The reduction of aggression-Punishment, Catharsis, Role modeling, Contracting ,Anger-management groups.

Arousal, anxiety and stress: Definitions of arousal, anxiety and stress-somatic and cognitive anxiety, state and trait anxiety. Factors inducing anxiety and stress-situational factors, event importance , expectations , uncertainty. Individual factors -trait anxiety, self-esteem and self-efficacy. The relationship between arousal and performance. Drive theory- evaluation of drive theory, inverted u hypothesis, evaluation of inverted u hypothesis.the relationship between anxiety and performance-the catastrophe model evaluation of the catastrophe model, zones of optimal functioning, evaluation of the zof theory. Stress management-relaxation techniques, biofeedback , progressive muscle relaxation. Cognitive-behavioural techniques-goal-setting theory, evaluation of goal-setting theory. Imagery techniques-mental rehearsal .

Social influences on sporting behavior: Sources of social influence-Coaching and socialization, Culture and socialization, Sport as a socialising agent. Groups and teams-Defining groups and teams, Group formation, Group cohesion, What determines team cohesion?, Cohesiveness and performance, Developing team cohesion. Social facilitation- Co-action and audience effects, Explanations for co-action and audience effects- Drive theory, evaluation of drive theory, evaluation-apprehension theory, evaluation of evaluation-apprehension theory. social loafing. groupthink. leadership-leadership style,theories of leadership, trait theories, evaluation of trait theories, fiedler's contingency theory, evaluation of fiedler's theory. summary. Who cares what other people think? Self-presentation in exercise and sport

Motivation and sport: Intrinsic and extrinsic motivation. Humanistic perspectives on motivation -Maslow's theory of needs, Evaluation of Maslow's theory. Achievement-motivation-The McClelland-Atkinson theory of need achievement, Evaluation of McClelland and Atkinson's theory, Fear of success, Evaluation of FOS theory. Cognitive approaches to motivation-Attribution, Internal and external attributions, Weiner's model of attribution, Evaluation of Weiner's model, Learned helplessness and reattribution training, Self-efficiacy, Evaluation of the self-efficiacy construct. Contemporary research on motives for sports participation. Summary. the psychology of superior sport performance:a cognitive and affective neuroscience perspective

Skill acquisition: Skills and abilities- definitions, classifying abilities, evaluation of the ability construct. classifying skills-gross and fine skills, open and closed skills, discrete, continuous and serial skills, external and internally paced skills. stages of skill acquisition- the cognitive stage, the associative stage, the autonomous stage. evaluation of the three-stage model.the information-processing approach to skills-evaluation of welford's model. memory -anderson's model of memory. evaluation of anderson's theory. theories of motor learning-closed loop theory, evaluation of closed loop theory, schema theory, evaluation of schema theory. enhancing skill acquisition-practice, massed and distributed practice, whole and part practice, physical and mental practice, guidance, feedback. mental skills training in sport

special topics: Eating disorders in sport. psychosocial antecedents of sport injury and interventions for risk reduction. psychology of sport injury rehabilitation. gender and cultural diversity, athletes with disabilities, alcohol and drug use among athletes: prevalence, etiology, and interventions.

PAPER 605 - RESEARCH METHODOLOGY, BIOSTATISTICS & EVIDENCE BASED PRACTICE

Course Description: The course covers the concept of research methodology, Evidence based practice and biostatistics related to physical therapy

Course Objective: The course aims to introduce the principles of research, methods of research and analysing the research studies using Biostatistics.

Course Outcome: On completion of the study of this Course the student should be able to understand the methods of research process and design so as to effectively plan a research.
To understand the statistical measures used in the analysis and interpretation of research data.
To acquire skills of critically reviewing the literature.

RESEARCH METHODOLOGY

SECTION – 1

Research in physiotherapy

a. Introduction
b. Research for Physiotherapist: Why? How? When?
c. Research – Definition, concept, purpose, approaches
d. Internet sites for Physiotherapists.

Research fundamentals

a. Define measurement
b. Measurement framework
c. Scales of measurement

d. Pilot Study
e. Types of variables
f. Reliability & Validity
g. Drawing Tables, Graphs, Master chart

Writing a research proposal
a. Defining a problem
b. Review of Literature
c. Formulating a question, Operational Definition
d. Inclusion & Exclusion criteria
e. Methodology- Forming groups Data collection & method for analysis
f. Informed Consent Steps of documentation – Title to Scope of study

Research ethics
a. Importance of Ethics in Research
b. Main ethical issues in human subjects" research
c. Main ethical principles that govern research with human subjects
d. Components of an ethically valid informed consent for research.

Overview of study designs
c. Observational ,Descriptive-Case study/ series, Cross sectional, Normative, Correlational ii. Analytical; case control, cohort
d. Experimental- True & quasi experimental

Sampling
a. Random and non-random sampling.
b. Various methods of sampling – simple random, stratified,systematic, cluster and multistage. Sampling and non-sampling errors and methods of minimizing these errors.

Plagiarism
Definition of Plagiarism, types, Avoiding plagiarism , software methods to detect plagiarism.

Evidence Based Practice
1. Introduction to evidence– based complementary medicine
2. Evidence–based health care
3.Evidence–based practices 4. Evidence–based decision making and management

Types of evidence:
a. Definition of evidence
b. Forms of evidence : Case–control studies
c. Cohort studies
d. Randomized controlled trials
e. Systematic Reviews.

Importance of Hierarchy of Evidence

Key element of scientific writing.

Structure, formulation and implementation of thesis, Structure, formulation and implementation of original research report ,Structure, formulation and implementation of systematic review/meta –analysis, How to read and critique research,Review of an indexed refereed research paper, - Evaluating paper scientific merit, Providing constructive feedback to the author, typical review formats for reviewing a paper ,Reasons for rejection

Presenting Research: Writing and submitting papers
(a) Strategies of paper writing
(b) Design of paper writing
(c) Tactics of paper writing - Where to publish

SECTION – II BIOSTATISTICS
Introduction
Descriptive and Inferential statistics
Types of data: Qualitative and Quantitative, Parametric and Non- Parametric tests
Which tests to use.
Tests of significance

m. Basics of testing of hypothesis – Null and alternate hypothesis, type I and type II errors, level of significance and power of the test, p value.
n. Tests of significance (parametric) - t – test (paired and unpaired), Chi square test and test of proportion, one way analysis of variance.
o. Repeated measures analysis of variance.
p. Tests of significance (non-parametric)-Mann-Whitney u test, Wilcoxon test, e. Kruskal-Wallis analysis of variance. Friedman"s analysis of variance.

Correlation and regression
Simple correlation – Pearson"s and Spearman"s; testing the significance of correlation coefficient, linear and multiple regressions. Interpretation of r.

Basic probability distributions and sampling Distributions
a. Concept of probability and probability distribution.
b. Normal, Poisson and Binomial distributions, parameters and application.
c. Concept of sampling distributions.
d. Standard error and confidence intervals.
e. Skewness and Kurtosis

Graphical Presentation
Frequency distributions, Describing data with Graphs, Describing data with Averages Mode Median Mean, Describing variability Variance, Standard deviation, etc. Normal Distributions

Role of Computers in Research
Basic of computers – Hardware and Software
Basic of Computer Applications – Windows, MS word, Power Point, etc.
Simple statistical Analysis using SPSS software.
Tabulation, Calculation of central tendency and dispersion, Using software packages, Analysis, Presentation of data in diagrammatic & Graphic form
Artificial Intelligence and its application in physiotherapy
Robotics and its application in physiotherapy
Information technology and its application in physiotherapy

PAPER 606P EXERCISE PHYSIOLOGY & ELECTROPHYSIOLOGY
The demonstrations and practicals should be inline with the theory topics covered in Exercise physiology and electrophysiology

PAPER 606P - DISSERTATION
As part of the requirement for the Master's degree the student is required to undertake a research study under the guidance of a guide. Oral Presentations at Conferences/Seminars - Preparing presentation,- Duration of presentation,- What to present. Student must publish/present at least one research paper at a National Level Conference/ International Level Journal.

PAPER 608 - CLINICAL & SEMINARS PRESENTATIONS
These will serve as a platform for students to integrate various components of patient management. Students will give presentations on topics provided to them.
Students will engage in clinical in Physiotherapy Departments in the Orthopaedic setting to enhance their clinical skills and apply theoretical knowledge gaining during teaching sessions.

List of Recommended books for MPT (Sports)		
S.N	Author	Title
1	O'Bannon, Teresa	Teaching With Movies Recreation Sport Tourism and Physical Education
2	Norton, Kevin	A Text book of body measurment for sport and health education
3	Verma, B.L	Biostatistics
4	Campbell,M.J	Medical statistics
5	Dvir,Zeevi	Isokinetics Muscle testing interpretation and clinical application
6	Oatis,C.A	Kinesiology
7	Ferguson, Tim	GCSE Physical Education
8	Gorwitz, Crystal	Teaching Healthy Lifestyles in Middle School PE
9	Lang, Annette	Morning Strength Workouts
10	Mujika,Inigo	Tapering and Peaking for Optimal Performance
11	Svensson, Malin	Nordic Walking
12	Koley,S	Textbook of Kinanthropometry
13	Nix, Staci	Williams' Basic Nutrition and Diet Therapy
14	Sherry,F	Oxford hand book of Sports Medicine
15	Baker,C.L	The Hughston clinic sport medicine book
16	Torgn J.S	Current Therapy in Sports Medicine
17	Vijay,S.A	MCQ in Sports Physiotherapy
18	Ram,C.S	Taping Technique Theory and Practice
19	Delee,J.C	Orthopaedic Sports Medicine Vol-1
20	Delee,J.C	Orthopaedic Sports Medicine Vol-2
21	Delee,J.C	Pediatric and Adolescent sports Medicine Vol-3
22	Gupta,L.C	Manual of First Aid

23	Harries,Mark	ABC of Sports Medicine
24	American Sport Education Program	Successful Sports Officiating
25	Karageorghis C.I	Inside Sports Physiology
26	Doughery, Jim	Survival Guide for Coaching Youth Football
27	Bass, Tom	Football Skills & Drills
28	Galat, Joe	Coaching Youth Football
29	Garland, Jim	Youth Soccer Drills
30	Brown, Jim	Tennis Steps to Success
31	Mcgregor, Stephen J.	The Runner's Edge
32	Mora,John	Triathlon 101 Essentials for Multisport Success
33	Panzera, Robert	Cycling Fast: Winning Essentials for Cycling Competition
34	Sovndal,Shannon	Cycling Anatomy
35	Mcardle W.D	Exercise Physiology
36	Demain, Arnold L.	Rehabilitation Medicine
37	Sivaram,C	Principles of Exercise in Physiotherapy
38	American College of sports Medicine	ACSM'S Resource Manual for Guidenes for exercise testing
39	Das,Lalita	Text book of Sports Medicine
40	Frontera, Walter R.	Clinical Sports Medicine : Medical Management & Rehabilitation
41	Khan,Karim	Clinical sports medicine
42	Perrin,D.H	The Injured Athlete
43	Prentice, W.E	Therapeutic Modalities in sports medicine
44	Stone,DA	Sports Injuries
45	Hall,Susan J	Sports Injury Management
46	EllenBecker,T.S	Knee Ligament Rehabilitation

47	American Sport Education Program	Coaching Youth Cheerleading
48	Susan, Jackson A.	Flow in Sport : The keys to Optimal Experiences & Performance
49	Taylor, Kevin J	Geocaching for School and Communities
50	Tood, Strong	Great Games for Big Activity Balls
51	Guy, Ray	Football Kicking and Punting
52	Biscombe. Tony	Rugby: Steps to Success
53	Masteralexis,L.A	Principles and Practice of Sport Management
54	Walter, Ryan	Hockey Plays and Strategies
55	Jung,Jim Woo	Freestyle Sparring : Techniques and Tactics for a Competitive edge
56	Sandler, David	Sports Power
57	Nicholas Hershman	Vol. I The Upper Extremity in Sports Medicine.
58	Nicholas Hershman	Vol. II The Lower Extremity in Sports Medicine.
59	Nicholas Hershman	Vol. III Spine in Sports Medicine. Mosby
60	D. Kulund	The Injured Athlete, Lippincott.
61	C. Norris	Sports Injuries – Diagnosis and Management for Physiotherapists, Heinmann.
62	Gould	Orthopaedic Sports Physical Therapy, Mosby.
63	Reed	Sports Injuries – Assessment and Rehabilitation, W.B. Saunders.
64	Zulunga	Sports Physiotherapy, W.B. Saunders.
65	Torg, Welsh & Shephard	Current Therapy in Sports Medicine III – Mosby.
66	Richard B. Birrer	Sports Medicine for the primary care Physician, CRC Press.

67	Morris B. Mellion	Office Sports Medicine, Hanley & Belfus.
68	Andrea Bates and Norm Hanson	Aquatic Exercise Therapy, W.B. Saunders.
69	Werner Kuprian	Physical Therapy for Sports, W.B. Saunders.
70	William Prentice	Rehabilitation Techniques for Sports Medicine and Athletic Training – Mosby.
71	James Cantlie	First Aid to Injured: St. John's Ambulance Association.
72	Indian Red Cross Society	Indian First Aid Manual

Electrotherapy		
S.N	Author	Title
1	Khandpur, R.S	Hand book of Biomedical Instrumentation
2	Glaser,Roland	Biophysics
3	Prentice William	Therapeutic Modalities in Rehabilitation
4	Robinson,A.J	Clinical Electrophysiology
5	Gersh,M.R	Electrotherapy in Rehabilitation
6	Robertson Val	Electrotherapy Explained principle and practice
7	Nelson ,Roger M	Clinical Electrotherapy
8	Kimura, Jun	Electrodiagnosis in Diseases of Nerve & Muscle: Principles & Practice
9	Stokes, Maria	Physical Management in Neurological Rehabilitation
10	Michlovitz,S.L	Modalities for Therapeutic Intervention

Sports Biomechanics		
S.N	Author	Title
1	Ackland Timolthy	Applied Anatomy and Biomechanics in Sports
2	Bell,Frank	Principles of Mechanics & Biomechanics
3	Raj Kumar,R.V	Biomechanics the Nucleus of Physiotherapy
4	Koley,S	Textbook of Biomechanics
5	Nordin, Margareta	Basic Biomechanics of the Musculoskeletal system
6	Griffith's IW	Principles of Biomechanics & Motion Analysis
7	Hall,Susan J	Basic Biomechanics
8	Smith, Laura K.	Brunnstrom's Clinical Kinesiology
9	Oatis,C.A	Kinesiology
10	Kapandji, I.A	The Physiology of The Joint Vol-1
11	Kapandji, I.A	The Physiology of The Joint Vol-2
12	Kapandji, I.A	The Physiology of The Joint Vol-3
13	Norkin C.C	Joint Structure and Function
14	Dvir,Zeevi	Isokinetics Muscle testing interpretation and clinical application
15	Mow,V.C	Basic Orthopaedic Biomechanics
16	R Bartlett	Introduction to Sports Biomechanics: Analysing Human Movement Patterns
17	McGinnis, P. M.	Biomechanics of sport and exercise. Human Kinetics
18	Shaw Dhananjoy	Biomechanics and Kinesiology of Human Motion. New Delhi: Khel Sahitya Kendra
19	Oatis	Basic Biomechanics & clinical Kinesiology.
20	D Winter	Biomechanics of Human Movement.
21	GL Soderberg	Kinesiology: Application to Pathological Motion.
22	K Luttgens, N	Kinesiology: Scientific Basis of Human Motion.

	Hamilton	
Research Methodology & Biostatistics		
S.N	Author	Title
1	Kothari, C.R.	Research Methodology Methods and Techniques
2	Singh, Sunita	Synopsis of Biostatistics
3	Prasad,S	Elements of Biostatistics
4	Pitney W.A	Qualitative Research in Physical Activity
5	Jewell,D.V	Guide to Evidence Based Physical Therapists Practice
6	Herbert,Rob	Practical Evidence Based Physiotherapy
7	Bhandri,Mohit	Clinical Research made Easy
8	Verma, B.L	Biostatistics
9	Campbell,M.J	Medical statistics

Exercise Physiology & Electrophysiology		
S.N	Author	Title
1	Koley,S	Textbook of Kinanthropometry
2	Nix, Staci	Williams' Basic Nutrition and Diet Therapy
3	Karageorghis C.I	Inside Sports Physiology
4	Sivaram,C	Principles of Exercise in Physiotherapy
5	American College of sports Medicine	ACSM'S Resource Manual for Guidelines for exercise testing
6	Mcardle W.D	Exercise Physiology
7	Woods,Ron	Energy Every Day
8	Skinner,J.S	Exercise Testing & Exercise Prescription For Special Cases
9	Wasserman, Karlman	Principles of Exercise Testing & Interpretation

10	Robinson,A.J	Clinical Electrophysiology
11	Kimura, Jun	Electrodiagnosis in Diseases of Nerve & Muscle: Principles & Practice
12	Mallarkey	Managing Obesity, Adis Publications
13	Burke	Precision Heart rate training, Human Kinetics
14	Mishra	Clinical Neurophysiology, B.I. Churchill Livingstone.
15	Era Volinski	Nutrition and exercise in Sports – CRC Press, New York
16	George A. Brooks, Thomas D. Fahey	Exercise Physiology – Human Bioenergetics and its applications John Wiley & Sons, New York
17	Astrand, Rodahl	Text Book of Work Physiology, McGraw Hill
18	Fox and Mathews	The Physiological Basis of Physical Education and athletics – Holt Saunders
19	Erston and Reilly	Kinanthropometry and Exercise Physiology Laboratory Manual tests, Procedures and Data – F & FN Spon Madras
20	Rowland	Developmental Exercise Physiology – Human Kinetics
21	Clarke	Exercise Physiology – Prentice Hall

Syllabus

For

Master of Physiotherapy
(OBSTETRICS AND GYNAECOLOGY)

Atal Bihari Vajpayee Medical University Lucknow, U.P., India
From session 2021-2022

MPT (OBSTETRICS AND GYNAECOLOGY)
FIRST YEAR

Paper Code	Title	Total Hours	Hours/ week	Yearly Credits	IA Marks	UE Marks	Total Marks
MPT501	Medical & Surgical Disorders in Obstetric and Gynaecology	100	4	8	25	75	100
MPT502	Obstetric and Gynaecology Bio-mechanics	100	4	8	25	75	100
MPT503	Obstetric and Gynaecology Physiotherapy Assessment and Equipments	50	2	4	25	75	100
MPT504	Advance Physiotherapy in Obstetric and Gynaecology	100	4	8	25	75	100
MPT505 P	*Practical- I* Obstetric and Gynaecolog Bio-mechanics	60	2	2	25	75	100
MPT 506P	*Practical- ii* – Obstetric and Gynaecology Physiotherapy Assessment and Equipmentss	50	2	2	25	75	100
MPT507 P	*Practical – iii*- advance physiotherapy in Obstetric and Gynaecology	100	4	4	25	75	100
	Total	**560**	**22**	**36**	**175**	**525**	**700**
MPT508	Clinics & Seminars Presentations	500	12	12	50	50	100
	Total	**1060**	**34**	**48**	**225**	**575**	**800**

- IA= INTERNAL ASSESSMENT
- UE=University Examination

SECOND YEAR

Paper Code	Title	Total Hours	Hours/ week	Yearly Credits	IA Marks	UE Marks	Total Marks
MPT601	Pedagogy in Physiotherapy Education	80	3	6	25	75	100
MPT602	Management, Administration and Ethical Issues	80	3	6	25	75	100
MPT603	Exercise Physiology & Electro Physiology	50	2	4	25	75	100
MPT604	Ergonomics	80	3	6	25	75	100
MPT605	Research Methodology, Biostatistics & Evidence Based Practice	100	4	8	25	75	100
MPT606 P	Practical I- Exercise Physiology and Electrophysiology	50	2	2	25	75	100
MPT607P	*Practical- II* Dissertation	200	12	12	25	75	100
Total		**640**	**29**	**44**	**175**	**525**	**700**
MPT608	Clinics & Seminars Presentations	500	12	12	50	50	100
GRAND Total		**1140**	**41**	**56**	**225**	**575**	**800**

- IA= INTERNAL ASSESSMENT
- UE=University Examination

MPT (Obstetrics and Gynecology)

FIRST YEAR

PAPER 501 - Basic Medical Science and Disorders in OBSTETRIC AND GYNAECOLOGY

Course Description: The course covers topics related to basic science and epidemiology, pathophysiological, clinical manifestation, conservative and surgical management in obstetric and gynaecology

Course Objective: The course should enable the student to develop a detailed concept about different obstetric and gynaecology diseases & disorders and its medical and surgical management.

Course Outcome: The Students will be able to use this information in planning and tailoring effective, specific, safe Physiotherapy treatment programmes.

This course provides the student with information on basic science and epidemiology, pathology, clinical presentation, relevant diagnostic tests and medical and surgical management of obstetric and gynaecological disorders. Students will be able to use this information in planning and tailoring effective, specific, safe Physiotherapy treatment programmes.

ANATOMY OF PELVIC GIRDLE, BREAST AND FEMALE REPRODUCTIVE SYSTEM)

1. Pelvic Anatomy (Pelvic bone, Pelvic girdle, Types of Pelvis)
2. Pelvic floor muscle, abdominal muscle
3. Female Pelvic Organ (Uterus, Ovaries, Cervix, Vagina, Bladder)
4. Anatomy and development of Breast.

PHYSIOLOGY OF PELVIC ORGAN, LACTATION AND FEMALE REPRODUCTIVE SYSTEM

1. Physiological changes during Puberty
2. Physiology of Menstrual cycle and menopause
3. Physiology of Urinary bladder
4. Physiology of Lactation

PREGNANCY AND LABOUR

1. Pregnancy and foetal development
2. Physical and physiological changes of pregnancy
3. Stages of labour
4. Physical and physiological changes of labour

PHARMACOLOGY

1. Drugs precaution, Contra indication during pregnancy
2. Anti-anaemic and anti-depressant drugs
3. Calcium, Vitamin D and minerals
4. Hormones
5. Anti-Hypertensives and their effects and contraindications in Pregnancy
6. Smooth muscle relaxants
7. Drugs used in gestational Diabetes.

RADIOLOGY

1. Indication, Contra indication and precaution of Radio diagnostic modalities
2. Ultrasound and Colour Doppler, TVS
3. MRI and CT scan
4. Foetal Doppler

FAMILY PLANNING METHODS

1. Need of Family Planning
2. Government scheme of Family Planning
3. Spacing Methods (Oral contraceptive, Condoms, IUCD)
4. Permanent Methods (Male sterilization, Female sterilization)

GENERAL GYNAECOLOGICAL PROBLEMS

1. Ovarian Cyst, Poly cystic ovarian syndrome, Infertility
2. Endometriosis, Fibroid, Pelvic pain
3. Pelvic inflammatory disease, UTI
4. Gynaecological trauma and sexually transmitted disease
5. Menopause and Osteoporosis
6. Gynaecological Problems in adolescent population
7. Breast cancer its screening

PELVIC FLOOR DISORDERS

1. Pelvic organ prolapse
2. Urinary incontinence, faecal incontinence
3. Recurrent UTI, Levator ani Syndrome
4. Coccygodynia, Pudendal neuralgia
5. Injury of female genital tract

PREGNANCY AND LABOUR

1. Antenatal period,
2. Complication during pregnancy
3. Postnatal period
4. Labour, Diagnosis of labour
5. Complication of labour, Management of labour

(GYNAECOLOGICAL SURGERY)

1. C section, Laparoscopic and LASER surgery in Gynaecological condition

2. Hysterectomy, Oophorectomy, IVF
3. Gynaecological repair surgery
4. MTP and DNC
5. Mastectomy

SPECIAL TOPICS IN OBSTETRICS

1. Intrapartum foetal monitoring
2. Foetal distress
3. Shock in obstetrics
4. Acute renal failure in obstetrics
5. Blood coagulation disorder in obstetrics
6. High risk pregnancy
7. Medical legal aspects in obstetrics
8. Diagnostic procedures in gynaecology and obstetrics

PAPER 502 - BIOMECHANICS IN OBSTETRIC AND GYNAECOLOGY

Course Description: the course covers the understanding of Biomechanics and kinesiology of body movement.

Course Objective: the course should enable the student to acquire in depth knowledge in understanding biomechanics and kinesiology.

Course Outcome: On completion of the study of this Course the student should be able to identify and apply the principles of biomechanics and kinesiology in understanding the normal functioning of the human body. To identify and apply the principles of biomechanics in understanding pathomechanics of various conditions. To use these principles in managing various clinical conditions.

Students will be able to identify and apply principles of Bio-mechanics while setting up individualized treatment protocols.

MUSCLES MECHANICS

- Structure & composition of muscle
- Fiber length & cross section area
- Mechanical properties
- EMG changes during fatigue & contraction
- Changes in mechanical properties because of aging and exercised & immobilization
- Clinical applications

LIGAMENT & TENDON MECHANICS

- Structure and composition

- Mechanical properties
- Cross sectional area measurements
- Muscle tendon properties
- Temperature sensitivity
- Changes in mechanical properties because of aging exercise and immobilization
- Mechanorecptors
- Clinical applications

BIOMECHANICS OF THE PELVIC GIRDLE

Section 1: Principles of Pelvic Floor Anatomy & Biomechanics

1. History of Biomechanics
    - History, Biomechanics, Female pelvic medicine

2. Pelvic floor Anatomy and Pathology
    - Levator Ani and Anal Sphincters
    - Connective Tissue Supports of the Pelvic Organs
    - Interactions among Different Compartments
    - Pelvic organ prolapse, Pathophysiology, Levator ani muscles, Cardinal ligaments, Uterosacral ligaments, Paravaginal defect, Biomechanics

3. Musculoskeletal PF anatomy
    - The Bony Pelvis and its Articulations
    - The Skeletal Pelvis as a Whole
    - Muscles of the Thoracoabdominal Pelvic Cavity
    - Muscles of the Anterolateral Abdominal Wall
    - Muscles of the Pelvis
    - Fascia: In General and Specific to the Female Pelvis
    - Neuroanatomy of the Female Pelvis
    - Abdominal Wall, Pelvic Floor Dysfunction, and the Promise of Computational Modeling.
    - Neuromuscular re-education, Soft tissue release, Myofascial release
4. Introduction to Classical Mechanics
    - Structural Versus Mechanical Properties
    - Structural Properties
    - Mechanical Properties
    - Types of Mechanical Tests- Uniaxial tensile test, Compression tests, Shear tests, Bending tests
    - Categorization of Material Deformations- Elastic deformation, Plastic deformation
    - Viscoelasticity- Strain rate, Stress relaxation, Creep, Hysteresis, Load, Elongation
    - Viscoelastic Experiments-Ultimate load, Ultimate elongation, Stiffness, Engineering stress, Cauchy stress, Engineering strain, Ultimate tensile strength, Ultimate tensile strain, Tangent modulus

5. Biomechanical Characterization of Native Pelvic Floor Organs and Tissues
    1. Pelvic Floor Tissue Constituents and Characteristics
    2. Functions of Pelvic Floor Organs- Active mechanics, Passive mechanics
    3. Common Experimental Conditions and Considerations- Uniaxial testing, Preconditioning, Temperature, Hydration, Tissue storage
    4. Cross-Sectional Area and Strain Measurements
    5. Examples of Mechanical Testing Related to the Pelvic Floor- Mechanical testing, Structural testing, Planar biaxial tensile testing
    6. Biaxial Tensile Testing

6. Biomechanical measurements in animal models
    - Current Animal Models and Their Applications- Pelvic organ prolapse
    - Small Animal Models- Sheep models, Rodent models
    - Rabbit models
    - Large Animal Models- Primate models, Bipedal pelvic mechanics, Quadruped pelvic mechanics

7. Biomechanics of pelvic floor prosthetic materials
    1. Overview of Prosthetic Devices- Mechanical testing of Prolapse
    2. Mechanical Tests Used to Evaluate Synthetic Meshes-
    3. Mechanical Analysis of Mesh-Tissue Complexes- , , , Structural properties, Polypropylene mesh, Synthetic mesh
    4. Application of Mechanical Tests to the Characterization of the ex vivo Structural Properties and Mechanical Behaviors of Synthetic Meshes-
    5. Biological Implications of Mechanical Behavior, Structural, and Textile Properties of Synthetic Meshes- in Stress urinary incontinence
    6. Mechanics of Pelvic Floor Prosthetic Development.

Section 2: Influencers of Pelvic Floor Biomechanics

8. Biochemistry and Ultrastructure of pelvic floor tissues and organs
    1. Pelvic Floor Musculature- Pelvic floor Ultrastructure, Biochemistry, Levator ani muscles, Striated muscle, Smooth muscle,Urethral sphincter, Anal sphincter.
    2. Pelvic Floor Connective Tissue- Pelvic floor connective tissue, Extracellular matrix

9. Impact of Genetics on pelvic floor biomechanics
    1. Molecular and Biochemical Changes in Pelvic Floor- Extracellular matrix, Collagen, Elastin
    2. Genetics of Pelvic Floor Disorders
    3. Influence of Genetics on Pelvic Floor Biomechanics

10. Impact of Pregnancy/Childbirth on pelvic floor biomechanics
    - Impact of Pregnancy on Biomechanics of Pelvic Floor
    - Pregnancy-Induced Alterations in Vaginal Biomechanical Properties

- Pregnancy-Induced Alterations in Biomechanical Properties of Pelvic Floor Muscles
- Impact of Vaginal Delivery on Biomechanics of Pelvic Floor
- Impact of Vaginal Delivery on Pelvic Floo

11. Biomechanical environment of the pelvic floor
    1. Physiological Function of the Pelvic Floor
    2. Disruption of Pelvic Floor Biomechanics Leads to Incontinence and Prolapse
    3. Pelvic Floor Changes with Rehabilitation
    4. Electromyography EMG Timing with Cough, Valsalva, Mixed urinary incontinence, Stress urinary incontinence

12. Effect of Physical activity on the pelvic floor

Section 3: Imaging & Segmentation of Pelvic Floor

13. Ultrasound Imaging of the pelvic floor
    - Dynamic Ultrasound Image Analysis, Timing of Pelvic Contractions, Visualization of the Pathway of Bladder/Urethra and ARA During a Cough, Visualization of the Pathway of Bladder/Urethra and ARA During Voluntary PFMs Contraction, Visualization of the Pathways of Bladder/Urethra and ARA During Valsalva, Strain Analysis of 2-D Dynamic Ultrasound Images, Elastic Properties, Vaginal Probe, Summary of Ultrasound Imaging Parameters

14. MRI imaging of PF
    - MRI of the Pelvic Floor- Puborectalis,Levator ani
    - Technique- Pubococcygeal line, H line, M line
    - Interpretation- Rectocele,Cystocele, Stress Incontinence, Bladder and Uterine Prolapse, Rectal Prolapse and Constipation

15. Geometric representation of PF tissues
    1. MR Image Acquisition- Source image,Segmentation,3-D reconstruction,Image stack, Image data set, Voxel dimensions, Slice thickness, Gap
    2. Identifying the Pelvic Organs
    3. Segmenting the Pelvic Organs
    4. Types of Image Segmentation
    5. Model Geometry
    6. Barriers to Optimal Geometric Representation

16. Image segmentation of pelvic floor (including super-resolution imaging methods)
    1. Introduction, Image Acquisition, Manual Segmentation/Template Pool Generation
    2. Label fusion
    3. Finite element method

17. Biomechanical Characterization of the Pelvic Floor using Tactile Imaging

- Tactile Imaging: Elastography tactile imaging, Bench Testing: Tissue elasticity, Muscle function,Young's modulus, Clinical Application

Section 4: Biomechanical Modeling and Simulation of Pelvic Floor

18. Computational Tools for Pelvic Floor Biomechanical analysis
    1. The Need for Better Software Tools.
    2. Methods and Capabilities- Finite element analysis, Meshfree modeling, Analysis-suitable geometry, Discrete point sets, Point clouds.
    3. Applications- Medical images, Patient-specific medicine, Epidemiological studies,

19. Applications of pelvic floor Modeling and Simulation
    1. Developing Anatomical 3-D Models of the Pelvic Floor
    2. Biomechanical Models of the Pelvic Floor
    3. Applications of Pelvic Floor Models

20. Building PF Simulations
    - Image Processing, Obtaining the Geometry, Simulation- Meshfree analysis
    - Extreme deformation, Patient-specific model, Interpretation of Results

21. Simulations of Female Pelvic Floor Dysfunction
    1. An Introduction to Pelvic Organ Prolapse
    2. Using Systems Analysis to Assess Biomechanical Factors Involved in Pelvic Organ Prolapse
    3. Using Biomechanical Modeling to Obtain Insights into the Pathomechanics of Prolapse-Prolapse size, Prolapse type, Verification

22. Biomechanical Childbirth Simulations
    - The Mechanics of Labor, Computational Simulation of Childbirth. Numerical simulations

Section 5: PF biomechanics - What have we learned, what can we learn?

24. Future work/directions

MPT-503 OBSTETRIC AND GYNAECOLOGY ASSESSMENT AND EQUIPMENTS

Course Description: The course covers topics related to obstetric and gynaecology assessment, diagnostic procedure interpretation, measurement and therapeutic equipments use in managing different disorders affecting obstetric and gynaecological system

Course Objective: The course should equip the student to acquire in-depth knowledge in different physiotherapy assessment, measurement and therapeutic equipment used in management of different disorders affecting obstetric and gynaecological systems.

Course outcome: The student should be able to:
1. To perform a comprehensive and complete Physiotherapy assessment of various obstetric and gynaecological patients.
2. To document systematic, meaningful, accurate written records of the patient.
3. To assess and eventually design individualized treatment strategies and measure outcome of intervention on measurement equipment for the obstetric and gynaecological patients.

GENERAL ASSESSMENT IN OBSTETRICS
1. Pre conceptual assessment and investigation, Antenatal assessment
2. Pregnancy test and investigation
3. Assessment during labour
4. Postnatal assessment

SPECIFIC ASSESSMENT IN OBSTETRICS
1. Assessment of common musculoskeletal impairment in Pregnancy
2. Assessment of soft tissue and muscular changes (Diastasis recti, Ligaments etc)
3. Assessment of pelvic floor muscles
4. Assessment of bowel and bladder impairment

GENERAL ASSESSMENT IN GYNAECOLOGY
1. Assessment of different physical impairment in gynecological condition
2. Assessment of edema and pain
3. Assessment of Pelvic girdle
4. Physiotherapy outcome measure tools in gynecological condition

SPECIFIC ASSESSMENT IN GYNAECOLOGY
1. Pre and post assessment of different gynecological surgical condition
2. Breast examination
3. Assessment of Uterine prolapse
4. Assessment of spinal curvature

MISCELLANEOUS ASSESSMENT
1. Height, Weight, Hip and waist, Neck measurement
2. Cardiorespiratory fitness and its assessment
3. Pre and post natal Gait and posture assessment
4. Pre and post natal neurovascular assessment

MEASUREMENT INSTRUMENTS AND TOOLS

1. Indication reliability and validity of different Scales used for different impairments and outcome for intervention in Obstetrics & Gynecology physiotherapy

TREATMENT INSTRUMENTS (Therapeutic effects, Indication, contra indication, Precaution, Method of application, doses and level of evidence of various physiotherapy intervention for management of various physical impairment related to Obs Gynae condition)

Therapeutic modalities

1. Superficial and deep heat therapy
2. Cryotherapy
3. Various types of current
4. Pneumatic compression devices
5. Low high and medium frequency currents
6. EMG
7. Recent advancement in therapeutic modalities
8. Vaginal cone
9. Vaginal tube
10. Pelvic floor stimulators
11. Biofeedback devices for pelvic floor muscles.
12. Ultraviolet therapy for the New Born.
13. IR Lamp

PAPER -504- Advance Physiotherapy in OBSTETRIC AND GYNAECOLOGY

Course Description:

The course covers topics on various advanced techniques and physiotherapy intervention in various types of obstetric and gynaecology disease,surgery and disorders. The course aims to provide a more functional and comprehensive approach based on manual therapy to manage a range of obstetric and gynaecological conditions.

Course Objective: The course should enable the student to acquire in-depth understanding and skill in managing obstetric and gynaecology conditions by using various types of advanced physiotherapeutic intervention and techniques.

Course Outcome: The student should be able to compare & contrast the outcome of various advanced physiotherapeutic intervention and approaches.

Therapeutic Exercise

1. Strengthening
2. Flexibility
3. Proprioceptive
4. Postural exercises
5. Kegel Exercises
6. Weight reduction exercises

Manual Therapy techniques

1. MET,PNF
2. Joints and soft tissue mobilization techniques
3. NMT

Special and integrated Techniques

Special and integrated techniques use in Obs Gynae physiotherapy.
Psycho social and physical therapies: Individual therapy, Behavioural Therapy-Heartfulness Relaxation therapy, cognitive therapy, positive- negative reinforcement, bio-feedback, guided imagery, ab-reactive therapy, Group Therapy, Family Therapy, Milieu Therapy, The Therapeutic Community, Occupational therapy, Recreational therapy, Play therapy, Music therapy, Light therapy, Color therapy, Aroma therapy

PT INTERVENTION FOR NEURO MUSCULOSKELETAL DYSFUNCTION IN OBSTETRICS

1. Back and neck pain, CTS
2. SI and Hip pain, Heel pain
3. Knee pain and Osteoporosis
4. Diastasis recti and Diastasis symphysis pubis

PT INTERVENTION FOR VASCULAR DYSFUNCTION IN OBSTETRICS

1. Varicose Vein
2. Superficial vein thrombosis and deep vein thrombosis
3. Pulmonary oedema and embolism
4. Haemorrhoids

PT INTERVENTION FOR PELVIC FLOOR DYSFUNCTION

1. Levator ani syndrome, Coccygodynia,
2. Pudendal Neuralgia, Incontinence, Overactive bladder
3. Anismus, Vaginismus and vulvodynia, Dyspareunia
4. Electrotherapeutic modalities used in pelvic floor muscle training

PT INTERVENTION IN POST SURGICAL CONDITION

1. PT management of C section
2. PT management of episiotomy
3. PT management of hysterectomy
4. PT management of normal delivery and other gynecological surgery
5. Post natal physiotherapy

PSYCHOLOGICAL CONDITION IN OBSTETRICS

1. Maternal blues
2. Depression in pregnancy
3. Psychosis and sexual problems

4. Anxiety and bipolar mood disorder

MISCELLANEOUS TOPIC

1. Breast milk, its advantages,Breastfeeding positions, Common problem in Breastfeeding
2. Breast engorgement and its PT management,Types of nipples and its problems.
3. Antenatal classes, Aerobic and Anaerobic training,Swiss ball in Pregnancy, Weight training in
4. Pregnancy
5. Women Health & fitness: Aerobics, Pilates, Ti-Chi, Yoga-meditation, Zumba etc

PRACTICAL

PAPER 505P – BIOMECHANICS IN OBSTETIRCS AND GYNAECOLOGY

This involves application of topics in PAPER 3 via demonstrations, field visits and case presentations.

MPT 506P OBSTETRICS AND GYNECOLOGY PHYSIOTHERAPY ASSESSMENT AND EQUIPMENTS

Students will be instructed via demonstration, hands on assessment, field visits and case conference on specific techniques used in the assessment of patients with musculoskeletal disorders and trauma. Students will draw on their experiences at the clinical postings to formulate a treatment plan for cases presented at the case conference

The demonstrations and practicals should be inline with the theory topics covered in **OBSTETRICS AND GYNECOLOGY** equipments. There should be simulators used teach, practice & learn advance skills.

PRACTICAL.

MPT 507P ADVANCED OBSTETRICS AND GYNECOLOGY PHYSIOTHERAPY

Students will be instructed via demonstration, hands on techniques, field visits and case conferences on specific techniques used in the management of patients with musculoskeletal disorders. Students will draw on their experiences at the clinical postings to formulate a treatment plan for cases presented at the case conference.

The demonstrations and practicals should be inline with the theory topics covered in Advanced **OBSTETRICS AND GYNECOLOGY.** There should be simulators used teach, practice & learn advance skills.

PAPER 508 CLINICAL & SEMINARS PRESENTATIONS

Students will engage in clinical practice in Department of **OBSTETRICS AND GYNAECOLOGY** Physiotherapy setting to enhance their clinical skills and apply theoretical knowledge gained during teaching sessions.

Seminars: These will serve as a platform for students to integrate components of patient management. Students will give presentations on topics provide to them.

Poster presentation of a research paper

MPT (OBSTETRIC AND GYNAECOLOGY)
SECOND YEAR

PAPER 601 PEDAGOGY OF PHYSIOTHERAPY EDUCATION

Course Description: The course covers topics related to physiotherapy ethics and theory of teaching.
Course Objective: On completion of the course the student should be able to understand the dynamics of teaching & learning, plan effective teaching sessions in physiotherapy..
Course Outcome: The student should be able to demonstrate adequate knowledge and skill in physiotherapy Ethics and learn ways to effectively teach.

This course will be provided students information on improving their teaching skills in the classroom and clinical setting
Following are the topics to be included but not limited to:

1. Philosophy of educational and emerging issues in Education meaning, functions and aims of education.
    - Formal, informal and non- formal education.
    - Agencies of education
    - Current issues and trends in higher education
    - Issues of quality in higher education, autonomy and accountability, privatization, professional development of teachers, education of persons with disabilities.
    - Need for education philosophy
    - Some major philosophies, Idealism Naturalism, Pragmatism and their implications for Education.
2. Concept of teaching and learning
    - Meaning scope of educational psychology
    - Meaning and relationship between teaching and learning
    - Learning theories
    - Dynamics of behaviour
    - Individual differences
3. Curriculum
    - Meaning and concept
    - Basis of curriculum formulation development
    - Framing objectives for curriculum

    Process of curriculum development and factors affecting curriculum
    Development evaluation of curriculum
4. Method and techniques of teaching
    - Lecture, Demonstration
    - Discussion, Seminar, Assignment, Project and Case Study.
5. Planning for Teaching
    - Bloom's Taxonomy of Instructional Objectives, Writing Instructional Objectives in Behavioural terms, Unit Planning and Lesson Planning.

6. Teaching Aids
    - Types of teaching aides
    - Principles of selection, preparation, and Use of Audio –Visual aids.
7. Measurement and evaluation
    - Nature of Educational Measurement : Meaning, Process, Types of tests.
    - Construction of an achievement test and analysis standardized test.
    - Introduction of some standardized tools, important tests of intelligence, Aptitude, Personality.
    - Continuous and Comprehensive Evaluation.
8. Guidance and Counseling
    - Meaning and Concepts of Guidance and Counseling
    - Principles
    - Guidance and Counseling services of students and faculty members
    - Faculty development and development of personnel for P.T. Services
9. Clinical Education
    - Awareness and Guidance to the Common people about Health and Diseases and Available professional Services
    - Patient Education
    - Education of the Practitioners

PAPER 602 MANAGEMENT, ADMINISTRATION AND ETHICAL ISSUES

Course Description: The course covers topics related to physiotherapy clinic and department management.

Course Objective: On completion of the course the student should be able to understand the basic issues of physiotherapy management & administration and practice as an informed professional on Legal & ethical issues.

Course Outcome: The student should be able to demonstrate adequate knowledge and skill in physiotherapy Ethics, clinic and department management.

This course deals with issues of management to assist the practitioner in efficiently addressing issues related to the organization and administration of a Physiotherapy Department following are the topics to be included but limited to:

MANAGEMENT

1. Functions of management,
2. Evaluation of management through scientific management theory,
   Classical theory
   System approach
   Contingency approach
3. Management process
   Planning, Organization, direction, controlling (decision making)
4. Introduction to personnel management
   Staffing recruitment selection, performance appraisal, collective bargaining, discipline, job satisfaction.
5. Quantitative methods of management
   Relevance of statistical and/or techniques in management.

6. Marketing
   Market segmentation, marketing research production planning pricing, channels of distribution, promotion, consumer behaviour, licenser.
1. Total quality management
   Basis of quality management – acid for quality control quality assurance program in hospitals, medical audit, and international quality system.

ADMINISTRATION

1. **Hospital as an organization** Functions and types of hospitals selected clinical supportive ancillary services of a hospital, emergency department, nursing, physical medicine & rehabilitation, clinical supportive and ancillary services of a hospital, emergency department nursing physical medicine & rehabilitation, clinical laboratory, pharmacy and dietary dept.
2. Roles of Physiotherapist, Physiotherapy Director, Physiotherapy supervisor, Physiotherapy assistant, Physiotherapy aide, Occupational Therapist, Home health side, Volunteer.
3. Directed care and referral relationship and confidentially.

LEGAL PROFESSIONAL ETHICAL ISSUES

1. Physical therapy: Definition and development
2. The implications & confirmation to the rules of professional conduct
3. Legal responsibility for their actions in the professional context and understanding the physiotherapist liability and obligations in the case of medical legal action.
4. Code of ethics A wider knowledge of ethics relating to current social and medical policy in the provisions of health care.
5. Functions of the relevant professional associations education body and trade union.
6. The role of the international health agencies such as the world health organizations.
7. Standards of practice for physical therapies.
8. Acts & Statutes relating to Physiotherapy.
9. Current issues

PAPER 603 - EXERCISE PHYSIOLOGY & ELECTRO PHYSIOLOGY

Course description: This course aims to deliver scientifically based standards on exercise and its effects on various systems of the body. It prepares students through the process of selecting and administering therapeutic exercises and electrotherapeutic agents, using Guidelines to interpret results, and drafting an physiotherapy interventional prescription that is in line with Guidelines parameters.

Course Objective: this course should deliver the concepts in exercise physiology, electrophysiology and prepare students to test and prescribe suitable exercises and electrotherapeutic agents to different groups of the population and conditions.

Course Outcome: On completion of the study of this Course the student should be able to select and administer using Guidelines to interpret results, and drafting an therapeutic exercise and electrotherapeutic agents prescription to different populations and conditions.

This course provides the student the required knowledge and skills on exercise and its effects on various systems of the body. The student shall also gain knowledge and skills on the various therapeutic exercises targeted for different conditions. The student shall learn the knowledge and skills on various electrotherapeutic agents, advanced techniques and physiological responses of nerve and muscle in diagnostic and therapeutic electro-agents.

Energy Transfer for Physical Activity:
a. Energy transfer in Body.
b. Energy transfer in exercise.
c. Energy expenditure during various activities.
d. Fatigue.
e. Biochemical responses to endurance training.

Cardio Vascular System and Exercise:
a. Athletes Heart.
b. Cardio Vascular adaptations to sustained aerobic exercises.
c. Lipids and sports, protection from coronary heart disease, exercise and optimization of lipid profile.
d. Sudden cardiac death in sports. Regulation of circulation during exercise. Exercise and vascular system-cardiovascular adaptation to sustained aerobic exercises, exercise and optimization of lipid profile, regulation of circulation during exercise

Exercise and nervous system - neural adaptation with exercises, cerebral perfusion and exercises, exercise for mood enhancement and anxiety.

Exercise and cell biology - effect of exercise on various cell activities, adaptation of organelles with exercise, exercise and aging-physiology changes of aging

Exercise and Respiratory System:
a. Second Wind.
b. Oxygen Debt.
c. Breath Holding, High Pressure Ventilation. Scuba Diving.
d. Regulation of Respiration during exercise.

Skeletal System:
a. Growth and Exercise.
b. Repair and adaptation during exercise. Delayed Onset Muscle Soreness (DOMS)
c. Exercise prescription for chronic low back pain
d. Training for Muscular Strength and Endurance.
e. Muscle fibre typing and significance.

Gastrointestinal Tract and Endocrine system:
a. Effect of Sports on GIT and Liver.
b. Hormone regulation of fluid and electrolytes during exercise.
c. Exercise and Menstrual Cycle.
d. Stress Hormones in Exercise.

Exercise and endocrine system-
Hormonal regulation of fluid and electrolytes during exercise and menstrual cycle, stress hormone in various activity, effect of exercise on various hormones in exercise, effect of exercise on GIT and liver, Opiods, Runners High, exercise addiction.

Exercise and Common Pulmonary Conditions
a. Exercise induced bronchial obstruction
b. Exercise in chronic airway obstruction
c. Air pollution and exercise

Exercise and Cardiac Conditions
a. Exercise prescription for heart disease
b. Exercise in primary prevention in ischemic heart disease
c. Exercise for secondary prevention of ischemic heart disease
d. Exercise induced Asthma;
e. Exercise Stress Testing for Diagnosis of CHD.

Exercise testing: incremental shuttle walk test, endurance shuttle walk test, six minute walk test, Step test, treadmill tests.(i.e. Balke, Bruce, Noughton, Modified Bruce protocol), interval bike test, sub maximal GXT, symptom limited GXT, exercise testing using cycle ergometer, oxygen uptake (VO2)

Doping in Sports
a. Banned drugs
b. Procedure of dope testing
c. Control of doping abuse

Diabetes and Exercise
a. Exercise in diabetic patients
b. Exercise as a method of control of diabetes

Exercises for special categories
a. Child and adolescent athlete's problems
b. Special problems of older athletes
c. Special concerns for differently abled athletes

Female Specific Problems:
1. Sports Amenorrhoea.
2. Injury to female reproductive tract.

3. Menstrual Synchrony.
4. Sex determination.
5. Exercise and pregnancy.
6. Eating disorders in athletes.

Rheumatology & Geriatric Disorder:

1. Rheumatoid arthritis, SLE and Juvenile Rheumatoid Arthritis.
2. Ankylosing Spondylitis.
3. Osteoarthrosis and other geriatric conditions.
4. Cost and benefits of exercise prescription in Osteoporosis.

Temperature Regulation

a. Heat Balance.
b. Methods of Assessing Heat Balance.
c. Effects of Climate.
d. Effects of Exercise on Temperature Regulation.
e. Limit of Tolerance of Heat.
f. Acclimatisation.
g. Avoidance in Heat illness during exercise.
h. Exercises in cold.

Physiological Basis and Principles of Training and Conditioning

a. Principles of endurance and strength training i. Recovery training intensities in heart rate ii. Manipulation of training principles iii. Training sub–phases
b. Fundamentals that aid training and performance i. Warm up and Cool down ii. Flexibility and stretching
iii. Missing workouts iv. Overtraining
c. Analysis of Training

Misc. Topics

High Altitude Training, Sports Diving, Hazards of underwater environment. Special Aids to Athletic Performance:– MORA, Oxygen Inhalation, Sleep.,Sex and performance. Assessment of Age. Muscle tissue fibre typing and its significance. Exercise for mood enhancement & anxiety.

Obesity and related problems

a. Dietary recommendation for healthy individual.
b. Obesity – epidemiology, classification of causes, complications and treatment.
c. Paediatric obesity- Regulation of food consumption, complications and prevention.

Stress Management

a. Introduction i. The history and definition of "stress" ii. The characteristics of stressors iii. Clinical implications of stress iv. Coping with stress – styles of coping, recruiting res ources for coping
b. Self management
c. Tools for stress management

Hazards of Smoking

a. The physiological, psychological and behavioral impact of cigarette smoking
b. Evidence based possibilities for treatment
c. Treatment for smoking cessation

Sleep Medicine

a. Acquaintance with basic concepts in sleep medicine, the structure and physiology of sleep
b. Classification of sleep disorders
c. Clinical implications of sleep disturbance
d. Physiotherapeutic measures for sleep deprivation

Yoga

a. Important Pranayamas and strengthening and rejuvenating asanas.
b. Methods, advantages and contraindications.

Nutrition & Dietetics

six nutrient classes a. carbohydrates, fats, proteins.b. Vitamins, minerals and water. water & electrolyte balance
Body weight; body composition

- Body build, body size & body composition
- Assessing body composition
- Body composition & sport performance
- Weight standards
- Achieving optimal weight

3. Diet & fitness products
4. Exercise & diet programme to gain weight
   - Gaining body fat
   - gaining muscle mass
5. Guidelines for healthy diet

c. Optimal Nutrition for exercise. Nutrition for Physical Performance. Pre–Game meal, Carbohydrate loading. f. Alcohol, Mega Vitamin Therapy.g. Food for various athletes of different disciplines.h. Fluid and energy replacement in prolonged exercise. i. AHA Dietary guidelines for Heart diseases

SECTION – II ELECTRO PHYSIOLOGY

Diagnostic Electrophysiology

10. Anatomy and Physiology of: Motor unit, action potential, excitability of nerve and
11. muscle, neuromuscular junction.

12. Technique of nerve conduction velocity and electromyography: Instrument, techniques, interpretations in terms of neuromuscular function and bio-feedback technique.
13. Nerve conduction studies, normal/abnormal nerve conduction, its relevance in muscle function.
14. Concepts of normal & abnormal EMG studies.
15. Late responses
16. Concepts of electro physiological studies in neuro muscular diseases as a diagnostic and therapeutic tool.
17. Electrical stimulation and its effects on various systems.
18. Evoked potentials – VEP, SSEP, MEP, BAEP

Therapeutic Electrophysiology
Physiological mechanism of action of electrotherapeutic modalities, Critical Analysis of Electrotherapeutic Modalities- IFT, TENS, MS, SWD, LASER, MWD, Pulsed SWD, Mechanical Traction etc.
Plasticity in response to Electrical stimulation.

Recent Advancement and Evidence based practice in Electrotherapy
Extracorporeal Shock Wave Therapy, tDCS, Long wave diathermy, Electro-Cupping and Vaccume, NMES, FES
Practicals:
The student will undergo laboratory and on–field training in Exercise physiology and Electrophysiology.

PAPER 604 - FUNCTIONAL REHABILITATION AND ERGONOMICS
Course Description: The course covers topics related to physiotherapy ergonomic and functional assessment used in managing, preventing different disorders. It also covers the assessment and management of occupational and functional problems. It gives a brief
overview of lifestyle and occupational medicine.
Course Objective: The course should enable the student to acquire in-depth knowledge in different physiotherapy ergonomic and functional assessment used in managing, preventing different disorders. It should equip the student to add the ergonomic advice and functional rehabilitation in physiotherapy prescription. It should provide the student with a brief overview of lifestyle and occupational medicine.

Course outcome: The student should be able to:
1. To perform a comprehensive and complete ergonomic and functional assessment in various disease disorders and dysfunction .
2. To document systematic, meaningful, accurate written records of the patient.
3. To assess and eventually design individualized treatment strategies for the disease disorders and dysfunction..

4. To develop an overview of the concept of Lifestyle medicine and Occupational medicine.

I. Introduction to Physiotherapy Assessment

- Purpose and need for Physiotherapy assessment
- Historical perspective
- Physiotherapy verses medical model of practice
- Various categories for movement dysfunction
- Preferred practice patterns in Physiotherapy.

- Today's health care model

II. Influence of Psychological Factors

- Psychological adaptation
- Personality and coping styles
- Common defense reactions to disability
- Anxiety
- Acute stress disorder and post traumatic stress disorder
- Depression
- Substance abuse
- Agitation and violence
- Hypersexuality
- Psychosocial wellness
- Wellness in rehabilitation
- Integrating psychosocial factors into rehabilitation
- Suggestions for rehabilitative interventions

III. Influence of Values on Patient Care; Foundation for Physiotherapy assessment

- Process of assessment
- Values and valuing
  - Code of ethics
  - The values of patient as a factor in care
  - The influence of the values on the primary goal of patient care
  - Value – Laden situation in rehabilitation

IV. Examination of Functional Status and Activity Level

- A conceptual framework
- Examination of function
- Response formats
- Interpreting test results
- Selected instruments assessing physical function
- Multidimensional functional assessment instruments

V. Examination of Environment

- Purpose
- Examination strategies
- Patient – Home environment relationship: Overview of access, usability and safety
- Adaptive equipment

- Assistive technology
- Examination of the workplace
- Community access
- Documentation
- Funding for environmental modifications
- Legislation

VI. Guideline for Physiotherapy Documentation

- Introduction
- Documenting the examination
- Documenting the evaluation
- Documenting the plan of care
- Application of documentation skills

PAPER 605 - RESEARCH METHODOLOGY, BIOSTATISTICS & EVIDENCE BASED PRACTICE

Course Description: The course covers the concept of research methodology, Evidence based practice and biostatistics related to physical therapy

Course Objective: The course aims to introduce the principles of research, methods of research and analysing the research studies using Biostatistics.

Course Outcome: On completion of the study of this Course the student should be able to understand the methods of research process and design so as to effectively plan a research.
To understand the statistical measures used in the analysis and interpretation of research data.
To acquire skills of critically reviewing the literature.

RESEARCH METHODOLOGY

SECTION – 1

Research in physiotherapy

a. Introduction
b. Research for Physiotherapist: Why? How? When?
c. Research – Definition, concept, purpose, approaches
d. Internet sites for Physiotherapists.

Research fundamentals

a. Define measurement
b. Measurement framework
c. Scales of measurement
d. Pilot Study
e. Types of variables
f. Reliability & Validity
g. Drawing Tables, Graphs, Master chart

Writing a research proposal
a. Defining a problem
b. Review of Literature
c. Formulating a question, Operational Definition
d. Inclusion & Exclusion criteria
e. Methodology- Forming groups Data collection & method for analysis
f. Informed Consent Steps of documentation – Title to Scope of study
Research ethics
a. Importance of Ethics in Research
b. Main ethical issues in human subjects" research
c. Main ethical principles that govern research with human subjects
d. Components of an ethically valid informed consent for research.

Overview of study designs
e. Observational ,Descriptive-Case study/ series, Cross sectional, Normative, Correlational ii. Analytical; case control, cohort
f. Experimental- True & quasi experimental

Sampling
a. Random and non-random sampling.
b. Various methods of sampling – simple random, stratified,systematic, cluster and multistage. Sampling and non-sampling errors and methods of minimizing these errors.

Plagiarism
Definition of Plagiarism, types, Avoiding plagiarism , software methods to detect plagiarism.

Evidence Based Practice
1. Introduction to evidence– based complementary medicine
2. Evidence–based health care
3.Evidence–based practices 4. Evidence–based decision making and management
Types of evidence:
a. Definition of evidence
b. Forms of evidence : Case–control studies
c. Cohort studies
d. Randomized controlled trials
e. Systematic Reviews.

Importance of Hierarchy of Evidence

Key element of scientific writing.

Structure, formulation and implementation of thesis, Structure, formulation and implementation of original research report ,Structure, formulation and implementation of systematic review/meta –analysis, How to read and critique research,Review of an indexed refereed research paper, - Evaluating paper scientific merit, Providing

constructive feedback to the author, typical review formats for reviewing a paper ,Reasons for rejection

Presenting Research: Writing and submitting papers
(a) Strategies of paper writing
(b) Design of paper writing
(c) Tactics of paper writing - Where to publish

SECTION – II BIOSTATISTICS

Introduction

Descriptive and Inferential statistics
Types of data: Qualitative and Quantitative, Parametric and Non- Parametric tests
Which tests to use.

Tests of significance

q. Basics of testing of hypothesis – Null and alternate hypothesis, type I and type II errors, level of significance and power of the test, p value.
r. Tests of significance (parametric) - t – test (paired and unpaired), Chi square test and test of proportion, one way analysis of variance.
s. Repeated measures analysis of variance.
t. Tests of significance (non-parametric)-Mann-Whitney u test, Wilcoxon test, e. Kruskal-Wallis analysis of variance. Friedman"s analysis of variance.

Correlation and regression

Simple correlation – Pearson"s and Spearman"s; testing the significance of correlation coefficient, linear and multiple regressions. Interpretation of r.

Basic probability distributions and sampling Distributions

a. Concept of probability and probability distribution.
b. Normal, Poisson and Binomial distributions, parameters and application.
c. Concept of sampling distributions.
d. Standard error and confidence intervals.
e. Skewness and Kurtosis

Graphical Presentation

Frequency distributions, Describing data with Graphs, Describing data with Averages Mode Median Mean, Describing variability Variance, Standard deviation, etc. Normal Distributions

Role of Computers in Research

Basic of computers – Hardware and Software
Basic of Computer Applications – Windows, MS word, Power Point, etc.
Simple statistical Analysis using SPSS software.
Tabulation, Calculation of central tendency and dispersion, Using software packages, Analysis, Presentation of data in diagrammatic & Graphic form
Artificial Intelligence and its application in physiotherapy
Robotics and its application in physiotherapy
Information technology and its application in physiotherapy

PAPER 606P EXERCISE PHYSIOLOGY & ELECTROPHYSIOLOGY

The demonstrations and practicals should be inline with the theory topics covered in Exercise physiology and electrophysiology

PAPER 607P - DISSERTATION

As part of the requirement for the Master's degree the student is required to undertake a research study under the guidance of a guide. Oral Presentations at Conferences/Seminars - Preparing presentation,-Duration of presentation,- What to present. Student must publish/present atleast one research paper at a National Level Conference/ International Level Journal.

PAPER 608 – CLINICS & SEMINARS PRESENTATIONS

These will serve as a platform for students to integrate various components of patient management. Students will give presentations on topics provided to them.

Students will engage in the clinical Obstetrics, Gynecology and Physiotherapy Department to enhance their clinical skills and apply theoretical knowledge gained during teaching sessions.

LIST OF RECOMMENDED BOOKS FOR M.P.T OBSTETRIC AND GYNAECOLOGY

Obstetric and Gynaecology		
S.NO.	Author	Title
1	Namrata-Kundariya	Physiotherapy-OBSTETRICS
2	Sylvia Verralls	Anatomy and Physiology Applied to Obstetrics
3	GB Madhuri	Textbook of Physiotherapy in Obstetrics and Gynecological Conditions
4	Lennox Hoyte Margot Damaser	Biomechanics of the Female Pelvic Floor
5	Carol B Benson	Ultrasonography in Obstetrics and Gynecology
6	Margaret Polden Jill Mantle	Physiotherapy in Obstetrics and Gynaecology
7	D.C. Dutta	Text book of Obstetrics
8	Lawrence Impey	Obstetrics and Gynaecology
9	Johnathan.S.Berek	Novak's Gynaecology
10	Stuart Campbell	Obstetrics by ten teachers
11	J. Laycock	Therapeutic Management of Incontinence and Pelvic Pain
12	Ruth Sapsford	Women's Health
13	E. Wilder	Obstetric and Gynaecologic Physical Therapy
14	Malti Hiranandani	Physiotherapy in Pregnancy
15	Changela	Role Of Physiotherapist In Obstetric And Gynecological Conditions

Obstetric and Gynaecology Biomechanics		
S.N	Author	Title
1	Lennox Hoyte, Margot Damaser	Biomechanics of the Female Pelvic Floor
2	Bell,Frank	Principles of Mechanics & Biomechanics
3	Raj Kumar,R.V	Biomechanics the Nucleus of Physiotherapy
4	Koley,S	Textbook of Biomechanics
5	Nordin, Margareta	Basic Biomechanics of the Musculoskeletal system
6	Griffith's IW	Principles of Biomechanics & Motion Analysis
7	Hall,Susan J	Basic Biomechanics
8	Smith, Laura K.	Brunnstrom's Clinical Kinesiology
9	Oatis,C.A	Kinesiology
10	Kapandji, I.A	The Physiology of The Joint Vol-1
11	Kapandji, I.A	The Physiology of The Joint Vol-2
12	Kapandji, I.A	The Physiology of The Joint Vol-3
13	Norkin C.C	Joint Structure and Function
14	Dvir,Zeevi	Isokinetics Muscle testing interpretation and clinical application
15	Mow,V.C	Basic Orthopaedic Biomechanics

Research Methodology & Biostatistics		
S.N	Author	Title
1	Kothari, C.R.	Research Methodology Methods and Techniques
2	Singh, Sunita	Synopsis of Biostatistics
3	Prasad,S	Elements of Biostatistics
4	Pitney W.A	Qualitative Research in Physical Activity

5	Jewell,D.V	Guide to Evidence Based Physical Therapists Practice
6	Herbert,Rob	Practical Evidence Based Physiotherapy
7	Bhandri,Mohit	Clinical Research made Easy
8	Verma, B.L	Biostatistics
9	Campbell,M.J	Medical statistics

Exercise Physiology & Electrophysiology		
S.N	Author	Title
1	Koley,S	Textbook of Kinanthropometry
2	Nix, Staci	Williams' Basic Nutrition and Diet Therapy
3	Karageorghis C.I	Inside Sports Physiology
4	Sivaram,C	Principles of Exercise in Physiotherapy
5	American College of sports Medicine	ACSM'S Resource Manual for Guidenes for exercise testing
6	Mcardle W.D	Exercise Physiology
7	Woods,Ron	Energy Every Day
8	Skinner,J.S	Exercise Testing & Exercise Prescription For Special Cases
9	Wasserman, Karlman	Principles of Exercise Testing & Interpretation
10	Robinson,A.J	Clinical Electrophysiology
11	Kimura, Jun	Electrodiagnosis in Diseases of Nerve & Muscle: Principles & Practice