DPU
Dr. D. Y. PATIL VIDYAPEETH, PUNE
(DEEMED UNIVERSITY)

Syllabus for Master of Physiotherapy (MPT)

2014-15
PREAMBLE:
The Master of Physiotherapy course is a 2-year fulltime program leading to the degree that equips the student with analytical, evidence based learning skills. The program is generic in nature and has a component of additional learning of one area leading to an elective in that area. Psychosomatic aspects of training are a component through all the elective areas.

GOALS OF THE COURSE:
1. To prepare a postgraduate student towards professional autonomy, promote community health through his/her professional practice by referral as well as first contact mode using evidence based practices.
2. To impart research basis to validate techniques during professional practice towards quality care of health care delivery.
3. To develop appropriate professional relationships in multi-disciplinary set up to provide total care of the name.
4. To update the students with recent advances in the professional practice and provide them opportunities to think, reason and practice towards excellent patients care.
5. To achieve skills in patients handling and professional teaching to other subordinates partly.
6. To train the graduates to execute professional practice through professional ethical code.

NOMENCLATURE
The course will be referred to as a Master of Physiotherapy (MPT) with their speciality as:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Course</th>
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<tbody>
<tr>
<td>01</td>
<td>MPT: Orthopaedics</td>
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<tr>
<td>02</td>
<td>MPT: Musculo-Skeletal Science &amp; Sports</td>
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<tr>
<td>03</td>
<td>MPT: Musculo-Skeletal Science &amp; Hand Conditions</td>
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<td>04</td>
<td>MPT: Musculo-Skeletal Science &amp; Manual Therapy</td>
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<td>05</td>
<td>MPT: Neurosciences</td>
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<td>06</td>
<td>MPT: Cardio – Respiratory Sciences</td>
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<td>07</td>
<td>MPT: General &amp; Community Based Rehabilitation</td>
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<tr>
<td>08</td>
<td>MPT: Paediatrics</td>
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ELIGIBILITY
Candidates admitted into the Master of Physiotherapy course should have passed the BPT degree examination of this University or an examination of any other University (on campus full time course) accepted by the authorities of this University as equivalent thereto. Candidates who have passed BPT Examination other than Dr. D. Y. Patil Vidyapeeth, Pune, shall obtain migration certificate from the parent university & an eligibility certificate from this University by remitting the prescribed fees along with the application form, before seeking admission.

REGISTRATION
A candidate admitted to the course in Dr. D.Y.Patil Vidyapeeth, Pune, should register with the University by remitting the prescribed fees along with the application form for registration duly filled in and forwarded to the Controller of Examination of this University through the Head of the Institution within the stipulated date.

DURATION OF THE COURSE
The period of certified study for the Master of Physiotherapy is a full time course extending over a period of two academic years for the award of the degree.

MEDIUM OF INSTRUCTION
Medium of instruction for the subject of study and for the examination of the MPT course will be English.

COURSE STRUCTURE:

Duration:
The course is of 80 weeks, for two academic years duration, which is conducted in two parts – First year & second year each having 41 & 41 weeks/one academic year respectively.
Seven hours in full day = 42 hours /week = 1722 hrs in the MPT first year & 1722 hrs in the MPT second year - a total of 3444 hours+ additional 100 clinical hours for on call / Sunday/Holiday duties per year. The total transcript hours will be 3644 hours.
University examination will be conducted at the end of second academic year.

**First Year MPT**

Duration – 41 weeks. (1722+100 hours = 1822 hours)

1. Didactic – 298 hours.
2. Clinical training /Laboratory work – 220 hours.
3. Regular clinical posting 24 hours /week for 41 weeks = 984 hours + on call duty of 100 hours = 1084 hours.
4. Scientific enquiry – 220 hours (includes project / review of literature/ seminars/case Presentation, journal clubs).

### First Year MPT

<table>
<thead>
<tr>
<th>S. No</th>
<th>Subject</th>
<th>Total No. of Hours</th>
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<tbody>
<tr>
<td>1</td>
<td>Physiotherapy Practice &amp; Education Technology</td>
<td>87</td>
</tr>
<tr>
<td>2</td>
<td>Research Methodology &amp; Bio-Statistics</td>
<td>99</td>
</tr>
<tr>
<td>3</td>
<td>Applied Biomechanics and Kinesiology</td>
<td>111</td>
</tr>
<tr>
<td>4</td>
<td>Exercise Physiology, Health &amp; fitness.</td>
<td>112</td>
</tr>
<tr>
<td>5</td>
<td>Advanced Electrotherapy</td>
<td>111</td>
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<tr>
<td>6</td>
<td>Electro-physiology and Electro Diagnosis</td>
<td>113</td>
</tr>
<tr>
<td>7</td>
<td>Advanced Manual Therapy</td>
<td>105</td>
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**Second year MPT**

Duration – 41 weeks. (1722+100 hours = 1822 hours)

1. Didactic – 218 hours.
2. Clinical training /Laboratory work – 260 hours.
3. Clinical posting 24 hours /week for 41 weeks = 984 hours + on call duty of 100 hours = 1084 hours.
4. Scientific enquiry – 260 hours (includes project / review of literature/ seminars/case Presentation, journal clubs etc.).

5

6. **MODE OF TRAINING**

The training for M P T degree will be on a full time pattern with graded responsibilities in the management and treatment of patients entrusted to his/her care. Training includes
involvement in academic learning, practical learning, clinical patient handling, administrative and planning of department works, experimental work and research studies. The participation of students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, clinical rounds, case demonstrations, clinics, journal review meeting and other continuing education activities. Every candidate should be required to participate in the teaching and training programs of undergraduate students.

INTERNAL MONITORING OF STUDENTS PROGRESS
The learning progress of each candidate will be monitored continuously to help teachers to evaluate students & also for students to evaluate themselves. The monitoring will be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured, and assessment be done using checklists that assess various aspects and will be projected for discussion every six months.

Work diary:
Candidates should record his /her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. in the work diary given. 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 from time to time and shall be presented in the university examinations for calculation of university internal marks.

Internal Examination:
The College will conduct three Exams - two in the first year, of which one will be after six months from the date of admission ,other at the end of the first year (college examination) & the third at the end of the second year (Preliminary examination), two months before the University examination. Internal assessment at specified intervals during the course of the academic year should be carried out on an ongoing basis. Continuous clinical assessment should be carried out though out the year.
The Exams 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 college and sent to the university.

CONTINUOUS APPRAISAL FOR TEACHING & LEARNING EXPERIENCE:
Every candidate admitted shall attend a minimum of and record these learning procedures in the work diary for their progressive evaluation.

a) Journal Review meetings : Minimum six in two years
b) Seminars : Minimum Ten in two years
   : Minimum 30 cases in two years
c) Clinical presentation : Minimum 20 in two years
d) Special clinics : Minimum 5 in two years
    Community work, camps/field visits : Minimum four in two years
e) Inter department meetings : Minimum 20 in two years
f) Journal Review meetings : Minimum six in two years
g) Special Clinical rounds : Minimum 250 in two years
   : Minimum 200 hours in two years
h) Dissertation work : Minimum 200 hours in two years
i) Participation in conferences/
   Presentation of papers : Minimum 2 in two years
   Teaching Activities – UG
j) Teaching : Minimum 10 in two years
k) Learning Activities: Self Learning, Use of computers & library
l) Participation in departmental activities:
m) Any other – Specify (eg: CME)
   Rotation and posting in other department if any – minimum 2 months in 1 speciality

CLIENT CENTERED LEARNING-GRADED RESPONSIBILITY
Structured Training Schedule for clinical & elective subjects will be as follows. The candidate will learn 40 cases through observation, 50 cases by Assisting & Handling senior Physiotherapist, 160 procedures performed with supervision, 80 procedures to perform individually.
Dissertation

(1) The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions.

(2) Every candidate pursuing MPT degree course is required to carry out work on a selected research project under the guidance of a recognized postgraduate teacher. The result of such a work shall be submitted in the form of dissertation.

(3) The candidate should submit to the university six-monthly progress report of Dissertation and his/her postgraduate work through his/her postgraduate Guide, HoD and the Principal. The postgraduate activity must be written/updated in the PG work diary.

(4) A minor change in the topic of Dissertation may be allowed at any time. A major change may be approved by necessary procedures, provided there is an interval of ten months between the date of application and the date of examination.

(5) Any change in the dissertation topic or guide should be informed to the university. No change in the dissertation topic shall be made within nine months for commencement of university examination.

(6) If the progress of a candidate’s work including Dissertation work is not satisfactory, the university, on the recommendation of Guide, HoD, Principal and the Academic Council, will not grant that particular term and the period of training will be extended accordingly.

(7) If any information/data/equipment is obtained/manufactured from outside source, the same will be allowed only after obtaining permission from the Guide, HoD, and the Principal. The appropriate reference of that source must be included in the Dissertation. The PG Guide shall certify that there is no plagiarism in the Dissertation.

(8) The Dissertation shall be submitted three months before the
final theory and practical examination to the university duly certified by the Guide, Head of the Department and Head of the Institution as per the format.

(9) Submission of Dissertation and thereby its approval by evaluators is one of the pre-requisite for a candidate to be eligible to appear for final MPT examination. The Dissertation should be submitted three months prior to the scheduled examination, i.e., on or before 28th February for candidates appearing for June Examination and 31st July for November Examination. Any delay in submission beyond the above mentioned dates will make the student liable for penalty of Rs. 50/- per day permissible up to seven working days only. Delay beyond this period will result in non-eligibility to appear the final MPT examination.

(10) Each candidate will be required to prepare total 7 (seven) copies of Dissertation, 4 (four) copies are required to be sent to the university. These copies will neither reveal the identity of the guide nor the candidate, nor have any acknowledgements. Remaining 3 (three) copies – 1 for the Guide, 1 for the candidate, and 1 for the College Library, should have the names of the guide and the candidate including certificate of Principal, certificate of Guide, Declaration and Acknowledgement. They should also submit 2 (Two) soft copies in CD, 1 for Guide and 1 for the College Library.

(11) The format of sequence of contents of Dissertation should be as under:

INDEX
1. Introduction
2. Aims and Objectives of study
3. Other relevant material like anatomical, physiological, biomechanical and therapeutic description, if applicable.
4. Review of literature
5. Material and methods
6. Results
7. Discussion
8. Conclusion
9. Summary
10. Bibliography
11. Annexure
   (a) Consent Form
   (b) List of abbreviations.
   (c) Proforma/ Questionnaire
   (d) Master Chart

**Review of Literature** should be written in chronological order viz. the reference with the oldest year or date should come as first and followed by chronology.

**References** should be written in **Vancouver format** i.e., name of the author, up to six authors with their initials, title of the paper followed by name of the journal, year of the journal, volume and page numbers. If the reference is taken from a book then name of the author with initials, name of the chapter, title of the book from which the reference is taken, followed by edition no., followed by name of the editor, name of the publisher, place of the publication, year of publication followed by page numbers.

**Bibliography** should be written in the order of appearance of references starting from introduction – numbered and onwards followed by the numerical references in their order of appearance and not alphabetically.

(12) The printed text of dissertation should not be less than 50 pages/2500 words and shall not exceed 75 pages excluding Bibliography and annexure.

(13) The examiners appointed by the university shall value the dissertation. Approval of dissertation work is an essential precondition for a candidate to appear in the university examination. Minimum three examiners; one internal, and two external from outside Dr. D. Y. Patil Vidyapeeth, shall value the dissertation as per the prescribed format. Acceptance from any two examiners is necessary for a candidate to be eligible to appear the examination.

(14) A candidate who has submitted his/her dissertation once is not required to submit a fresh dissertation if he/she reappears for the examination in the same branch on the subsequent occasion, provided the dissertation has been accepted by the examiners.
(15) Disapproved dissertation subject to modifications (if permitted) by the university should be resubmitted for approval based on the Guidelines / remarks stated within 30 days of disapproval or the date scheduled.

POST-GRADUATE GUIDE:* 
A PG guide must have a Post-Graduate Degree in Physiotherapy with at-least 5 years of full time teaching in the core subject area after post-graduation. To withstanding the above clause, in a case of acute shortage of qualified Post-Graduate guides, A PG teacher with 3 years full time teaching experience after Masters Degree can be considered. This clause is subject to review by the academic year 2015-16. The guide student ratio shall be 1: 3.

Co- guide: may be included provided the work requires substantial contribution from a sister department or from another medical institution recognized for teaching /training by Dr.D.Y.Patil University, Pune. The co- guide shall be a recognized postgraduate teacher of Dr.D.Y.Patil University, Pune.

Change of Guide:

In the event of a recognized guide leaving the college for any reason or in the event of death of guide, another recognized guide may take over the duties of the guide with prior permission from the university subject to withstanding to the Guide Student ratio.

PRACTICAL EXAMINATION

1. Panel of Examiners

A PG guide as defined above is eligible to be appointed as an examiner*. There should be three examiners in each practical examination out of which, two of them shall be external examiners (one from the same state & one from other state) & the other shall be an internal from the same institution. The external examiners who fulfill the conditions should ordinarily be invited from another recognized University, preferably.
Internal examiner shall be the Coordinator of the examination. All the examiners shall jointly plan the overall conduct of examination prior to its commencement & conduct the ENTIRE examination together.

*Note: These above qualifications are applicable to all future recruitments. In the case of teachers who are already recognized as PG guides/examiners status quo will be maintained.

2. **Selection criteria of examiners.**

☐ For any Practical examination, Appointment of the Internal Examiner shall be done by the Controller of examination. Qualification of the examiner shall be same as the paper setter.

☐ In case of substitute examiner, refer procedures for appointment of substitute practical examiners enclosed.

3. **Number of candidates to be evaluated per day in MPT FINAL EXAMINATION**— There shall be **NOT MORE THAN 4** candidates evaluated per day per elective for any practical evaluation. In persisting circumstances the maximum candidate evaluated per day shall not exceed **5**.

4. **Pattern of Examination** - The pattern shall be according to the need of the particular subject. The Coordinator shall take care that maximum syllabus shall be covered in the Practical Examination. It is recommended to include Viva & O.S.P.E., / O.S C. E. methods in the exam.

5. **Conduct of Practical examination** - Before the assessment of the candidate, all the examiners shall jointly prepare arbitrary questions & marks for each such question as per the total marks granted to each experiment & accordingly evaluate the candidate - e. g –
Max 150 marks granted to a Long Case shall be distributed as:

- Ability of History taking - 25 marks,
- Ability of psychomotor & affective skill of examination/evaluation - 50 marks
- Ability of Investigation & appropriate Diagnosis - 25 marks
- Ability of planning /prescription of appropriate treatment/management with an ability of Clinical reasoning - 50 marks.

Such allotment of marks shall be documented on the Practical Examination mark list and Practical answer book before sealing such answer books and submitted to the university.

TRANSFER OF CANDIDATES:-
Request for transfer from one specialty to another during the course of study will not be entertained under any circumstances.

ATTENDANCE REQUIREMENTS FOR ADMISSION TO EXAMINATION.

- No candidate shall be permitted to appear for the Examination (internal & university) unless he/she puts 80% of attendance during his/her period of study & training.
- If a candidate is not permitted for examination due to lack of attendance, he/she has to fulfill the required attendance by compensation in the extension period to be eligible for the University examination.

CONDONATION OF ATTENDANCE
There shall be no condonation of attendance in postgraduate studies. (However 5% compensation shall be permitted with the discrete permission of the authorities in case of Epidemic illness only.)
SYLLABUS

Aims of the programme:-

The objective of the course is to deepen the student’s knowledge in both physiotherapy and scientific methods. The student shall, independently, with supervision write and present a Master’s degree project with relevance to developing the profession.

The aims of the course are to give the student:

- Advanced knowledge of physiotherapy and the ability for formulate problems.
- A critical approach to scientific theories, concepts and methods.
- Applicable knowledge of scientific methods.
- Create an awareness of the paramount importance of patient safety at all times.
- Advanced knowledge of ethical principles in research.
- The ability to compile and present research results. Preparation of a proposition for the Master’s degree project. Identification of a relevant area for research – formulating a problem. Choice of research methods. Collecting and analyzing data.
- Ethical considerations in research.
- Presentation of results.
- Participation in working and examination seminars.

Opposition and defence of written Master’s degree projects

Objectives of the Programme: -

At the end of the course the candidate shall be able to:

- Acquire the in-depth knowledge of structure and function of human body related to the respective branch of specialty.
- Acquire the in-depth knowledge of movement dysfunction of human body, cause thereof, & of principles underlying the use of physiotherapeutic interventions, for restoring movement dysfunction towards normalcy.
- Demonstrate ability to critically appraise recent physiotherapeutic and related medical literature from journals & adopt diagnostic & therapeutic procedures based on it.
Demonstrate the skill in Physical & functional diagnosis pertaining to patient under care.
Demonstrate the ability to make clinical decision & select appropriate outcome measures based on the comprehensive knowledge of theoretical aspects of specialty.
Demonstrate an expertise in evidence-based skill in the management of movement dysfunction.
Expertise in health promotion & quality restoration of functional movement.
Acquire the skills of Planning and implementation of treatment programme adequately and appropriately for all clinical conditions related to respective specialty in acute and chronic stage, in intensive care, indoor and outdoor institutional care, independent practice, on fields of sports and community and during disaster or natural calamities.
Demonstrate proficiency in planning and executing Physiotherapy services and teaching technology skills.
Acquire managerial and administrative skills.
Demonstrate the knowledge of legislation applicable to compensation for functional disability & appropriate certification.
MPT- FIRST YEAR

The regular clinical posting shall be evenly distributed for training in different clinical areas (elective & non-elective) and clinical training/laboratory work shall be done in various special clinics.

SUBJECT - I: Physiotherapy Practice & Education Technology.

(Didactic -42, Clinical training / Laboratory work - 23, Scientific Enquiry - 22)

OBJECTIVES – Physiotherapy Practice

At the end of the course, the candidate will acquire the knowledge of

1. Ethical codes, of Physio Therapy practice as well as moral and legal aspects
2. Constitutions and Function of the Indian Association of Physiotherapy
3. Be able to impart the knowledge with the undergraduate students
4. Acquire the brief knowledge of role of W.H.O. and W.C.P.T.
5. Acquire the managerial & management skills in planning, implementation, & administration in clinical practice (service / self-employment) & academic activities including the skill of Documentation & use of information technology in professional practice.

Education Technology

1. Describe the development of Education and Aims from early civilization to modern times.
2. Compare and contrast the beliefs of traditional and modern philosophies of education.
3. Define the major educational theories and illustrate their application in curriculum development.
4. Describe the history of education in India giving the current issues and trends.
6. Describe and explain the concepts and principles of curriculum development, instruction, learning and evaluation.
7. Locate the use of library and other resources in planning.

SYLLABUS: Physiotherapy Practice
a) Concept of morality, Ethics & Legality, confidentiality and responsibility.
d) Management – Theories and their application to physiotherapy practice, service quality at various levels of the health delivery system, teaching institution & self-employment and principles and concepts.
e) Administration & marketing – Personal policies – Communication & Contact-Administration principles based on Goal & Functions at large hospital / domiciliary set up / private clinical / academic institution.
   - Methods of maintaining records – Budget planning
   - Leadership and Teamwork.
f) Quality control related to treatment procedure, audit and Programme evaluation
   • Advances in Disaster Management.
   • Regulatory Agencies and Legal Issues
   • Legislation and Social Care.
   • Independent Practice Issues
g) Evidence based Practice:
   • Introduction, Concepts.
   • Finding the evidence
   • Assessing the evidence
   • Systematic reviews and meta-analysis
h) Clinical Reasoning: Introduction, Hypothesis Categories and errors
SUBJECT - II : - Education Technology

a. Aims, Philosophy and Trend and Issues in education including
   – Aims, agencies, formal and in-formal education, philosophies
   of education (past, present & future).

b. Role of education philosophy.


d. Concepts of teaching and learning – theories of teaching,
   relation between teaching and learning, dynamics of behavior,
   learning perception, individual differences.

e. Curriculum formation – committee framing, development &
   types of curriculum, formation of philosophy & course
   objectives, master plans of courses, co-relation of theory and
   practice.

f. Principles and methods of teaching – strategies and planning,
   organization and teaching methods - micro teaching.

g. Measurement and evaluation – nature of measurement, steps of
   constructing a test measurement, standard tools, program
   evaluation.

h. Guidance and counseling – Philosophy, principles and
   concepts, guidance and counseling services (mode of framing
   and execution).

i. Faculty development services.

- Documentation of Rehabilitation assessment and management
  of ICF (International Classification of Function, disability and
  health)

- Standardized test and scales used in various types of cases,
  assessment and interpretations in PT practice.

- Development of Physiotherapy profession.

- Scope of Physiotherapy in Hospital, Community and Industry.
SUBJECT -III : -Research Methodology & Biostatistics.

(Didactic -42, Clinical training / Laboratory work - 26, Scientific Enquiry - 31)

OBJECTIVES: -
At the end of the course the candidates will be able to
1. Apply basic concepts of statistics & principles of scientific enquiry in planning and Evaluating the results.
2. Participate in or conduct descriptive, explorative, survey studies in PT practice.
3. Present data in appropriate methods

Research methodology
1. Introduction
   • Terminology in research, Ethical issues in research, Research process
2. Review of literature.
   • Importance, sources & steps in reviewing the literature.
3. Research design
   • Type of research – qualitative & quantitative.
   • Experimental & non experimental, survey – advantages & disadvantages
4. Research process
   • Research question, Aim & objectives, Assumptions, Limitations & Delimitations, Variables
   • Hypothesis – formation & testing.
5. Sampling
   • Sampling technique
   • Population, sample,
   • Sample size & determination
   • Sampling methods
   • Sampling error
6. Data collection and analysis
   • Data sources, technique of data collection, tools
   • Reliability & validity
   • Process of data collection
   • Pilot study-method, need
7. Interpretation & presentation of data
   - Quantitative & qualitative analysis
   - Graphical representation of data
   - Conclusion & discussion
8. Writing a dissertation, research paper
9. Critical appraisal of research
10. Presentation and Publication of research – Steps and process.

**Biostatistics**

1. Introduction
   - Frequency distribution
   - Tabulation & graphical presentation of data
2. Measures of central tendency (Mean, median, mode)
3. Measures of variability (range, percentage, SD)
4. Sample distribution & error
5. Correlation
   - Meaning
   - Rank order
   - Product Moment correlation (Pearson’s product moment, Spearman’s Regression analysis)
6. Statistical significance
   - Parametric tests-’t’ tests, Tukeys following One-way ANOVA
   - ANOVA (One-way, two way – for parametric & nonparametric), ANCOVA, Multistage ANOVA
   - Nonparametric tests-Chi-square test, Mann Witney U test, ‘Z’ test
   - Wilcoxon’s matched pairs test
7. Vital health statistics
8. Computer application for statistical analysis
(Didactic -38, Clinical training / Laboratory work -39, Scientific Enquiry - 34)

OBJECTIVES: -
At the end of the course, the candidate will –
1] Acquire the updated knowledge of the Patho-mechanics of the human movement.
2] Be able to apply the principles of Biomechanics in functional analysis of movement Ergonomic analysis / advice & prostheses / Orthotics.
3] Be able to prescribe, check out & train in the application of lower limb upper prostheses, Spinal / lower / upper extremity Orthosis used as mobility aids.
4] Be able to prescribe the Ergonomic alternations at the work place & industry.
5] Be able to fabricate, temporary hand splints and functional splints for gait training.
6] Acquire a skill in disability evaluation & will be able to CERTIFY the same
7] Be able to impart knowledge and train the students in this subject at the undergraduate level

SYLLABUS: -
a) Forces, Equilibrium, levers – laws – mechanical advantage, Material properties of bones and soft tissues.
c) Kinetics / Kinematics of extremity and spinal joints, (including T. m. joint) Posture gait jogging, running, climbing up/down, A.D.L & exercises.
d) Biophysics of connective tissue – ligament, Cartilage, tendon, muscle, neural tissues & vessels, – Response to mechanical loading.
e) Applied mechanics in physiological & pathological deviations (pathomechanics / Patho kinetics) of spinal & extremity disorders (functional & static)
f) Applied mechanics in exercise prescription with clinical reasoning.
g) Analysis of functional hazards related to Environment /Industry
& clinical reasoning for the appropriate Ergonomic advice.

h) Applied mechanics in the application of Prostheses, Orthoses, & mobility aids – materials, designs & biomechanical compatibility.

i) Biomechanics of respiration & circulation.

j) Biomechanics of the nervous system

**SUBJECT- V: -Advance Electrotherapy**

(Didactic -38, Clinical training / Laboratory work - 39, Scientific Enquiry - 35)

**OBJECTIVES:**

At the end of the course the candidate will

1] Acquire the updated knowledge of production / biophysics as well as the Physiological / therapeutics effects (at the cellular levels) of various electrical currents, Thermal agents, ultrasound & electro – magnetic forces & potential risk factors on prolonged exposure.

2] Acquire the knowledge about various Pharmaco Therapeutic agents to be used in combination with various electro – therapeutic modes, with appropriate clinical decision & reasoning in the management of pain / tissue healing / Wound care & skin condition conditions.

**SYLLABUS:**

a) Medical Physics of various therapeutic currents, ultrasound & Electro – magnetic energy, SWD.


c) Appropriate dose for the treatment of various disorders / disease conditions with various therapeutic modalities.

d) Advanced Electro therapeutic in the management of Pain, and various other conditions.

e) Principles of combination of Therapeutic currents & / ultrasound , with Pharmaco – Therapeutics with special reference to Musculo-skeletal, / neuropathic & psychosomatic
pain and various other conditions.
f) Advanced Electro, Therapeutics in Tissue healing, Wound Care, management of Scars, Keloids & De-pigmentation – skin conditions.
g) Acupressure and Acupuncture Points.

**SUBJECT - VI : - Electrophysiology and Electro diagnosis:**

*(Didactic -33, Clinical training / Laboratory work - 37, Scientific Enquiry - 41)*

**OBJECTIVES:**

At the end of the course the candidate will

1. Be able to interpret the E.M.G. and nerve conduction studies with appropriate clinical reasoning.
2. Acquire the sound Knowledge of E.M.G. machine for the simple electro diagnosis of motor unit and methodology of sensory and Motor conduction, Reflex study
3. Expertise in the skill of using various electrical currents for the purpose of Electro diagnosis able to interpret the same with appropriate clinical reasoning.
4. Be able to train the undergraduate students at Pre clinical and clinical level

**SYLLABUS:**

b. Neuro –transmitters
c. Classification – 1) Muscle fiber 2)Nerve fiber 3) Motor Unit
d. Synapse & synaptic transmission
e. Propagation of nerve impulses, Physiology of muscle contraction
f. Reflex-classification and properties
g. Sensations – pathways and classification
h. Type of Nerve injury, Wallerian degeneration and regeneration.
i. Electro diagnosis with therapeutic currents, – S.D. curves for motor, sensory and Pain assessment
j. Applied Electrotherapy –1) instruments 2)electrodes used in EMG -3) E.M.G. normal ( at rest & Activity) and abnormal.
k. Application of nerve conduction studies 1) Sensory /Motor
   2) “F” Wave, 3) “H” reflex, 4) Blink reflex, 5) SSEP
l. Application in Neuro-muscular junction disorders, repetitive
   nerve stimulation.
m. Motor unit potential diseases (Dystrophies, myopathy,
   myotonia)
n. Entrapment syndromes, Peripheral neuropathies,
   Nerve trauma & compression syndromes.
o. Evoked potentials SSEP

SUBJECT - VII :-- Exercise Physiology, Health &
fitness.

(Didactic -50, Clinical training / Laboratory work - 29, Scientific
Enquiry - 34)

OBJECTIVES: -
   At the end of the course the candidate will -
1] Acquired the updated knowledge of Physiology and Physical
   exercise & will be able to interpret the physiological effects of the vital
   parameters of simple laboratory tests, such as “ Stress Test”
2] Acquire the skill of using Bicycle – Ergometry & Treadmill for the
   purpose of General Fitness & Exercise tolerance for Healthy persons.
3] Be able to prescribe & train for general fitness & health promotion
   for children, pregnant/ lactating females, Obese & elderly subjects.
4] Be able to impart knowledge for training the undergraduate student.

EXERCISE PHYSIOLOGY

1. ENERGY PRODUCTION, EXPENDITURE, AND
   TRANSFER
   • Energy transfer in cells during exercise.
   • Oxygen metabolism and transfer during metabolism.
   • Oxygen transport in blood
   • Oxygen deficit, Oxygen debt.
   • Oxygen measurement, Oxygen during exercise, Oxygen
     during recovery.
• Energy release from carbohydrate, lipids and proteins.
• BMR – during rest, at activity.
• Energy expenditure during activity.
• Short Term and Long term energy systems.

2. EXERCISE PERFORMANCE
• Lung function and its role in exercise performance
• Regulation of ventilation & blood pressure during exercise.
• Cardiovascular adjustment during exercise.
• Muscle fiber, types and its role in exercise performance.
• Ventilation during steady and non-steady rate exercise.
• Energy cost and breaking.
• Blood pressure (BP) response to exercise.
• Cardiac output during exercise in – trained / untrained.
• Cardiovascular drift.

3. AEROBIC AND ANAEROBIC EXERCISES
• Principles of Training
• Anaerobic system changes with training
• Aerobic system changes with training
• Factors affecting aerobic and anaerobic training response.
• System adaptation to aerobic and anaerobic training
• Overtraining
• Strength training – physiology in various age groups
• Methods of training, Circuit training & De-training
• DOMS.
• Aid in enhancing training and performance.

4. EXERCISE AND ENVIRONMENT
• Acclimatization
• Exercising at high and low altitude and hypoxia.
• Exercise at hot climate, thermoregulations, dehydration and rehydration.
• Exercise at cold climate.

5. FATIGUE
• Classification, physiology
• Assessment and management.
HEALTH & FITNESS

1. NUTRITION:
   2. Lipids: Nature, Source, Classification, Recommended intake, and role in exercise.
   4. Vitamins: Kind, Source, Role of vitamins.
   6. Nutritional deficiencies and management.

2. DIET
   1. Recommended dietary intake, Pre-competition meal,
   2. Diet for endurance and strength training.

3. FITNESS TESTING
   1. Predicting/measurement of aerobic fitness
      1. Field tests
      2. Lab tests
      3. Sub-maximal test (cycle ergometer, treadmill tests)
      4. Maximal testing
   2. Predicting/measurement of anaerobic fitness, strength and power
   3. Predicting/measurement of flexibility.
   4. Predicting/measurement of agility
   5. Fitness testing for special population-Paediatrics, women, geriatrics

4. BODY COMPOSITION
   1. Obesity and weight control.
   2. Measurement of body composition – BMI, WHR, indirect methods of measurement
5. EXERCISE TESTING AND PRESCRIPTION FOR SPECIAL CONDITION
   1. Diabetes mellitus
   2. Hypertension
   3. Cardio-vascular system
   4. Respiratory impairment

6. PAEDIATRIC EXERCISE SCIENCE

SUBJECT - VIII : Manual Therapy

(Didactic –40, Clinical training / Laboratory work - 31, Scientific Enquiry - 34) OBJECTIVES: -
At the end of the course, the candidate will –
1] Acquire the knowledge and skill of various approaches of Manual therapy for joints of the limbs/spine.
2] Be able to integrate the manual therapies to rehabilitate the Mechanical Neuro.Muscular problems.
3] Be able to impart knowledge and train the undergraduate in Manual therapy.

SYLLABUS: -
   a) Physiological movements
   b) Articular Neuro Physiology and principles of applications.
   c) History of manual therapy, overview of manual therapy approaches for all the joints.
   d) Terminology, Principles, indications, contraindications, assessment & methods of application of – Maitland, Karltenborn, Cyriax, Mulligan and Mackenzie, Butler’s Neural Mobilisation, Shacklok neural tissue mobilization.
   (Practical application of various manual therapy modes given in no. d & e above.)

25
# MPT- SECOND YEAR

The syllabus for the following specialities

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Course</th>
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<tbody>
<tr>
<td>1.</td>
<td>MPT: Orthopaedics</td>
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<td>2.</td>
<td>MPT: Musculo-Skeletal Science &amp; Sports</td>
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<tr>
<td>3.</td>
<td>MPT: Musculo-Skeletal Science &amp; Hand Conditions</td>
</tr>
<tr>
<td>4.</td>
<td>MPT: Musculo-Skeletal Science &amp; Manual Therapy</td>
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<td>5.</td>
<td>MPT: Neurosciences</td>
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<td>6.</td>
<td>MPT: Cardio – Respiratory Sciences</td>
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<td>7.</td>
<td>MPT: General &amp; Community Based Rehabilitation</td>
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<tr>
<td>8.</td>
<td>MPT: Paediatrics</td>
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</table>

Duration – 41 weeks. (1722+100 hours =1822 hours)

1. Didactic – 218 hours.
2. Clinical training /Laboratory work – 260 hours.
3. Regular clinical posting 24 hours /week for 41weeks = 984 hours + on call duty of 100 hours = 1084 hours.
4. Scientific enquiry – 260 hours (includes project / review of literature/ seminars/case Presentation, journal clubs).

The regular clinical posting shall be done in the concerned elective and clinical training/ laboratory work shall be done in various special clinics.
MPT - ORTHOPAEDICS

Objective

At the end of the course, the candidate will

1. Be able to identify, discuss & analyse, the Musculo skeletal dysfunction in terms of Biomechanical, Kinesiological and Biophysical basis & co-relate the same with the provisional diagnosis, routine radiological & Electro-physiological investigations and arrive at appropriate functional diagnosis with clinical reasoning.
2. Use the anatomical rationale for the clinical tests used in differential diagnosis.
3. Learn the ability to perform an appropriate subjective and physical examination, with development of suitable analytical skills to evaluate data obtained.
4. Further develop clinical reasoning that incorporates theoretical concept with evidence-based practice in the field of musculoskeletal physiotherapy.
5. Recognize the implication of dysfunction on the Neuro- Musculoskeletal system and the student’s clinical decision making.
6. Document patients with scale, outcome measures and assess the progression.
7. Use recent Technique/ approaches to treat & train patients with musculo-skeletal deficit in children, adults & geriatrics.
8. Be able to impart knowledge for training the undergraduate students.

ORTHOPAEDICS - I (Total = 369 hours)

Didactic – 109 hours,
Clinical training /Laboratory work – 130 hours,
Scientific enquiry – 130 hours (includes project / review of literature/ seminars/case Presentation, journal clubs etc.)
Introduction To Orthopaedics – Assessment & Evaluation in detail related to orthopedic patient history taking, clinical features, clinical examination and investigation.

Musculoskeletal system:
- Embryology of musculoskeletal system
  - Long bone.
  - Short & Flat bone.
  - Skull & Thumb.
- Architecture of bone.
- Gross anatomy of bone, joints, muscles and nerves.
- Dermatomes & Myotomes.
- Joint play movements.
- Skeletal growth and development (normal & Pathological)
- Types of muscle contraction, nerve – muscle pathology.
- Calcium – phosphorus metabolism (normal & Pathological states).

Fractures
- General principles
- Fracture treatment – ast, Present & Future.
- Stress shearing / shielding devices.
- Fracture healing (normal & Pathological)
- Dislocation
  - Acromioclavicular joint., sternoclavicular joint.
  - Recurrent dislocation of shoulder., elbow, wrist & phalanx.
- Hip , ankle, dislocation.

Soft Tissue Injuries [injury & repair, clinical presentation, evaluation & general principles of rehabilitation management]
Lower Limb.- Fat pad inflammation. Baker’s cyst. ACL, PCL.
Meniscal injury. Chondromalacia patella.
Deltoid Fibrosis, Trigger Finger & Thumb, Quadriceps
Fibrosis. Bursitis around the knee, Plantar Fascitis, Calcaneal
Spur, IT Syndrome, TMJ dysfunction, Gait.
Home program and counselling for care givers
Ergonomics in musculoskeletal dysfunction
Pilates
PNF techniques
Swiss ball therapy

ORTHOPAEDICS - II (Total = 369 hours)

Didactic – 109 hours,
Clinical training /Laboratory work – 130 hours,
Scientific enquiry – 130 hours (includes project / review of
literature/ seminars/case Presentation, journal clubs etc.)

Osteokinematics & Arthrokinematics of Musculoskeletal
system
Podiometry.
Down the stairs.
Congenital Malformation.- Congenital hip displasia.
Congenital Talipes Equinovarus. Calcaniovalgus.
Arthrogryposis Multiplex Congenita. Congenital Torticolis.
Development Disease Of Skeleton- Chondro-osteodystrophy.
Osteogenesis. Imperfecta. Osteoporosis. Heterotopic
Tibial epiphysitis. Congenital coxa vara.
Neuromuscular Diseases- Muscular dystrophies. Infantile
hypotonia. Volkman’s Ischaemic contracture. Obstetrical
paralysis. Peroneal muscle atrophy. Cerebral palsy.
Poliomyelitis.
Spinal Deformities - Scoliosis. Kyphosis. Traumatic
deformities. Flat back.
Infections Of Musculoskeletal System - Bacterial infections


Neurovascular Diseases. - Nerve injuries (general & specific). Plexus injuries. Vascular ailments (Raynaud’s. Thromboangiitisoblitrans Frostbite Diabetic foot.)


Amputation.

Disability Evaluation.

Role of Orthotics & Prosthetics in Orthopaedics.
- Applied mechanics in application of prosthesis
- Procedure in Prosthetic & Orthotic Fabrication of temporary splints

Orthopaedic Surgeries:
- Bone Skin Graft
- Osteotomy
- Nerve suturing and grafting
- Joint replacement, arthrodesis, arthroplasties, repair surgeries, surgeries of spine, knee, hip, ankle, hand, elbow, shoulder

REFERENCE BOOKS

MPT: Orthopaedics

MPT – MUSCULO-SKELETAL SCIENCE & MANUAL THERAPY

Objective
At the end of the course, the candidate will
1. Be able to identify, discuss & analyse, the Musculo skeletal dysfunction in terms of Biomechanical, Kinesiological and Biophysical basis & co-relate the same with the provisional diagnosis, routine radiological & Electro-physiological investigations and arrive at appropriate functional diagnosis with clinical reasoning.
2. Use the anatomical rationale for the clinical tests used in differential diagnosis through manual therapy.
3. Learn the ability to perform an appropriate subjective and physical examination, with development of suitable analytical skills to evaluate data obtained.
4. Further develop clinical reasoning that incorporates theoretical concept with evidence-based practice in the field of musculoskeletal physiotherapy.
5. Recognize the implication of dysfunction on the Neuro-Musculoskeletal system and the student’s clinical decision making.
6. Document patients with scale, out come measures and assess the progression.
8. Be able to impart knowledge for training the under graduate students.

PART A – MUSCULO-SKELETAL SCIENCE (Total = 369 hours)

Didactic – 109 hours,
Clinical training /Laboratory work – 130 hours,
Scientific enquiry – 130 hours (includes project / review of literature/ seminars/case Presentation, journal clubs etc.)
Introduction To Orthopaedics – Assessment & Evaluation in detail related to orthopedic patient history taking, clinical features, clinical examination and investigation.

Musculoskeletal system:
- Embryology of musculoskeletal system - Long bone, Short & Flat bone, Skull & Thumb - Skeletal growth and development (normal & Pathological)
- Architecture of bone.
- Gross anatomy of bone, joints, muscles and nerves.
- Dermatomes & Myotomes.
- Joint play movements.
- Types of muscle contraction, nerve – muscle pathology.

Fractures
- General principles of Fracture treatment
- Stress shearing / shielding devices.
- Fracture healing (normal & Pathological)

Dislocation – Complication & management

Soft Tissue Injuries [injury & repair, clinical presentation, evaluation & general principles of rehabilitation management]
- Deltoid Fibrosis, Trigger Finger & Thumb, Quadriceps Fibrosis, Bursitis around the knee, Plantar Fascitis, Calcaneal Spur, IT Syndrome, TMJ dysfunction.
- Sprains & strains of spine & extremities.  
  - Fibromyalgia, trigger points.  
- TMJ dysfunction.

Osteokinematics & Arthrokinematics of Musculoskeletal system

Gait Analysis - Walking.

Activity Analysis – Lifting, Throwing, Jogging, Running, Ascending & descending stairs


Neuro-musculo skeletal conditions – Spasticity, Neural compression, Compartment syndromes.

Ergonomics in Musculoskeletal Dysfunction

**PART – B MANUAL THERAPY**

**(Total = 369 hours)**

**Didactic – 109 hours,**

**Clinical training /Laboratory work – 130 hours,**

**Scientific enquiry – 130 hours (includes project / review of literature/ seminars/case Presentation, journal clubs etc.)**

**General Course Objectives:**

After completing this course, students are expected

1. Describe the basic theories and principles of various types of manual therapy
2. Understand the indications and contra-indications, treatment efficacy, and clinical applications of each kind of manual therapy
3. Explicit and perform the steps of each manual therapy skills
GOALS:
1. Identify the scope of manual therapy and summarize basic biomechanics of synovial joint and its related soft tissues
2. Demonstrate basic techniques of orthopedic physical therapy assessment, especially biomechanical examination
3. Identify the indications, limitations, and contra-indication of joint mobilization and soft tissue mobilisation
4. Explicit interpretations and principles of orthopedic physical therapy assessment
3. Distinguish the differences in core concepts among various schools of thought

Syllabus
- Introduction & Basic concepts of Manual therapy
- History and Principles of Manual Therapy
- Clinical Reasoning in Manual Therapy
  - Hypothesis generation
  - Pattern recognition
  - Errors in Clinical Reasoning
- Evidence based practice & Medico-legal issues in manual therapy.
- Pain – Concepts, theories, assessment, differential diagnosis & principles of management.
  - Pain Sciences:
    - Models of Pain and Disability
    - Neuropathophysiology of Pain
    - Classification
    - Pain Assessment
    - Pain Management
    - Principles of chronic Pain Management

- Neurodynamics and neural tissue mobilization.
  - basics of anatomy, physiology, biomechanics of neural tissue
  - clinical reasoning, principles of subjective, objective, treatment and reassessment in spinal and extremity adverse neural tension disorders
• Clinical presentation of the intraneural and extraneural pathology
• indications, contraindications and precautions in adverse neural tension testing and management in upper and lower extremity and spine

Osteopathic and Chiropractic school of thoughts

Different schools of thought – its clinical applications, principles of assessment & management of various segments of the body (Joints, Spine, Soft-Tissues), in accordance with the pathology, patho-mechanics (Traumatic & Non Traumatic) of structural & functional dysfunction.

• Mulligan – principles of assessment and treatment using mulligan concept NAGS, SNAGS, RNAGS, MWM, application in spinal and peripheral joint dysfunction
• Maitland – Principles and application in spinal and peripheral joint dysfunction Principles of subjective examination and physical examination, treatment, re-assessment of spinal and peripheral joint problems
• Kaltenborn – Principles and application in spinal and peripheral joint dysfunction
• Cyriax – history, physical examination-selective tissue tension test, management strategies in spinal and peripheral joint and soft tissue techniques - deep transverse friction massage, massage, manipulation, injection
• McKenzie – classification of spinal pain as adopted by McKenzie-postural, dysfunction and derangement - assessment and treatment procedures

Pilates techniques.

Mennel’s technique

Myofasial Release technique—fibromyalgia, trigger point therapy principles of assessment and treatment

Positional release technique--assessment and treatment procedures strain and counter strain technique - Functional technique

Muscle Energy Technique--theories of spinal and peripheral joint dysfunction - fryette’s laws of physiological spinal motion - segmental vertebral dysfunction - NRS, ERS, FRS - screening examination, scanning examination, skill rolling, segmental definition (diagnosis), treatment using MET
Neuro-Muscular Taping
Combined Movements of spine
Recent advances in manual therapy.
Movement Impairment Syndrome
Motor Control : Spinal and peripheral
Core stability : Cervical and Lumbar

REFERENCE BOOKS

MPT-MUSCULO-SKELETAL SCIENCE & MANUAL THERAPY

MPT - MUSCULO-SKELETAL SCIENCE & SPORTS

Objectives:-
At the end of the course, the candidate will be able to

• Be able to identify, discuss & analyse, the Musculo skeletal dysfunction in terms of Biomechanical, Kinesiological and Biophysical basis & co-relate the same with the provisional diagnosis, routine radiological & Electro-physiological investigations and arrive at appropriate functional diagnosis with clinical reasoning for fitness training & rehabilitation.
• Understand the psychosocial factors, environmental factors & individual factors affecting the performance.
• Use the anatomical rationale for the clinical tests used in differential diagnosis.
• Be able to identify, discuss & analyse, the various cardio-respiratory function & co-relate the same with the provisional diagnosis, for fitness training & rehabilitation.
• Lay down rehabilitation protocol for sports specific injuries focusing an early rehabilitation to injuries.
• Identify the causes prone for injury & prevent them.
• Guide participants for a confident sports activity & rehabilitation to attain maximal achievement.
• Understand the role of Sports physiotherapist in the team.

PART A – MUSCULO-SKELETAL SCIENCE
(Total = 369 hours)

Didactic – 109 hours,
Clinical training /Laboratory work – 130 hours,
Scientific enquiry – 130 hours (includes project / review of literature/ seminars/case Presentation, journal clubs etc.)

Introduction To Orthopaedics – Assessment & Evaluation in detail related to orthopedic patient history taking, clinical features, clinical examination and investigation.
Musculoskeletal system:
- Embryology of musculoskeletal system - Long bone, Short & Flat bone, Skull & Thumb - Skeletal growth and development (normal & Pathological)
- Architecture of bone.
- Gross anatomy of bone, joints, muscles and nerves.
- Dermatomes & Myotomes.
- Joint play movements.
- Types of muscle contraction, nerve – muscle pathology.

Fractures
- General principles of Fracture treatment
- Stress shearing / shielding devices.
- Fracture healing (normal & Pathological)

Dislocation – Complication & management

Soft Tissue Injuries [injury & repair, clinical presentation, evaluation & general principles of rehabilitation management]
- Deltoid Fibrosis, Trigger Finger & Thumb, Quadriceps Fibrosis, Bursitis around the knee, Plantar Fascitis, Calcaneal Spur, IT Syndrome, TMJ dysfunction.
- Sprains & strains of spine & extremities. o Fibromyalgia, trigger points.
- TMJ dysfunction.

Osteokinematics & Arthrokinematics of Musculoskeletal system
- Gait Analysis - Walking.
- Activity Analysis – Lifting, Throwing, Jogging, Running, Ascending & descending stairs
- Neuro-musculo skeletal conditions – Spasticity, Neural compression, Compartment syndromes.
- Ergonomics in Musculoskeletal Dysfunction

PART B – SPORTS (Total = 369 hours)

- Didactic – 109 hours,
- Clinical training /Laboratory work – 130 hours,
- Scientific enquiry – 130 hours (includes project / review of literature/ seminars/case
- Presentation, journal clubs etc.)

1. APPLIED EXERCISE PHYSIOLOGY
   - Training the aerobic and anaerobic energy system
   - Physiological responses, changes & adaptations to various exercises - aerobic exercises & anaerobic exercises in Pulmonary, Cardiovascular, Neuromuscular system, Hormones
   - Detraining effects of cardiovascular, musculoskeletal and nervous system
   - Sports specific training and cross training.
2. SPORTS SPECIFIC BIOMECHANICS
   • Principles & Importance of biomechanics in sports
   • Introduction to biomechanical analysis. Recruitment & techniques – Isokinetic dynamometer, kinesiological EMG, electronic goniometer, force platform, videography.
   • Biomechanics of shoulder girdle, elbow, hand, hip, knee, ankle and foot joint and its movements.
   • Biomechanics of spine and its movements.
   • Gait analysis
   • Sports specific biomechanics of: rowing, swimming, throwing, walking, jogging, jumping, landing, tennis, golf, cricket, volleyball, soccer, basketball, short and long distance running (pattern, velocity, angular and linear movements)

3. KINANTHROPOMETRY
   • Significance of kinanthropometric knowledge in sports medicine.
   • Various Body measurements: Gross size and mass, length and height measurement, circumference of body parts, Skinfold thickness measurements.
   • Body composition
     i. Different Body composition
     ii. Various methods to estimate body composition : water displacement method, under water weighing method, skinfold method, application of surface anthropometry, bioelectrical impedance analysis, ultrasound assessment of fat, arm X-ray assessment of fat, computer tomography assessment of fat
   • Somatotyping
     a. Sheldon’s method of somatotyping - Critical evaluation of Sheldon’s method of somatotyping
     b. Heath – Carter method of somatotyping - The rating scales, Kinanthropometric measurements Somatotyping, & distribution, Somatotype distribution
4. ASSESSMENT AND EVALUATION IN SPORTS PHYSIOTHERAPY

- Evaluation of Physical Fitness: Assessment of strength, power, endurance (muscular & cardiac), VO$_{2\text{max}}$, flexibility, reaction time and pulmonary function.
- Assessment of lower limb complex: Pelvis, hip, thigh, knee, leg, ankle and foot
- Assessment of upper limb complex: Shoulder girdle, shoulder, arm, elbow, forearm, wrist and hand
- Assessment of spinal column: Cervical, thoracic and lumboscaral, Tests of neural tension
- Evaluation of injuries in old age sportsperson
- Evaluation of disabled sportsperson
- Assessment and evaluation of pediatric sportsperson
- Ground evaluation

5. MEDICAL CONDITIONS OF ATHLETE

- Delayed onset muscle soreness (DOMS), G.I.T. Diseases, Exercises and congestive heart failure, Diagnosis and management of skin conditions of Athletes, Bacterial infections, Fungal infections, Viral infections, boils and cellulitis, Eating disorders in athletes
- Exercise induced bronchial obstruction
- Exercise in chronic airway obstruction
- Exercise in diabetic patients
- Exercise as a method of control of diabetes

6. DOPING IN SPORTS:

- Banned drugs
- Various drugs used and their affects
- Procedure of dope testing
- Control of doping abuse

7. SPORTS TRAUMA
   A. Musculoskeletal injuries
      - Pre-participation examination
      - Causes & Mechanism of Sports Injuries, prevention of sports injuries to various structures.
• Common acute, chronic and overuse injuries in various sports at:
  i. Shoulder girdle, Shoulder, Arm, Elbow, Forearm, Wrist & hand
  ii. Pelvis, hip, thigh, knee, leg, ankle & foot
  iii. Spine
  iv. Head
  v. Thoracic cage and abdomen
  vi. Peripheral nerve injuries, injuries to muscles, ligament, tendon, bone, synovial joint structure (with physiological response to injury)

B. Cardiopulmonary section
• Sporting emergencies & first aid
• 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.

C. Radiology in sports
Basics of radiology including ultrasonography CT & MRI scanning - head and neck, Shoulder girdle, elbow, wrist hand, spine, pelvis, hip and thigh. Patello Femoral Joint & Knee joint foot and ankle.

8. PHYSIOTHERAPY METHODS IN SPORTS
✓ Define Rehabilitation, Goals and Objectives of Rehabilitation in Sports, Clinical
✓ Evaluation phases of rehabilitation. (multidisciplinary approach)
✓ Modern concepts in rehabilitation.
✓ Definition, details of effects and uses of therapeutic exercises.
  • Dynamic Exercises, Plyometric Exercises
  • Isokinetic Exercises
  • Manipulative Techniques
  • Kinetic chain exercises
  • Warm up and cool down exercises
• Therapeutic exercises – strength training, power training, flexibility training, endurance training, plyometrics, reaction timing, proprioceptive training, stretching.
• Sports Massage
• Trigger point release
• Neural tissue mobilization
• Core stability assessment and training
• Pilates
• Swiss ball training
• Sports tapping
• Hydrotherapy
• Electrotherapy in sports injuries
• Cryotherapy and thermotherapy in sports

9. DIET AND NUTRITION IN SPORTS
• Carbohydrates, Fats, Proteins.
• Vitamins, Minerals and Water.
• Optimal Nutrition for exercise.
• Nutrition for Physical Performance.
• Pre–Game meal, Carbohydrate loading.
• Alcohol, Mega Vitamin Therapy.
• Food and meal planning for various athletes of different disciplines.
• Fluid and energy replacement in prolonged exercise.

10. WOMEN’S HEALTH AND ATHLETE
• Assessment and evaluation of women athlete
• Anemia, hypertension in women athlete
• Sports Amenorrhea.
• Injury to female reproductive tract.
• Menstrual Synchrony.
• Sex determination.
• Exercise and pregnancy.
• Eating disorders in athletes.
• Exercise for the childbearing year, adolescence, older woman.
11. SPORTS PSYCHOLOGY

- Personality Assessment and sports personality: Theories of personality and personality assessment.
- Attention and perception in sports.
- Concentration in sports: basic principles of concentration, concentration training, concentration exercises.
- Motivation in sports:
  - Athlete’s needs of motivation
  - Motivational inhibitors
  - Motivational techniques

12. Sports in special conditions.
   a. Disabled sports

Reference Books.

MPT - MUSCULO-SKELETAL SCIENCE & SPORTS

2. Bird, S. R., Black, N. Sports Injuries: Causes, Diagnosis, Treatment and Prevention
4. Cash, M. Sport and Remedial Massage Therapy
6. Hollis, M. Massage for Therapists
7. Hutson, M.A. Sports Injuries, Recognition and Management
8. Kuprian, W. Physical Therapy for Sports

Journals

1. British Journal of Sports Medicine (UK)
2. Journal of Orthopaedic and Sports Physical Therapy (USA)
3. Journal of Sport Rehabilitation (USA)
4. Journal of Sports Chiropractic and Rehabilitation (USA)
5. Medicine and Science in Sports and Exercise (USA)
MPT - MUSCULO-SKELETAL SCIENCE
& HAND CONDITIONS

Objectives:--
At the end of the course, the candidate will be able to
1. Be able to identify, discuss & analyse, the Hand
dysfunction in terms of Biomechanical, Kinesiological and
Biophysical basis & co-relate the same with the provisional
diagnosis, routine radiological & Electro-physiological
investigations and arrive at appropriate functional
diagnosis with clinical reasoning.
2. Use the anatomical rationale for the clinical tests used in
differential diagnosis.
3. Learn the ability to perform an appropriate subjective and
physical examination, with development of suitable
analytical skills to evaluate data obtained.
4. Further develop clinical reasoning that incorporates
theoretical concept with evidence-based practice in the
field of Hand rehabilitation.
5. Recognize the implication of dysfunction on the Neuro-
Musculoskeletal system on hand function and the student’s
clinical decision making for rehabilitation.
6. Asses and diagnose all possible findings on the patient to
plan a Rehabilitation programme.
7. Lay down rehabilitation protocol for sports specific hand
injuries focusing an early rehabilitation to injuries.
8. Identify the causes prone for injury & prevent them.
9. Document patients with scale, out come measures and
asses the progression.
10. Use recent Technique/approaches to treat & train patients
with hand dysfunction in children, adults & geriatrics.
11. Be able to impart knowledge for training the under
graduate students.
PART A – MUSCULO-SKELETAL SCIENCE
(Total = 369 hours)

Didactic – 109 hours,
Clinical training /Laboratory work – 130 hours,
Scientific enquiry – 130 hours (includes project / review of literature/ seminars/case Presentation, journal clubs etc.)

Introduction To Orthopaedics – Assessment & Evaluation in detail related to orthopedic patient history taking, clinical features, clinical examination and investigation.

Musculoskeletal system:
- Embryology of musculoskeletal system - Long bone, Short & Flat bone, Skull & Thumb - Skeletal growth and development (normal & Pathological)
- Architecture of bone.
- Gross anatomy of bone, joints, muscles and nerves.
- Dermatomes & Myotomes.
- Joint play movements.
- Types of muscle contraction, nerve – muscle pathology.

Fractures
- General principles of Fracture treatment
- Stress shearing / shielding devices.
- Fracture healing (normal & Pathological)

Dislocation – Complication & management

Soft Tissue Injuries [injury & repair, clinical presentation, evaluation & general principles of rehabilitation management]
shoulder. Thoracic outlet syndrome. Shoulder hand syndrome.

- Deltoid Fibrosis, Trigger Finger & Thumb, Quadriceps Fibrosis, Bursitis around the knee, Plantar Fascitis, Calcaneal Spur, IT Syndrome, TMJ dysfunction.
- Sprains & strains of spine & extremities. o Fibromyalgia, trigger points.
- TMJ dysfunction.

Osteokinematics & Arthrokinematics of Musculoskeletal system

Gait Analysis - Walking.

Activity Analysis – Lifting, Throwing, Jogging. Running, Ascending & descending stairs


Neuro-musculo skeletal conditions – Spasticity, Neural compression, Compartment syndromes.

Ergonomics in Musculoskeletal Dysfunction
PART B - HAND CONDITIONS

Didactic – 109 hours,
Clinical training / Laboratory work – 130 hours,
Scientific enquiry – 130 hours (includes project / review of literature/ seminars/case Presentation, journal clubs etc.)

1) Anatomy:
   Wrist joint, Carpometacarpal joint, Metacarpo-Phalangeal Joint, Interphalangeal joint
   i) **Surface Anatomy**
      (1) Flexor Retinaculum and recurrent branches of median nerve.
      (2) Motor functions of median, ulnar and radial nerve.
      (3) Pulse points
   ii) **Muscles**
       Dorsal interossei, Palmar Interossei, Adductor Pollicis, Thenar Muscles, Hypothenar Muscles, Lumbricals
   iii) **Soft tissue**
       Carpal Tunnel & Structures, Palmar Aponeurosis, Palmaris Brevis, Anatomical Snuff Box Extensor Hoods, Tunnels and Synovial Sheath of flexor and extensor tendons
   iv) **Lymphatic system.**
   v) **Biomechanics & Kinesiology**
      a. Biomechanics and Pathomechanics of hand
      b. Functions of hand
      c. Mode of Prehension
      d. Percussion contact gestures
      e. Positions of functions and of immobilization
      f. Motor & sensory testing and function of the upper limb
      g. Prehensile ability of hand

1. **EXAMINATION**
   - Anatomy & biomechanics of hand and wrist., Assessment and evaluation of Hand & Wrist, Elbow, Shoulder, Brachial plexus, Cervical spine, Nerves, Architecture of hand, Assessment of strength, power, endurance, specific scales & outcome measures of pain, movement, ROM, flexibility, joint pliability, joint mobility (articular & Osteo), skin.
2. **HAND TRAUMA**
   - Debridement, Contaminated wounds I & II, Amputation, Arthrodesis in trauma, Joint transfer, Mutilated hand, crushed hand, Pediatric mutilated hand, Nail bed, Fingertip
   - Skin Grafts, Cross and reverse cross finger flaps
   - Local regional flaps of the hand, Emergency free flaps
   - Dorsal hand reconstruction, Soft tissue coverage-traumatized limb
   - Thumb replant/immediate pollicization/immediate transfer
   - Chemical, radiation, frostbite injuries
   - Electrical burns, Injection injuries, Farm injuries, Microvascular techniques
   - Recent advances in the management of replantation.

3. **TENDONS INJURIES.**
   - Applied anatomy, physiology and biomechanics of tendons
   - Scientific basis of flexor rehabilitation, Technical aspects of flexor repair
   - History of flexor tendon repair
   - Postoperative management flexor tendon injuries
   - Extensor tendon injuries: Extensor tendon repair I & II: bracing/splinting/therapy
   - Extrinsic, intrinsic tightness, quadregia, and lumbral plus.

4. **BONE**
   - Anatomy/physiology of bone healing & cartilage, Kienbock/Preisers, Scapular and clavicular fractures
   - Shoulder & Humerus (extrarticular) fractures, Elbow fractures, Forearm (Extrarticular) fractures, Distal radius fractures
   - Distal radius malunion, Distal ulna fracture & dislocations DRUJ
   - Scaphoid fractures, Scaphoid nonunions/malunions, Carpal dislocation./fractures (not scaphoid), CMC, MCPJ dislocation without fractures
   - Metacarpal and P1 fractures, P2 fractures PIP fractures - dislocations
   - P3 fractures & dislocations and bony mallet
   - Phalangeal/metacarpal malunions, Carpal instability
   - Principles and advantages of External Fixation in hand &
5. **ARTHROPLASTY**
   - Principles and physiotherapy management with recent advances for Shoulder, Elbow, Wrist

6. **ARTHROSCOPY**
   - Rehabilitation of Shoulder, Elbow, Wrist with advancements.

7. **TUMORS:**
   - Benign & Malignant soft tissue tumors, Benign bone tumors, Malignant and metastasis, Radiology of bone tumors, Skin cancer, Melanoma in the hand, Ganglion cysts

8. **INFECTIONS:**
   - Common infections (excluding tenosynovitis): Atypical hand infections: Tenosynovitis. Leprosy: Deformities and Management

9. **DUPUYTREN’S:**
   - Anatomy and pathobiology & Treatment

10. **NERVE COMPRESSIONS:**
    - Compressive neuropathies, Neuromicroanatomy, physiology Nerve blood flow, Sense and sensibility; Nerve grafting in acute/chronic injury; Vascularized nerve grafts, Carpal tunnel, Carpal tunnel: open vs. closed, Median compression outside the carpal tunnel, Radial compressive neuropathy, Ulnar compressive neuropathy, Decision making in nerve compression, History of nerve compression

11. **NERVE PALSIES**
    - Ulnar nerve palsy, Radial nerve palsy, Median nerve palsy, Brachial plexus, Obstetrical palsy, Tendon transfers in tetraplegia, Tendon transfers in plexus, Combined nerve palsy, Cerebral palsy/stroke

12. **NERVE INJURIES**
    - Nonsurgical neuropathies, Dystrophy/chronic regional pain, Painful neuromas/neurolysis, Pain Management

13. **CONGENITAL:**
    - Overview, Genesis,
    - Examination of the congenital hand, Congenital radiology, Transverse absence / symbrachydactyly / phocomelia, Radial club hand, Radial deficiencies, Camptodactyly,
clinodactyly, Kirner’s, delta phalanx, Syndactyly and Thumb clasped and windblown hand,
• Polydactyly, Macrodactyly, constriction band syndrome, Synostosis and brachydactyly

14. ARTHRITIS
• Medical treatment, Non RA arthropathies
• Osteoarthritis wrist, including arthrodesis and arthroplasties
• Osteoarthritis digits (not CMC)
• RA general principles, Swan neck/boutonierre, CMC except arthroplasty
• CMC Jt. Arthroplasty

15. MISCELLANEOUS
• History of hand surgery, Tourniquet, Transplantation of the hand, Elbow pathology (not neuropathy), Shoulder pathology/treatment, Trigger digits, Compartment syndromes, Vascular disorders, Sports injuries

16. COMPLEX REGIONAL PAIN SYNDROME

17. HAND THERAPY:
• Hand Therapy, Massage for hand, Prosthetics & Orthotics of upper limb, principles of tendon splinting, Sensory Re-education, Desensitization

18. Outcome Measures of Hand function
19. Clinical decision making skill in assessment and management of Hand conditions in details
• Recent advances and evidence based practice in Hand Rehabilitation
• Disability evaluation

REFERENCE BOOKS
1. Clinical Mechanics of hand (2nd edn); Paul Brand & Anne Hollister [Mobsy publications]
2. Hand rehabilitation: A practical guide (2nd edn); Gaylord L.Clark [Churchill Livingston]
3. Clinical pathways in therapeutic intervention upper extremities; David C. Saidoff & Andrew L. McDonough [Mobsy publications]

4. The Hand: Fundamental of therapy (2nd edn); Judith Boscheinen Morrin & Victoria Davey [Butter worth Heinemann]

5. Examination of hand & wrist; Tubiana [Mobsy publications]

6. Fundamentals of hand rehabilitation; Salter [Mobsy publications]

7. Concepts of hand rehabilitation [Mobsy publications]

8. Rehabilitation of Hand; J.M. Hunter [C.V.Mobsy]


10. Structural and dynamic bases of surgery; Zancolli; J.B. Lippincott

11. Rehabilitation of Hand; Wynn Parry [Butter worth Heinemann]


13. Hand Secrets by Peter Jebson [Mobsy publications]


15. Physical Agent Modalities:: Theory and Application for the Occupational Therapist by Alfred Bracciano [Mobsy publications]


17. Hand and Upper Extremity Splinting: Principles and Methods by Elaine Ewing Fess - [Mobsy publications]


Journals

4. Achieves of physical medicine & rehabilitation.
5. Occupational therapy & rehabilitation.
6. American journal of hand surgery

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M PT - NEUROSCIENCES

Objectives: -

At the end of the course. The student should be able to

a) Asses and diagnose all possible findings on the patient to plan a Rehabilitation programme.
b) Document patients with scale, outcome measures and assess the progression.
c) Use recent Technique/approaches to treat & train patients with Neurological deficit in children, adults & Geriatrics.
d) Be able to impart knowledge for training the under graduate students.

SYLLABUS NEUROSCIENCES – I (Total = 369 hours)

Didactic – 109 hours,
Clinical training/Laboratory work – 130 hours,
Scientific enquiry – 130 hours (includes project/review of literature/seminars/case Presentation, journal clubs etc.)

a) Embryology.
b) Electro Diagnosis
c) Neurology and Applied aspects

All topics shall be discussed and learnt with clinical manifestations, pathology & pathophysiology, assessment &investigations, management procedures and recent advances.

• Growth & Development of central Nervous system.
• Reflex
• Physiology & anatomy of Nervous system- Review
• Sensory for approaches – (PNF, Roods, Burnstrom, NDT, SI, Vojta, Temple-Fay).
• Motor learning theories.
• Motor control theories.
• CIMT
• Robotics in neurological rehabilitation
- Stem cell therapy
- Mirror therapy
- Infections Conditions.
  - Pyogenic infections of CNS (Bacterial & Tuberculosis meningitis, Brain Abscess)
  - Viral infections of CNS (Poliomyelitis encephalitis) Neuro syphilis, HIV, rabies.
- Metabolic Disorders of Brain - Hypokalemic encephalopathy, hypoglycemic encephalopathy, Hepatic encephalopathy.
- Degeneration Diseases of Nervous system - Parkinson Diseases, Motor Neuron disease Amyotrophic lateral sclerosis, Progressive bulbar palsy, progressive muscular atrophy.
- Poly Neuropathy - Peripheral Neuropathy, Post infective polyradiculoneuropathy, Diabetic poly Neuropathy, Hereditary sensory motor Neuropathy, Infective polyneuropathy.
- Disorders of muscle & Neuro muscular function - Myasthenia gravis, myotonic disorders, progressing muscular dystrophy, Duchenne muscular dystrophy Becker muscular dystrophy Limb-girdle muscular dystrophy, LEMS, Spinal muscular atrophy.
- Stroke- Focal, multiple focal, lacunar infects, gross infect, degradation of Brain.
- Movement dysfunction (Cerebellar lesions, basal ganglionic lesions).
- Bladder & Bowel dysfunction.
- Convulsive disorders.
- Vestibular Disorder.
- Pain pathway & management.
- Electro diagnosis – S D. curve.
- Basic elements of Neuro diagnostic tests – CT, MRI, Myelography, NCV and EMG.
- Electro – physiological studies - Somato sensory evoked potentials, Motor evoked potentials, Brainstem & auditory evoked potentials, Visual evoked potentials, Differential diagnosis of E.M.G, Differential diagnosis of N.C.V with clinical reasoning, Diagnosis of the above mentioned topics
- Fatigue.
NEUROSCIENCES – II (Total = 369 hours)

Didactic – 109 hours,
Clinical training /Laboratory work – 130 hours,
Scientific enquiry – 130 hours (includes project / review of
literature/ seminars/case Presentation, journal clubs etc.)

a) I.C.U. Management
b) Neuro surgery
c) Neuro Psychology
d) Paediatric Neurosciences

Objective:-
All the end of the course the student should be able to-
a) Assess & plan management programme for critical care
patients in I.C.U.
b) Plan management programme with response to drop & its
complication, monitoring lines.
c) Understanding, behave & counsel patients in ICU, surgery,
following Neurological deficit, behavioral problem.
d) Provide emergency care with the multidisciplinary team.

Syllabus.

A) I.C.U Management
   • Adult ICU - evaluation & management.
   • Pediatrics ICU - Evaluation & management.
   • Neonatal ICU

B) Neuro surgery
   • Intra cranial tumours – Gliomas, meningioma,
     Neutrinos Angioma, Cranio Pharyngioma,Pituitary
     adenoma.
   • Traumatic spinal card injury- complete, in-complete.
   • Disorder of spinal cord- Compression of spinal card,
     spinal card tumors, neoplasm of vertebral column,
     IVDP, Extradural & Epidural Abcess, Syringomyelia,
     Syringobulbia,
• Cranio-vertebral function Anomalies – Soft tissue anomalies, Bony Anomalies.
• Head injury – Hemorrhage, Haematoma, Aneurismal rupture. Diffused Axonal Injury
• Stroke (Hemorrhagic).
• Coma stimulation.
• Peripheral Nerve injuries.
• Cognitive & perceptual Disorders.

C) Neuro Psychology
• Psychiatric illness – Anxiety, Neurosis, Depression, obsessive compulsive Neurosis psychosis, organic brain syndrome, dementia, post- traumatic stress disorder, drug dependence & alcoholism, Somatoform & dissociate disorders.
• Child psychiatry – Mental retardation, attention deficit syndrome, Behavioral disorders.
• Geriatric psychiatry.
• Role of Orthotics in Neurological conditions
• Disability Evaluation

D) Paediatric Neurosciences
• Learning disability.
• Autistic behavior
• Spina bifida.
• Hydrocephalus.
• Raised Intra-cranial pressure.
• Oro- motor Dysfunction.
• Central palsy.
• Hippotherapy
REFERENCE BOOKS

MPT: Neurosciences
23. Bobath B Development in the different types of cerebral palsy.
M PT - CARDIO-RESPIRATORY SCIENCES

Objectives
At the end of the year the students will

1. Be able to identify, discuss & analyse, the Various cardio-respiratory dysfunction & co-relate the same with the provisional diagnosis, routine radiological & Electro-physiological investigations and arrive at appropriate functional diagnosis with clinical reasoning.
2. Use the anatomical rationale for the clinical tests used in differential diagnosis.
3. Learn the ability to perform an appropriate subjective and physical examination, with development of suitable analytical skills to evaluate data obtained.
4. Further develop clinical reasoning that incorporates theoretical concept with evidence-based practice in the field of cardio-pulmonary physiotherapy.
5. Document patients with scale, outcome measures and assess the progression.
6. Use recent Technique/ approaches to treat & train patients with cardio-respiratory dysfunction in children, adults & geriatrics.
7. Be able to impart knowledge for training the undergraduate students.

CARDIO-RESPIRATORY DISEASES – I (Total = 369 hours)

Didactic – 109 hours,
Clinical training /Laboratory work – 130 hours,
Scientific enquiry – 130 hours (includes project / review of literature/ seminars/case Presentation, journal clubs etc.)

RESPIRATORY DISORDERS

- Development of Pulmonary system.
- Biomechanics of Thoracic cage, normal & diseased.
Mechanics of breathing & lung compliance, Body positioning techniques.
Assessment and Management of Respiratory muscles, respiratory muscle fatigue, 1
Cough reflex, Paediatric lung, Breathing techniques, IPPB, ACBT, PD, AD.
Bronchial Hygiene – Humidification, nebulization, aerosol therapy, suctioning.
Artificial Ventilation – Mechanical Ventilation, tracheostomy, manual hyperinflation.
Neonatal Respiratory diseases.
  o Pulmonary disease in immature babies, neonates.
  o Asthma, Birth asphyxia, Bronchopulmonary dysplasia, Nickity Wilson Syndrome, Bronchial stenosis.
Children with respiratory dysfunction.
COPD, Asthma, Cystic Fibrosis, Immunological deficits, Pertusis.
Adult COPD- Causes, pathomechanics, presentation, evaluation, investigation, management, rehabilitation.
Restrictive lung disorders- Causes, pathomechanics, presentation, evaluation, investigation, management, rehabilitation.
Infective lung diseases- Causes, pathomechanics, presentation, evaluation, investigation, management, rehabilitation.
Tumors of lung.
Trauma of Chest.
Pulmonary embolism, Interstitial lung diseases, Disorders of Pleura.
Industrial lung disorders. Surgical conditions.
  o Thoracoplasty, Empyema, Thrombosis, Rib-resection, Decortications, Window operation, Pneumonectomy, Lobectomy, Pleurodesis, Thoracotomy, Tracheostomy.
ICU- Management for respiratory disorder, Drainage indication, Mechanical Ventilation-(setting & weaning), Humidification, O2 Therapy, Nebulization, Suctioning, Endotracheal Tube, Tracheostomy Tube, Neonate ICU.
PFT- Evaluation and Interpretation.
Pulmonary fitness testing- Adults/Paeds/Geriatric.
Geriatric Lung.

CARDIO-RESPIRATORY DISEASES – II (Total = 369 hours)

Didactic – 109 hours,
Clinical training /Laboratory work – 130 hours,
Scientific enquiry – 130 hours (includes project / review of literature/seminars/case Presentation, journal clubs etc.)

CARDIAC CONDITIONS
- Inspection- Chest wall deformities, respiratory pattern, cyanosis, clubbing, palpation.
- Auscultation- Heart sounds, normal & abnormal respiratory
sounds.
- ECG- Lead placement, tracing, recording, interpretation of normal & abnormal.  
- Stress testing. 
- ADL + Functional evaluation in cardiac patients. 
- Exercise testing 
  - Low level/submaximal/maximal.
  - Procedure of testing, Contraindications & precautions in adults and Paediatrics.
  - Exercise testing and prescription, METS in stress testing.

- Evaluation of Peripheral vascular diseases- 
  Artery/Vein/Lymphatic.
- ICU evaluation of cardiac patient.
- Cardio-pulmonary evaluation of ventilator dependant patient.
  - Respiratory rate, pulse rate, drainage tube, fluid collection, 
    ABG, ECG, catheter, IV line, central venous pressure, 
    intra-cranial pressure.
- Radiological Investigations.
  - CT, MRI, Echo, Doppler, Angiography + interpretations.
- Physiotherapy evaluation and management in Cardiac conditions – CHD, MI, Hypertension, Pericarditis, Cardiac tumours.
- Physiotherapy evaluation in cardiac surgeries- Pre operative & Post operative.
- Causes, Pathomechanics, Signs & Symptoms, Medical/Surgical management, Physiotherapy management for: 
  - Congenital heart disease, Valvular heart disease, Rheumatic heart disease, Diseases of myocardium, Ischaemic heart disease, Hypertension, cardiac hypertrophy, Cardiac failure, altered heart beat & rhythm.
  - Cardiac compliance in burns, conservative, pre & post operative management.
- Recent advances in management of surgical conditions.
  - Thoracic wall surgeries.
  - Cardiac surgeries & rehabilitation.
- Cardiac evaluation and management in ICCU.
  - Monitoring, recording, ventilatory support, rehabilitation protocol.  
  - Coma patient evaluation & management in ICCU.
Acute MI.
Defibrillators & Cardiopulmonary resuscitations.
Peripheral Vascular disorders- DVT, Venous insufficiency, oedema congestion, varicose veins, Claudication.
Pre & Post operative rehabilitation of Arterial disorders.
Recent advances in management of cardiac conditions (surgical and conservative).
Life style modification for cardiac patients – Diet, Yoga, Exercises for prevention and management to improve health status.

REFERENCE BOOKS
MPT: Cardio Respiratory Sciences
2. Chest physiotherapy in Intensive care unit – Makezie, Williams & Wilkins, Baltimore.
MPT - General and Community Based Rehabilitation

Objectives:

At the end of the course the candidate will –

a) Acquire the in-depth understanding of the concept of Community Based Rehabilitation, Physiotherapy in community health and Institution Based Rehabilitation.

b) Be able to assist in planning and organization camps at community level.

c) Be able to organize events for health promotions as per various days as recommended by WHO.

d) Be able to impart services and training at the community level effectively with minimum resources.

e) Be able to plan and implement treatment programme adequately and appropriately for various conditions in community and during disaster or natural calamities.

f) This course shall enable the candidate to expertise in the Community health and function in the general set up as consultant.

g) As a consultant, works with the team of health professionals involved in various areas.

GENERAL AND COMMUNITY BASED REHABILITATION – I

(Total = 369 hours)

Didactic – 109 hours,
Clinical training /Laboratory work – 130 hours,
Scientific enquiry – 130 hours (includes project / review of literature/ seminars/case Presentation, journal clubs etc.)

The syllabus shall focus on General Community Physiotherapy, women’s health and Fitness & health promotion.

General & Community Physiotherapy:

- Scope for Community Physiotherapy
- Institution based rehabilitation and community based rehabilitation:– its principles and differences, multi-disciplinary
approach, role of national institutes, District rehabilitation centre and primary health centre.

- W.H.O.’s policies about rural health care, concept of primary, secondary, tertiary health centers, District hospitals etc.
- Principles and Functions of a Rehabilitation team like Medical person, Physiotherapist, Occupational therapist, audiologist, speech therapist, Prosthetic & Orthotics, etc., Vocational guide in C.B.R. of physically handicapped person.
- Population studies and epidemiological implications of impairment, handicap and disability.
- Evidence based practice in Community health.
- Natural calamity or disaster management – Role of Physiotherapist in disaster management team.
- Public health education methods and appropriate media:– Public awareness to the various disabilities, communications, message generation and dissipation.
- Health care - National and International health delivery systems.
- Role of Government in Community based rehabilitation, inter-sectoral programs and co-ordination, Implementation of the Act.
- Role of Non-Government organizations in Community based rehabilitation.
- Disability evaluation, National policies for rehabilitation of disabled.
- Rehabilitation: Geriatric rehabilitation, pediatric rehabilitation, cardiac and neurological rehabilitation, community based rehabilitation. Specific rehabilitation like, AIDS, Cancer, Burns, etc.
- Disability rehabilitation, vocational rehabilitation, institutional rehabilitation, home based rehabilitation etc.

**Fitness and health promotion**

- Principles of fitness for health promotion in community, Nutrition and Diet. Physical fitness definition and evaluation.
- Physiological effects of aerobic exercise – clinical reasoning for advocating aerobic exercise as preventive measure in obesity & its related conditions / in cardio-respiratory conditions / Aging / deconditioning effect after prolonged bed rest / Diabetes.
Women’s health and mother & child care

- Applied anatomy, physiology and biomechanics related to Women’s health, mother and child care.
- Health Promotion in Women’s Health. Social issue having impact on physical Function, Legal rights and benefits for women.
- Anatomy of Pelvic floor, Physiological changes occurring in female during pregnancy, Clinical reasoning for Physical exercises during pregnancy. Clinical reasoning for care to be taken while performing exercises during pregnancy,
- Prenatal /antenatal programme, Clinical reasoning for specific breathing exercises/ relaxation/ postural training/ Pelvic floor stretching & strengthening exercises, musculoskeletal pain during pregnancy, Maintenance of posture during pregnancy
- Physiology of Labour, Pain during delivery and its management, Physiotherapy during labor
- Post-natal care after normal labour and labour with invasive procedures and Physiotherapy management
- Fitness programmes and breast feeding techniques. Mother and child care.
- Psychological and emotional changes and coping up with demands of new born.
- Uro-genital dysfunctions like organ Prolapse, PID, Incontinence, etc. and its management
- Physiological changes occurring with Menopause, Problems faced by women after menopause and role of physiotherapy
- Common Gynaecological surgeries and its Physiotherapy management
- Radical Mastectomy and Its Management
- Application of Electro- therapeutic measures in Obstetrics and Gynecology with Clinical reasoning
General and Community Based Rehabilitation –
II (Total = 369 hours)

Didactic – 109 hours,
Clinical training /Laboratory work – 130 hours,
Scientific enquiry – 130 hours (includes project / review of
literature/ seminars/case Presentation, journal clubs etc.)

The syllabus shall focus on Industrial health, Geriatrics and health
promotion.

Industrial Health-

- Applied anatomy, physiology and biomechanics related to
  Industrial health.
- Clinical decision making skill in assessment and management of
dysfunction related to Industrial community health. Ability
  Management:- Job analysis- Job description, Job demand
  Analysis, Task Analysis, Ergonomics Evaluation, Injury
  Prevention, Employee Fitness Programme
- Disability Management:- Acute care, Concept of Functional
  Capacity assessment, Work Conditioning and Work
  Hardening, work station adaptations/ modifications
- Environmental stress in the industrial area --Accidents due to
  a] Physical agents-e.g.-Heat/cold, light, noise, Vibration, U.V.
  radiation, Ionizing radiation.
  b] Chemical agents-Inhalation, local action, ingestion,
  c] Mechanical hazards-overuse/fatigue injuries due to ergonomic
  alteration & ergonomic evaluation of work place and
  mechanical stresses per hierarchy –
  i] Sedentary table work –executives, clerks, etc
  ii] Inappropriate seating arrangement- vehicle drivers,
  iii] Constant standing- watchman, Defense forces, surgeons,
  etc
  iv] Over-exertion in labourers,- common accidents
  d] Psychological hazards - e.g monotonicity & dissatisfaction in
  job, anxiety of work completion with quality,
- Physiotherapist role in industry – preventive, promotive,
curative, intervention, ergonomic and rehabilitative services.
- Occupational Stress and its management.

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Health promotion in the industry

Geriatrics:
- Applied anatomy, physiology and biomechanics related to Geriatrics.
- Clinical decision making skill in assessment and management of dysfunction related to geriatric community health.
- Physiology of Aging, Theories of Aging, Age related changes in Musculoskeletal system, Central Nervous System, Cardio-Vascular system, Respiratory system, Immune system, Metabolic and Temperature related changes, Balance problems
- Role of Physiotherapy in a Home for the aged - geriatric care, holistic approach.
- Communication with Elderly,
- Fitness and Health promotion in Elderly.
- Evidence based practice in Elderly
- Psychosomatic approaches in management of disorders of stress, change in life-style to reduce risk factors for disability.
- Drug dependence and iatrogenic disorders. Ethical considerations in Elderly
- Assistive Technology used for Stability & mobility to enhance function.

REFERENCE BOOKS
MPT: General and Community based Rehabilitation
Disability
MPT - PAEDIATRICS

Objectives
At the end of the course the student should be able to:
1. Assess and diagnose all possible findings on the patient to plan a Rehabilitation programme.
2. Document patients with scale, outcome measures, electro diagnostic procedures and assess the progression.
3. Use recent Technique/approaches to treat & train children with Neurological, Orthopaedic & Cardiorespiratory deficit.
4. Be able to impart knowledge for training the under graduate students.

Paediatrics – I (Total = 369 hours)

Didactic – 109 hours,
Clinical training /Laboratory work – 130 hours,
Scientific enquiry – 130 hours (includes project / review of literature/ seminars/case Presentation, journal clubs etc.)

a) Embryology of nervous system
b) Paediatric neurology
c) ICU in neurological condition
d) Electro diagnosis
e) Mother and child care

TOPICS:
- Embryology of nervous system
- Reflex & Reactions
- Motor development - theories, developmental sequence, movement in infants
- Motor control
- Motor learning – principles, factors affecting motor learning, theories
- Developmental Assessment, Developmental Diagnosis, Developmental screening using various scales.
- Cerebral palsy - assessment & management with approaches, Roods, Vojta, Sensory integration, N.D.T
- Cognitive and perceptual dysfunction (Developmental coordination disorder) – learning disabilities, attention deficit, hyperactive disorder, autism
- Gravitational insecurity, Mental retardation, Epilepsy
- Genetic disorder – Down’s syndrome, Marfan’s syndrome, Trisomy 21
- Movement disorder – Chorea, Athetosis, Dystonia, Choreoathetosis
- Oromotor disorder
- Bowel/bladder dysfunction
- Infection condition – pyogenic infection (Bacterial, brain abscess, tuberculosis, Meningitis), viral infections of CNS (polio, encephalitis, neurosyphilis, HIV)
- Metabolic disorder – hepatic encephalopathy, hypoglycemic encephalopathy, Hypocalcemic encephalopathy, Hypokalemic encephalopathy
- Polyneuropathy – Post infective polyneuropathy, acute infective polyneuropathy
- Disorder of muscle – Muscular dystrophy (Duchenne’s, Becker’s, Limb girdle, Facio-scapulohumeral, Spinal muscular atrophy)
- Developmental anomalies – Spina bifida, hydrocephalus, cranio-vertebral junction anomalies
- Traumatic head injury
- Neonatal ICU, Paediatric ICU, Complications of low birth weight
- CBR in Paediatric conditions- Mother and child care, Role of Orthotics in Paediatric conditions. Birth injuries – brachial plexus injuries
- Electro physiological studies – somatosensory evoked potentials, brainstem, auditory evoked potentials, visual evoked potentials, EMG, single fiber EMG, nerve conduction studies.
Paediatrics – II (Total = 369 hours)

Didactic – 109 hours,
Clinical training /Laboratory work – 130 hours,
Scientific enquiry – 130 hours (includes project / review of literature/ seminars/case Presentation, journal clubs etc.)

a) Embryology of cardiovascular, pulmonary & musculoskeletal system
b) Developmental deformities & congenital anomalies
c) Paediatric musculo-skeletal condition
d) Paediatric cardio-vascular & pulmonary condition
e) Paediatric fitness

TOPICS:
- Development of heart, lung, conduction system, great vessels, hand, foot, thumb,
- Vertebral column, long bones & muscular system
- Anatomical & physiological differences of cardio-vascular & respiratory system in neonates, childhood & adults
- Fetal circulation
- Arthrogryposis
- Congenital dislocation of hip
- CTEV, vertical talus, Blount disease, Perthe’s disease, slipped capital femoral epiphysis, limb length discrepancies and Osteogenesis Imperfecta.
- Deformities of vertebral column, deformities of chest wall
- Traumatic injuries in child – fractures, dislocations, epiphyseal injuries
- Infective condition of musculo-skeletal – osteomyelitis, pyogenic arthritis, juvenile rheumatoid arthritis, tuberculous arthritis
- Amputation and Limb deficiencies in childhood
- Burns in childhood – Classification, Pathophysiology and Management.
- Tumors of bone & muscle in pediatrics
- Congenital heart disease – pathodynamics, clinical presentation, investigation, medico-surgical & physiotherapy management of cyanotic & acyanotic heart disease
Rheumatic heart disease
Chest injuries
Respiratory disorder in childhood – IRDS, Bronchopulmonary dysplasia, pneumonia, lung abscess, asthma, cystic fibrosis, bronchitis, bronchiectasis, bronchiolitis, pertussis, CROUP, epiglotitis, chronic lung disease, primary ciliary dyskinesia, fatigue, sleep apnoea, hyperventilation syndrome
Respiratory problems in neonates – respiratory failure in neonates, neonatal ICU
Child abuse
Childhood obesity
Exercise testing & prescription in children
Strength endurance & flexibility in children
Sports injuries in children
PT management in PICU, NICU, emergency care & trauma, ventilator management, oxymeter, defibrillator.
Paediatric cardio-thoracic surgeries.
Recent advances in management of musculo skeletal, cardiovascular & pulmonary conditions
Role of Orthotics in Paediatric conditions.

REFERENCE BOOKS

MPT: Paediatrics

6. Physical management of multiple handicapped – Fraser, William & Wilkins, Baltimore.
18. Cook S: Motor Control

Development:

REFERENCE BOOKS – GENERAL

15. Elements of Research in physical Therapy- Currier D. P. Williams & Wilkins, Baltimore, 1990, Ed. 3.

Swimming and Hydrotherapy

Riding
Play

Research

Education

Postural Management

Manual Handling
Scheme of Examination for MPT

The University Examination will be at the end of two full academic years of study. However to maintain internal progression and assessment the College will conduct three tests - two in the first year, of which one will be after six months from the date of admission, other at the end of the first year (college examination) & the third at the end of the second year (Preliminary examination), two months before the University examination. **The candidate must obtain 50% marks in internal assessment & continuous appraisals separately every year to be eligible for appearing the University examinations.**

Pattern of Examination

A). First Year MPT (Internal examinations)

<table>
<thead>
<tr>
<th>S. No</th>
<th>Paper</th>
<th>Part</th>
<th>Subject</th>
<th>Max marks</th>
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<td>Theory</td>
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<tr>
<td>1</td>
<td>1</td>
<td>A</td>
<td>P.T. Practice &amp; Education Technology.</td>
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<td>B</td>
<td>Research Methodology &amp; Biostatistics</td>
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<td>2</td>
<td>A &amp; B</td>
<td>Applied Biomechanics and Kinesiology</td>
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<td>3</td>
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<td>A</td>
<td>Manual Therapy.</td>
<td>50</td>
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<td></td>
<td>B</td>
<td>Advanced Electrotherapy Electrophysiology and Electro diagnosis.</td>
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<tr>
<td>4</td>
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<td>A &amp; B</td>
<td>Exercise Physiology, Health &amp; Fitness.</td>
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<td>Practicals</td>
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<td><strong>Total</strong></td>
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Distribution of Marks Internal examination - Practical Examination

Case – I   = 50 marks
Case – II  = 50 marks
Case – III = 50 marks
Case – IV  = 50 marks

TOTAL    = 200 marks

B). Second Year MPT (Preliminary examination / University Pattern)

(The pattern of examination will be same as the university examination for 800 marks.)

Marks obtained in internal examination in first & second year will be simplified for 25 & 25 respectively and Marks obtained in continuous appraisals in first & second year will be simplified for 25 & 25 respectively for a total of 100 marks as Internal Assessment marks.

In case of marks simplified are in decimals, will be rounded to the nearest round figure, (e.g.) 42.01 to 42.49 will be considered to the round sum as 42 & 42.50 to 42.99 will be considered to the round sum as 43.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Paper</th>
<th>Part</th>
<th>Subject</th>
<th>Max marks Theory</th>
<th>Max marks Practical</th>
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<tbody>
<tr>
<td>1</td>
<td>Advanced Physiotherapeutics</td>
<td>A</td>
<td>Physiotherapy Practice &amp; Education Technology. Research Methodology &amp; Biostatistics</td>
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<td>10</td>
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<td></td>
<td>B</td>
<td>Applied Biomechanics and Kinesiology, Manual Therapy,</td>
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## Distribution of Marks for Theory Examination (Internal & University)

Each paper shall have

**Part A:**
1. Essay (1 X 20 marks) = 20 marks
2. Short Answers (Any two out of three) 2 X 10 marks = 20 marks
3. Short Notes (Any two out of three) 2 X 5 marks = 10 marks

**Part B:**
1. Essay (1 X 20 marks) = 20 marks
2. Short Answers. (Any two out of three) 2 X 10 marks = 20 marks
3. Short Notes (Any two out of three) 2 X 5 marks = 10 marks

### Table

<table>
<thead>
<tr>
<th></th>
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<th>A</th>
<th>Advance Electrotherapy Electro-physiology and Electro diagnosis.</th>
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Distribution of Marks for University Practical Examination.

<table>
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<td>One Long Case</td>
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<tr>
<td>1st Short Case</td>
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<tr>
<td>2nd Short Case</td>
<td>50</td>
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<td>Spots (All electives)</td>
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<td>Dissertation Viva</td>
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<tr>
<td>Microteaching</td>
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</table>

400 Marks

Eligibility Criteria for appearing in the University Examination

A candidate shall be permitted for appearing the university examination only if he/she fulfills all the following criteria:

1. A candidate shall be permitted to appear for the University Examination only if he/she puts 80% of attendance during his/her period of study & training.
2. The candidate must obtain 50% marks in internal assessment & continuous appraisals separately in each year, to be eligible for appearing the University examinations.
3. Approval of dissertation work is essential for a candidate to appear for the university examination.

Criteria for Passing

To pass the Examination,

1. To pass the Theory Examination the Candidate must obtain 50% of the total Marks in the respective paper.
2. To pass in practical exam, candidate must obtain 50% of total marks in the respective paper.
3. If a candidate is unable to pass in Paper – 1 or Paper – 2, he/she shall reappear for the concerned paper only.
4. A candidate must pass in two heads of passing i.e. Theory and Practical separately at the same time. If a candidate is unable to pass in Paper – 3 or Paper - 4 or practical, then he/she has to reappear for paper 3 & 4 and practical examination together.
Grace Marks

The grace marks up to a maximum of five may be awarded to a student who has failed only in one subject but has passed in all other subjects. These five marks shall be distributed in different heads of passing of that subject. Provided that these grace marks shall be awarded only if the student passes after awarding these marks. (Refer clause 59, Bye-laws of Dr.D.Y.Patil University).

Classification of successful candidates

1. A candidate who obtains not less than 60% of the aggregate marks in the whole examination shall be declared to have passed the examination in the first Class provided they pass all the examinations prescribed for the course within a period of two academic years (at the first appearance) from the year of admission to the course.

2. Candidates who secure less than 60% of the aggregate marks in the whole examinations shall be declared to have passed the examination in the Second Class, provided they pass all the examinations prescribed for the course within a period of two academic years from the year of admission to the course.

3. Candidates who obtain 75% of the marks in the aggregate shall be deemed to have passed the examination in First class with Distinction provided they pass all the examinations prescribed for the course at the first appearance.

4. Candidates who pass all the examinations prescribed for the course in the first appearance only are eligible for ranking.