

LOK JAGRUTI KENDRA UNIVERSITY

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Website- www.ljku.edu.in

Regulations Governing Master of Physiotherapy Course



CURRICULUM & SYLLABUS

FOR MPT REGULATIONS 2023

FROM ACADEMIC YEAR

2023- 24 ONWARDS

Introduction:

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

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

2. Able to be a prominent member of the multidisciplinary physiotherapy team and treat all the conditions which need physiotherapeutic procedures.
3. Able to provide adequate knowledge about the treatment procedures and its benefit.
4. Able to transfer knowledge and skills to students as well young professionals.
5. Able to perform independent physiotherapy assessment and treatment for patients.
6. Able to undertake independent research in the field of physiotherapy.
7. Learn multidisciplinary practice skills.
8. Able to practice and assess patient independently.
9. On successful completion of M.P.T programme, the Physiotherapist professional will be able to take up physiotherapy teaching assignments independently for undergraduate teaching programme. He / She will be able to prepare project proposal with selected research design and interpret the Evaluated outcome measures (using sound data processing techniques and statistical methods). He/she will be able to practice in his / her specialty area with advanced knowledge and skills.

PROGRAM OUTTCOMES:

1. Course work includes advanced knowledge and skills related to the respective branch of specialty.
2. Acquire in-depth knowledge of structure and function of human body related to the respective branch of specialty.
3. Acquire the in-depth knowledge of movement dysfunction of human body, cause thereof principles underlying the use of physiotherapeutic interventions for restoring movement dysfunction towards normalcy.
4. Demonstrate skill in Physical & Functional diagnosis pertaining to patient under his/her care.
5. Demonstrate ability to critically appraise recent primary and secondary literature from journals & adopt diagnostic & therapeutic procedures based on it.

6. The student will also perform independent research within the department and help the department and the team for treatment planning of the patient.
7. PT post-graduate is encouraged to pursue further qualification to attain senior position in the professional field, also to keep abreast with the advance and new technology the professional should opt for continuous professional education credits offered by national and international institutes.
8. Employment opportunities can be found in hospitals in both private and public sectors as well as in independent physiotherapy clinics and as well as teaching institutes.
9. Demonstrate ability to make clinical decision (based on evaluation) regarding Physiotherapy strategy techniques and select appropriate outcome measures based on the comprehensive knowledge of specialty.
10. Demonstrate an expertise in evidence-based skill in the management disorders including movement dysfunction in concerned specialty.

ELIGIBILITY

Candidates admitted into the Master of Physiotherapy course should have passed the BPT degree examination of this University or 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 L J University, Ahmedabad, 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.

DURATION OF THE COURSE

The period of study for the Master of Physiotherapy is a full time Program extending over a period of two academic years with University exams at the end of the each year.

MEDIUM OF INSTRUCTION

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

ATTENDANCE REQUIREMENTS FOR ADMISSION TO EXAMINATION.

A candidate will be permitted to appear for the University Examination if he / she secure not less than 75% of attendance in the number of instructional days/ practical at hospitals during the calendar year, failing which he / she should complete the number of days/hours and undergo the next /year/final examination conducted by the university.

EXAMINATIONS AND ASSESSMENT

Assessment:

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring is 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.

The University Exams will be conducted at the end of each academic year.

CRITERIA FOR PASSING

To pass the University Examination:

1. A candidate must pass in two heads of passing i.e. theory and practical separately at the same time.
2. In the theory exam, the candidate must obtain 50 % of the total marks to pass theory exam.
3. In practical exam, the candidate must obtain 50% of total marks to pass practical exam.
4. A candidate must obtain 50 % marks to pass in the respective course [subject].

			Scheme Of Study for Master Of Physiotherapy (M.P.T) Annual Pattern First Year M.P.T Examination			Examination S		
Serial No	Course code	Course Title	Teaching Hours					
			Lecture	Practical	Clinical Training/Dissertation	Total	Credits	Ext
1	MPT101	BASIC SCIENCES						
		1) Physiotherapy Education.	60	60	---	120	6	100
		2) Electro Physiology & Electro Diagnosis.	60	60	--	120	6	50-
		3) Research Methodology & Biostatistics	60	0		60	4	
		4) Exercise Physiology	60	0		60	4	

2	MPT102	Biomechanics & Pathomechanics	90	0		90	6	100
3	MPT103	Physical and Functional Diagnosis – Speciality Wise Subjects.	120	120		240	12	100 100
4	MPT104	Skills acquisition and refinement (Teaching Assignment, seminars, Journal club, case studies etc.)		240		240	8	
5	MPT105	Dissertation-I			180	180	4	

6	MPT106	Clinical Training-I			540	540	12	
		Grand Total	450	480	720	1650	62	450
					Scheme Of Study for Master Of Physiotherapy (M.P.T) Annual Pattern Second Year M.P.T Examination			
Serial No	Course code	Course Title	Teaching Hours					Examination Scheme
			Lecture	Practical	Clinical Training/Dissertation	Total	Credits	Examination Scheme
1	MPT201	Elective	120	120		240	12	100-100
2	MPT202	Recent Advances in the Speciality.	60	0		60	4	100
3	MPT203	Skills acquisition and refinement (Teaching		240		240	4	50-

		Assignment, seminars, Journal club, case studies etc.)						
4	MPT204	Dissertation-II			540	540	12	100
5	MPT205	Clinical Training-II			540	540	12	
	Grand Total		420	120	1080	1620	48	450

Course Outcomes:

PAPER 1: BASIC SCIENCES 1: PHYSIOTHERAPY EDUCATION

At the end of the course learner should be able to

CO 1.Be an ethical Physiotherapist, aware of legal rights and duties as per Indian Association of Physiotherapy, World Confederation of Physical Therapists and World Health Organization. Describe environment protection act.

CO 2.Understand and apply principles of learning, and use different teaching - learning methods appropriately

CO 3.Describe the concepts of learning, evaluation and curriculum development

CO 4.Describe advantages and challenges of different assessment methods.

CO 5.Apply management skills in planning, implementation & administration of clinical and academic activities

CO 6.Document comprehensive and accurate health records
Be a Critical Thinker

PAPER 1: BASIC SCIENCES 2: ELECTRO PHYSIOLOGY & ELECTRO DIAGNOSIS

At the end of the course learner should be able to

CO 1 Understand theoretical concepts and physiological effects of various electrical currents at cellular level.

CO 2 Select appropriate modality for various conditions along with clinical reasoning.

CO 3 Apply conceptual theories and principles to interpret EMG and NCV investigations.

CO 4 Select appropriate therapeutic modality / combinations for electro-diagnostic and therapeutic purpose.

PAPER 1: BASIC SCIENCES -3: RESEARCH METHODOLOGY & BIOSTATISTICS

At the end of the course learner should be able to

- CO 1 Describe how research is undertaken, and its benefits
- CO 2 Differentiate between quantitative research and qualitative research
- CO 3 Select an appropriate study design based on research question
- CO 4 Identify ethical issues in research.
- CO 4 Design a research proposal

PAPER 1 : BASIC SCIENCES -4:EXERCISE PHYSIOLOGY:

At the end of the course learner should be able to

- CO 1. Describe various physiological/systemic changes that occur during exercise.
- CO 2 Describe various types, principles and application of different types of exercise training methods.
- CO 3 Apply the principles of diet and nutrition in exercise prescription
- CO 4 Assess and prescribe exercise protocol in special populations like Geriatrics, athletes, obese, pregnancy and in various systemic conditions like hypertension and respiratory conditions
- CO 5 Describe the process of body's acclimatization to various environmental conditions.

PAPER II : BIOMECHANICS & PATHOMECHANICS:

At the end of the course learner should be able to

- CO1: Apply principles of mechanics (forces, moments, levers) to analyze human movement.
- CO2: Explain the biomechanical properties of musculoskeletal tissues.
- CO3: Analyze the impact of pathologies on normal joint kinematics and kinetics.
- CO4: Identify abnormal movement patterns associated with specific conditions.
- CO5: Understand the biomechanical basis of pain syndromes.
- CO6: Perform basic biomechanical assessments of movement.
- CO7: Interpret biomechanical assessment findings for treatment planning.
- CO8: Design therapeutic exercises targeting biomechanical deficits.

CO9: Explain the biomechanical rationale behind physiotherapy interventions.

CO10: Analyze research on the biomechanics of movement disorders.

PHYSICAL AND FUNCTIONAL DIAGNOSIS –SPECIALITY WISE SUBJECTS.

PAPER- 3. CLINICAL, PHYSICAL AND FUNCTIONAL DIAGNOSIS IN MUSCULOSKELETAL PHYSIOTHERAPY

Course outcomes:

At the end of the course learner should be able to

CO 1. Elicit and interpret clinical signs and symptoms of diseases commonly seen in Orthopaedics & interpret clinical tests and special investigations commonly used in the diagnosis of these conditions.

CO 2. Generate a primary diagnosis and a list of differential diagnoses consistent with typical presentations.

CO 3. Identify normal & pathological anatomy on diagnostic images.

CO 4. Discuss how the serious and common disorders and the specialized areas of medical practice may impact on Orthopaedic Physiotherapy practice.

CO 5. Demonstrate a broad range of technical skill in diagnosing the physiotherapy related Orthopaedic conditions.

PAPER- 3. CLINICAL, PHYSICAL AND FUNCTIONAL DIAGNOSIS IN NEUROLOGICAL –PHYSIOTHERAPY

Course outcome

At the end of the course learner should be able to

CO1. Elicit and interpret clinical signs and symptoms of diseases commonly seen in Neurology medicine & interpret clinical tests and special investigations commonly used in the diagnosis of these conditions.

CO 2. Generate a primary physical diagnosis and a list of differential diagnoses consistent with typical presentations.

CO 3. Identify normal & pathological anatomy on diagnostic images.

CO 4. Discuss how the serious and common disorders and the specialized areas of medical practice may impact on Neurological physiotherapy practice.

CO 5. Demonstrate a broad range of technical skill in diagnosing the physiotherapy related neurology conditions.

PAPER 3 CLINICAL, PHYSICAL AND FUNCTIONAL DIAGNOSIS IN CARDIO – PULMONARY PHYSIOTHERAPY.

Course outcome

At the end of the course learner should be able to

CO 1. Elicit and interpret clinical signs and symptoms of cardio-vascular and pulmonary diseases & interpret clinical tests and special investigations commonly used in the diagnosis of conditions.

PAPER 3 CLINICAL, PHYSICAL AND FUNCTIONAL DIAGNOSIS IN COMMUNITY BASED REHABILITATION.

At the end of the course learner should be able to

CO1: Utilize appropriate screening tools to identify individuals at risk for functional limitations in community settings.

CO2: Conduct comprehensive assessments to evaluate movement dysfunction, activity limitations, and participation restrictions in community populations.

CO3: Analyse assessment findings to develop individualized intervention plans for community-based rehabilitation.

PAPER-VI ELECTIVE-MUSCULOSKELETAL PHYSIOTHERAPY

Course outcome

At the end of the course learner should be able to

CO 1. Develop a management plan, generally including some lifestyle factors, in co-operation with the Clinical Supervisor and consider a prognosis that reflects on the patient's problem.

CO 2. Manage a patient in consultation and co-operation with the clinical supervisor, identifying the presenting problem, developing a basic working diagnosis and selecting a treatment regime that considers the presenting problem with some consideration for ethical, practical and pragmatic concerns.

CO 3. Maintain legal (accurate, clear and legible) patient histories, write basic referral letters and recognize the need of further referral in conference with Clinical Supervisor and peers.

CO 4. Discuss the Common exercise prescriptions and their clinical use, and the sequence of treatment and how to advise different sorts of patients.

PAPER-VI- ELECTIVE: Neurological rehabilitation

Course outcome

At the end of the course learner should be able to

CO 1. Develop a management plan, generally including some lifestyle factors, in cooperation with the Clinical Supervisor and consider a prognosis that reflects on the patient's problem.

CO 2. Manage a patient in consultation and co-operation with the clinical supervisor, identifying the presenting problem, developing a basic working diagnosis and selecting a treatment regime that considers the presenting problem with consideration for ethical, practical and pragmatic concerns.

CO 3. Maintain legal (accurate, clear and legible) patient histories, write basic referral letters and recognize the need of further referral in conference with Clinical Supervisor and peers.

CO 4. Discuss the Common exercise prescriptions and their clinical use, and the sequence of treatment and how to advise different sorts of patients.

PAPER-VI- ELECTIVE: Cardio-vascular and pulmonary physiotherapy

At the end of the course learner should be able to

CO1. Develop a management plan, generally including some lifestyle factors, in co-operation with the Clinical Supervisor and consider a prognosis that reflects on the patient's problem.

CO 2. Manage a patient in consultation and co-operation with the clinical supervisor, identifying the presenting problem, developing a basic working diagnosis and selecting a treatment regime that considers the presenting problem with some consideration for ethical, practical and pragmatic concerns.

CO 3. Maintain legal (accurate, clear and legible) patient histories, write basic referral letters and recognize the need of further referral in conference with Clinical Supervisor and peers.

CO 4. Discuss the Common exercise prescriptions and their clinical use, and the sequence of treatment and how to advise different sorts of patients.

PAPER-VI- ELECTIVE: COMMUNITY BASED REHABILITATION

At the end of the course learner should be able to

CO1: Explain the core concepts of rehabilitation, including its foundations, and apply a community-based rehabilitation (CBR) approach considering legal frameworks for disability support.

CO 2 Demonstrate assessment and intervention skills for physiotherapy in various conditions such as diabetes, chronic lung disorders, and cardiovascular diseases, prescribing appropriate exercise programs

CO 3 Collaborate effectively within a multi-disciplinary team to develop and implement rehabilitation plans considering psychosocial and safety issues for targeted populations (e.g., elderly, workers)

CO 4: Critically evaluate recent advances in physiotherapy treatment for specific conditions and integrate evidence-based practices into community rehabilitation programs.

CO 5: Communicate effectively with patients, families, and other healthcare professionals regarding rehabilitation and promote self-management through education

PAPER-VII Recent advances and Evidence Based Practice in Musculoskeletal Physiotherapy

Course outcome

At the end of the course learner should be able to

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CO 1 Understand and apply the information regarding recent advances in Orthopaedic Manual Therapy for patient care.

CO 2. Search the evidences available for assessment and management of orthopaedic conditions.

CO 3. Apply the evidences available for the management of various orthopaedic conditions

PAPER-VII Recent advances and Evidence Based Practice in Neurological Physiotherapy

At the end of the course learner should be able to

CO 1 Understand and apply the information regarding recent advances in Neurological Physical therapy and approaches therapy for patient care.

CO 2. Search the evidences available for assessment and management of Neurological 2. Apply the evidences available for the management of various Neurological conditions

PAPER-VII-Recent advances and Evidence Based Practice in Cardio-vascular and pulmonary physiotherapy

At the end of the course learner should be able to

CO1. Understand and apply the information regarding recent advances in cardio-pulmonary physiotherapy for patient care.

CO 2. Search the evidences available for assessment and management of cardiopulmonary conditions.

CO3. Apply the evidences available for the management of various cardio-pulmonary

PAPER-VII-Recent advances and Evidence Based Practice in Community Based Rehabilitation:

At the end of the course learner should be able to

CO 1 :Critically analyse recent trends in community-based rehabilitation for paediatric and geriatric populations, identifying emerging strategies and considering their applicability in different contexts

CO 2 :Evaluate recent advancements in community-based neurorehabilitation, discussing their potential benefits and challenges for improving patient outcomes

CO 3: Students will appraise contemporary approaches in community-based orthopaedic rehabilitation, demonstrating understanding of their effectiveness in enhancing functional mobility within various communities.

CO 4 : Analyze recent trends in community-based women's health programs, identifying strategies to address specific needs and promote well-being across the lifespan.

CO 5 : Compare and contrast emerging approaches in community-based cardiopulmonary rehabilitation and palliative care, discussing their impact on improving quality of life for individuals with chronic conditions

CO 6 : Evaluate recent advancements in industrial health and ergonomics, demonstrating understanding of their significance in promoting worker safety, health, and productivity within community settings.

PAPER I Basic Sciences: 1) PHYSIOTHERAPY EDUCATION

Course Objectives:

1. To promote student learning and enrich the overall system of education.
2. Provide knowledge of applications of the methods, strategies and approaches of teaching in a well-organized manner.
3. To enhance knowledge about the planning and preparation of curriculum

1	INTRODUCTION :
	1.1 Education: Definition, aims, concepts, philosophies & their education implications, Impact of Social, economical, political & technological changes on education: 1.2. Professional education 1.3.Current trends and issues in education 1.4. Educational reforms and National Educational policy, various educational commissions-reports 1.5.Trends in development of Physiotherapy education in India
2	TEACHING – LEARNING PROCESS
	2.1.Concepts of teaching and learning: Definition, theories of teaching and Learning, relationship between teaching and learning. 2.2.Competency based education (CBE) and outcome based education (OBE) Instructional design: Planning and designing the lesson, writing lesson Plan: meaning, its need and importance, formats.

	<p>2.3. Instruction strategies – Lecture, discussion, demonstration, simulation, laboratory, seminar, panel, symposium, problem solving, problem based learning (PBL), workshop, project, role- play(socio- drama), clinical teaching methods, programmed instruction, self-directed learning(SDL), micro teaching, computer assisted instruction(CAI), computer assisted learning (CAL)</p>
3	<p>CURRICULUM</p> <p>3.1. Curriculum committee, Types of curriculum, formation of philosophy, course objectives, course placement, time allotment, Selection and organization of learning experience,</p> <p>3.2. Master plans of courses, Master rotational plan-individual rotational plan,</p> <p>3.3. correlation of current trends in curriculum planning, Evaluation strategies, process of curriculum change, role of students, faculty, administrators, statutory bodies and Other stakeholders Equivalence of courses: Transcripts, credit system.</p>
4	<p>TEACHING METHODS</p> <p>4.1. Method and techniques of teaching: Lecture, Demonstration, Discussion, Seminar, Assignment, Project, Case Study.</p> <p>4.2. Planning for teaching: Bloom’s taxonomy of instructional objectives, writing instructional objectives in behavioral terms, MODULE planning, Lesson planning.</p> <p>4.3. Teaching aids: Types of teaching aids, Principles of selection, preparation and use of audio-visual aids.</p>
5	<p>EVALUATION</p> <p>5.1. Nature of measurement and evaluation, meaning, process, standardized & non-standardized tests- formative and summative evaluation.</p> <p>5.2. Taxonomy of cognitive, affective and psycho motor domains.</p>

	5.3. Construction of achievement test - Essay type short answers Multiple Choice Questions
6	<p>TEACHER PREPARATION</p> <p>6.1. Teacher – roles & responsibilities, functions, characteristics, competencies, Qualities, Preparation of professional teacher. Faculty development and development of personnel for physiotherapy services</p> <p>6.2. Organizing professional aspects of teacher preparation programs</p> <p>6.3. Evaluation: self and peer</p> <p>6.4. Critical analysis of various programs of teacher education in India.</p>
7	<p>GUIDANCE AND COUNSELLING</p> <p>7.1. Philosophy, principles and concepts, Need for guidance-objectives of guidance-kinds of guidance-educational, vocational, personal and social.</p> <p>7.2. Types of counselling- directive, non-directive, eclectic and group counselling. Guidance and counselling services for students.</p>
8	<p>ADMINISTRATION OF PHYSIOTHERAPY CURRICULUM</p> <p>8.1. Role of curriculum coordinator – planning, implementation and evaluation.</p> <p>8.2. Evaluation of educational programs in Physiotherapy- course and program.</p> <p>8.3. Factors influencing faculty staff relationship and techniques of working Together.</p> <p>8.4. Concept of faculty supervisor (dual) position.</p> <p>8.5. Curriculum research in Physiotherapy.</p> <p>8.6. Different models of collaboration between education and service</p>
9	<p>MANAGEMENT AND ACCREDITATION OF PHYSIOTHERAPY EDUCATIONAL INSTITUTIONS</p> <p>9.1. Planning, organizing, staffing, budgeting, recruitment, discipline, public relation, performance appraisal, welfare services, library</p>

	<p>Services and hostel.</p> <p>9.2. Development and maintenance of standards and accreditation in Physiotherapy education programs.</p> <p>9.3. Role of Indian Physiotherapy Council, State Registration Physiotherapy Councils, Boards and University</p>
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TEXT BOOKS:

1. Loughran J. Developing a Pedagogy of Teacher education: Understanding teaching and learning about teaching. 1st ed. Routledge, 2005.
2. Herring M.C. Handbook of Technological pedagogical content knowledge (TPACK) foreducators. 2nded. Routledge, 2016.
3. Somekh B. Pedagogy and Learning with ICT: Researching the art of innovation. 1st ed. Routledge, 2007.
4. Hewett E.C. A Treatise on Pedagogy for Young teachers. 1st ed. Nabu press, 2010.

PAPER I Basic Sciences:-2) ELECTRO PHYSIOLOGY & ELECTRO DIAGNOSIS.

Course Objectives:

1. To provide knowledge about the principles of diagnosis of patients with various disorders.
2. To enhance knowledge related to all appropriate invasive and non-invasive methods for evaluation.

1	<p>INTRODUCTION</p> <p>1.1. Anatomy and physiology of peripheral nerve, muscle and neuromuscular junction,</p> <p>1.2. Electrical properties of muscle and nerve,</p> <p>1.3. Electrical stimulation and its effects on various systems, Safety considerations in electrotherapy.</p>
2	<p>INSTRUMENTATION</p> <p>Instrumentation, Surface electrodes- Needle electrodes-Types, intracellular electrodes, amplifiers, Filters, Signal averages, stimulator, cathode-ray oscilloscope, digital processing & Electrical safety.</p>

3	<p>EMG and Biofeedback.</p> <p>3.1. Principles of NCS and EMG, Techniques of Application.</p> <p>3.2.METHOD OF EXAMINATION</p> <p>EMG Examination during</p> <ul style="list-style-type: none"> - Muscle at rest, - Insertional activity, - Minimum effort, - Maximum effort. <p>Quantitative methods in EMG</p>
4	<p>ABNORMAL MOTOR UNIT POTENTIALS:</p> <p>4.1. EMG findings in the following conditions: Motor neuron disease, hereditary motor neuron diseases poliomyelitis, muscular dystrophies. Inflammatory myotonias, metabolic myopathies.</p>
5	<p>MOTOR AND SENSORY CONDUCTION STUDIES</p> <p>5.1. Physiology of nerve conduction, General factors affecting nerve conduction, Nerve Stimulation-Latency, Amplitude, nerve conduction velocity.</p> <p>5.2.Special conduction techniques- H wave and F wave in Proximal conduction studies,</p> <p>5.3. standard motor conduction techniques of radial nerve, ulnar nerve, median nerve, femoral nerve, sciatic nerve, tibial nerve,</p> <p>5.4. Standard sensory conduction techniques, radial nerve, ulnar nerve, median nerve, tibial nerve, sural nerve, Blink reflex.</p>
6	<p>CONDUCTION STUDIES IN PERIPHERAL NEUROPATHIES</p> <p>6.1. Nerve conduction changes in peripheral neuropathy, Electromyographic changes in peripheral neuropathies, electrical study of Axon reflexes, Blink reflex.</p> <p>6.2. Nerve Trauma and Compression Syndromes</p> <p>Brachial plexus lesions, Entrapment neuropathies, Median nerve (Carpal Tunnel syndrome) Ulnar nerve (Cubital Tunnel Syndrome), radial nerve ,Tarsal Tunnel</p>

	syndrome, Myasthenia gravis , Lambert – Eaton myasthenia syndrome, electro diagnosis in radiculopathy.
7	SOMATO SENSORY EVOKED POTENTIALS General principles, Electrode placement, Polarity methodology for upper extremities studies, methodology for lower extremity studies, 7.1.Use of somato sensory evoked potentials in peripheral nerve problems, 7.2.Use of somato sensory evoked potentials in Brachial plexopathy, 7.3. Use of somato sensory evoked potentials for determining prognosis & Diagnosis.
8	Type of Nerve injury, Wallerian degeneration and regeneration
9	Electro diagnosis with therapeutic currents, – S.D. curves for motor, sensory and Pain assessment

TEXT BOOKS:

1. Cameron MH. Physical agents in Rehabilitation: From research to practice. 4th ed .Elsevier Health-US, 2012.
2. Belanger A .Y .Evidence basedguidetoTherapeuticPhysicalagents.1st ed .LWW, 2002.
3. Kimura J. Electro diagnosis in diseases of nerve and muscle: Principles and practice. 4thed.OUP USA, 2014.
4. RobinsonA.J.ClinicalElectrophysiology.3rd ed .LWW, 2008.

REFERENCES:

1. Mehta P.J. Understanding Electro cardiography. 6thed.CBS, 2017.
2. White G.C. Pulmonary function testing guide. 1sted.FADavis, 2009.

PAPER I: - BASIC SCIENCES -3) RESEARCH METHODOLOGY & BIOSTATISTICS

Course Objectives:

1. To provide a comprehensive understanding of the research methodology and biostatistics.
2. To provide a basis for application of the research methodology in research.
3. To provide a basis for application of biostatistics in research.

S.NO	TITLE
1.	Research in Physiotherapy 1.1 Introduction 1.2 Research for Physiotherapist: Why? How? And When? 1.3 Research – Definition, concept, purpose, approaches . Internet sites for Physiotherapist
2	Research Fundamentals 2.1 Types of variables 2.2 Reliability & Validity 2.3 Drawing Tables, graphs, master chart etc
3	Writing a Research Proposal 3.1 Defining a problem 3.2 Hypothesis: function of hypothesis in quantitative research 3.3 Types of hypothesis, characteristics of testable hypothesis, wording of the hypothesis 3.4 Review of Literature 3.5 Formulating a question, Operational Definition 3.6 Inclusion & Exclusion criteria 3.7 Forming groups 3.8 Data collection & analysis 3.9 Results, Interpretation, conclusion, discussion 3.10 Informed Consent 3.11.Limitations
4	Research Design 4.1 Qualitative and Quantitative research designs - Difference between qualitative and quantitative designs 4.2. Experimental designs

	<ul style="list-style-type: none"> - Quasi experimental research; advantages and disadvantages of quasi experiments, 4.3.- Non experimental designs - Controlled trials -Parallel or concurrent controls - Randomized - Non randomized - Sequential controls - Self controlled - Crossover - External controls 4.4 - Studies with no controls - Observational Study design - Descriptive or case series - Case control studies (retrospective) - Cross sectional studies, surveys - Cohort studies (prospective) -Historical Cohort studies d. Meta analyses
<p>5</p>	<p>Population and sample</p> <ul style="list-style-type: none"> 5.1. Definition of population and sample 5.2 Types of sampling 5.3 Sample size determination and calculation 5.4 Sample rationale 5.5. Non-probability sampling ; convenience sampling , quota sampling, purposive sampling, advantages and disadvantages of non-probability sampling 5.6. Probability sampling; Simple random sampling, stratified random sampling, 5.7. Cluster sampling, systematic sampling, advantages and

	disadvantages of probability sampling
6.	Data collection methods
	<p>6.1. Scales and techniques of psychological measures</p> <p>6.2. Research reliability, validity and criteria for assessing, measuring the tools</p> <p>6.3. Presentation of data</p> <p>6.4 Analysis and interpretation of research data</p> <p>6.5 Role of computers</p> <p>6.6 Pilot study</p>
7	Interpretation of statistical results
	<p>7.1. Interpreting significant and non-significant results</p> <p>7.2. Discussion and conclusion of obtained results</p> <p>7.3. Guidelines to interpret and critique research results</p>
8	Scientific Writing
	<p>8.1. Definition and kinds of scientific documents – Research paper, Review paper, Book , Reviews, Thesis, Conference and project reports (for the Scientific community and for funding agencies).</p> <p>8.2. Publication – Role of author, Guide, Co-authors. Guidelines to publish a research paper and its contents</p> <p>8.3. Structure, Style and contents; Style manuals (APA, MLA); Citation styles: Footnotes, References; Evaluation of research</p> <p>8.4. Significance of Report writing; Different steps in Report writing; Mechanics and precautions of writing research reports Oral and poster presentation of research papers in conferences/symposia; Preparation of abstracts., Structure of Thesis and Content – Preparing Abstracts</p>
9	Research Ethics
	<p>9.1. Importance of Ethics in Research, Ethical issues in human subjects, Ethical principles that govern research with human subjects</p>

	9.2. Components of an ethically valid informed consent for research.
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BIOSTATISTICS

COURSE OUTLINE

S.NO	TITLE
1.	Biostatistics 1.1. Introduction 1.2. Definition 1.3. Types 1.4. Application in Physiotherapy
2	Data 2.1. Definition 2.2. Types 2.3. Presentation 2.4. Collection methods 2.5. Various types of graphs, obtaining graphs using statistical software Like excel.
3	Measures of central value 3.1. Arithmetic mean, median, mode, Relationship between them 3.2. Partitioned values- Quartiles, Deciles, Percentiles 3.3. Graphical determination
4.	Measures of Dispersion 4.1. Range 4.2. Mean Deviation 4.3. Standard Deviation
5	Normal Distribution Curve

	<p>5.1. Properties of normal distribution</p> <p>5.2. Standard normal distribution</p> <p>5.3. Transformation of normal random variables.</p> <p>5.4. Inverse transformation</p> <p>5.5. Normal approximation of Binomial distribution.</p>
6	<p>Correlation analysis</p> <p>6.1. Bivariate distribution</p> <p>6.2. Scatter Diagram</p> <p>6.3. Coefficient of correlation</p> <p>6.4. Calculation & interpretation of correlation coefficient</p> <p>e. T-test, Z-test, P-value.</p>
7	<p>Regression analysis</p> <p>7.1 Lines of regression</p> <p>7.2. Calculation of Regression coefficient</p>
8	<p>Sampling</p> <p>8.1. Methods of Sampling b. Sampling distribution c. Standard error</p> <p>8.2. Types I & II error</p>
9	<p>Probability</p> <p>9.1. Probability and sampling</p> <p>9.2. Probability as a mathematical system</p> <p>9.3. Population and samples</p> <p>9.4. Sampling distribution</p> <p>9.5. Sampling methods</p> <p>9.6. Point and interval estimation for proportion mean</p> <p>9.7. Hypothesis testing, simple test of significance</p> <p>9.8. Inferential technique: normal</p>
10	<p>Hypothesis testing</p> <p>10.1. Null hypothesis</p>

	<p>10.2. Alternative hypothesis</p> <p>10.3. Acceptance & rejection of null Hypothesis</p> <p>10.4. Level of significance Alternative hypothesis</p> <p>10.5. Acceptance & rejection of null Hypothesis</p> <p>10.6. Level of significance</p>
11	<p>Parametric & Non parametric tests</p> <p>11.1. Chi square test</p> <p>11.2. Mann-Whitney U test</p> <p>11.3. Wilcoxon Signed test</p> <p>11.4. Kruskal-Wallis test</p> <p>11.5 Friedman test</p> <p>11.6. T-test/student T test g. Analysis of variance</p> <p>11.7. Standard errors of differences</p> <p>11.8. SPSS software application and Graph Software application</p>

TEXTBOOKS:

1. Portney L.G, Watkins M.P. Foundations of Clinical Research: Applications to Practice.3rd ed. F.A Davis Company, 2015.
2. C. R Kothari, Gaurav Garg. Research Methodology: Methods and Techniques. 4thed.NewAgeInternational Publishers, 2019.

PAPER-I :- 4) EXERCISE PHYSIOLOGY.

Course Objectives:

1. To impart knowledge of various systems involved and their physiological changes during rest and physical activities.
2. To improve knowledge in the performance, understanding and interpretation of basic physiological assessment.

1	<p>ENERGY PRODUCTION, EXPENDITURE, AND TRANSFER</p>
	<p>INTRODUCTION</p> <p>Muscle & contraction-Architecture of skeletal muscles, sliding filament theory, types of muscle fibres, mechanical efficiency of muscle contraction, force-velocity relationship, motor unit, muscle fatigue-blood supply, Prolonged exercise.</p>
2	<p>AEROBIC & ANAEROBIC EXERCISE</p> <p>2.1. Sources of Energy, Energy Transfer and Energy Expenditure at rest and various physical activities.</p> <p>2.2. Aerobic processes intensity & duration of exercise, prolonged exercise, muscular stress involved in exercise.</p> <p>2.3. Anaerobic processes: Power & capacity of high energy breakdown.</p> <p>Lactate: Production- distribution & disappearance, effect of metabolism on tissue & blood Ph., Anaerobic threshold, Maximal aerobic power, maximal anaerobic power.</p>
3	<p>PHYSICAL FITNESS TESTS</p> <p>Test of Maximal aerobic power – Measurement of oxygen uptake, Treadmill tests, Bicycle ergo meter test, step-test, maximal oxygen uptake</p> <p>In various sports. Evaluation of anaerobic power, Exercise electrocardiogram</p>
4	<p>Training and conditioning</p> <p>Physiological basis of physical training , training principles , interval training , continues running concept of anaerobic threshold and vo2 max , physiological effects of various physical training methods,- aerobic and anaerobic training , strength training factors influencing training effects – intensity ,frequency , duration , detraining, , process of</p>

	recovery , post exercise oxygen consumption factors affecting recovery process , overtraining
5	<p>Cardiovascular responses to exercise</p> <p>Cardiovascular system and exercise, acute vascular effects of exercise , Circulatory responses to various types of exercise regulation of cardiovascular system during exercise, Pattern of redistribution of blood flow during exercise, adaptive responses of cardiovascular system to aerobic and anaerobic training. Athlete heart.</p>
6	<p>Respiratory responses to exercise:</p> <p>Ventilation at Rest and during Exercise, Ventilation and the Anaerobic Threshold, static and dynamic lung volume. Gas diffusion, Oxygen and carbon dioxide transport second wind, stich by side control of pulmonary ventilation during exercise adaptive changes in the respiratory systems due to regular physical activities.</p>
7	<p>APPLIED WORK PHYSIOLOGY:</p> <p>7.1.Factors affecting sustained physical work,</p> <p>7.2.assessment of work load in relation to work capacity,</p> <p>7.3.Assessment of maximal aerobic power measurement of oxygen uptake in a typical work situation,</p> <p>7.4.Assessment of load exerted on specific muscles, Classification of work,</p> <p>7.5.Daily rates of energy expenditure, energy expenditure during specific activities like sleeping, sedentary, work, house work, light industry, manual labor.</p> <p>Basal metabolic and resting metabolic rates and factors affecting them, Classification of physical Activities by energy expenditure, Concept of MET , measurement of energy cost of exercise</p>
8	<p>FATIGUE:</p> <p>General Physical fatigue, local muscular fatigue, shift work, effect of Menstruation. Fatigue assessment and scientific organization of work-rest</p>

	Regimes to control fatigue.
9	<p>NUTRITION & PHYSICAL PERFORMANCE:</p> <p>metabolism of Carbohydrate, fats, proteins , vitamin, mineral and water</p> <p>Nutrition in exercise</p> <p>ii. optimum nutrition for exercise , nutrition for physical performance , pre-game meal</p> <p>iii. carbohydrate loading , food for various athletic events , fluid and energy replacement in prolonged exercise</p>
10	<p>FACTORS AFFECTING PERFORMANCE:</p> <p>10.1.Considerations of age and sex in exercise and training,</p> <p>10.2.Environmental influence on Performance,</p> <p>10.3.Influence of altitude on performance,</p> <p>10.4.Influence of body composition, Sleep, Rest, Warm up, Massage and stretching on performance,</p> <p>10.5. Influence of ergogenic aids on performance. DIET.</p>
11	<p>BODY COMPOSITION</p> <p>11.1 Obesity and weight control.</p> <p>11.2 Measurement of body composition – BMI, WHR, indirect Methods of measurement.</p>
12	<p>EXERCISE TESTING AND PRESCRIPTION FOR SPECIAL CONDITIONS</p> <p>12.1 Diabetes mellitus</p> <p>12.2 Hypertension</p> <p>12.3 Cardio- vascular system</p> <p>12.4 Respiratory impairment</p>
13	<p>PAEDIATRIC EXERCISE SCIENCE</p> <p>Exercise in testing in Paediatric- 1) Flexibility 2) Endurance 3) Fitness</p> <p>4) Strength 5) Functional Testing.</p>

14	<p>Physical activity, body composition, energy balance and weight control</p> <p>Significance and measurement of body composition, Body composition during growth and aging, Body composition and physical performance, Effect of diet and exercise on body composition, Physical activity, energy Balance, nutrient balance and weight control, Physical activity, fat distribution and the metabolic syndrome , Healthy weight loss, Ways and methods of weight reduction , fluid maintenance, disordered eating, nutritional ergogenic Diet supplements in athletes and others involved in physical activity.</p>
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TEXT BOOKS:

1. Wilmore J.H, Kenney W.L. Physiology of sport and exercise. 6th ed. Human Kinetics, 2015.
2. Mc Ardle W.D, Katch F. I. Exercise physiology: Nutrition, energy and human performance. 7th ed. LWW, 2009.
3. Robergs R.A, Roberts S.O. Exercise Physiology: Exercise performance and clinical applications. 1st ed. McGraw-Hill education, 1996.
4. Farre Il P. A, Joyner M.J. ACSM's advanced exercise physiology. 2nd ed. LWW, 2011.

PAPER II; BIOMECHANICS & PATHOMECHANICS

Course Objectives:

1. To provide knowledge about defining the structure, normal mechanical and anatomical features of the joints in the musculoskeletal system and the components that make up the joint.
2. To provide extensive understanding of normal mechanics of human musculoskeletal system.
3. To provide extensive understanding of patho mechanics of human musculoskeletal system.

1	<p>PHYSICAL PROPERTIES OF BONE, CARTILAGE & MUSCLES:</p> <p>a. Bone</p> <p>Elasticity of bone, stress resistance of bone, compression, shearing and bending stress, torsion, Application of the theory of beam and column, Effect of muscular tension on Gravitational stress in bone.</p> <p>b. Cartilage</p>
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	<p>Stress and structure, elasticity, deformation and pressure, patho kinetics of cartilage</p> <p>c. Muscle</p> <p>Elasticity and contractility of muscle, Electro Physiology of muscle, Contraction length, Physical properties of ligaments and tendons.</p>
2	<p>MECHANICS OF JOINT:</p> <p>General mechanical principles, shape of the articular surfaces, joint contact, type of joint movement, degrees of freedom of motion, kinetic chain</p>
3	<p>MECHANICS OF MUSCLE ACTION:</p> <p>Stabilizing and rotatory components, leverage and equilibrium, morphological adaptation of muscle, co-ordination of skeletal muscle</p> <p>Action, bi-articular muscles.</p>
4	<p>SHOULDER COMPLEX:</p> <p>Anatomy of Shoulder Complex , Physiological movements of Shoulder, Dynamics of shoulder complex - Translatory movements of the shoulder blade, rotatory movement of the shoulder blade, physiology of adduction, Scapulohumeral rotation.</p> <p>Pathomechanics of paralytic shoulder:</p> <p>Paralysis of the trapezius, paralysis of the serratus anterior, paralysis of Rhomboids, paralysis of deltoid, , paralysis of supraspinatus, paralysis of The subscapularis, paralysis of pectoralis major, paralysis of lattismus dorsi.</p> <p>Kinetic point of view – operations for paralysis of trapezius, serratus anterior, deltoid.</p>
5	<p>ELBOW JOINT:</p> <p>Anatomy of Elbow Complex , Physiological movements of Elbow, Dynamics of elbow complex, position of function and compensatory Movements.</p> <p>Patho mechanics of paralytic elbow:</p> <p>Paralysis of extensors of elbow, paralysis of flexors, transposition of Forearm muscles, substitution by the triceps.</p>
6	<p>WRIST AND HAND:</p>

	<p>Anatomy of Wrist Complex , Physiological movements of Wrist, Dynamics of wrist complex, scaphoid-lunate couple, Functional pattern of Wrist motion, paralysis of wrist extensors, paralysis of wrist flexors. Modes of prehension-Terminal opposition, subterminal opposition, subterminal – lateral opposition, tridigital grips, tetradigital grips, Pentadigital grips, palmar grips, dynamic grips.</p> <p>Pathokinetics of paralytic disabilities:</p> <p>Paralysis of finger extensors and flexors, paralysis of interossei and Lumbricals, tendon transplantation in flexors and extensors. Arthrodesis of The wrist combined with tendon transplantation-kinetic analysis. Analysis of movements under open kinetic chain conditions – Ball Throwing, Discus throwing, shot putting, movement of the upper extremity in a closed kinetic Chain, weight lifting and boxing.</p>
7	<p>HIP JOINT:</p> <p>Movements of the hip and their ranges, movements of the circumduction of the hip, capsule and ligaments of the hip, muscular and bony factors affecting stability of the hip. Inversion of muscle action. Architecture of femur, analysis of the static forces operating upon the femur, static pressure And shear effects produced by muscle action, muscle dynamics.</p> <p>Pathomechanics:</p> <p>Coxa valga- skeletal factors, mechanical muscle situation of coxa valga, pathomechanics of the dysplasia of hip joint, patho mechanics of fixed Pelvic obliquity. Dynamics of pelvic obliquities in coxa vara. Paralysis of hip abductors, abductors, extensors and flexors, Internal and external Rotators. Mechanics of reconstructive procedure of paralyzed hip joint – paralytic dislocation, Shelving operation, Legg’s operation, substitution of the abductors by external oblique, substitution of gluteus maximus By sacrospinalis.</p>
8	<p>KNEE:</p> <p>Axes of the knee joint, movements of the knees and its range of motion, ligaments of the knee, lesions of the menisci, transverse stability of the</p>

	<p>knee anterior, posterior stability of the knee, mechanical role of cruciate ligaments, rotational stability of the knee, stress analysis of the bones, Mechanics of menisci, muscle dynamics of the knee joint.</p> <p>Pathomechanics of static deformities</p> <p>Genu valgum- static factor, dynamic factor, static genu varum, static genu Recurvatum, mechanics of tibial torsion.</p> <p>Pathomechanics of the paralytic knee:</p> <p>Extensor paralysis, Flexor paralysis of the knee, methods of reconstruction Of genu recurvatum. Fasciodesis, Tenodesis, Osteoplastic – Arthrodesis, Reconstruction of the paralytic Genu valgum, reconstruction of flexor Contracture.</p>
<p>9</p>	<p>ANKLE AND FOOT:</p> <p>Anatomy of Ankle and foot complex, antero posterior stability of the ankle And factors limiting flexion and extension. Transverse stability of ankle tibiofibular joints, construction of the arches, Axes of the joint of the foot, internal architecture of the foot, ligamentous reinforcements of the articularis.</p> <p>General architecture of the plantar vault, three arches of the plantar vault - medial arch, lateral arch, anterior arch, distribution of stresses and static distribution of the plantar vault, dynamic changes of the arches of the foot during working dynamic changes of the arches of the foot during working dynamic changes related to the medial and lateral rotation of the leg on the Foot.</p> <p>Pathomechanics or the static deformities of the foot and ankle:</p> <p>Development factors, pathological equilibrium- pronated foot, instability of the subtalar joint, pathomechanics of the foot structures: pes cavus, pes Planus.</p> <p>Pathomechanics of the paralytic foot and ankle:</p> <p>Talipsequinovarus sub talar joint, midtarsal joint, arthrodesis of paralytic joints for the establishment of equilibrium, stabilization of the ankle, single Arthrodesis, double joint arthrodesis and three joint arthrodesis.</p>

<p>10</p>	<p>NORMAL AND APPLIED BIOMECHANICS OF SPINE & PELVIS INCLUDING SI & PUBIC SYMPHYSIS.</p> <p>Structure and function including kinematics and kinetics of Various Vertebral joints. Factors affecting stability and mobility. Arthrology and Arthrokinematics and Pathomechanics of Spine. Effects of aging, exercise, Immobilization and injury</p>
<p>11</p>	<p>CLINICAL KINESIOLOGY OF POSTURE</p> <p>Posture Control, Optimal Posture and their deviations in different planes Posture assessment in Standing, Sitting.</p>
<p>12</p>	<p>BIOMECHANICS AND PATHOMECHANICS OF RESPIRATION.</p> <p>Respiratory mechanics – Mechanism of respiration , Boyle’s Law, Surface Tension , Compliance, Law of Laplace, Pathomechanics of Restrictive lung Disorders</p>
<p>13</p>	<p>THE THORAX AND CHEST WALL</p> <p>General structure and function</p> <p>13.1 Rib cage and the muscles associated with the rib cage</p> <p>13.2 Ventilatory motions: its coordination and integration</p> <p>13.3 Developmental aspects of structure and function</p> <p>13.4 Changes in normal structure and function in relation to pregnancy, scoliosis and COPD</p>

<p>14</p>	<p>BIOMECHANICS AND PATHOMECHANICS OF GAIT.</p> <p>Normal Gait and its determinants</p> <p>Kinematic and Kinetic of normal human gait</p> <p>Pathological gait</p> <p>Gait Analysis.</p> <p>Overview of normal gait analysis : kinetic and kinematic analysis;</p> <p>Description of some of the most commonly used types of observational gait analysis; Advantages and disadvantages of kinematic qualitative and kinematic Quantitative gait analyses.</p> <p>Gait Training, Pre ambulation programme, assistive devices and gait patterns, Recent advances in analysis of Gait</p> <p>Pathological gait and its biomechanical implications</p>
<p>15</p>	<p>ERGONOMICS:</p> <p>Work capacity analysis, role of physiotherapy in industrial set up, job site paralysis, pre-employment screening, worker's functional capacity assessment, work hardening program, industrial therapy, postural examination, job task analysis, educational program for prevention of Injury, adult education, and documentation.</p>
<p>16</p>	<p>ACTIVITIES OF DAILY LIVING (ADL)</p> <p>Kinetics & Kinematics: Supine to sitting, sitting to standing, Squatting, climbing up and down, pushing, pulling, overhead activities, walking, running, jogging.</p>

TEXT BOOKS:

1. Levangie P. K, Norkins C. C, Lewek M. D. Joint Structure and function: a comprehensive analysis, F.A Davis.
2. Neumann D. A. Kinesiology of the musculoskeletal system: Foundations for Rehabilitation. 3rd ed. Mosby, 2016.
3. Whittle M.W. Gait Analysis: An Introduction. 4th ed. Butterworth-Heinemann Ltd, 2006.
4. Oatis C. A. Kinesiology: The mechanics and pathomechanics of Human anatomy. 3rd ed. Wolters Kluwer India Pvt. Ltd., 2016.

REFERENCES:

1. Koley S. Textbook of Biomechanics. AITBS publishers, 2018.
2. Singh A, Singh P. A textbook of biomechanics, PV books, 2016.

Paper- 3. Clinical, Physical and Functional Diagnosis in Musculoskeletal Physiotherapy

Course Objectives:

1. Elicit and interpret clinical signs and symptoms of diseases commonly seen in Orthopaedics & interpret clinical tests and special investigations commonly Used in the diagnosis of these conditions.
2. Generate a primary diagnosis and a list of differential diagnoses consistent with typical presentations.
3. Identify normal & pathological anatomy on diagnostic images.
4. Discuss how the serious and common disorders and the specialized areas of medical practice may impact on Orthopaedic Physiotherapy practice.
5. Demonstrate a broad range of technical skill in diagnosing the physiotherapy related Orthopaedic conditions.

S.NO	CONTENT
1.	Musculoskeletal physiotherapy assessment: Demographic data, Chief complaints and body chart, History taking including pain history with focus on mechanism (nociceptive/neuropathic/nociplastic pain), Ruling out red flags, Differential diagnosis, on observation, on palpation, Movement testing – principle, repetitive, sustained, combined, accessory, Resisted isometrics, Muscle length testing, Muscle strength testing, Gait analysis, Limb length testing, Sensory examination, Dermatome and myotome testing, Reflexes, Special tests, Functional evaluation, Diagnosis, treatment plan according to ICF model, predicting prognosis.
2.	Head and Face: Patient history, observation Examination, examination of the head, examination of the face, examination of the eye, examination of the nose, examination of the teeth, examination of the ear, special tests, reflexes and cutaneous distribution, joint play movements, palpation, diagnostic imaging.

3	Cervical Spine: Patient history, observation Examination, active movements, passive movements, resisted isometric movements, peripheral joint scanning examination, myotomes, functional assessment, special tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.
4	Temporomandibular Joint: Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.
5	Shoulder: Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.
6	Elbow: Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.
7	Forearm, Wrist and Hand: Patient history, Observation – common hand and finger deformities, other physical findings Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.
8	Thoracic (dorsal) Spine: Patient history, observation Kyphosis, scoliosis, breathing chest deformities. Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.
9	Lumbar Spine: Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.
10	Pelvis: Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests,

	reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.
11	Hip: Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.
12	Knee: Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements , palpation, diagnostic imaging.
13	Lower leg, Ankle and Foot: Patient history, observation Examination, active movements, passive movements, resisted isometric movements, functional assessment, specific tests, reflexes and cutaneous distribution, joint play movements, palpation, diagnostic imaging.
14	Assessment of Gait: a) Normal patterns of gait, stance phase, swing phase , joint motion during normal gait Normal parameters of gait, base width, step length, stride length, lateral pelvic shift, vertical pelvic shift, pelvic rotation centre of gravity, normal cadence. Overview and patient history, Observation – foot wear Examination, locomotion score, compensatory mechanisms. b) Abnormal gait, antalgic (painful) gait, arthrogenic gait (stiff hip or knee), ataxic gait, contracture gait, equines gait, gluteus maximus gait, gluteus medius (Trendelenburg's) , hemiplegic or hemiparetic gait, parkinsonian gait, plantar flexor gait, psoatic limp, quadriceps gait, scissors gait, short leg gait, steppage or drop foot gait.
15	Assessment of Posture: a) Postural development, factors affecting posture, causes of posture Common spinal deformities, Lordosis, kyphosis, scoliosis Patient history, Observation – standing, forward flexion, sitting, supine lying prone lying Examination
16	Assessment after acute injury of bone, ligament, and tendon a. Mechanism of injury b. History c. Observation d. Examination e. Special tests f. Palpation and diagnostic imaging.
17	Assessment of the Amputee: a. Levels of amputation b. Patient history, observation c. Examination, measurements related to amputation active movements, passive

	movements, resisted isometric movements, functional assessment, sensation testing, psychological testing , palpation, diagnostic imaging.
18	Pre-operative and post-operative assessment in orthopaedic surgeries
19	Assessment and evaluation of pain Apart from the above; the student is expected to learn assessment and evaluation in the following clinical conditions (pre-operative and post-operative)
20	Application of ICF in Musculoskeletal Diagnosis.
21	<p>Clinometric properties of functional outcome measures:</p> <p>Tampa scale, Fear avoidance belief questionnaire, Pain catastrophizing Scale, Central sensitization inventory, Pain anxiety symptom scale, Brief illness perception questionnaire, Patient health questionnaire, LANSS pain scale, VAS and NPRS scale, Neck disability index, Oswestry disability scale, Roland Morris disability questionnaire, Shoulder pain and disability index, Disabilities of arm, shoulder and hand, Upper extremity functional scale, Lower extremity functional scale, Knee injury and osteoarthritis outcome score, Western Ontario and McMaster University, Arthritis Index, Cincinnati knee rating scale, Kujala score questionnaire, Rheumatoid arthritis evaluation record, IOWA functional hip evaluation, Carpal tunnel functional disability form, Headache disability inventory questionnaire, Whiplash disability questionnaire, Plantar arch index, Foot function index, Foot health status questionnaire.</p>
22.	Clinical Reasoning in Musculoskeletal Practice.

TEXT BOOKS:

1. Sandra J. and Peggy A. H. Examination of musculoskeletal injuries. 4th ed. Human Kinetics, 2016.
2. Magee D. J. Orthopaedic physical assessment. 6th ed. Elsevier India, 2014.
3. Petty N. J. Neuromusculoskeletal Examination and Assessment 4th ed. Churchill Livingstone, 2013.
4. Cleveland J. A, Koppenhaver S, Su J. Netter's Orthopaedic Clinical Examination. 3rd Ed.Elsevier, 2015.

REFERENCES:

1. Cook C, Hegedus E. J. Orthopaedic physical examination tests: an evidence based approach. 2nd ed. Pearson Prentice Hall, 2011.
2. Dr. M Baj. Essentials of orthopaedic and trauma radiology. 2nded, 2016.

E-RESOURCES:

1. <https://www.physiotutors.com>
2. <https://www.physio-network.com>

PAPER-VI ELECTIVE-MUSCULOSKELETAL PHYSIOTHERAPY

S.NO	TOPIC
1	<p>Physiotherapy management following fractures: Upper limb – clavicle, scapula, proximal humerus, supracondylar fracture of humerus, shaft of humerus, olecranon, monteggia, galeazzi, radial head, forearm, colle’s, reverse colle’s, scaphoid, metacarpal, phalangeal.</p> <p>Lower limb – pelvis, femoral neck, intertrochanteric, subtrochanteric, femoral shaft, supracondyle of femur, patella, tibial plateau, tibial shaft, tibial plafond, pott’s, malleolar, calcaneal, midfoot, forefoot, stress fractures.</p> <p>Spine – Jefferson, hangman’s, odontoid, compression and burst fractures, thoracolumbar.</p> <p>Skull and mandible fractures.</p> <p>Physiotherapy management following dislocations: Acromio-clavicular joint; shoulder – anterior, posterior and multidirectional; elbow; hip – anterior and posterior;atlantoaxial dislocations</p> <p>Physiotherapy management in Inflammatory and degenerative disorders: Osteoarthritis - hip and knee, Osteoporosis, Ankylosing Spondylitis, Degenerative Disc Disease, Marfan syndrome, Fibrodysplasia Ossificans. Still’s disease (Juvenile rheumatoid arthritis), Rheumatoid Arthritis. Gouty arthritis, Psoriatic arthritis, Hemophilic arthritis, Charcot’s joints. Connective Tissue Disorders: Systemic Lupus Erythematosus, Scleroderma, Dermatomyositis. Conservative, Surgical management and Advanced physiotherapy management of the inflammatory and degenerative conditions.</p> <p>Physiotherapy management in metabolic, hormonal, neoplastic and infective conditions of bones and joints: Osteomyelitis, Septic Arthritis, Lyme disease, Pyogenic arthritis, TB of bones, Pott’s Spine, Discitis.</p>

	<p>Tumors of the bone</p> <p>Bone Tumors: Classification, clinical features, management - medical and surgical of the following tumors: Osteoma, Osteosarcoma, Osteochondroma, Enchondroma, Ewing’s sarcoma, Giant cell tumor, Multiple myeloma, Metastatic tumors.</p> <p>Congenital deformities</p> <p>CTEV, Congenital flat foot (Vertical talus), CDH, Sprangel’s shoulder, Madelung deformity, Radio ulnar synostosis, Syndactyly, Polydactyly, Ectrodactyly, Torticollis, Klippel Feil syndrome, Cervical rib.</p> <p>Acquired Deformities: Acquired Torticollis, Scoliosis, Kyphosis, Lordosis, Coxa vara, Genu varum, Genu valgum, Genu recurvatum, Pes Cavus, Hallux rigidus, Hallux valgus, Hammer toe, Metatarsalgia.</p> <p>Conservative, Surgical management and Advanced physiotherapy management of the various deformities.</p> <p>Developmental disorders of bone</p> <p>Perthes disease, Slipped Capital Femoral Epiphysis and Avascular Necrosis.</p> <p>Bone Diseases: Rickets, Osteomalacia, Osteopenia, Osteoporosis.</p>
2	<p>Physiotherapy management following cumulative trauma disorders:</p> <p>Tenosynovitis, Wrist tendonitis, De Quervain’s tenosynovitis, Trigger finger, Mallet finger, Hand arm vibration syndrome, Neck tension syndrome, Writer’s cramp, Sticher’s Wrist, Carpenter’s Elbow, Epitrochleitis, Achilles tendinopathy, Shin splint, Runner’s knee.</p>
3	<p>Physiotherapy management procedures in orthopaedic surgeries:</p> <p>Physiotherapy management following amputations: Upper limb; Lower limb; Management following prosthesis and orthosis.</p> <p>Physiotherapy following Osteotomy and Arthroplasty: Hip, Knee, Shoulder, wrist, elbow, ankle.</p> <p>Physiotherapy following Tendon transfers, Bone grafting, Nerve suturing and grafting.</p>
4	<p>Physiotherapy management following specific joint disorders and injuries:</p> <p>Head and neck- Headaches (cervicogenic, Tension-type, Cluster, Migraine), Cervicogenic dizziness, cervical IVDP, cervical facet syndrome , Cervical</p>

	<p>radiculopathy, Cervical spine instability, Acute locking of the cervical spine , Cervical spondylosis, Mechanical neck pain, Myofascial neck pain, FHP, Wry neck.</p> <p>Shoulder- Rotator Cuff related pain, Acute Bursitis, Bicipital Tendinitis, Glenohumeral Instability, Scapular dyskinesia, Adhesive capsulitis, Thoracic Outlet Syndrome, Suprascapular nerve entrapment, acromioclavicular Joint dysfunction, SLAP lesion.</p> <p>Elbow and forearm- Extensor tendinopathy, Posterior interosseous nerve entrapment, cubital tunnel syndrome, pronator syndrome, supinator syndrome, Osteochondritis dissecans, Tennis elbow, Golfer’s elbow, Ulnar nerve compression, Olecranon bursitis, Pulled elbow.</p> <p>Wrist, hand and fingers- Triangular fibrocartilage complex, Dequervain’s tenosynovitis, Intersection syndrome, Carpal tunnel syndrome, Mallet finger, Trigger finger, Guyon’s canal syndrome.</p> <p>Hip & thigh- Groin injuries (Femoral-acetabular impingement),osteoarthritis, Quadriceps contusion, hamstring strain, hip tendinopathies (abductor, gluteal, hamstring), Piriformis syndrome, Meralgia paresthetica, Obturator nerve entrapment, Ischio-gluteal bursitis, Trochanteric bursitis, Slipped capital femoral epiphysis.</p> <p>Knee and lower leg- Ligament (ACL,PCL, MCL, LCL)and meniscal injuries, IT band friction syndrome, Patellar tendinopathy, Quadriceps tendinopathy, PFPS, Acute bursitis, Osgood-schlatterdisease, Fat pad syndrome, Baker’s cyst of the knee, Tennis leg, Common peroneal nerve entrapment syndrome, Medial tibial stress syndrome, Extensor mechanism disorders.</p> <p>Ankle and foot- Tarsal tunnel syndrome, Morton’s neuroma, Posterior impingement syndrome, Tibiales posterior tendinopathy, Peroneal tendinopathy, plantar heel pain, Achilles tendinopathy, Calcaneal spur, and Ankle sprain.</p> <p>Thoracic spine- Thoracic Intervertebral Joint Disorder, Costovertebral and costotransverse joint disorders, Scheuermann’sDisease, Thoracic Intervertebral Disc Prolapse, T4 Syndrome, Costochondritis, Intercostal Muscle Strain, Thoracic Spinal Canal Stenosis, Chest Deformities.</p> <p>Lumbar- Lumbar radiculopathy, IVDP, Lumbar spine stenosis, Lumbar facet syndrome, Lumbar spine instability, Lumbar spondylolysis, Lumbar spondylitis, Spondylolisthesis.</p> <p>SI joint - Sacroiliac joint pain & dysfunction, coccydynia.</p>
5	<p>Orthosis, Protheses and mobility aids in musculoskeletal problems:</p> <ol style="list-style-type: none"> a. Principles of Orthosis and protheses b. Biomechanical compatibility, materials and designs of mobility aids

	<p>c. Different types of Orthosis and Prostheses used in musculoskeletal problems Functional training with Orthosis and Prostheses</p>
6	<p>Physiotherapeutic approaches in musculoskeletal conditions:</p> <p>Manual Therapy: Joint Mobilization Techniques-Terminology, Principles, Indications, Contra-indications, Assessment and method of application of the following techniques for specific joints of upper extremity, lower extremity and spine.</p> <p>: Kaltenborn, Maitland, Mulligan, McKenzie, Cyriax, Butler & Shacklock's neural mobilization.</p> <p>Manual therapy approaches Manual Therapy: Soft Tissue Techniques and recent advances in manual therapy-Terminology, Principles, Indications, Contra-indications, Assessment and method of application of the following techniques: Myofascial release techniques, Muscle energy techniques, Trigger point release, High velocity thrust techniques, Positional release techniques, Lymphatic manipulations.</p> <p>Therapeutic exercises commonly used in musculoskeletal conditions including correction exercises and home exercises</p> <p>Pilates and core stability exercises</p> <p>Proprioceptive Neuromuscular Facilitation (PNF)</p> <p>Hydrotherapy in common musculoskeletal conditions</p> <p>Swiss ball exercises</p> <p>Taping, Wrapping and Bracing techniques.</p> <p>Ergonomic Principles and its application.</p> <p>Recent advances in Orthopaedic Physiotherapy.</p> <p>Community Based Rehabilitation in musculoskeletal conditions.</p> <p>Evidence based physiotherapy management for different musculoskeletal conditions.</p>
7.	<p>Sports Injuries:</p> <p>Analysis and classification of sports and sports injuries.</p>

	Management of sport injuries, sports fitness / rehabilitation of paediatric, Musculoskeletal disorders.
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TEXT BOOKS:

1. Hoppenfeld S, Murthy V. L. Treatment and rehabilitation of fractures. LWW, 1999.
2. Brotzman S.B, Wilk K. E. Hand book of Orthopaedic Rehabilitation. 2nded. Mosby, 2006.
3. Maxey L, Magnusson J. Rehabilitation for the post-surgical orthopaedic patient. 3rd ed. Mosby, 2013.
4. Kisner C, Colby L. A. Therapeutic Exercise: Foundations and Techniques. 7th ed. F. A. Davis, 2017.

REFERENCES:

1. Brody L. T, Hall C. M. Therapeutic Exercise: Moving toward function. 3rd ed. LWW, 2010.
2. Magee D. J, Zachazewski J. E. Pathology and intervention in Musculoskeletal Rehabilitation. 2nd ed. Saunders, 2015.

E-RESOURCES:

1. <https://www.physiotutors.com>
2. <https://www.physio-network.com>

PAPER-VII Recent advances and Evidence Based Practice in Musculoskeletal Physiotherapy

S.NO	CONTENT
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1	<p>Section-A</p> <p>Back School</p> <p>Manual Therapy: Manual therapy: soft tissue manipulations and mobilization, neural mobilization, acupuncture.(Cyriax, Maitland, Butler, McKenzie, Kaltenborn, Mulligan)</p>
2	EBP and Recent advances in clinical assessment, laboratory investigations and diagnosis of musculoskeletal disorders.
3	EBP In Management of pain in musculoskeletal disorders. Recent Advances in management of orthopaedic conditions- medical, surgical and physiotherapy
4	Recent Advances in Physiotherapy management in arthritis and allied conditions.
5	Recent Advances and Controversies in Electrotherapy for orthopaedic conditions.
6	Assessment and training for Core, postural stability and balance in musculoskeletal conditions
7	Recent advances in Kinematic & kinetic analysis.
8	Use of advance Assistive devices and technologies in musculoskeletal system
9	Evidence Based physiotherapy in management of metabolic and hormonal, neoplastic and infective conditions of bones and joints
10	<p>Section-B</p> <p>Recent Advances in Physiotherapy following arthroplasty, implants and soft tissue repairs.</p>
11	EBP in Rehabilitation of congenital conditions and malformation of musculoskeletal disorders.
12	Recent Advances in External aids, appliances, adaptive self-help devices; prescription, biomechanical compatibility, check- out and training.

13	EBP and Recent advances in electro diagnosis, Electromyography, NCV and evoked potential studies.
14	Community based rehabilitation in musculoskeletal disorders.
15	Recent Advances and Controversies in Orthopaedic physiotherapy.
16	Ergonomics assessment and management at work place.
17	Evidence Based Practice and Recent Advances of Manual Therapy in Musculoskeletal Conditions
18	Evidence based practice and recent advances of Aquatic therapy in Orthopaedic conditions

TEXT BOOKS:

1. Kisner C, Colby L. A. Therapeutic Exercise: Foundations and Techniques. 7th ed. F. A. Davis, 2017.
2. Donatelli R. A. Orthopaedic Physical Therapy. 4th ed. Churchill Livingstone, 2009.
3. Clealand J. A, Dommerholt J. Manual Therapy for musculo skeletal pain syndromes. Churchill Livingstone, 2015.
4. Brukner P, Khan K. Clinical sports medicine. 5th ed. McGraw-Hill education, 2017.
5. Brotzman S. B. Clinical Orthopaedic rehabilitation: An evidence based approach. 4th ed. Mosby, 2017.

REFERENCES:

1. Houghlum P. A. Therapeutic exercise for musculoskeletal injuries. 4th ed. Human Kinetics, 2016.
2. Hewetson T. J, Austin K, Gwynn-Brett K, Marshall S. An illustrated guide to taping techniques: Principles and practice. 2nd ed. Mosby Ltd., 2009.
3. Kase K. Clinical therapeutic applications of Kinesiotaping method. 3rd ed. Kinesio, 2013.

Paper- 3. Clinical, Physical and Functional diagnosis in Neurological –physiotherapy

S.NO	CONTENT
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1	Adult Neuro Assessment- The History & Systems review (observation); Differential diagnosis; Assessment of higher cortical functions; Assessment of cranial nerves; Sensory examination; Reflexes; Motor examination; Assessment of balance & coordination; Gait assessment; Functional evaluation.
2	Paediatric Neuro Assessment- History taking & Observation; Differential diagnosis; Assessment of higher cortical functions; Assessment of cranial nerves; Sensory examination; Reflexes; Motor examination; Assessment of balance & coordination; Gait assessment; Functional evaluation.
3	Motor control & motor learning assessment.
4	<p>Neurological Investigations:</p> <p>Laboratory investigations- Lumbar Puncture, Biopsy, Genetic testing</p> <p>Electro diagnosis- NCS, EMG, RNS, Evoked potentials</p> <p>Non-invasive Cardiovascular studies- Ultrasonography: B-mode & Doppler</p> <p>Neuroimaging- Basic principles of Computed Tomography (CT), Magnetic Resonance Imaging (MRI), Angiography, Myelography.</p>
5	Neurological disorders and their Assessment: Vascular disorders of the nervous system- Stroke, AV malformations; Trauma of the nervous system- Craniocerebral trauma, spinal cord trauma, Peripheral nerve trauma; Tumors of the Central nervous system; Infections of the Nervous system- Meningitis & Encephalitis, Neurosyphilis, Neurological complications of HIV, TB spine; Inflammatory demyelinating diseases of Central Nervous system-Multiple sclerosis.
6	Disorders of speech and language and perception: Dysarthria, Aphasia, apraxia of speech, body image & scheme disorders, spatial perception disorders, agnosias, apraxias.
7	Disorders of Spinal cord: Acute myelopathies (IVDP, Transverse myelitis, haematomyelia), non-compressive myelopathies (Syringomyelia, Subacute combined degeneration of spinal cord), compressive myelopathies (spinal tumors, Paget's disease, Atlantoaxial subluxation).

8	<p>Disorders of peripheral nerves: Entrapment Neuropathies- Upper and lower extremity; Hereditary Neuropathies- Charcot-Marie-Tooth Disease; Neuropathies associated with systemic disease- Diabetic Neuropathy, Alcoholic Neuropathy & Nutritional deficiencies, Paraneoplastic sensory Neuronopathy & Sensory motor Neuropathy; Inflammatory/Infective Neuropathy- GBS, Leprosy, Polio & PPS.</p> <p>Disorders of Cranial nerves: Trigeminal neuralgia, Facial palsy, Bell's palsy, Glossopharyngeal neuralgia.</p>
9	<p>Disorders of Skeletal Muscles: Inherited Myopathies- Muscular dystrophies; Channelopathies-Hypo/Hyperkalemic Periodic paralysis; inflammatory myopathies- Polymyositis & Dermatomyositis; Congenital muscle diseases- Congenital Hypotonias.</p>
10	<p>Disorders of Neuromuscular Transmission: Myasthenia Gravis, Lambert-Eaton Myasthenic syndrome, Botulism.</p>
11	<p>Disorders of Upper and Lower motor neurons: Upper motor neuron syndromes- Hereditary spastic Paraplegia; Lower motor neuron syndromes- Spinal Muscular atrophy, bulbar palsy; Upper & Lower motor Neuron syndromes- Amyotrophic Lateral Sclerosis (ALS), Primary Lateral Sclerosis, Lathyrism.</p>
12	<p>Movement disorders: Akinetic-Rigid Syndromes & Parkinsonism- Idiopathic Parkinson's disease, Progressive Supranuclear palsy (PSP), Corticobasal degeneration, Multiple system atrophy, Parkinsonism-Dementia complex of Guam; Dyskinesias- Tremors, Dystonia, Chorea & Ballism, Tic syndromes, Myoclonus, hemifacial spasm, Wilson's disease.</p>
13	<p>Cerebellar and Spinocerebellar disorders: Vascular diseases involving cerebellum- Infarction & haemorrhage; Autosomal recessive ataxias- Friedreich's ataxia; Autosomal dominant ataxias; Hereditary spastic Paraplegia.</p>
14	<p>Developmental disabilities: Cerebral Palsy, Attention Deficit Hyperactive Disorder (ADHD), Autism, Learning disabilities & Mental Retardation.</p>
15	<p>Physiotherapy assessment in Dysphagia; Neurogenic Bladder & Bowel dysfunction; Dizziness and vertigo; Coma and sleep disorders.</p>

TEXT BOOKS:

1. Snell R. Clinical Neuroanatomy. 7thed. Lippincott Williams and Wilkins, 2009.
2. Prasad K, Yadav R, Spillane J. Bickerstaff's Neurological examination in clinical practice. 7th ed. Wiley India, 2013.
3. Harvey L. Management of Spinal cord injuries: A guide for Physiotherapists. Churchill Livingstone, 2008.
4. Umphred D. A, Lazaro R. T. Neurological Rehabilitation. 6thed. Mosby, 2012.

REFERENCES:

1. Campbell W. W. Dejong's The Neurologic examination. SA. ed. Wolters Kluwer India Pvt. Ltd., 2012.
2. O' Sullivan S. B, Schmitz T. J, Fulk D. G. Physical Rehabilitation. 6thed. Jaypees medical, 2013.

PAPER-VI- ELECTIVE: Neurological rehabilitation

S.NO	TOPIC
1	Anatomy and physiology of central nervous system and peripheral nervous system.
	CLINICAL NEUROLOGICAL CONDITIONS & PHYSIOTHERAPY INTERVENTIONS
2	Causes, clinical features, pathophysiology, general investigation (blood test, serum creatinine, CSF analysis, etc.) Medical and surgical management of the below mentioned conditions
3	Intracranial neoplasms, Gliomas, meningiomas, neuromas, angiomas, cranio, pharyngiomas, pituitary adenomas, medical and surgical management.
4	Pyogenic infections of CNS: Meningitis, brain abscess, tuberculosis, neurosyphilis.
5	Viral infections of CNS: Poliomyelitis, viral encephalitis, substance sclerosing encephalitis, AIDS

6	Role of Physiotherapy in Cerebellar and Spinocerebellar disorders: Vascular diseases involving cerebellum- Infarction & haemorrhage; Autosomal recessive ataxias- Friedreich's ataxia; Autosomal dominant ataxias; Hereditary spastic Paraplegia.
7	Cerebro vascular disease: Stroke syndrome, ischaemic stroke infarction, thrombo- embolic stroke, Haemorrhagic stroke, Transient ischaemic attack, arterio- venous malformation of the brain, intracranial haemorrhage. Metabolic disorders of brain : Hypoencephalopathy, hypoglycaemic encephalopathy, hepatic encephalopathy
8	Role of Physiotherapy in Developmental disabilities: Cerebral Palsy, Attention Deficit Hyperactive Disorder (ADHD), Spina Bifida, Autism, Learning disabilities, Hydrocephalus & Mental Retardation.
9	Polyneuropathy: Post infective Polyneuropathy (gullian bare syndrome) diabetic neuropathy, hereditary sensory neuropathy.
10	Management of Disorders of Spinal cord: Acute myelopathies (IVDP, Transverse myelitis, haematomyelia), non-compressive myelopathies (Syringomyelia, Subacute combined degeneration of spinal cord), compressive myelopathies (spinal tumors, Paget's disease, Atlantoaxial subluxation). Degenerative disease of the brain: motor neurone disease, amyotrophic lateral sclerosis, progressive bulbar palsy, Alzheimer's disease.
11	Management of disorders of Skeletal Muscles: Inherited Myopathies- Muscular dystrophies; Channelopathies-Hypo/Hyperkalemic Periodic paralysis; inflammatory myopathies- Polymyositis & Dermatomyositis; Congenital muscle diseases- Congenital Hypotonias. Management of disorders of Neuromuscular Transmission: Myasthenia Gravis, Lambert-Eaton Myasthenic syndrome, Botulism. Management of disorders of Upper and Lower motor neurons: Upper motor neuron syndromes- Hereditary spastic Paraplegia; Lower motor neuron syndromes- Spinal Muscular atrophy, bulbar palsy; Upper & Lower motor Neuron syndromes- Amyotrophic Lateral Sclerosis (ALS), Primary Lateral Sclerosis, Lathyrism, Multiple sclerosis. NDT approach for neurological dysfunction. SI approach for sensory integration dysfunction.
12	Management of disorders of peripheral nerves: Entrapment Neuropathies- Upper and lower extremity; Hereditary Neuropathies- Charcot-Marie-Tooth Disease; Neuropathies associated with systemic disease- Diabetic Neuropathy, Alcoholic Neuropathy & Nutritional deficiencies, Paraneoplastic sensory

	Neuronopathy & Sensory motor Neuropathy; Inflammatory/Infective Neuropathy- GBS, Leprosy, Polio & PPS. Management of disorders of Cranial nerves: Trigeminal neuralgia, Facial palsy, Bell's palsy, Glossopharyngeal neuralgia.
13	Role of Physiotherapy in Movement disorders: Akinetic-Rigid Syndromes & Parkinsonism- Idiopathic Parkinson's disease, Progressive Supranuclear palsy (PSP), Corticobasal degeneration, Multiple system atrophy, Parkinsonism-Dementia complex of Guam; Dyskinesias- Tremors, Dystonia, Chorea & Ballism, Tic syndromes, Myoclonus, hemifacial spasm, Wilson's disease.
14	Other associated manifestations 19.1.Abnormalities in communications 19.2.Abnormalities in swallowing 19.3.Abnormalities of bladder and bowel functions 19.4.Learning disorders 19.5.Visual dysfunction 19.6 Cognitive and perceptual dysfunction

TEXT BOOKS:

1. Trombly C. A. Occupational Therapy for Physical dysfunction. Williams and Wilkins, 2016.
2. Brunnstrom S. Movement Therapy in Hemiplegia. LWW, 1991.
3. Carr J. H, Shepherd R. B. Motor relearning program for stroke. Aspen publishers, 1987.
4. Shumway-Cook A, Woollacott M. H. Motor Control: Translating research into clinical practice. 4th ed. LWW, 2011.
5. Harvey L. Management of Spinal cord injuries: A guide for Physiotherapists. Churchill Livingstone, 2008.
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REFERENCES:

1. O' Sullivan S. B, Schmitz T. J, Fulk D. G. Physical Rehabilitation.6thed. Jaypee medical, 2013.
2. Martin S.T, Kessler M. Neurological Interventions for Physical Therapy. 3rd ed. Saunders, 2015.

Paper- VI. Recent advances and Evidence Based Practice in Neuro-physiotherapy

Chapter- 3. Clinical, Physical and Functional diagnosis in Cardio – Pulmonary Physiotherapy.

& interpret clinical tests and special investigations commonly

Used in the diagnosis of conditions.

S.NO	CONTENT
1	Section-A Genetic counselling, Stem cell therapy, Gene therapy.
2	Recent advances in Pain Modulation and Rehabilitation.
3	Recent advances in Vocational Rehabilitation in Neurology Disorders with disability
4	Recent advancement in Neurology Orthosis – prescription and training.
5	Psychiatry problems in Neurological conditions and physiotherapy (BAT, CBT). Psychological aspects of adaptation during various aspects of neurological disabilities
6	Institutional & community based rehabilitation for Neurological Dysfunction.
7	Recent Neuro Physiotherapy technique - Mental Imagery technique, Virtual Reality Therapy/Virtual Clinic, Robotic Movement Therapy, Pilates therapy, Mirror Box therapy, Mime therapy, Floatation Therapy, Cupping Therapy, Matrix Rhythm Therapy, , Neurodynamics in Neurological conditions and Neural Mobilization, Hippo-therapy, Transcranial Direct Current Stimulation, Transcranial Magnetic Stimulation, Artificial Intelligence, Whole Body Vibrator and Neuromuscular Technique
8	Eclectic Approach
9	Section- B History of Evidence Based Practice in Neurological physiotherapy, Clinical Decision Making, importance of Evidence Based Practice, Evidence about Prognosis, experience and diagnosis, locating evidences, challenges and barriers in EBP.
10	Evidences in interventions for Neurological Impairments (Sensory, Motor, Cognitive and Perceptual)
11	Evidences for physiotherapy in Traumatic CNS conditions
12	Evidences in physiotherapy management of Stroke, Cerebellar Ataxia.
13	Evidences in physiotherapy management of Peripheral Nerve Injuries
14	Evidences in physiotherapy management of Parkinson’s Disease

15	Evidences in physiotherapy management of Myopathies, Neuropathies and NMJ Disorders
16	Sports training in Neurological Physiotherapy. Tele rehabilitation in Neurological Physiotherapy
S. N O	CONTENTS:
1.	Basics of cardiac, pulmonary and vascular system: Anatomy, physiology, biomechanics, pathomechanics & applied anatomy related to Cardiovascular & Pulmonary Systems for Adult and paediatrics, neonates, Age related changes in Cardiovascular & Pulmonary System; Physiology of microcirculation and edema; Body positioning and Musculo skeletal chest wall abnormalities; cardio Respiratory Pharmacology; Respiratory muscle physiology, fatigue and training; Breathing mechanism in normal and disease. Embryology of cardiopulmonary system and difference between adult and paediatric cardiopulmonary system.
2	Detailed assessment of cardio- vascular and pulmonary symptoms Subjective & objective assessment: dyspnoea, cough, sputum production, haemoptysis, clubbing, cyanosis, chest pain, Syncope, fever, night sweating, headaches, altered sensorium, personality changes, snoring. . Orthopnoea, hematemesis, swelling, skin changes, oedema, weight loss etc.
3	Vital signs assessment 1. Obtaining vital signs, clinical impressions 2. General clinical presentation 3. Temperature 4. Pulse including the peripheral pulses 5. Blood pressure 6. Respiratory rate
4	Fundamentals of physical examination with diagnosis in cardiovascular and respiratory physiotherapy History of past present illness any surgical history 1. Examination of head and neck 2. Lung topography – thoracic cage landmarks

	<p>3. Examination of Thorax/ pulmonary system</p> <p>4. Examination of Precordium/cardiac system</p> <p>5. Examination of Abdomen</p> <p>6. Examination of Extremities.</p>
5	Assessment of neonatal and paediatrics patients – new born, critically ill infants, older infants and child
6	Comprehensive geriatric assessment – age related sensory deficits, cardio-respiratory deficits and diagnostic tests, standard scales and questionnaires Used in geriatric assessment.
7	Nutritional assessment of patients with cardio- respiratory diseases
8	Fitness assessment <ol style="list-style-type: none"> 1. Anthropometric and biophysical measurement and body composition 2. Flexibility tests and standards 3. Muscle strength and standard 4. Endurance tests and standards 5. Agility tests and coordination tests
9	Exercise testing and standardization and interpretation <ol style="list-style-type: none"> 1. TMT protocols- Maximal and submaximal protocols 2. Field protocols 3. Bicycle protocols 4. Step test protocols 5. 6, 9 and 12 minute walk tests 6. Protocols for paediatric and geriatric population 7. Arm ergometry 8. Non exercises estimation 9. Environmental & ergonomic assessment in cardio vascular & pulmonary disorder
10	Investigation and their interpretation and clinical relevance in cardio- pulmonary physiotherapy <ol style="list-style-type: none"> I. Clinical laboratory studies – haematology, microbiology, urine analysis, histology, pathology II. Pulmonary function tests – normal values, dlco/playthsmography. <ol style="list-style-type: none"> a. Spirometry, arterial blood gas analysis and its interpretation in cardio – respiratory physiotherapy, capnography and pulse oximetry and its relevance in cardio- pulmonary physiotherapy

III Clinical application of chest radiograph – chest x-ray, examination, views; computed tomography, magnetic resonance imaging, lung scans - PET scan.
 Evaluation of chest radiography – clinical and radiographic findings in cardio-pulmonary disorders and its relevance cardio-pulmonary physiotherapy

IV. Laboratory and bedside interpretation of ECG findings – interpretation of normal and abnormal ECGs and its importance in cardio-respiratory physiotherapy and various ECG patterns in cardiac and lung disease
 echo cardiograph findings and its assessment related to physiotherapy

V. Cardio respiratory monitoring in critically ill patients including patients with artificial airways

1. Ventilator assessment and evaluation of oxygenation in ICU
2. Assessment of cardiac output in ICU
3. Assessment of haemodynamic pressures in ICU
4. Clinical diagnosis in cardio- respiratory disorders in intensive care.
5. urine input output in critically ill patient
6. invasive monitoring

VI. Blood flow studies-arteriography, venography, Color Doppler, ANS testing and interpretation used in cardio- respiratory physiotherapy and edema
 Evaluation and interpretation.

VII. Cardio respiratory assessment and diagnosis of patient on mechanical ventilator and interpretation of graphical forms, weaning modes and indices

VIII. Risk factor stratification, disability evaluation with reference to cardio vascular and pulmonary disorders

IX. Psychological evaluation with reference to stress and anxiety in cardio-pulmonary disorders, Evaluation of stress and anxiety using various scales and questionnaires

X. Outcome measures used in Cardio – vascular and pulmonary physiotherapy

XI.. Cardio-pulmonary Exercise Testing, VO₂ max, METs – its importance in calculating energy expenditure and physical activities

XII. calculating energy expenditure using calorimetry method, various formulae and equations with emphasis on its importance in prescribing exercise in various patient population

XIII. Evaluation and diagnosis of sleep and breathing disorders.

International classification models of assessment in cardio vascular and pulmonary disorders

TEXT BOOKS:

1. Quinn F, Hough A. Physiotherapy in respiratory care. Nelson Thornes Ltd., 2001.
2. Frownfelter D, Dean E. Principles and practice of cardiopulmonary Physical Therapy. 3rd ed. Mosby, 1996.
3. Pollock.M.L, Schmidt D.H. Heart disease and rehabilitation. Human Kinetics, 1995.
4. Cash J. E, Downie P. A, Jackson S. E. Cash's textbook of Chest, Heart and Vascular disorders. Mosby, 1987.

REFERENCES:

1. Irwin S, Tecklin J.S. Cardiopulmonary Physical Therapy: a guide to practice. 4th ed. Mosby, 2004.
2. Pryor. J.A. Prasad S.A. Physiotherapy for respiratory and cardiac problems. 4th ed. Elsevier Health, 2013.

PAPER-VI- ELECTIVE: Cardio-vascular and pulmonary physiotherapy

S.NO	TOPIC
1.	<p>A. Principles of exercise prescription and exercise program adherence.</p> <ol style="list-style-type: none"> 1. Components of physical fitness and Basic principles of exercise program design. 2. The art of science of exercise prescription in various patient population 3. Bioenergetics of exercise and training 4. Warm ups, stretching and cool down and its importance 5. Exercise program adherence and factors affecting exercise adherence. 6. Different forms of training methods. <p>B</p> <ol style="list-style-type: none"> 1. Designing cardio-respiratory exercise programs for cardiac and pulmonary patients, geriatric and general population. Essentials of a C.R. exercise work-Out, Aerobic training. Methods and modes, personalized programs. 2. Designing Resistance exercise programs. <ul style="list-style-type: none"> · Types of resistance training and developing respiratory exercise program including calisthenics. · Resistance exercise program for children and older adults.

	<p>3. Designing flexibility and stretching programs.</p> <p>4. Designing weight management (weight loss and weight gain) and Body composition programs.</p> <p>5. Application of exercise prescription principles in various cardio-pulmonary disorders including edema management.</p> <p>6. Designing and prescribing various energy conservation strategies & assisted device</p> <p>7. Environmental vocational counselling in cardio vascular and pulmonary conditions</p>
	<p>C</p> <p>1. Nutrition and cardio-vascular and pulmonary diseases including diabetic population- Role of carbohydrates, proteins, fats, vitamins in health and disease.</p> <p>2. Diet prescription in diabetic, hypertensive, cardio-metabolic syndromes, and obesity and cancer patients according to calorie expenditure.</p> <p>3. Exercise prescription/ physical activity in a high risk cardiac patient including L.V Dysfunction, chronic heart failure, and myocardial ischemia. Critical care neuropathies, chronic renal and liver diseases.</p> <p>4. Exercise prescription in prevention of CAD, obesity, renal dysfunction, diabetes mellitus, hypertension.</p>
2	<p>Cardio-Vascular Disorders –Assessment and Physiotherapy Management Including Cardiac Surgeries- Pre Operative & Post –Operative Exercise Prescription In:</p> <ul style="list-style-type: none"> · Myocardial infarction · Acquired heart conditions · Hypertension, hypotension · Rheumatic fever, rheumatic heart disease and non- rheumatic valvular diseases. · Diseases of myocardium ,pericardial diseases, cardiomyopathies · Tumours of heart . Pericarditis. · Athlete heart · Congestive cardiac failure · Cardiac arrhythmias

	<ul style="list-style-type: none"> · Congenital heart diseases · Cardiac transplantation . Ischemic Heart Disease. . Cardiac arrest. <p>Role of Physiotherapy in Surgical Conditions</p> <p>CARDIO THORACIC SURGERY</p> <p>Open heart surgery (OHS)</p> <p>Closed heart surgery (CHS)</p> <p>Angioplasty</p> <p>CABG</p> <p>PTCA</p> <p>Valve replacement & valvotomy</p> <p>Heart transplantation</p> <p>Pace maker</p> <p>Other procedures like paediatric and new born palliative and corrective surgeries</p> <p>Transplant surgeries</p>
3	<p>Pulmonary Disorders –Assessment and Physiotherapy Management Including Pulmonary Surgeries- Pre Operative & Post –Operative Exercise Prescription In:</p> <p>Obstructive Lung disorders: COPD, Asthma, Cystic Fibrosis, Immunological Deficits; Adult COPD- Causes, pathomechanics, presentation, evaluation and investigations.</p> <p>Restrictive Lung disorders: Causes, Pathomechanics, Presentation, Evaluation, Investigation; Tumours of Lung and Chest, Pulmonary Embolism, Interstitial Lung Diseases, Disorders of Pleura; Industrial Lung Disorders. Infective Lung Diseases.</p> <ul style="list-style-type: none"> · Infective lung diseases · Occupational lung diseases · Lung cancer · Chest wall deformities and spinal cord injury · Diaphragmatic diseases

	<ul style="list-style-type: none"> · Sleep apnea/ hyperventilation syndrome · Respiratory disorders in children, cystic fibrosis · COVID-19. <p>Lobectomy</p> <p>Pneumonectomy</p> <p>Segmentectomy</p> <p>Pleuro-pneumonectomy</p> <p>Thoracoplasty</p> <p>Decortication</p> <p>And other surgeries like transplant , bronchoscopies,</p>
4	<p>Vascular Disorders –Assessment and Physiotherapy Management Including Vascular Surgeries- Pre Operative & Post –Operative Exercise Prescription In:</p> <p>Arterial insufficiency, Arteriosclerosis Obliterans, Venous insufficiency, Thromboangitis Obliterans (Burger’s Disease), Raynaud’s’ Disease, Aneurysm, Thrombophlebitis, Deep Vein Thrombosis (DVT), Varicose Veins. PABG, Vascular ulcers and related surgeries and assessment.</p>
5	<p>Basics of therapeutic gases: Manufacture, storage and delivery. - Chemical and physical properties of therapeutic gases, Transportation system, Storage and medical distribution of medical gases, Regulators, Medical gas cylinder, Safety index connection system.</p> <p>Therapeutic gases: Management and administration - Indications for oxygen therapy, Limitations of supplemental oxygen, Complications, dosage regulation and administration devices, Monitoring the physiologic effects of oxygen</p> <p>Humidity and Aerosol therapy: Humidity, Devices used for humidification and aerosol, Aerosol delivery during invasive and non-invasive mechanical ventilation.</p>
6	<p>ICU MANAGEMENT ;</p> <p>Role of physiotherapist in ICU.</p> <p>Evaluation, Monitoring and Principles of chest physiotherapy in I.C.U., I.C.C.U along with effect on cardiopulmonary system.</p>

	<p>ICU Equipment's- Airways And It's intubation Extubation, Suctioning IABP, Pulse oximeter, nebulizers, humidifiers, O₂ therapy and Medical gas therapy, aerosol therapy (Indications, Contraindications, Hazards, Techniques/Methods, Types Etc..)</p> <p>Body positioning: art and its physiological importance in general and in ICU physiotherapy for acute and chronic neurological, metabolic and medical disorders.</p>
7	<ol style="list-style-type: none"> 1. Airway clearance and lung expansion therapy: Postural Drainage, ACBT, Autogenic Drainage, Cuffing Techniques. Assisted coughing technique manual & mechanical. 2. Normal mechanism of mucociliary transport, Airway clearance, Sputum collection, Lung expansion therapy. 3. Common emergency conditions in cardio-respiratory system in adults and children and ethical issues in intensive care 4. Management of Paediatric and geriatric Cardiac and pulmonary disorders. 5. Cardio-pulmonary problems and complications in various neuromuscular disorders, facilitatory and inhibitory techniques and PNF techniques in various pulmonary disorders, manual techniques for various pulmonary disorders. 6. Physical agents used in various cardio-vascular and respiratory disorders 7. Cardio-vascular and pulmonary pharmacology- Indications, contraindications and effects and pharmacological management in cardiac and pulmonary Disorders. 8. Stress, Importance of exercise in stress management and various stress coping strategies, relaxation techniques including yogic postures and yogic breathing in various lifestyle disorders and other cardio-vascular and pulmonary conditions. 9. Importance of Patient education and counselling in various cardio-vascular and pulmonary disorders in cardio- respiratory conditions, CBR in cardio vascular and respiratory conditions. 10. Role of Tele-rehabilitation in cardiac and pulmonary disorders 11. Clinical decision making in Cardiovascular and pulmonary physiotherapy.
8	<p>Mechanical ventilation: Classification and principles of operation - Basic concepts, Understanding ventilator technology, Taxonomy of mechanical ventilation, Comparing modes of mechanical ventilation, Indication and complications of mechanical ventilation, Ventilator settings, Monitoring the</p>

	<p>mechanical ventilated patients, Choosing ventilator settings for different forms of respiratory failure.</p> <p>Various technique used by physiotherapist on ventilators.</p> <p>Non-invasive Mechanical Ventilation and CPAP: Non-invasive positive pressure ventilation, CPAP, Negative pressure ventilation. Rocking beds, pneumobelts.</p>
9	<p>Neonatal and paediatric respiratory care: Oxygen therapy, Mechanical ventilation, Nasal continuous positive airway pressure, Non-invasive positive pressure ventilation, Conventional infant and paediatric ventilation, High frequency ventilation ,Adjuncts to neonatal and paediatric mechanical ventilation.</p> <p>Positioning during ventilations, modes of o2 therapy in Neonates, haemodynamic monitoring in paediatric and neonates, reflex assessment in ICU, early intervention</p>
10	<p>Extracorporeal life support for respiratory failure: ECMO basics, Indication and contraindication, Complication, Utilization and outcomes.</p>
11	<p>CHRONIC LUNG DISORDERS</p> <p>9.1 Exercise Rehabilitation for Chronic Lung disorders.</p> <p>9.2 Recent advances in physiotherapy treatment for Chronic Lung disorders</p>
12	<p>OBESITY</p> <p>11.1 Obesity Management with exercise.</p> <p>11.2 Complications of obesity with its management.</p> <p>11.3 Recent advances in Physiotherapy treatment of obesity.</p>
13	<p>Disaster management: History, The threat, planning for mass casualty respiratory failure, Personal protective equipment, Ventilator mass casualty respiratory failure</p>
14	<p>Patient safety: Patient safety, Safety initiatives and respiratory care applications, Management and medical information.</p>
15	<p>Diabetes And Metabolic Syndrome Related Disorders</p> <p>15.1 Exercise Rehabilitation for diabetics and related complications.</p> <p>15.2 Electrotherapy intervention for diabetics and related complications.</p> <p>15.3 Recent advances in physiotherapy treatment for diabetics & related complications.</p>

TEXT BOOKS:

1. Quinn F, Hough A. Physiotherapy in respiratory care. Nelson Thornes Ltd., 2001.

2. Frownfelter D, Dean E. Principles and practice of cardiopulmonary Physical Therapy. 3rd ed. Mosby, 1996.
3. Pollock.M.L, Schmidt D.H. Heart disease and rehabilitation. Human Kinetics, 1995.
4. Cash J. E, Downie P. A, Jackson S. E. Cash's textbook of Chest, Heart and Vascular disorders. Mosby, 1987.

REFERENCES:

1. Irwin S, Tecklin J.S. Cardiopulmonary Physical Therapy: a guide to practice. 4th ed. Mosby, 2004.
2. Pryor. J.A. Prasad S.A. Physiotherapy for respiratory and cardiac problems. 4th ed. Elsevier Health, 2013.

PAPER-VII-Recent advances and Evidence Based Practice in Cardio-vascular and pulmonary physiotherapy

S.NO	CONTENT
1	Section-A GENERAL: <ul style="list-style-type: none"> · Optimizing treatment prescription: relating treatment to the underlying pathophysiology of cardio-vascular and pulmonary disorders- an evidence based practice · Documentation of the data, Report writing –prescription of exercises · Importance of creating awareness in community, Patient education and psychological counselling in various cardio-vascular and pulmonary disorders- evidence based practice · Recent advancement in Cardio- pulmonary resuscitation (basic and advanced)
2	Bronchial hygiene- Physiological basis and clinical application, evidence based practice and recent advances of airway clearance techniques, including Facilitating airway clearance with coughing techniques.
3	Care of a dying patient. – Ethical issues and recent guidelines
4	Cardiopulmonary training in various patient populations. Athletes, Geriatric and paediatric population

	Medical gas therapy including oxygen therapy: physiological basis, modes of administration, and home delivery care- an evidence based practice and Recent advances including hyperbaric oxygen therapy.
5	Aerosol therapy- An Evidence based practice in chest physiotherapy.
6	Section-B Recent advances and evidence based practice in Exercise testing, planning, principles of exercise prescription and PT management in cardio- vascular and pulmonary conditions.
7	Recent advances and evidence base practice in cardio-respiratory Physiotherapy and exercise prescription in special populations like cancer, renal conditions, burns, abdominal surgeries, Neurological patients and Diabetic mellitus patients. Liver diseases.
8	Recent advances in the use of physical agents and PT management in wounds, ulcers, grafts and incisions and vascular disorders.
9	Evidence based practice of core muscle strengthening, resistance training, endurance training, and other training methods in cardiac and pulmonary rehabilitation
10	Pilates- school of thought for cardiopulmonary conditions.
11	Physiotherapy management in oncology- Evidence based practice and recent advances.
12	Recent advances and evidence based practice in Respiratory physiotherapy training techniques and respiratory physiotherapy devices.
13	Evidence based practice and recent advances in improving Cardio-respiratory fitness training in all populations including general, paediatric and geriatric population.
14	Evidence based practice and Recent guidelines in cardiac rehabilitation and pulmonary rehabilitation

	Role of exercise and quality of life and cardio-pulmonary rehabilitation, health status measurements and recent advances
15	Use of advance Assistive devices like Robot therapy, continuous lateral rotation therapy, intrapulmonary percussive ventilator and technologies in Cardiovascular and pulmonary system.
16	Evidence based practice and recent advances of Aquatic therapy in Cardiovascular conditions like diabetes, PVD, hypertension etc.
17	Recent advances and evidence based practice of other Techniques like yoga, pranayama, tai chi, thoracic manipulation and mobilisation in treating respiratory disorders Various community based rehabilitation strategies by government of India and Gujarat for population suffering from cardio pulmonary disorders.

TEXT BOOKS:

1. Quinn F, Hough A. Physiotherapy in respiratory care. Nelson Thornes Ltd., 2001.
2. Frownfelter D, Dean E. Principles and practice of cardiopulmonary Physical Therapy. 3rd ed. Mosby, 1996.
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Paper- 3. Clinical, Physical and Functional Diagnosis in Community Based Rehabilitation.

Course Objectives:

1. To provide a deeper understanding of the anatomy and function of various body systems.
2. To enhance knowledge about the pathologies and clinical features of various conditions.
3. To teach principles of assessment related to various conditions in a community set up.

S.NO	CONTENT
1	Community based assessment of various paediatric, musculo-skeletal, OBG, neurological, cardio-respiratory conditions
2	Outcome measures used in community physical therapy
3	Clinical decision making in rehabilitation. Public health education methods and appropriate media, Public awareness to the various disabilities, communications, message generation and dissipation.
4	Patho-mechanics of posture, movement and gait, Gait analysis and diagnosis
5	Diagnostic imaging (CT, MRI, Ultra sound, bone scan and other Diagnostic imaging for diagnosis of congenital anomalies and normal variants, traumatic injuries, scoliosis).
6	Diagnosis of clinical podiatric musculo-skeletal, OBG, neurological, cardio-respiratory conditions, problem based learning relevant to clinical conditions typically seen in community.
7	Clinical examination in general and detection of movement dysfunction
8	Principles of pathological investigations and imaging techniques related to multi-system disorders with interpretation.
9	Anthropometrics measurements.
10	Physical fitness assessment by a) Range of motion. b) Muscle strength, endurance and skills. c) Body composition. d) Cardiac efficiency tests and Spirometry.

	e) Fitness testing.
11	Persons with Disabilities Act (PWD) 1995 with its latest amendments
12	Lifestyle disorders- Identification & management in the community
13	Disability models, Disability screening ,its various methods & prevention with levels of prevention
14	Health indicators, National Health programs & Family welfare programs
15	District Rehabilitation centre & district level rehabilitation program
16	CBR Matrix & indicators
17	ICF,
18	Modes of delivery of Rehabilitation (IBR & CBR)
19	Legal & ethical issues related to Community Physiotherapy
20	Rural services, extension services & mobile units`
21	Tele-rehabilitation – Need, Methods and standards ,Challenges

TEXT BOOKS:

1. Peat M. Community Based Rehabilitation. Bailliere Tindall, 1997.
2. Nagar S. B. Disability and Community based Rehabilitation. LAP, 2015.
3. Nagar S. B. A concise book of Community based Rehabilitation. Himanshu publications, 2015.
4. Naqvi W. Physiotherapy in community health and Rehabilitation. Jaypee brothers, 2012.

REFERENCES:

1. Rao T. B. Textbook of community medicine and community rehabilitation, Paras.
2. Sunder S. Textbook of Rehabilitation. 3rd ed. JPB, 2010.
3. Devapitchai K. Action plan for Community Based Rehabilitation in India. VDM, 2010.

PAPER-VI Elective- Community Based Rehabilitation

Course Objectives:

1. To provide a deeper understanding of the ICF model and problem list related to various conditions.
2. To enhance knowledge about the goal setting for providing physiotherapy in a community set up.
3. To teach various physiotherapy management strategies related to various conditions to be applied in a community set up.

1.	<p>REHABILITATION</p> <p>1.1 Basic Concepts of rehabilitation and foundations of rehabilitation.</p> <p>1.2 Institute based rehabilitation services and multi-disciplinary approach.</p> <p>1.3 Methodology of CBR with reference to National Health Delivery system.</p> <p>1.4 Principles of Community Based Rehabilitation.</p> <p>1.5 Role of National Institutes, District Rehabilitation Centre and Primary Health Centre.</p> <p>1.6 Public awareness to the various disabilities. Communications. Message generation and Dissipation.</p> <p>1.7 Persons with disability; Act – 1995 and related Government infrastructure.</p> <p>1.8 Role of Government in CBR, inter-sectorial programs and co-ordination.</p> <p>1.9 Implementation of the Act.</p> <p>1.10 Role of Non-Government organizations in CBR.</p> <p>1.11 Scope of community physiotherapy.</p> <p>1.12 Advances in disaster management.</p> <p>1.13 Role of Physiotherapist as a member in Disaster Management team.</p> <p>1.14 Evidence Based Practice in Community Rehabilitation.</p> <p>1.15 Psycho somatic Disorders.</p>
2.	<p>DIABETES AND RELATED DISORDERS</p> <p>2.1 Exercise Rehabilitation for diabetics and related complications.</p> <p>2.2 Electrotherapy intervention for diabetics and related complications.</p> <p>2.3 Recent advances in physiotherapy treatment for diabetics & related complications.</p>
3.	<p>CHRONIC LUNG DISORDERS</p> <p>3.1 Exercise Rehabilitation for Chronic Lung disorders.</p> <p>3.2 Recent advances in physiotherapy treatment for Chronic Lung disorders.</p>

4	<p>HYPERTENSION & HEART DISEASES</p> <p>4.1 Exercise prescription for hypertensive patients.</p> <p>4.2 Exercise prescription for Chronic Heart Diseases.</p> <p>4.3 Recent advances in Physiotherapeutics of Hypertension & Chronic Heart Diseases</p>
5.	<p>OBESITY</p> <p>5.1 Obesity Management with exercise.</p> <p>5.2 Complications of obesity with its management.</p> <p>5.3 Recent advances in Physiotherapy treatment of obesity.</p>
6.	<p>STROKE & SPINAL CORD INJURY</p> <p>6.1 Exercise regimen for Stroke patient with recent advances.</p> <p>6.2 Exercise regimen for Spinal Cord injury patient with recent advances.</p>
7.	<p>HIV/ AIDS & CANCER</p> <p>7.1 Exercise program for HIV/ AIDS patient with its complications.</p> <p>7.2 Exercise program for cancer patients with its complications</p> <p>7.3 Radical Mastectomy and Its Management</p>
8.	<p>WOMEN'S HEALTH</p> <p>8.1 Physiotherapy for the problems of Adolescence & pubertal age groups.</p> <p>8.2 Physiotherapy for Child bearing age groups: Labour, Caesarean Section, Abortion, Infertility, Puerperium.</p> <p>8.3 Physiotherapy for Climectric & Menopausal Age group: Prolapsed uterus,</p> <p>8.4 Hysterectomy, Osteoporosis, Obesity.</p> <p>8.5 Physiotherapy in Urinary Incontinence.</p> <p>8.6 Common Gynaecological Surgeries and its management.</p> <p>8.7 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</p>

9.	<p>GERIATRICS AND RELATED DISORDERS</p> <p>9.1 Exercise prescription for the elderly: ROM exercise, Stretching, Strengthening, Aerobics, Gait training, Orthotics, Electrotherapeutic Modalities, Cawthorne Cooksey.</p> <p>9.2 Exercises for dizziness, Brandt-daroff exercises, Canalith Repositioning Treatment, Liberatory Manoeuvre.</p> <p>9.3 Physiotherapy management of Osteoporosis in the elderly: weight bearing exercises – Exercise using own bodyweight.</p> <p>9.4 Falls rehabilitation in elderly: Causes of fall, Falls assessment, Rehabilitation, Education of Patients, fall prevention.</p> <p>9.5 Yoga for the aged: Balkasana, Makarasana, Setubandhasana, Sarpasana, Samarpanasana, Sukhasana, The chair pose, Dandasana.</p> <p>9.6 Psychosocial and safety issues in elderly.</p>
10.	<p>FITNESS</p> <p>10.1 Physical Activity for Health & Fitness.</p> <p>10.2 Principles of fitness training for health promotion in community.</p>
11.	<p>INDUSTRIAL HEALTH</p> <p>11.1 Returning the worker to Productivity, Acute care and functional treatment, Functional capacity assessment, Working conditioning and work hardening, Flexibility, Mobility, Strength & Aerobic conditioning, Job Simulation, Education of worker for Maximum productivity, Rehabilitation of worker from Psychosocial perspective, Vocational Rehabilitation, on-site therapy, Assessing Physical Impairment.</p> <p>11.2 Management of Industrial Therapy, Regulations and regulatory agencies, Ensuring & monitoring client safety, Economic Considerations of Industrial Therapy, Transition to Industrial therapy, Legal Issues in Industrial therapy, Marketing Industrial Therapy Services.</p>

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3. Devapitchai K. Action plan for Community Based Rehabilitation in India. VDM, 2010.

PAPER-VI RECENT ADVANCES IN CBR

S.NO	CONTENT
1	Recent trends in community based Paediatric and Geriatric Rehabilitation.
2	Recent trends in community based Neuro Rehabilitation.
3	Recent trends in community based Orthopaedic Rehabilitation.
4	Recent trends in Women's health in community.
5	Recent trends in community based cardiopulmonary rehabilitation; palliative care.
6	Recent advances in Industrial Health & ergonomics.

TEXT BOOKS:

5. Peat M. Community Based Rehabilitation. Bailliere Tindall, 1997.
6. Nagar S. B. Disability and Community based Rehabilitation. LAP, 2015.
7. Nagar S. B. A concise book of Community based Rehabilitation. Himanshu publications, 2015.
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5. Sunder S. Textbook of Rehabilitation. 3rd ed. JPB, 2010.
6. Devapitchai K. Action plan for Community Based Rehabilitation in India. VDM, 2010.

DISSERTATION:

Every candidate shall submit the prescribed proforma, a synopsis containing particulars of proposed dissertation work within 4 months from the date of commencement of the course on or before the dates notified by the university. The synopsis shall be sent through the proper channel (Duly approved by the guide, HOD, Principal and Ethical committee with in the first year) such synopsis will be reviewed and the university will register the dissertation topic. 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. 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 in Second year. Any change in the dissertation Topic or guide should be informed to the authorities of this university for its approval.

The dissertation should be written under the following headings.

1. Introduction
2. Aims or objectives of study
3. Review of literature
4. Material and methods
5. Results
6. Discussion
7. Conclusion
8. Summary
9. References
10. Tables
11. Annexure.

The printed text of dissertation should not be less than 50 pages/2500 words and shall not exceed 75 pages excluding references, tables, questionnaires and other annexure. It should be neatly typed in double line spacing (Font 12, Times New Roman) on one side of paper (A4 Size, 8.27" X 11.69") and Hard bound properly (No Spiral binding). Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), three months before final examination on or before the dates notified by the university duly certified by the guide, head of the department and head of the institution.

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.. 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.