

Pravara Institute of Medical Sciences (Deemed University)
All India Ph. D Entrance Test
PIMS- AIPET
Syllabus For: Orthopedic Physiotherapy I -Paper II

(Musculo-skeletal Dysfunctions of the Upper Quadrant)

(Upper Quadrant includes occiput, cervical spine, thoracic spine, shoulder girdle and upper extremities)

1. Anatomical, Physiological and Biomechanical basis for assessment of movement dysfunctions of the upper quadrant
2. Pathophysiological and Pathomechanical basis for management of movement dysfunctions of the upper quadrant
3. Clinical decision making skills in evaluation & management of all pediatric, adult and geriatric dysfunctions of the upper quadrant
4. Advances in functional diagnostic procedures & various outcome measures relevant to musculo-skeletal dysfunctions of the upper quadrant
5. Pathobiological mechanisms of pain; Recent advances in pain evaluation and management
6. Advances in the field of Manual Therapy (joint manipulation, MFR, MET, Neural mobilization – cyriax, maitland, butler, mckenzie, kaltenborn, mulligan)
7. Principles of musculo-skeletal health and performance related fitness and Physiotherapeutic management of musculo-skeletal injuries & dysfunctions in various sports
8. Principles of assessment of industrial fitness and assessment & management of musculoskeletal dysfunctions related to various industries.
9. Ergonomics in Musculo-skeletal dysfunction of the upper quadrant
10. Assistive technology used for stability and mobility to enhance function.
11. Evidence based practice to formulate effective assessment and treatment program
12. Evaluation of disability
13. Legislation and social care.
14. Assessment, clinical reasoning and management of Integumentary impairments due to musculoskeletal dysfunction

15. Pharmacotherapeutics in musculoskeletal conditions and its relevance in physiotherapy
16. Clinical decisions for lower quadrant function in presence of upper quadrant dysfunction.

(Musculo-skeletal Dysfunctions of the Lower Quadrant)

(Lower Quadrant includes lumbar spine, sacrum, pelvis and lower extremities)

1. Anatomical, Physiological and biomechanical basis for assessment of movement dysfunctions of the lower quadrant
2. Pathophysiological and Pathomechanical basis for management of movement dysfunctions of the lower quadrant
3. Clinical decision making skills in evaluation & management of all pediatric, adult and geriatric dysfunctions of of the lower quadrant
4. Advances in functional diagnostic procedures & various outcome measures relevant to musculo-skeletal dysfunctions of the lower quadrant
5. Pathobiological mechanisms of pain; Recent advances in pain evaluation and management
6. Advances in the field of Manual Therapy
7. Principles of musculo-skeletal health and performance related fitness and Physiotherapeutic management of musculo-skeletal injuries & dysfunctions in various sports
8. Principles of assessment of industrial fitness and assessment & management of musculoskeletal dysfunctions related to various industries.
9. Ergonomics in Musculo-skeletal dysfunction of the lower quadrant
10. Assistive technology used for stability and mobility to enhance function.
11. Assistive technology used for stability and mobility to enhance function.
12. Evidence based practice to formulate effective assessment and treatment program
13. Evaluation of disability
14. Legislation and social care.
15. Assessment and management of Integumentary impairments due to musculoskeletal dysfunction.
16. Orthopaedic implants, design, material. External aids, appliances, adaptive self help devices

17. Clinical decisions for upper quadrant function in presence of lower quadrant dysfunction

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Syllabus For: Neuro Physiotherapy -Paper II

This paper will focus on advances in theory and practices in adult neurological conditions

1. Neurodevelopmental and neurophysiological approaches in Adult neurological condition.
Neuro-anatomy and neurophysiology-
 - Development of nervous system, Peripheral nerves and ganglia, receptors and effectors, dermatomes and muscular activity, CNS an overview, spinal cord, brainstem.
 - Blood supply of the brain
 - Meninges, cerebrospinal fluid and Fluid compartments and fluid balance in the CNS
 - Autonomic nervous system
 - Reflex maturation- Neurophysiologic basis
 - Normal sequential physiological changes throughout the developmental age
 - Physiology of pain: Models of pain, Basic molecular biology, neurobiology, stress biology and pain, Peripheral and central pain mechanisms, theory of modulation of pain.
2. Basic and Advance skills in assessment of adult neuro-pathological, neuropsychological and neurosurgical conditions
3. Various outcome measures and assessment methods used in adult neurological condition
4. **Brain diseases and disorders-** Definitions, Causes, Clinical features, Pathophysiology & General Investigation
5. **Physiotherapy in cranial nerve disorders:-** Bell's Palsy, Trigeminal Neuralgia, Facial nerve Palsy, Glossopharyngeal Nerve Injury, Vestibular system dysfunction and other Cranial Nerve Disorders
6. **Spinal cord injury/diseases (Traumatic / non Traumatic- Infective, Degenerative & Demyelinating, Tumor**
7. **Peripheral nerve injury(Traumatic/non Traumatic)**
8. **Muscle disorders-** Myotonic disorders, progressing muscular dystrophy, Duchenne muscular dystrophy, Becker muscular dystrophy, Limb-girdle muscular dystrophy, Spinal muscular atrophy,
9. **Neuromuscular disorders-** Myasthenia gravis, Lambert-Eaton syndrome,

10. **Autonomic nervous system disorders**-Acute Autonomic Paralysis, Primary Autonomic Failure, Peripheral Neuropathy with Secondary Orthostatic Hypotension, Autonomic Failure, Horner and Stellate Ganglion Syndromes, Sympathetic and parasympathetic paralysis in tetraplegia and paraplegia
11. **Psychosomatic disorders**:- Anxiety disorder, Mood disorder, Psychotic, Personality, Sleeping, Eating Disorder, Drug addiction, Identity disorder, Memory and cognitive disorder
12. Advanced Neuro-therapeutic skills for management
13. Evaluation, Assessment and Acute/long term goals for Physiotherapy management in neurological conditions
14. Role of Physiotherapy in progressive neurological conditions, management of terminally ill patient.
15. Clinical decision making and evidence based practice to formulate effective assessment and treatment program
16. Pharmacotherapeutics in neurological conditions and its relevance in physiotherapy
17. **Recent Advances/ techniques in Physiotherapy**
18. **Recent Advances in Neuro-surgeries and role of physiotherapy in neurological conditions**
19. **Orthoses used in neurological conditions** :-Material used, Assessment, Prescription of Splints and Braces, Orthosis for Upper limb and lower limb
20. ICU management of a neurologically ill patient.
21. **Neuro- Rehabilitation**:-Introduction, team, Equipments, phases, exercise testing, exercise prescription and Exercise interventions in neurological conditions.

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Syllabus For: Cardio Respiratory Physiotherapy -Paper II

1. Structural, functional and Biomechanical basis for assessment and management of dysfunctions of the respiratory system and thorax throughout the life span.

Assessment and Physiotherapy Management in Obstructive diseases: Chronic obstructive pulmonary disease, chronic Bronchitis, Emphysema, Asthma, Bronchiectasis, Cystic fibrosis.

Assessment and Physiotherapy Management in Restrictive diseases: Pleural disorders, Pneumonia, lung abscess, Empyema, Pulmonary tuberculosis.

Assessment, Acute and long term Physiotherapy management in acute chest trauma, pulmonary fibrosis, atelectasis, interstitial lung disease, Guillain Barre syndrome, pulmonary embolism, acute respiratory distress syndrome, ventilator associated Pneumonia, respiratory failure, organophosphorous poisoning.

2. Clinical reasoning in physiotherapeutic evaluation & management of all neonatal ,pediatric, adult and geriatric dysfunctions of the respiratory system and thorax in acute care and in rehabilitation
3. Advances in functional diagnostic procedures & various outcome measures relevant to assess intervention to dysfunctions of thorax and respiratory system.
4. Interpretation and application of Investigations related to Respiratory and thoracic dysfunction and its relevance to physiotherapy
5. Evidence based practice in management of Respiratory & Thoracic impairments & dysfunction.
6. Pulmonary rehabilitation: Introduction, team, equipments, phases, exercise interventions, exercise testing and exercise prescription in respiratory conditions
7. Ergonomics and energy conservation in Respiratory dysfunction and use of assistive devices to enhance function and performance.
8. Pathology of pain in medical and Post-surgical conditions related to thoracorespiratory dysfunction and advances in its evaluation and management
9. Pulmonary Surgery: Classification of Pulmonary surgeries, Complications and Role of Physiotherapy in Pulmonary Surgeries.
10. Surgical investigations: Microbiological investigations, Pathological investigations, Radiological investigations, recent advances in pulmonary surgical investigations

11. Clinical decision making and evidence based practice in physiotherapeutic evaluation & management of all medical , surgical and traumatic disorders across the life span in a critical care (ICU) setting
12. Respiratory Physiotherapy in intensive Care Unit: Mechanical Ventilation, initiation of Mechanical ventilation, modes of mechanical ventilation, complications during mechanical ventilation, monitoring during mechanical ventilation, weaning criteria, post-extubation care, lung recruitment maneuvers, non invasive mechanical ventilation, oxygen therapy, aerosol therapy and nebulization, bronchial hygiene techniques, humidification, suctioning methods .
13. Principles of health and performance, Risk stratification, Prevention and health promotion
14. Pharmacotherapeutics in respiratory condition and its relevance with physiotherapy
15. Structural and functional and Biomechanical basis for assessment and management of dysfunctions of the circulatory system including peripheral vessels and mediastinum throughout the life span.
16. Clinical decision making skills in physiotherapeutic evaluation & management of all neonatal ,pediatric, adult and geriatric dysfunctions of the cardiovascular including peripheral vasculature system and mediastinum in acute care and rehabilitation
17. **Physiotherapy and Cardiac Rehabilitation in Cardiac Disorders** : Myocardial Infarction, Congestive Cardiac failure, Ischemic heart disease, Physiotherapy after cardiac surgery, Physiotherapy after angioplasty.
18. **Exercise testing and prescription in clinical population other than cardiac disease:** Exercise testing and prescription in Hypertension, Diabetes mellitus, Cancer, Dyslipidemia, Metabolic syndrome.
19. Advances in functional diagnostic procedures & various outcome measures relevant to assess intervention to dysfunctions of cardiovascular and peripheral vascular system.
20. Evidence based practice in assessment and management of cardiovascular and peripheral vascular dysfunction and failure
21. Ergonomics and energy conservation in cardiovascular dysfunction and use of assistive devices to enhance function and performance.
22. Classification of surgeries, Complications of surgeries and role of Physiotherapy in Cardiac Surgeries
23. Post-surgical intensive care: Overview, Patient's Monitoring, Airway clearance , Prevention of complications & Physiotherapy Management in Cardiac Intensive Care Unit.

24. Management of the critically ill: knowledge of Airways -types & management Mechanical ventilator, use of Oxygen therapy; Physiotherapeutic Interventions in intensive care, weaning and ICU monitoring
25. Physiotherapy in Peripheral vascular Disorders: Peripheral arterial diseases, venous disorders, lymphatic diseases.
26. Life style modification for Cardiac Patients: Teaching patient to monitor heart rate, for unsupervised exercise, incorporation of physical activity in daily schedule, methods to motivate for regular physical activity.
27. Interpretation and application of Investigations related to Respiratory, cardiac and thoracic dysfunction and its relevance to physiotherapy.
28. Pharmacotherapeutics in cardiac condition and its relevance with physiotherapy.
29. Clinical decision-making skills in physiotherapeutic evaluation & management of Lifestyle disorders.
30. Cardio-Respiratory fitness testing and training in sports and diseases
31. Cardiopulmonary Resuscitation: Chest Compression, Airway, Breathing, BLS for adults and pediatric age group, ACLS, Post Resuscitation care.
32. Clinical reasoning, assessment and management of Integumentary and other system impairments due to cardiovascular and respiratory diseases.

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Syllabus For: Pediatric Physiotherapy -Paper II

1. **Physiotherapy in Obstructive diseases:** Emphysema, bronchial Asthma, Bronchiectasis, Cystic fibrosis, Inhaled foreign tracheal esophageal fistula.
2. **Physiotherapy in Restrictive diseases :** Pneumonia, Lung abscess, Empyema, Pulmonary Tuberculosis, acute respiratory distress syndrome.
3. **Respiratory Physiotherapy In NICU and PICU-** Meconium aspiration syndrome, respiratory distress syndrome, Pulmonary fibrosis, Atelectasis, Ventilator Associated Pneumonia , Respiratory failure.
4. **Physiotherapy in cardiac conditions-** Acynotic and cyanotic heart diseases, Rheumatic heart diseases, cardiac arrhythmia and pericarditis, cardiac failure.
5. **Pulmonary and cardiac surgeries-** Pneumonectomy, Lobectomy, Pleural tapping, Intercostal drainage, Heart transplantation, Pericardiocentesis, valve replacement surgery, congenital heart surgeries.
6. **Congenital disorders and Physiotherapy-** Congenital talipesquinovarus (CTEV), Congenital dislocation or dysplasia of hip, Idiopathic scoliosis, congenital muscular torticollis, arthrogryposis, osteogenesis imperfect,
7. **Infection of bones and joints and Physiotherapy-** Osteomyelitis, Tom smith arthritis, Pyogenic arthritis, Pott's spine
8. **Inflammatory conditions and Physiotherapy-**Juvenile rheumatic arthritis.
9. **Traumatic-**Limb and spinal fracture
10. **Clinical decision making in prosthetic and orthotic prescription in pediatrics**
11. **High risk infants-** Low birth weight, prematurity, spina bifida, seizures disorder.
12. **Physiotherapy in central nervous system and peripheral nervous system-** cerebral palsy, hydrocephalus, Syringomyelia, Facial palsy, Obstructed Erb's palsy..
13. **Physiotherapy in inherited disorders, traumatic injuries, infectious diseases-** Myopathies &Dystrophies, Traumatic brain injury, Spinal cord injury, Meningitis, Encephalitis & GBS.
14. **Neurosurgeries-** Nerve repair and grafting, Neurovascular surgeries, Rhizotomies, Stereotactic surgeries, Surgeries for cerebral palsy, Surgeries for poliomyelitis

15. **Psychological and behavioral disorder-** Learning disabilities, Autism & pervasive disorder, ADHD , Developmental Coordination Disorder, Perception and sensory disorder
16. **Clinical decision making in fitness and exercise prescription for special pediatric population:**Cerebral palsy, Down's syndrome, Polio, Muscular dystrophies, Obesity
17. **Tumors and physiotherapy: physical and functional diagnosis in oncology and palliative care**
18. **Recent advances in pediatric physiotherapy**
19. **Functional assessment**
20. **Introduction of current concept in pediatric science-** Hippotherapy, Kangaroo mother care, Botox and physiotherapy management, stem cell therapy and physiotherapy management,

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Syllabus For: Community Physiotherapy -Paper II

1. Health and Illness; Levels of Healthcare & Fitness
2. Principles and practice of fitness training for health promotion in community
3. Basic Concepts of rehabilitation and foundations of rehabilitation
4. Institute based rehabilitation services and multi-disciplinary approach.
5. Methodology of CBR with reference to National Health Delivery system.
6. Role of National Institutes, District Rehabilitation Centre and Primary Health Centre (with appropriate exposure).
7. Public awareness to the various disabilities. Communications, Message generation and dissipation.
8. National and UN (United Nations) Legislations for persons with disability.
9. Disability detection and early intervention.
10. Appropriate Technology, Assistive devices used for Stability & Mobility to enhance function
11. Home exercise programs for various classifications of disabilities.
12. Physical fitness, stress management through yoga and psychosomatic approaches.
13. Principles and practice of Rehabilitation and outreach services including domiciliary services
14. Role of Government in CBR, inter-sectoral programs and co-ordination. Implementation of the Act.
15. Role of Non-Government organizations in CBR.
16. Community dynamics & scope of community physiotherapy.
17. Physiotherapist as a Master Trainer in CBR.
18. Disaster management team ,Disaster cycle ,Role of physiotherapist in Disaster management ,Advances in Disaster management
19. Evaluation and theories of aging; Assessment of the elderly;

20. Exercise prescription for the elderly; Psychosocial and safety issues in elderly
21. Geriatric Rehabilitation
22. Holistic physiotherapy for the aged.
23. Electrotherapy in geriatric conditions
24. Physiotherapy in maternal and child health care.
25. Women's, Health: Women's reproductive health and health care;
26. Assessment and exercise prescription for antenatal and post- natal females ‘
27. Diagnosis and treatment of musculoskeletal pain and dysfunction during pregnancy
28. Diagnosis and treatment of musculoskeletal pain and dysfunction during post menopause.
29. Treatment of Incontinence and Pelvic floor dysfunction; Special problems related to women
30. Clinical reasoning and recent advances in Electrotherapy in obstetrics and gynecological conditions.
31. Occupational Health, Occupational Hazards, Industrial Hygiene, Vulnerable workers group and labor law;
32. Industrial therapy, Injury prevention and returning the worker to productivity
33. Ergonomics, Principles, Issues related to hand tools, posture, material handling and lifting
34. Prevention of work related Injuries and redesigning workspace, Designing auditory and visual displays for workers; Occupational stress; Environmental Pollution – noise, vibration etc.
35. Physiotherapy role in industry – preventive, intervention, ergonomic and rehabilitative.
36. Recent Advances in **Women's Health, Industrial Health and Geriatric Health** in Community Physiotherapy.
37. Evidence Based Practice in Community Health.
38. **Vocational rehabilitation: Overview**, Indications, Types of employment, Role of vocational counselor, Role of physiotherapist
39. **Oncology rehabilitation: Overview**, Types of cancer, screening and diagnosis, Treatment of cancer, Physiotherapy Management of cancer, Palliative care, Recent advances

40. **Wound Healing:** Overview, Stages of healing, Assessment of wound, Management of wound, Recent advances in wound healing

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Syllabus For: Biotechnology – Paper – II

1. **Biological Macromolecules:** Structure of atoms, molecules and chemical bonds. Composition, structure and function of biomolecules (carbohydrates, lipids, proteins, nucleic acids and vitamins). Stabilizing interactions (Van der Waals, electrostatic, hydrogen bonding, hydrophobic interaction, etc.). Principles of biophysical chemistry (pH, buffer, reaction kinetics, thermodynamics, colligative properties). Bioenergetics, glycolysis, oxidative phosphorylation, coupled reaction, group transfer, biological energy transducers. Principles of catalysis, enzymes and enzyme kinetics, enzyme regulation, mechanism of enzyme catalysis, isozymes. Conformation of proteins (Ramachandran plot, secondary structure, domains, motif and folds). Conformation of nucleic acids (helix (A, B, Z), t-RNA, micro-RNA).
2. **Biochemistry and Biophysics:** Composition, structure, conformation and function of biomolecules -carbohydrates, lipids, proteins, nucleic acids and vitamins. Principles of biophysical chemistry (pH, buffer, reaction kinetics). Bioenergetics, glycolysis, oxidative phosphorylation, coupled reaction, group transfer, biological energy transducers. Principles of catalysis and enzymes, enzyme kinetics, enzyme regulation, inhibition, isozymes. Conformation of proteins (Ramachandran plot, secondary structure, domains, motif and folds).
3. **Cell Biology & Cell Signaling:** Membrane structure and function, Structural organization and function of intracellular organelles, Organization of genes and chromosomes, Cell division and cell cycle (Mitosis and meiosis, their regulation, steps in cell cycle, regulation and control of cell cycle), Cancer: Genetic rearrangements in progenitor cells, oncogenes, tumor suppressor genes, cancer and the cell cycle, metastasis, interaction of cancer cells with normal cells, therapeutic interventions of uncontrolled cell growth, Programmed cell death, aging and senescence, Cell signaling: General principles of cell communication, cell adhesion and roles of different adhesion molecules, gap junctions, extracellular matrix, integrins, neurotransmission and its regulation. Hormones and their receptors, cell surface receptor, signaling through G-protein coupled receptors, signal transduction pathways, second messengers, regulation of signaling pathways.
4. **Microbiology:** Historical perspectives; Pure culture techniques. General outline and classification of viruses, fungi, bacteria and molecular taxonomy. Archaea, Microbial growth, Microbial nutrition and metabolism, Microbes and environment, Microbial diseases, Antibiotics: Types, mode of action, resistance and mechanism, virulence factors, pathogenesis, treatment, prevention and control of infectious diseases.
5. **Bioinstrumentation & Biostatistics:** Centrifugation Techniques Chromatographic Techniques, Electrophoretic Techniques, Spectroscopic techniques, Radiolabeling techniques Microscopic techniques, Statistical Methods: Measures of central tendency and

dispersion; probability distributions (Binomial, Poisson and normal); Sampling distribution; parametric and non-parametric statistics; Confidence Interval; Errors; Levels of significance; Regression and Correlation; t-test; Analysis of variance and multiple range tests, chi-square test, experimental design, data transformation

6. **Molecular Biology:** DNA replication, repair and recombination, RNA synthesis and processing, Protein synthesis and processing, Control of gene expression at transcription and translation level.
7. **Genetics:** Mendelian principles, Concept of gene, Extensions of Mendelian principles, Gene mapping methods, Extra chromosomal inheritance, Microbial genetics, Human genetics, Mutation, Structural and numerical alterations of chromosomes, Recombination, Population genetics
8. **Ecology & Evolution:** Ecosystem and Environment, Population Ecology, Species Interactions, Community Ecology, Mechanisms of Evolution, Molecular Evolution.
9. **Immunology:** Innate and adaptive immune system: Cells and molecules involved in innate and adaptive immunity, antigens, antigenicity and immunogenicity. B and T cell epitopes, structure and function of antibody molecules. generation of antibody diversity, monoclonal antibodies, antigen-antibody interactions, MHC molecules, antigen processing and presentation, activation and differentiation of B and T cells, B and T cell receptors, humoral and cell-mediated immune responses, inflammation, hypersensitivity and autoimmunity, vaccines. Histochemical and Immunotechniques: Antibody generation, Detection of molecules using ELISA, RIA, western blot, immunoprecipitation, fluocytometry and immunofluorescence microscopy.
10. **Developmental Biology:** Basic concepts of development : Potency, commitment, specification, induction, competence, determination and differentiation; morphogenetic gradients; cell fate and cell lineages; stem cells; genomic equivalence and the cytoplasmic determinants; imprinting; mutants and transgenics in analysis of development, Gametogenesis, fertilization and early development: Production of gametes, cell surface molecules in gamete recognition; zygote formation, cleavage, blastula formation, gastrulation and formation of germ layers.
11. **Recombinant DNA Technology:** Isolation, purification, analysis of RNA and DNA (genomic and plasmid). Molecular cloning of DNA and RNA fragments in cloning vectors and expression. Construction of genomic and cDNA libraries and screening. DNA sequencing methods, strategies for genome sequencing. Methods for analysis of gene expression at RNA and protein level, micro array, DNA chips. PCR, RFLP, Southern and Northern blotting, AFLP techniques, Real-time PCR. In situ localization, FISH and GISH.
12. **Bioprocess and Microbial Technology:** Primary and secondary metabolites, Batch culture, the growth cycle, effect of nutrients, energetics of growth. Design of bioreactors, Transport phenomena in bioprocess, Downstream processing of biological, Microbial products,

Microbes for sustainable agriculture: Biological nitrogen fixation, Biofertilizers, Biological control, Biopesticides.

13. **Bioinformatics:** Biological Databases, Information Retrieval from Biological Databases, Unique Requirements of Database Searching, Heuristic Database Searching, Basic Local Alignment Search Tool (BLAST), FASTA, Comparison of FASTA and BLAST.
14. **Plant & Animal Biotechnology:** Cell and Tissue Culture Technology, Micropropagation, Germplasm preservation, Haploid Technology, Protoplast Technology, Secondary metabolite production, Plant transformation techniques, Transgenic plants, Culture of animal cells, Cell characterization, Cell and Tissue engineering, In vitro fertilization and Embryo transfer, Cloning of Animals, Transgenic animals, Applications of Animal Cell Culture, Stem Cell Technology: Basics of stem cells, Embryonic, adult and amniotic fluid stem cells, Applications of stem cells.

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Syllabus For: Biotechnology – Public Health - Paper II

1. **Introduction to Public Health-** Approaches to Public Health, Determinants of Health, Concept of Primary Health Care, Community Diagnosis & Needs Assessment, Community perception and priorities on health and disease, Disease profiles & Epidemiological transition, Public Health delivery system in India, Ecology of health, Right to health, Introduction to National Health Policy – 1983 & 2002, National Population Policy – 2005, National Rural Health Mission (NRHM) and National Urban Health Mission (NUHM), National Public Health Programs.
2. **Health Psychology & Counseling-** Human Psychology- Factors influencing human behavior, Human growth and development across the Life span, Conflict resolution, Health Psychology- Concepts, Understanding, & health seeking behaviors, factors influencing health psychology, Society & Health - socio-psychological barriers (Social taboos, blind faiths, beliefs, myths that affect health).
Health Counseling- Introduction, theories, process & techniques, Stigma and discrimination: Definitions, context and role of stigma and discrimination in health and disease, Counselor- Personal and interpersonal development of the Counselor.
3. **Epidemiology-** Basic principles, Uses of Epidemiology, Epidemiological methods: Descriptive Epidemiology, Analytical Epidemiology, Experimental Epidemiology, Epidemiological study designs –Descriptive (cross-sectional), analytical (case control & Cohort) and experimental, Epidemic investigations, Association and causation, Risk measurement, Measurement of morbidity and mortality: Incidence, Prevalence
4. **Demography & Population Sciences-** Methods of Demographic Data Collection: Primary and Secondary sources of data collection, Procedures, Uses, Strengths and weakness of census, vital statistics, sample survey, Population composition: Sex composition, factors affecting sex composition, Age structure Population pyramids, Demographic transition and measures- Fertility: Determinants: Social economic, political, natural fertility levels and trends in India and world, Mortality: Measures of mortality, Migration and urbanization: Population Growth and Problems, Population Policy, Demographic dividend
5. **Communicable & Non Communicable diseases-** Communicable diseases -Biology, pathogenesis and pathology, clinical presentation of common infections –Respiratory, Intestinal, Contact, Vector borne. Disease prevention and control, Malnutrition and infection, Health aspects of Disaster management.
Non-Communicable Diseases- New approaches and policies of NCDs, NCDs programs of WHO, PAHO, and Government of India. Etiology, Pathophysiology, Epidemiology, Prevention and Control. -Asthma, Cancer, Cardiovascular diseases, Chronic, rheumatic diseases, Diabetes, Tobacco use, Mental Health, Emerging & re-emerging diseases.

6. **Environmental Health & Sustainable Development-** Environmental Health-Sources, Impacts and treatments of Air (Indoor/Outdoor), Water, Soil, Nuclear, Solid waste, Biomedical waste pollution. Environmental Ethics, Global Warming, Climate Change, Ozone Depletion, Acid Rain. Eco-friendly environmental practices-Waste management, Energy practices, Agriculture Practices., Environmental Disaster, Environment & Health Impact Assessment-Concept, Steps and application
Sustainable Development: Development theories, Sustainable Development –principles, models, Developmental Planning-Macro & Micro level, Healthy Settings-Cities, Villages, Schools., Poverty & Its Measurements, Wellbeing and its measurements, Human Development and Its measurements, Societal Health & Development, Community Organization and participation
7. **Occupational, Industrial and Urban Health-** Occupational Health – Prevention, promotion, access to health services, legal aspects, Occupational Safety & Health, Occupational health disorders and diseases, Industrial Hygiene, Ergonomics, Industrial Psychology, Occupational Services at workplace, Occupational health of working population of organized and unorganized sectors-Farmers, Industrial Workers, health workers, CSW, etc., Urban population: Determinants of urban health, Consequences of urbanization and Urban health services, Concept of urban health planning and practices
8. **Health Care Policy, Planning & Economics-**Health Policy- Health policy, population policy, nutritional policy-food security, gender policy, child policy, Health Policy environment, Methods to assess the needs of for the policy development / assessment process, Frameworks for policy analysis. Healthcare Legislation in India, Health Planning -Models , Strategic planning, implementation and evaluation, Health care manpower planning and development, Health Care Utilization Patterns, Management of Primary Health Care, Health Sector Reforms, Organizational behavior and development, Privatization, commercialization & globalization of health care, Public- Private partnership, Health care quality assurance, Health economics , Investment in Health Care & Public health, Financing of Health Care – Public, Private & Community/Individual, Health Insurance Schemes, Development Partners in Public health.
9. **Public Health Nutrition-**Principles of human nutrition, Nutrition and Health, Balanced diet, consumption unit, nutritional classification, Nutritional problems, Nutritional factors in selected/ major diseases, Applied nutrition, Nutrition assessment, Community nutrition – Recommended dietary allowances, nutrition throughout life cycle, malnutrition and chronic energy, micronutrient disorders, Food toxicity, socio-ecology of nutrition, Maternal and child nutrition.
10. **Health Systems Development & Management-** Health System Models, Health services, Levels of health care, Health care providers, Alternative systems of medicine, Integrated health care delivery, Inter-sectoral approach for health care delivery , Decentralized health care delivery system, Organization Behavior and Design , Human Resource Development Quality & Assurance, Management Information and Evaluation System, Health resources & Management, Total Quality Management.

11. **International Health**-Socio-cultural perspectives of International health, Health Problems, Issues and concerns that transcend national boundaries, Policy development in international health, health care, educational and economic development. Globalization, Global burden of Diseases, Global Governance-Neoliberal and neorealist regime theory, critical theory approaches, international law, role of corporations and private authority and the activity of global civil society, Public Health in developing & developed countries, International Drug Policies & programmes, International health legislations, International funding for health care & conditions, International Health Agencies and their role and contribution, International Public Health Programs- Millennium Development Goals (MDG), International Health tourism.

12. **Public Health Updates**- National Health Policy 2017, Sustainable Development Goal (SDG's) 2017, BMW (Management and Handling) Rules 2016, RMNCHA+, NHM 2015, Zika virus and Pregnancy etc.