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# PhD COURSE WORK MODULES, STU Udaipur

### (w.e.f. 07-03-2025)

#### COMPULSORY MODULES (8 CREDITS) Total 120 hrs.

MODULE – 1 :	Research Methodology Biostatistics Computer Applications	(2 credits, 30hrs.) (1 credit, 15hrs.) (1 credit, 15hrs.)
MODULE –II :	Research and Publication Ethics including Scientific conduct and practices	(2 credits , 30hrs.)
MODULE – III:	Copyright (Intellectual Property ) & Ethical issues , Scientific writing /Review of literature	(2 credits , 30hrs.)

#### CORE MODULES (4 CREDITS) Total 60 hrs

Discipline Specific Course Work (Elective) Each 4 credits

**CORE / ELECTIVE Module 1 : ANATOMY** 

**CORE / ELECTIVE Module 2 : BIOCHEMISTRY** 

**CORE / ELECTIVE Module 3 : MICROBIOLOGY** 

**CORE / ELECTIVE Module 4 : PHARMACOLOGY** 

**CORE / ELECTIVE Module 5: PHYSIOLOGY** 

**CORE/ ELECTIVE Module 6 : NURSING** 

**CORE/ ELECTIVE Module 7 : PHYSIOTHERAPY** 

#### **CORE/ ELCETIVE Module 8: MANAGEMENT STUDIES**



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# SYLLABUS for PhD Coursework, STU Udaipur

## MODULE – 1 : Research Methodology Biostatistics Computer Applications

(2 credits, 30hrs.) (1 credit, 15hrs.) (1 credit, 15hrs.)

## Research Methodology : 2 Credits , 30hrs

### Unit 1 – Science and Research:

Definition- History- Evolution of Scientific Inquiry- Verification versus falsification- Objectivity: Facts, theory and concepts- Philosophy of Science and Technology, Epistemology of sciences- Construction of scientific facts.

### Unit 2 - Introduction to Research Methodology

- Meaning and importance of Research Types of Research Selection and formulation of Research Problem.
- Research Design- Need- Features- Inductive, Deductive and Development of models.
- Developing a Research Plan- Exploration, Description, Diagnosis, Experimentation, Determining Experimental and Sample Designs.
- Analysis of Literature Review- Primary and Secondary Sources, Web sourcescritical Literature Review.
- Hypothesis- Different Types- Significance- Development of Working Hypothesis.
- Research Methods: Scientific method vs. Arbitrary Method, Logical Scientific Methods: Deductive, Inductive, Deductive-Inductive, Pattern of Deductive-Inductive Logical process- Different types of inductive logical methods.

### Biostatistics : 1 Credit , 15 hrs.

#### **Unit 1 - Data Collection and Analysis**

- Source of Data Primary, Secondary and Tertiary Types of Data Categorical, nominal & ordinal. Sampling Merits and Demerits of Experiments, Procedure and Control Observations, Sampling Errors - Type-I, Error - Type-II Error.
- Methods of Collecting Data: Observation, field investigation, Direct studies-



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- Reports, Records or Experimental observation.
- Sampling methods- Data Processing and Analysis strategies- Graphical representation- Descriptive Analysis- Inferential Analysis- Correlation analysis- Least square method- Data Analysis using statistical package- Hypothesis- testing-Generalization and Interpretation- Modeling..

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#### Unit II - Statistical analysis

- Statistical analysis and fitting of data : Introduction to Statistics Probability Theories
  Conditional Probability, Poisson Distribution, Binomial Distribution and Properties of Normal Distributions, Estimates of Means and Proportions; Chi-Square Test, Association of Attributes, t-Test.
- Standard deviation Coefficient of variations. Correlation and Regression Analysis. Introduction to statistical packages, plotting of graphs.

### Computer Applications : 1 Credit , 15 hrs.

Unit I:	Basic Knowledge of Computer
Unit II:	Use of Computer in Research
Unit III:	Use of technology and other equipments in Research.
Unit IV:	Data Analysis Software and
	Analysis Techniques Use of
	multimedia tools
	Use of MS Office
	Preparation of Power Point Presentations, Use of Internet for Research Purpose
	Introduction to UGC infonet, INFLIBNET and ERNET etc.
Unit V:	Practical Work (as required under the above units)



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### **MODULE – 2 : Research and Publication Ethics**

(2 credits, 30hrs.)

#### Theory

RPE 01: Philosophy and Ethics (3Hrs.)

1. Introduction to philosophy: definition, nature and scope, concept, branches

2. Ethics: definition, moral philosophy, nature of moral judgments and reactions

#### RPE 02: Scientific Conduct (5 Hrs.)

- 1. Ethics with respect to science and research
- 2. Intellectual honesty and research integrity
- 3. Scientific misconducts: Falsification, Fabrication, and Plagiarism (FFP)
- 4. Redundant publications: duplicate and overlapping publications
- 5. Selective reporting and misrepresentation of data

#### RPE 03: Publication Ethics (7 Hrs.)

- 1. Publication ethics: definition, introduction and importance
- 2. Best practices / standards setting initiatives and guidelines: COPE, WAME etc.
- 3. Conflicts of interest
- 4. Publication misconduct: definition, concept, problems that lead to unethical Behaviour and vice versa, types
- 5. Violation of publication ethics, authorship and contributorship
- 6. Identification of publication misconduct, complaints and appeals
- 7. Predatory publishers and journals

#### PRACTICE

#### RPE 04: Open Access Publishing (4 Hrs.)

- 1. Open access publications and initiatives
- 2. SHERPA/RoMEO online resource to check publisher copyright & self-archiving Policies
- 3. Software tool to identify predatory publications developed by SPPU
- 4. Journal finder / journal suggestion tools viz. JANE, Elsevier Journal Finder, Springer

### **RPE 05: Publication Misconduct (4 Hrs.)**

- A. Group Discussions (2 Hrs.)
- 1. Subject specific ethical issue, FFP, authorship
- 2. Conflicts of interest
- 3. Complaints and appeals: examples and fraud from India and abroad



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B. Software tools (2 Hrs.)

Use of plagiarism software like Turnitin, Urkund and other open source software tools *RPE 06: DATABASES AND RESEARCH MATRICS (7 hrs.)* 

A. Databases (4 hrs.)

1. Indexing databases

2. Citation databases: Web of Science, Scopus, etc.

- B. Research Metrics (3 Hrs.)
- 1. Impact factor of journal as per journal Citation Report, SNIP, SJR, IPP, Cite Score

2. Metrics: h-index, g index, i10 index, altmetrics



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## MODULE – 3: Copyright (Intellectual Property ) & Ethical issues, Scientific writing / Review of literature (2 credits, 30hrs.)

#### Unit I: Introduction to Intellectual Property Right (IPR)

Origin and Genesis of IPR, The Ways and Means of Creation of IPR, Sources of IPR-Custom, Treaties, General Principles of Law, Resolutions of International Organizations, Patents – Basic aspects, Trade Marks – Basic principles, Copy Right – Basic Issues and Industrial Designs and Geographical Indications- Basic aspects

#### Unit II - Application of Results and Ethics

Environmental Impacts, Ethical issues, Ethical Committees, Reproduction of published material, Plagiarism, Citation and Acknowledgement, Reproducibility and accountability.

#### **Unit III – Scientific Writing**

- Structure and components of Scientific Reports- types of Report- Technical Reports and Thesis- Significance- Different steps in the preparation- Layout, structure and Language of typical reports- Illustrations and tables- Bibliography, Referencing and foot notes- Oral presentation- Planning- Preparation and practice- Making presentation- Use of visual aids- Importance of Effective Communication.
- Conventions and strategies of Authentication- Citation Style- sheet.
- Preparing Research papers for journal, Seminars and Conferences- Design of paper using TEMPLATE, Calculations of Impact factor of a journal, citation Index, ISBN & ISSN.
- Preparation of Project Proposal- Title, Abstract, Introduction- Rational, Objectives, Methodology- Time frame and work plan- Budget and Justification- References.



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# SYLLABUS for PhD Coursework, STU Udaipur

## Discipline Specific Course Work (Elective) 4 credits, 60 hrs.

### **CORE / ELECTIVE Module 1 : ANATOMY**

#### **GENERAL AND GROSS ANATOMY**

Bones, joints, Muscles Connective tissue, Lymphatic and cardiovascular, Nervous system, Skin and facia

#### **SUPEX**

Mammary gland, Axilla, Brachial plexus, Cubital fossa, Shoulder joint, Elbow joint, Wrist Joint, Fascial spaces of hand, Radiocarpal joint.

#### INFEX

Femoral triangle, Adductor canal, Gluteal region, popliteal fossa, Arches of foot, Hip joint, Knee joint, Ankle joint.

#### THORAX

Pleura and lung, Pericardium, Heart, Blood supply of heart, Mediastim, Azygous system of vein.

#### ABDOMEN

Inguinal canal, Male exretnal genitalia, Peritoneum, Stomach, Small and large intestine, Aorta and its branches, Extrahepatic biliary apparatus, caecum and appendix, Rectum and anal canal, spleen, liver, kidney, ureter, urinary bladder, urethra, Suprarenal gland, Diaphragm, Perinuem, Ischiorectal fossa, Ptrostate, Uterus and vagina, Ovaries.

#### HEAD, NECK AND FACE

Scaip, side of neck, cranial cavity and dural venous sinuses, orbit, parotid region, infratemporal region, muscles of mastication and mandibular nerve, temporomandibular joint, facial nerve, submandibular gland, thyroid gland, tongue, pharynx and palate, palatine tonsil, paranasal sinusea, larynx, eyeball, cranial nerves.

#### **NEUROANATOMY**

Meninges and CSF, Blood vessels of brain, spinal cord, cerebrum, cerebellum, brain stem, ventricles of brain, basal nuclei, reticular formation, thalamus, hypothalamus, limbic system, autonomic nervous system

#### **HISTOLOGY & HISTOCHEMISTRY**

Cell, Epithelium, connective tissue, glands , musle, bone, nervous tissue, lymphatic system, cardiovascular system, skin, respiratory system, salivary glands, oesophagus,stomach,small intestine & large intestine, liver, pancreas & appendix, kidney,ureter,urinary bladder, urethra, male genital system, female genital system, endocrine system, cerebrum and cerebellum, cornea, retina

#### EMBRYOLOGY

Gametogenesis, menstrual cycle, formation of germ layers, development of embryonic disc, somites, placenta and foetal membranes, pharyngeal archeas and poches, development of



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face, nose and palate, mouth, pharynx, development of gut, development of liver, spleen, pancreas, development of respiratory system, development of cardiovascular system, development of urogenital system, development of nervous system, development of eye, ear and congenital malformations

#### **GENETICS**

Chromosomes and chromosomal aberrations, karyotyping, cell division, Single gene pattern inheritance, Multifactorial pattern of inheritance, Reproduction genetics



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## Discipline Specific Course Work (Elective) 4 credits, 60 hrs.

## **CORE / ELECTIVE Module 2 : BIOCHEMISTRY**

### 1. MOLECULES AND THEIR INTERACTION RELEVANT TO BIOCHEMISTRY

- 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, tertiary and quaternary structure; domains; motif and folds).
- Conformation of nucleic acids (A-, B-, Z-, DNA), t-RNA, micro-RNA).
- Stability of protein and nucleic acid structures.
- Metabolism of carbohydrates, lipids, amino acids, nucleotides and vitamins, acid base balance and disbalance, minerals, concept of human nutrition, xenobiotics, hormone
- Clinical and applied biochemistry, interpretation of clinical laboratory data and concept of quality control

### 2. CELLULAR PROCESSES

- Membrane structure and function: Structure of model membrane, lipid bilayer and membrane protein diffusion, osmosis, ion channels, active transport, ion pumps, mechanism of sorting and regulation of intracellular transport, electrical properties of membranes.
- Structural organization and function of intracellular organelles
- Organization of genes and chromosomes: Operon, interrupted genes, gene families, structure of chromatin and chromosomes, unique and repetitive DNA, heterochromatin, euchromatin, transposons.
- Cell division and cell cycle: Mitosis and meiosis, their regulation, steps in cell cycle, and control of cell cycle.
- Microbial Physiology: Growth, yield and characteristics, strategies of cell division, stress response.

### **3. FUNDAMENTAL PROCESSES**



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- DNA replication, repair and recombination: Unit of replication, enzymes involved, replication origin and replication fork, fidelity of replication, extra chromosomal replicons, DNA damage and repair mechanisms.
- RNA synthesis and processing: Transcription factors and machinery, formation of initiation complex, transcription activators and repressors, RNA polymerases, capping, elongation and termination, RNA processing, RNA editing, splicing, polyadenylation, structure and function of different types of RNA, RNA transport.

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- Protein synthesis and processing: Ribosome, formation of initiation complex, initiation factors and their regulation, elongation and elongation factors, termination, genetic code, aminoacylation of tRNA, tRNA-identity, aminoacyl tRNA synthetase, translational proof-reading, translational inhibitors, post- translational modification of proteins.
- Control of gene expression at transcription and translation level: Regulation of phages, viruses, prokaryotic and eukaryotic gene expression, role of chromatin in regulating gene expression and gene silencing.

### 4. CELL COMMUNICATION AND CELL SIGNALING

- Host parasite interaction: Recognition and entry processes of different pathogens like bacteria, viruses into animal and plant host cells, alteration of host cell behavior by pathogens, virus-induced cell transformation, pathogen-induced diseases in animals and plants, cellcell fusion in both normal and abnormal cells.
- Cell signaling: Hormones and their receptors, cell surface receptor, signaling through Gprotein coupled receptors, signal transduction pathways, second messengers, regulation of signaling pathways, bacterial and plant two-component signaling systems, bacterial chemotaxis and quorum sensing.
- Cellular communication: Regulation of hematopoiesis, general principles of cell communication, cell adhesion and roles of different adhesion molecules, gap junctions, extracellular matrix, integrins, neurotransmission and its regulation.
- Cancer: Genetic rearrangements in progenitor cells, oncogenes, tumor suppressor genes, cancer and the cell cycle, virus-induced cancer, metastasis, interaction of cancer cells with normal cells, apoptosis, therapeutic interventions of uncontrolled cell growth.
- 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, antibody engineering, antigen-antibody interactions, MHC molecules, antigen processing and presentation, activation and differentiation of B and T cells, B and T cell receptors,



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humoral and cell mediated immune responses, primary and secondary immune modulation, the complement system, Toll-like receptors, cell-mediated effector functions, inflammation, hypersensitivity and autoimmunity, immune response during bacterial (tuberculosis), parasitic (malaria) and viral (HIV) infections, congenital and acquired immunodeficiencies, vaccines.

### 5. METHODS IN BIOCHEMISTRY

 Molecular biology and recombinant DNA methods: Isolation and purification of RNA, DNA (genomic and plasmid) and proteins, different separation methods; analysis of RNA, DNA and proteins by one and two dimensional gel electrophoresis, isoelectric focusing gels; molecular cloning of DNA or RNA fragments in bacterial and eukaryotic systems; expression of recombinant proteins using bacterial, animal and plant vectors; isolation of specific nucleic acid sequences; generation of genomic and cDNA libraries in plasmid,

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phage, cosmid, BAC and YAC vectors; in vitro mutagenesis and deletion techniques, gene knock out in bacterial and eukaryotic organisms; protein sequencing methods, detection of post-translation modification of proteins; DNA sequencing methods, strategies for genome sequencing; methods for analysis of gene expression at RNA and protein level, large scale expression analysis, such as micro array based techniques; isolation, separation and analysis of carbohydrate and lipid molecules; RFLP, RAPD and AFLP techniques

- Histochemical and immunotechniques: Antibody generation, detection of molecules using ELISA, RIA, western blot, immunoprecipitation, flow cytometry and immunofluorescence microscopy, detection of molecules in living cells, in situ localization by techniques such as FISH and GISH.
- Biophysical methods: Analysis of biomolecules using
- UV/visiblespectroscopy, fluorescence, circular dichroism, NMR and ESR spectroscopy, structure determination using X-ray diffraction and NMR; analysis using light scattering, different types of mass spectrometry and surface plasma resonance methods.
- Separation techniques: chromatography and electrophoresis
- Preparation of analytical quality solutions and dilution series ; determination of concentrations of biological molecules by, and understand relative advantages of, a range of methods(clinical biochemical method)
- Methodology of clinical biochemistry laboratory



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## Discipline Specific Course Work (Elective) 4 credits, 60 hrs.

### **CORE / ELECTIVE Module 3 : MICROBIOLOGY**

#### Unit 1: General Microbiology & Immunology:

Historical events, Introduction, Morphology and physiology of bacteria, Microbial pathogenicity. Sterilization and disinfection, Culture media and culture method, Identification of bacteria. Bacterial genetics. Antimicrobial agent, antimicrobial resistance, and antimicrobial susceptibility testing. Recent advanced diagnostics (MALDI-TOF, CB-NAAT, PCR, Blotting techniques, Immunoassay).Immunity, Antigen, Antibody, Antigen-antibody reaction. Complement system pathway. Structure of immune system, Immune response (CMI & AMI), Hypersensitivity. Autoimmunity, Immunodeficiency disorders.Transplant and cancer immunology, Immunoprophylaxis and immunohematology.

#### **Unit 2: Systematic Bacteriology:**

Gram positive cocci: Staphylococcus, Streptococcus, Enterococcus and Pneumococcus. Gram negative cocci: Neisseria and Moraxella.

Gr positive bacilli: Corynebacterium, Bacillus, Anaerobes (Clostridium and non-sporing anaerobes), Mycobacteria (M. tuberculosis, non-tuberculous mycobacteria, and M. leprae). Gram negative bacilli: Enterobacteriaceae-I (Escherichia, Shigella, Klebsiella, proteus, Yersinia and others), Enterobacteriaceae-II, Salmonella.Vibrio and aeromonas, Pseudomonas and other non-fermenters, Haemophilus, HACEK group, Bordetella and Brucella. Other groups of bacteria: Spirochetes (Treponema, Borrelia, Leptospira), Rickettsiae, Coxiella, Bartonella, Chlamydiae, Mycoplasma and Ureaplasma.

### Unit 3: Virology & Medical Mycology:

General properties of Viruses.

DNA viruses: Herpesviruses (Herpes simplex viruses, Varicella zoster virus,

CMV, EBV, Parvoviridae, Papillomaviridae, Poliomaviridae, Poxviridae, Adenoviridae and Bacteriophages).

RNA viruses: Myxoviruses and Rubella, Picornaviruses, Arboviruses, Rhabdoviruses, HIV and other Retroviruses, Hepatitis, Oncogenic viruses.

Fungi causing superficial, systemic and opportunistic fungal infections and their diagnosis.



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#### Unit 4: Hospital infection control:

HAI and its types-surveillance and prevention, BMW, NSI and its prevention and management. Antimicrobial stewardship. Environmental surveillance. -2-

#### **Unit 5: Clinical Microbiology:**

Bloodstream infections, Healthcare-associated infections, Gastrointestinal infections, Respiratory tract infections, Central nervous system infections, Urogenital infections, Congenital infections, emerging and re-emerging infections & their diagnostic approach.



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## Discipline Specific Course Work (Elective) 4 credits, 60 hrs.

**CORE / ELECTIVE Module 4 : PHARMACOLOGY** 

### Unit 1: Basic principles of Pharmacology including molecular pharmacology.

Describe the process of new drug development including preclinical and clinical phases. Describe principles of the pharmacokinetics of drugs and apply these to prescribe medicines for individualization of pharmacological therapy, including the use of medicines in special categories (Paediatrics, Geriatrics, Pregnancy, and Pathological states). Explain the principles of pharmacodynamics and apply these in different therapeutic situations. Describe mechanisms of drug-drug interactions and their clinical importance. Describe pharmacological principles underlying the effects of drugs used in the diagnosis, prevention, and treatment of common systemic diseases in man. Define pharmacovigilance. Describe the importance of pharmacovigilance in ensuring patient safety and the various methods/procedures in pharmacovigilance.

Unit 2: Application and integration of the the knowledge of the pathophysiology of diseases and pharmacological principles underlying the effects of drugs, for diagnosis, prevention, and treatment of common systemic diseases in man including disorders of -Synaptic & neuroeffector junctional sites of the autonomic nervous system, Neuromuscular junction, Central nervous system, Cardiovascular system, Endocrine system, Gastrointestinal system, Respiratory system, Renovascular system, Hematological system, Immunological system, Autacoids. Describe the

mechanism of action, pharmacological effects and therapeutic status of drugs used for prevention and management of microbial and parasitic infections/infestations and neoplastic disorders. Demonstrate an understanding of the special considerations in pharmacokinetics, mechanism of action, pharmacological effects, and therapeutic status of drugs used for dermatological and ocular disorders.



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## Discipline Specific Course Work (Elective) 4 credits, 60 hrs.

### **CORE / ELECTIVE Module 5 : PHYSIOLOGY**

**Cellular & Molecular Physiology, Immune Biology:** Cell to cell communication and cell signalling, check points and regulation of cell cycle, cancer, protein folding and higher order structures, Ramachandran plot, protein sequencing , proteomics, enzyme kinetics, enzyme regulation technical approach to the study of enzyme activities; purification and characterization of enzymes; clinical enzymology, diagnostic and therapeutic uses of enzymes, genome size, C-value paradox, catenation and decatenation of DNA, regulation of transcription and translation,DNA sequencing, amplification,epigenetics, genomics and applications, thermodynamics and energetics, redox potential and Electron transport chain, Molecular basis of hormonal signalling, hormone assay, Immune system and antigen presentation, antibody diversity, cellular and molecular interaction during induction of immune responses, immunodiagnostics, immunity to infectious diseases,hypersensitivity vaccine development, immune response to inflammatory reaction and role of interleukins

**Biotechnology:**Fermentation technology, production of ethanol, penicillin and other antibiotics, microbial-insecticides, enzymes, amino acids etc. and application in industry. Use of microorganisms in pollution control. Enzyme biotechnology: Immobilized enzymes and its application in industry. Principles of protein engineering. Biotechnology as applied to Immunology

Human genetics: Organisation of human chromosomes; Inheritance; Genes in the Kinderds and in the individuals: Genetic variations, genetic factors in diseases, Pedigree analysis; Immunogenetics; Genes in Development and Differentiation; Population \ Genetics; Hardy-Weinberg equilibrium, mutation, selection, drift, gene flow, inbreeding, genetic diversity, races; Genetics disorders: Sickle cell anaemia, hemophilia, thalassemia, cystic fibrosis, Huntington disease, Colour blindness, Phenylketonuria; Cancer Genetics; Molecular diagnosis of genetic disorders: Use of RE, RFLP, Oligonucleotide probes, DNA-probes, DNA blotting, etc. DNA fingerprinting and SNP analysis, Genetic screening and genetic counselling; The Human genome project (HGP): Implications and future prospects.

**Biopotentials and Electrophysiology:** Bioelectric potential generation in excitable cells muscle, nerve, heart and brain, properties of various ion channels, gating current, electrodes, single ion channel study, bioelectrodes and clamping techniques, EEG, ECG, EMG, echocardiography, visual evoked potential,, auditory, olfactory and gustatory potentials.



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**Hemodynamics and Homeostasis:** Principles and application of hemodynamics, blood vascular resistance, turbulence, blood pressure, role of platelets in blood homeostasis, complement system, neural and chemical regulation of blood pressure

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**Cardiovascular and Respiratory Physiology:** Laws of Heart, electrical axis of heart, heart sound in cardiac cycle, cardiorespiratory and vasomotor centres, reflex regulation of heart and respiratory system, Mechanics of breathing, compliance, hysteresis, airway resistance, gas exchange, ventilation perfusion ratio and its significance, cardiovascular diseases and their pathophysiology, hypoxia, artificial respiration, neonation heart and lungs, Respiratory distress syndrome; Sudden infant death

Nervous system, Biorhythm and Special Senses: Modern techniques for studying nervous mechanisms including neuroimaging. neuronal migration. Neural Plasticity. Higher order functions of Cerebral Cortex, Dominant Cortex, Laterality. Cognition, Learning and Memory-cellular and Molecular basis, Regulation of tone, posture and equilibrium, Modern concept of hypothalamic functions. Neurological disorders of brain- general cellular events; Mechanism development of degenerative diseases - Alzheimer's, Parkinson's Disease, ALS etc. Thalamo cortical projections and its influence on evoked cortical activity, wakefulness. Biorhythm generation and regulation, clock genes, disorders of biological clock Perception of vision, audition, gustation and olfaction, accommodation, colour vision,role of brain in- coding of colour,pitch, taste and odour discrimination

Alimentation and Excretion: Regulation of GI secretion and function, Gubrain connection and role of hormones in gastric function, diseased conditions and their management (Ulcer, Malabsorption and Diarrhoea), cancer of the GI Tract. Structure and functional relationship of nephron, renal regulation of sodium-ion-exchange, body fluid volume. Neural and Endocrine control of renal functions; Non-excretory functions-renin-angiotensin system, erythropoietin system, biosynthesis of dihydroxychole calciferols,guanidinoacetate and prostaglandins; Pathophysiological aspects and renal failures

**Reproductive Physiology:** Blood testis barrier and role in spermatogenesis, immune endocrine interactions of testis in health and venereal diseases, sperm metabolism, immune endocrine interaction in pregnancy, hormones of lactation, ovarian reserve and in vitro fertilisation **Ergonomics, Exercise & Work Physiology:** Ergonomics and its contemporary application in industrial sectors. Ergonomics and Cognition, Assessment of physiological and mental stress;



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Evaluation of physiological fatigue during overload job in extreme environment, Design Ergonomics, Human error and its relation with psychological condition during operation; Decision making and cognitive ability; Cost- effective study and improvement of individual productivity, VE Max, VO2Max; Alveolar ventilation at different state of breathing. Lactic acid concentration and O2 debt. Nutrition in sports and exercise, Physician's Interest in the Physiology of Exercise; Dynamic Physical Examination; Principles of safety in Physical Activity and sports; Management of Illness and Injury sustained in Exercise Activities; Rehabilitation procedures.



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## Discipline Specific Course Work (Elective) 4 credits, 60 hrs.

## **CORE / ELECTIVE Module 6 : NURSING**

## I. Nursing leadership in Healthcare Delivery Systems

- I. Current health issues and policies -
- 1. Analysis of current health problems national & global
- 2. Health care delivery system in India
- 3. National health policy, population policy and alternative systems of medicine
- 4. Health policy issues relevant to nursing practice Development of nursing services in health policy
- 5. The functions and roles of law in health care delivery Existing legislations related to nursing . Laws for new and emerging roles (eg)Nurse practitioner, private practice (nursing homes)
- 6. Social system and health policy
- 7. Politics & health policy Lobbying for development of nursing profession
- 8. Health economics and health policy (Economics of health care and nursing)
- 9. Health insurance
- II. Nursing Leadership:-
- 1. Leadership theories
- 2. Nursing leadership and decision making
- 3. Nursing leadership and change process
- 4. Human resource planning and management by nurse leaders
- 5. Profession building in health care system Advocacy, Lobbing
- 6. Nursing ethics
- Code of ethics, professional conduct for nurses in India
- Nursing standards, nursing practice, standards and quality assurance
- 7. Human relations
- Valuing human being
- 8. Communication skills

### **II. PHILOSOPHY OF NURSING SCIENCE AND THEORETICAL PERSPECTIVES-**

- 1. Introduction to the course, study of philosophy, History of philosophy
- 2. History and philosophy of nursing science
- 3. Nursing as a science and a discipline (Evolution and development)



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- 4. Nursing knowledge and development
- Historical roots
- Domains of nursing
- Paradigms in nursing
- Knowledge development

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- 5. Paradigms that influence approach to nursing science development.
- 6. Epistemological and ontological assumptions of diverse approaches to knowledge generation in nursing.

### **III. NURSING THEORIES AND THEORY DEVELOPMENT-**

- 1. Epistemology-
- Concepts, statements and theories
- Strategies for theory development
- Evaluation of theories
- Met theory
- 2. Overview of theory in nursing-
- Overview of theory
- Importance of theory in nursing
- Historical overview
- Classification of theories in nursing
- Issues in theory development in Nursing
- Nursing Theory : an examination of the concept development of nursing theory.
- 3. Overview of nursing theories

The theorists and the theories

- On nursing clients
- On human being Environment interactions
- On interactions
- On nursing therapeutics
- Other theories
- 4. Analysis of Nursing theories & evaluation of nursing theories-
- 5. Nursing theory and practice
- 6. Nursing theory and research
- 7. Inter relationships between science, theory, practice and research in Nursing.



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## Discipline Specific Course Work (Elective) 4 credits, 60 hrs.

**CORE / ELECTIVE Module 7: PHYSIOTHERAPY** 

# **ADVANCED CLINICAL ASSESMENT & MANAGMENT**

Unit I Nervous system development & applied neurology.

Normal development of the following-Ligament, Cartilage, Muscles, Bones and Joints.

Clinical Decision Making and Effective Planning Processes, Data Collection, Problem Identification, Diagnosis Prognosis, plan of Care, Using knowledge base, Self monitoring documentation. Applied Biomechanics and Ergonomics.

**Unit II** Soft tissue (bone, cartilage, tendon ligament and muscles) mechanism, response to mechanical stress, remolding process, stress, strain, modulus, Posture and gait assessment of normal and pathological conditions. Geriatric Rehabilitation.

Principles of Injury Prevention and Management.

Congenital and Acquired orthopedic problems in children.

Movements Disorders.

**Unit III** Definition and history of ergonomics, Physical, cognitive and Organizational ergonomic concept, Methods of Ergonomics, Problems and Solution with methods of ergonomic.

Principles of Assessment and Evaluation.

Vitals, Musculo-Skeletal, Sensory, Motor function. Motor Control Evaluation and treatment

Different Physiotherapy approaches like Maitland, Mulligan, and Cyrix etc.

Scientific Basis for exercise programme.

Cardiopulmonary Rehabilitation.

Physiotherapy Management of Spinal disorders & Injuries.



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Athletic Injuries and their physiotherapy management.

#### References:-

- 1. Orthopedic Physical Therapy- Donattelli, London, Churchill Livingstone, 1994.
- 2. Sander's Manual of Physical Therapy (Mosby)
- 3. Common Vertebral problems-Grieve (Churchill Livingstone)
- 4. Physical Rehabilitation- Susan 'O' Sullivan
- 5. Motor Relearning Programme for Stroke-Carr & Shepherd.
- 6. Neuro Rehabilitation- Farber, WB Saunders, Philadelphia.
- 7. Spinal Cord Injuries- Orthopedic & Neurological aspects A.G. hardy & Rossier A.B.
- 8. Strength Training-D.P. Riley.
- 9.. Sports Injury, assessment & Rehabilitation David C.Reid.
- 10. Neurological Physiotherapy-Susan Edward.
- 11. Physical Therapy for children-Suzann K. Campbell
- 12. Cardiopulmonary Rehabilitation- Frown Felter.



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# SYLLABUS for PhD Coursework, STU Udaipur

### Discipline Specific Course Work (Elective) 4 credits, 60 hrs.

### **CORE / ELECTIVE Module 8: MANAGEMENT STUDIES**

**Unit–I** Management–Concept,Process,TheoriesandApproaches,ManagementRolesandSkills Functions – Planning, Organizing, Staffing, Coordinating and Controlling. Communication – Types, Process and Barriers.

Decision Making-Concept, Process, Techniques and Tools

OrganizationStructureandDesign-Types,Authority,Responsibility,Centralization,

Decentralization and Span of Control

Unit - II Organizational Behavior-Significance & Theories

Individual Behavior–Personality, Perception, Values, Attitude, Learning and Motivation Group Behavior – Team Building, Leadership, Group Dynamics Interpersonal Behavior & Transactional Analysis Organizational Culture & Climate Work force Diversity & Cross Culture Organizational Behavior Emotions and Stress Management Organizational Justice and Whistle Blowing

Human Resource Management – Concept, Perspectives, Influences, and Recent TrendsHumanResourcePlanning,Recruitment,andSelection,Induction,Training,andDevelopme nt Job Analysis, Job Evaluation and Compensation Management

Unit- III AccountingPrinciplesandStandards,PreparationofFinancialStatements

FinancialStatementAnalysis–RatioAnalysis,FundsFlowandCashFlowAnalysis,Preparation of Cost Sheet, Marginal Costing.

CapitalStructure–Theories,CostofCapital,SourcesandFinanceBudgetingandBudgetary Control, Types and Process, Zero base Budgeting.

Value&Returns-TimePreferenceforMoney,ValuationofBondsandShares,Riskand Returns.

Capital Budgeting-NatureofInvestment,Evaluation,ComparisonofMethods;Riskand Uncertainty Analysis Dividend – Theories and Determination



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Mergers and Acquisition-CorporateRestructuring,ValueCreation,MergerNegotiations, Leveraged Buyouts, Takeover

Portfolio Management-CAPM, APT

Derivatives–Options,OptionPayoffs,OptionPricing,ForwardContracts&FutureContracts Working Capital Management – Determinants, Cash, Inventory, Receivables and Payables Management, Factoring

Unit - IV Strategic Management-Concept, Process, Decision& Types

StrategyFormulation-SWOTAnalysis,CorporateStrategy-Growth,Stability,Retrenchment.

Market Segmentation, Positioning, and Targeting

ProductandPricingDecision–ProductMix,ProductLifeCycle,NewProductdevelopment, Pricing – Types and Strategies

Placeandpromotiondecision–Marketingchannelsandvaluenetworks,VMS,IMC,Advertising, and Sales promotion

**Unit –V** Consumer and Industrial Buying Behavior: Theories and Models of Consumer Behavior BrandManagement–RoleofBrands,BrandEquity,EquityModels,DevelopingaBranding Strategy; Brand Name Decisions, Brand Extensions, and Loyalty

LogisticsandSupplyChainManagement,Drivers,Valuecreation,SupplyChainDesign, Designing and Managing Sales Force, Personal Selling

ServiceMarketing–ManagingServiceQualityandBrands,MarketingStrategiesofService Firms CustomerRelationshipMarketing–RelationshipBuilding,Strategies,Values,andProcess Retail

Marketing – Recent Trends in India, Types of Retail Outlets.

Emerging Trends in Marketing – Concept of e-Marketing, Direct Marketing, Digital Marketing and Green Marketing

InternationalMarketing-EntryModeDecisions,PlanningMarketingMixforInternational Markets



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**Unit –VI** Statistics for Management: Concept, Measures of Central Tendency and Dispersion, Probability Distribution –

Binominal, Poison, Normal and Exponential

Data Collection & Questionnaire Design Sampling – Concept, Process and Techniques Hypothesis Testing–Procedure; T, Z, F, Chi-square tests Correlation and Regression Analysis. Operations Management – Role and Scope FacilityLocationandLayout–SiteSelectionandAnalysis,Layout–DesignandProcess

**Unit – VII** Entrepreneurship Development– Concept, Types, Theories and Process, Developing Entrepreneurial Competencies, Intrapreneurship – Concept and Process

Women Entrepreneurship and Rural Entrepreneurship

Innovations in Business – Types of Innovations, Creating and Identifying Opportunities, Screening of Business Ideas

Business Plan and Feasibility Analysis – Concept and Process of Technical, Market and Financial, Analysis Microand Small-Scale Industries in India; Role of Government in Promoting SSI Sickness in Small Industries – Reasons and Rehabilitation

Institutional Finance to Small Industries – Financial Institutions, Commercial Banks, Cooperative Banks, Micro Finance.