MALLA REDDY
VISHWAVIDYAPEETH

SYLLABUS FOR PhD ENTRANCE EXAMINATIONS – JULY 2025 BATCH

SECTION - A

SECTION – B

PhD Entrance Exam Pattern

Paper 1 (Research Methodology): 30 Marks

Paper 2 (Subject-Specific): 30 Marks

Duration: 1-2 hr

Total Marks: 60

Syllabus for PhD admission 2025

SECTION A

RESEARCH METHODOLOGY, BIOSTATISTICS, RESEARCH ETHICS, AND PUBLICATION ETHICS (COMMON TO ALL FACULTIES)

Unit I: Understanding the Research: Definitions, Quality, Purpose, Importance, and Objectives. Research Ethics: Integrity, Moral Principles, and Ethical Practices, Values, Privacy, and Confidentiality.

Unit II: Types of Research: Basic and Applied Research, Quantitative and Qualitative Research, Descriptive and Analytical Research.

Unit III: Writing a Research Proposal: Identifying and selecting the Research problem, Research questions, Background or literature review, Method and design, and References.

Unit IV: Definition and Importance of Hypothesis, Types of Hypothesis (Null Hypothesis and Alternative Hypothesis). Sampling Techniques – Random sampling, Stratified sampling, Cluster sampling, Systematic sampling, convenience sampling, and Judgment sampling.

Unit V: Data Collection Tools: Primary data and secondary data, Types of Questionnaire, Interview protocol, observation methods, Data Interpretation. Data Analysis: Tabulation, Diagrammatical representation of the data, Graphical representation of the data; Basics of documentation software tools

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SYLLABUS FOR Ph.D. ENTRANCE EXAMINATIONS

SECTION – B

FACULTY OF MEDICINE

UNIT I: Molecular and Cellular Foundations

i. **Cell Biology**: structure-function relationships, nucleic acids, chromatin organization, DNA replication, RNA synthesis, and epigenetic regulation.
ii. **Developmental biology**: Organogenesis, teratogens, and congenital anomalies
iii. **Homeostasis**: Body fluid dynamics, electrolyte and acid base balance, blood composition (RBCs, WBCs, platelets), plasma proteins, and lymphatics.

UNIT II: Systemic Physiology and Pathophysiology

i. **Cardiovascular dynamics:** Cardiac cycles, hemodynamics, ECG interpretation, blood pressure regulation.
ii. **Respiratory physiology:** Gas exchange, pulmonary function tests, regulatory mechanisms.
iii. **Neurophysiology: Nerve** conduction, synaptic transmission, neuromuscular disorders.
iv. **Reproductive and endocrine physiology:** Gametogenesis, hormonal cycles, pregnancy physiology, renal-endocrine interactions.

UNIT III: Metabolic and Immunological Processes

i. **Biochemistry:** Carbohydrate, lipid, and protein metabolism; vitamins and micronutrients (calcium, iron, iodine).
ii. **Immune mechanisms:** Innate and adaptive immunity, hypersensitivity, autoimmunity, transplantation immunology.
iii. **Pathological responses**: Inflammation, carcinogenesis, metabolic disorders, shock syndromes, and hemorrhage management.

UNIT IV: Pharmacological Principles and Clinical Applications

i. **Pharmacokinetics/pharmacodynamics:** Drug absorption, bioavailability, therapeutic indices, drug interactions.
ii. **Advanced therapeutics:** Gene therapy, pharmacoeconomics, critical appraisal of clinical trials.
iii. **Antimicrobial science:** Bacterial, viral, and fungal pathogenesis; antimicrobial resistance.

UNIT V: Cardiovascular and Respiratory Medicine

i. **Cardiac pathologies:** Ischemic heart disease, arrhythmias, heart failure, congenital defects.
ii. **Respiratory diseases:** Asthma, COPD, tuberculosis, occupational lung disorders, neoplastic conditions.

UNIT VI: Gastrointestinal, Hepatic, and Renal Health

i. **GI disorders:** Peptic ulcers, malabsorption syndromes, inflammatory bowel disease.
ii. **Hepatobiliary and pancreatic diseases:** Hepatitis, cirrhosis, portal hypertension.
iii. **Renal pathophysiology:** Acute/chronic kidney injury, glomerular disorders, dialysis, transplantation.

UNIT VII: Endocrinology, Hematology, and Oncology

i. **Endocrine dysregulation:** Diabetes, thyroid/parathyroid/adrenal disorders.
ii. **Hematologic conditions:** Anemias, leukemias, coagulopathies.
iii. **Oncology:** Oncogenes, tumor markers, common cancers (breast, lung), palliative care.

UNIT VIII: Neurological and Psychiatric Disorders

i. **Neuropathology:** Stroke, epilepsy, spinal cord injuries, neurodegenerative diseases.
ii. **Mental health:** Mood disorders, schizophrenia, psychosomatic illnesses, therapeutic interventions.

UNIT IX: Maternal, Neonatal, and Pediatric Health

i. **Obstetrics:** Antenatal care, hypertensive disorders, labor complications.
ii. **Pediatrics:** Neonatal sepsis, growth anomalies, nutritional deficiencies, childhood infections (malaria, dengue).

UNIT X: Dermatology and Musculoskeletal Health

i. **Integumentary disorders:** Infections (bacterial, fungal, viral), autoimmune skin conditions.

ii. **Musculoskeletal pathologies:** Osteoarthritis, rheumatoid arthritis, osteomyelitis, trauma management.

UNIT XI: Sensory Systems and ENT

i. **Ophthalmology:** Cataracts, glaucoma, retinal diseases, preventive ophthalmology.

ii. **Otolaryngology:** Hearing loss, chronic otitis media, sinusitis, airway emergencies.

UNIT XII: Public Health and Epidemiology

i. **Disease control:** Transmission dynamics, disinfection, vaccination strategies.

ii. **Health systems:** Primary healthcare, universal health coverage, national health programs.

iii. **Social determinants:** Occupational hazards, environmental health, demographic trends.

Recommended books

1. Achar's textbook of Pediatrics 4th edition. ISBN: 978-8173716546
2. Ananthanarayan and Paniker's Textbook of Microbiology, 11th edition. ISBN: 978-9389211436
3. Davidson's Principles and Practice of Medicine, International Edition, 24th edition. ISBN: 978-0702070273
4. Guyton and Hall Textbook of Medical Physiology, International Edition, 13th edition. ISBN:978-1455770168
5. Harper's Biochemistry, 32nd edition. ISBN: 978-1260469943
6. Mudaliar & Menon Clinical Obstetrics 12th edition ISBN: 978-9393330369
7. Park's textbook of Preventive & Social Medicine, 26th edition. ISBN: 978-9382219163
8. Parsons' Diseases of the Eye 23rd edition. ISBN: 978-8131254158
9. Rang & Dale's Pharmacology, 10th edition. ISBN: 978-0323873956
10. Textbook of Ear, Nose and Throat Diseases 12th edition. ISBN: 978-9350904954

SYLLABUS FOR Ph.D. ENTRANCE EXAMINATIONS

SECTION - B

FACULTY OF DENTISTRY

UNIT I: Anatomy & Physiology (Dental & Craniofacial Focus)

- Cranial nerves relevant to dental practice.
- TMJ anatomy, disorders, and biomechanics.
- Muscles of mastication and facial expression.
- Pterygopalatine and infratemporal fossae, submandibular region.
- Oral cavity boundaries, palate, tongue, vascular and nerve supply.
- Paranasal sinuses in sinus lift surgeries.
- Osteology of maxilla, mandible, cranial bones.
- General physiology of blood, endocrine, and cardiovascular systems.
- CBCT-based 3D anatomy, neurosensory mapping, anatomical variations in implant planning.

UNIT II: Biochemistry & Cell Biology in Oral Sciences

- Macromolecule metabolism relevant to oral tissues.
- Collagen, bone matrix proteins; calcium/phosphate metabolism.
- Diagnostic enzymes and dental material interactions.
- Hormonal influence on oral health.
- Salivary diagnostics and biochemistry.
- Salivary diagnostics, molecular signaling in tooth development and repair.

UNIT III: Oral Histology & Embryology

- Tooth morphogenesis and epithelial-mesenchymal interaction.
- Microscopic anatomy of dental and supporting tissues.
- Age-related histological changes.
- Oral mucosa and salivary gland development.
- Tissue engineering, stem cell research, regenerative endodontics.

UNIT IV: General Pathology & Microbiology

- Pathological mechanisms: cell injury, necrosis, inflammation, healing.
- Blood disorders and implications in dental practice.
- Infection control, sterilization, and culture techniques.
- Oral microbiome and its role in disease.
- Bacterial, viral, fungal, and parasitic infections relevant to oral health.
- Oral microbiota modulation, immunopathogenesis, antimicrobial resistance.

UNIT V: Pharmacology & Dental Therapeutics

- Pharmacokinetics/pharmacodynamics of dental drugs.
- Analgesics, antibiotics, anesthetics in dental practice.
- Systemic drug implications: cardiovascular, endocrine, CNS drugs.
- Vitamin deficiencies and oral health.
- Topical agents: mouthwashes, fluoride, astringents.
- Pharmacogenomics, nano-drug delivery systems in dentistry.

UNIT VI: Oral Medicine, Diagnosis, and Radiology

- Precancerous/cancerous lesions and differential diagnosis.
- Mucocutaneous lesions and systemic disease manifestations.
- Oral radiology: IOPA, OPG, CBCT, MRI.
- Common oral diseases and their management.
- AI in diagnostics, salivary biomarkers, digital pathology.

UNIT VII: Operative Dentistry & Endodontics

- Dental caries and restorative approaches.
- Cavity preparation and pulp protection.
- Endodontic access, shaping, obturation techniques.
- Aesthetic dentistry and hypersensitivity management.
- Bio ceramics, rotary endodontics, regenerative endodontics.

UNIT VIII: Oral & Maxillofacial Surgery*

- Surgical principles, asepsis, infection control.
- Extractions, impacted teeth, sinus pathologies.
- TMJ disorders and maxillofacial trauma.

- Implantology and peri-implant disease.
- Guided implantology, CAD-CAM surgical stents, and platelet concentrates.

UNIT IX: Oral Diagnosis & Management

- Developmental anomalies and traumatic injuries.
- Salivary gland disorders and pigmentation.
- Pain disorders, altered sensations, halitosis.
- Systemic conditions affecting oral health.
- Tele-dentistry, AI in diagnostics, oral-systemic links.

UNIT X: Orthodontics & Dentofacial Orthopaedics

- Craniofacial growth and occlusion.
- Etiology and classification of malocclusion.
- Orthodontic appliances: removable, fixed, myofunctional.
- Materials and biomechanics in orthodontics.
- Clear aligners, 3D cephalometry, AI-based planning.

UNIT XI: Periodontology

- Periodontal histology and aging.
- Gingival and periodontal diseases.
- Regenerative procedures and implant maintenance.
- Periodontal-systemic health link.
- Host modulation therapy, lasers, salivary diagnostics.

UNIT XII: Prosthodontics

- Complete and removable dentures.
- Fixed partial dentures and implant-supported prostheses.
- Occlusion and esthetics.
- Digital workflow in prosthodontics.
- CAD/CAM prostheses, zirconia, digital impressions.

UNIT XIII: Pedodontics & Preventive Dentistry

- Child growth and dental development.
- Pediatric pathology and psychology.

- Preventive and interceptive orthodontics.
- Special needs dentistry and dental trauma.
- MI dentistry, AI in behavior management, fluoride innovations.

UNIT XIV: Research Methodology & Biostatistics

- Study designs: observational, experimental.
- Data analysis, hypothesis testing, statistics.
- Research ethics and literature review.
- Systematic reviews, meta-analyses, evidence-based dentistry.

UNIT XV: Digital Dentistry & Innovation

- CAD/CAM, 3D printing, intraoral scanners.
- Virtual planning and AI diagnostics.
- Digital records and data security.
- AR/VR simulations, robotic dentistry, digital occlusion analysis.

UNIT XVI: Public Health Dentistry & Policy

- Oral epidemiology and health indicators.
- Health education and dental programs.
- Dental health policy and outcomes.
- mHealth, dental teleconsultations, health economics.

UNIT XVII: Translational & Regenerative Dentistry

- Stem cell types and applications.
- Tissue engineering scaffolds and biomaterials.
- Gene therapy and biomimetic regeneration.
- CRISPR gene editing, scaffold-free 3D bioprinting, exosome therapy.

Reference books

1. Newman MG, Takei H, Klokkevold PR, Carranza FA. Newman and Carranza's Clinical Periodontology E-Book: Newman and Carranza's Clinical Periodontology E-Book. Elsevier Health Sciences; 2018 May 29.
2. McMinn RM. Last's Anatomy-Revised Edition. Churchill Livingstone; 2019 Oct 30.
3. Guyton AC. Textbook of medical physiology. China; 2006.

4. Murray K, Rodwesll V, Bender D, Botham KM, Weil PA, Kennelly PJ. Harper's illustrated biochemistry. 28. Citeseer, New York, United States. 2009.
5. Anusavice KJ, Shen C, Rawls HR, editors. Phillips' science of dental materials. Elsevier Health Sciences; 2012 Sep 27.
6. Kumar V, Abbas AK, Aster JC, Deyrup AT, editors. Robbins & Kumar basic pathology, e-book: Robbins & Kumar basic pathology, e-book. Elsevier Health Sciences; 2022 Oct 23.
7. Ananthanarayan R. Ananthanarayan and Paniker's textbook of microbiology. Orient Blackswan; 2006.
8. Tripathi KD. Essentials of medical pharmacology. Jaypee Brothers medical publishers; 2018 Oct 31.
9. Bhaskar SN, editor. Orban's oral histology and embryology. Elsevier India; 1991.
10. Walker BR, Colledge NR. Davidson's principles and practice of medicine e-book. Elsevier Health Sciences; 2013 Dec 6.

SYLLABUS FOR PhD ADMISSION 2025

SECTION B

FACULTY OF PHARMACEUTICAL SCIENCES

UNIT I

PHARMACEUTICS

1. (a) Professional Pharmacy: Professional Pharmacy, Pharmaceutical jurisprudence including Drugs and Cosmetics Act 1940 and rules 1945. Pharmacy Act 1948, Revised Schedule M, Code of Pharmaceutical ethics. Drug regulatory agencies. Concepts on ICH, WHO, FDA, TGA, ISO, GMP, SOP, QBD, Patents etc.

(b) Physical Pharmaceutics: Physical properties of drug molecules, pH, buffers and isotonic solution, solubility phenomena, surface tension, interfacial phenomenon, Kinetics, Rheology, Micromeretics & powder flow, Diffusion and dissolution, Colloids, Complexation and protein binding

Pharmaceutical Technology:

(a) Principles, Formulation, Ingredients, method of manufacture, evaluation, quality control tests, labelling and packaging of the following class of product:

- ✓ **Solid dosage forms**- Tablets, coating, capsules, microcapsules, powders, granules etc. **Liquid dosage forms**- solutions, suspensions, emulsions,
- ✓ **Semisolid dosage forms**- ointment, creams, gels, suppositories,
- ✓ **Parenterals**- injections small volume, large volume, ophthalmic preparations and
- ✓ Pre-formulation studies, stability studies and pharmacopeial specifications for various formulations.
- ✓ Formulation of cosmetics preparation like lipstick, shampoo, creams, nail preparations, dentifrices, powers etc.

(b) Novel Drug Delivery Systems, Targeted Drug Delivery Systems.

Biopharmaceutics and Pharmacokinetics and their importance in formulation.

Introduction to biopharmaceutics: Drug absorption, distribution, metabolism and elimination. Compartment model- Definition and Scope. Pharmacokinetics of drug absorption - Zero order and

first-order absorption rate constant. Determination of pharmacokinetic parameters. Dose adjustment in Renal and Hepatic failure.

Bioavailability and bioequivalence: Measures of bioavailability, Cmax, tmax, K_{el} and Area Under the Curve (AUC); Review of regulatory requirements for conducting bioequivalent studies. Biopharmaceutical Classification System (BCS) of drugs, Biosimilars.

UNIT II

PHARMACEUTICAL CHEMISTRY

Pharmaceutical Organic Chemistry

- ✓ Structure, nomenclature, stereochemistry, reactivity, named reactions, reagents, and associated mechanism.

Heterocyclic Chemistry

- ✓ Structure, nomenclature, synthesis, chemical reactions, and medicinal uses.

Medicinal Chemistry

- ✓ Structure, nomenclature, classification, synthesis, SAR, mechanism of action, therapeutic uses, and metabolism of the following classes: Drugs acting on ANS, CNS, CVS, Anti-infectives, and Anti-cancer agents.

Biochemistry

- ✓ Biochemical role of biomolecules (Carbohydrates, Proteins, Lipids, Nucleic acids), hormones, vitamins, enzymes, metabolic pathways, and bioenergetics.

Phytochemistry

- ✓ Major classes of phytochemicals (Alkaloids, Terpenoids, Phenolics, Glycosides); their isolation, identification, and biological activities.

UNIT III

PHARMACEUTICAL ANALYSIS AND QUALITY ASSURANCE

1. Spectroscopic techniques: UV-Visible spectroscopy, infrared (IR) spectroscopy, nuclear magnetic resonance (NMR) spectroscopy and mass spectrometry (MS).

2. Chromatography: Analytical high-performance liquid chromatography (HPLC), preparative HPLC, Gas chromatography (GC), ion exchange chromatography, affinity chromatography, Gel chromatography and, capillary electrophoresis (CE), super critical fluid chromatography (SFC).

3. Hyphenated techniques: LC-MS and GC-MS.

4. Other analytical techniques: X-ray diffraction (XRD), Differential scanning calorimetry (DSC), Thermogravimetric analysis (TGA) and differential thermal analysis (DTA).

5. Stability studies: Stability testing of pharmaceuticals, various stability tests, kinetic studies, shelf-life determination, thermal stability, formulation stability and impurity profiling.

6. Bioanalysis: Sample preparation techniques, bioanalytical method validation, Pharmacokinetics, cytochrome P450-based drug interactions, drug interactions linked to transporters. microsomal assays, reaction phenotyping, enzyme inhibition, enzyme induction, metabolic stability, metabolite profiling, Caco-2 permeability assay, plasma protein binding, tissue binding and tissue distribution.

7. **Quality assurance:** cGMP guidelines, ICH guidelines, documentation, Quality management systems, cleaning validation, calibration, validation, qualification.

UNIT IV

PHARMACOGNOSY &PHYTOCHEMISTRY

1. Systematic pharmacognostic study of the following: Carbohydrates and derived products:

Agar, guar gum, acacia, Honey, Isabagol, pectin and Tragacanth. Lipids: Bees wax, Castor oil, Codliver oil, Shark liver oil and Wool fat. Resins: Colophony, podophyllum, jalap, cannabis, capsicum, myrrh, asafoetida, balsam of Tolu, balsam of Peru, benzoin, turmeric, ginger. Volatile oils: Mentha, Coriander, Cinnamon, Cassia, Lemon peel, Orange peel, Lemon grass, Citronella, Caraway, Dill, Clove, Fennel, Nutmeg, Eucalyptus, Chenopodium, Cardamom, Sandal wood.

2. **Study of the biological sources**, cultivation, collection, commercial varieties, chemical constituents, substitutes, adulterants, uses, diagnostic macroscopic and microscopic features and specific chemical tests of following groups of drugs. Cardioactive glycosides: Digitalis, squill, strophanthus and thevetia, Anthraquinones: Aloe, senna, rhubarb and cascara, Alkaloid containing drugs: Pyridine-piperidine: Tobacco, areca and lobelia. Tropane: Belladonna, hyoscyamus, datura, duboisia, coca and withania. Quinoline and Isoquinoline: Cinchona, ipecac, opium. Indole: Vinca alkaloids, Ergot, rauwolfia, catharanthus, nux-vomica and physostigma. Steroidal: kurchi. Purines: Coffee, tea and cola.

3. **Selection of plant materials**, claims of folklore on traditional systems, Authentication of

plant materials by various organizations. Extraction methods of plant materials, chromatographic techniques (TLC, HPTLC, and LCMS) of plant constituents, characterization of the isolates by spectroscopy techniques (UV, IR, NMR and Mass). Methods of isolation of volatile oils and their identification & Chemical identification of plant constituents

4. **WHO Guidelines for the assessment of crude drugs:** Evaluation of identity, quality and purity of crude drugs. Alternative system of medicine: Principles of Ayurveda, Homeopathy and Unani system of medicines, there merits and demerits. Methods of improving quality of crops and their application. Plant tissue culture techniques. Applications of plant biotechnology in Pharmacy. Indian and International patent laws, proposed amendments as applicable to herbals/natural products and processes.

UNIT V

PHARMACOLOGY

1. (a) **Fundamentals of general pharmacology:** Dosage forms and routes of administration, mechanism of action, combined effect of drugs, factors modifying drug action, tolerance and dependence; Pharmacogenetics; Principles of Basic and Clinical pharmacokinetics, absorption, Distribution, Metabolism and Excretion of drugs, Adverse Drug Reactions; Bioassay of Drugs and Biological Standardization; Discovery and development of new drugs, Bioavailability and bioequivalence studies.

(b) **Pharmacology of Peripheral Nervous System:** Neurohumoral transmission (autonomic and somatic), Parasympathomimetics, Parasympatholytics, Sympathomimetics, Sympatholytics, Ganglion stimulants and blocking agents, Neuromuscular blocking Agents, Local anesthetic Agents.

(c) **Pharmacology of Central Nervous System:** Neurohumoral transmission in the C.N.S., General Anesthetics, Alcohols and disulfiram, Sedatives, Hypnotics, Anti-anxiety agents and Centrally acting muscle relaxants, Psychopharmacological agents (anti-psychotics), anti-maniacs, and hallucinogens, Antidepressants, Anti-epileptics drugs, Anti-Parkinsonism drugs, Analgesics, Antipyretics, Narcotic analgesics and antagonists, C.N.S. stimulants, Drug Addiction and Drug Abuse.

2. (a) **Pharmacology of Cardiovascular System:** Drugs used in the management of congestive cardiac failure, Antihypertensive drugs, Anti-angina drugs and Vasodilator drugs, including calcium channel blockers and beta adrenergic antagonists, Anti arrhythmic drugs, Anti-hyperlipidemic drugs, drugs used in the therapy of shock.

(b) **Drugs acting on urinary system:** Fluid and electrolyte balance, Diuretics, Anti-diuretics; Drugs Acting on the Respiratory System: Anti-asthmatic drugs including bronchodilators, Anti-tussives and expectorants, Respiratory stimulants.

(c) **Drugs acting on the Gastrointestinal Tract:** Antacids, Anti-secretory and Anti-ulcer drugs, Laxatives and anti-diarrhoeal drugs, Appetite Stimulants and Suppressants, Emetics and anti-emetics, Miscellaneous: Carminatives, demulcents, protectives, adsorbents, astringents, digestants, enzymes and mucolytics.

3. (a) **Pharmacology of Endocrine System:** Hypothalamic and pituitary hormones, Thyroid hormones and anti-thyroid drugs, parathormone, calcitonin and Vitamin D, Insulin, glucagons, incretins, oral hypoglycemic agents and insulin analogs, ACTH and corticosteroids, Androgens and anabolic steroids, Estrogens, progesterone and oral contraceptives, Drugs acting on the uterus.

(b) Chemotherapy: General Principles of Chemotherapy, Bacterial resistance; Sulfonamides and cotrimoxazole, Antibiotics- Penicillins, Cephalosporins, Aminoglycosides, Chloramphenicol, Macrolides, Tetracyclines, Quinolones, fluoroquinolones and Miscellaneous antibiotics; Chemotherapy of tuberculosis, leprosy, fungal diseases, viral diseases, HIV and AIDS and Cancer Chemotherapy.

Books recommended:

1. The Science and Practice of Pharmacy by Remington
2. Bentley and Driver's Text Book of Pharmaceutical Chemistry by Atherden L M
3. Foyes principles of Medicinal chemistry.
4. Text book of Pharmacognosy by Trease and Evans, 16th edition.
5. Ross and Wilson Anatomy and Physiology in Health and Illness, International Edition 12th Edition
6. Robbins & Cotran Pathologic Basis of Diseases, by Vinay Kumar Abul Abbas Jon Aster, 9th edition
7. A Textbook of Pharmacy Practice , by Dr. K.G. Revikumar and Dr. B.D. Miglani
8. A Text Book of Clinical Pharmacy Practice: Essential Concepts and Skills by G. Parthasarathi, Karin Nyfort-Hansen, Milap C. Nahata.Merchant & Quadry's A Text Book Of Hospital Pharmacy by Dr.R.K.Goyal, Dr.R.K.Parikh, Dr.Mayur M.Patel.

9. Hospital Pharmacy by H. P. Tipnis, Bajaj Amrita 1st Edition.
10. Hospital and Clinical Pharmacy, by Mohammed Ali, 1st Edition
11. Wilson and Gisvold text book of organic medicinal and pharmaceutical chemistry
12. Drug Screening methods- preclinical evaluation of new drugs- S K Gupta
13. Pharmacognosy – C K Kokate, A P Purohit, s B Gokhale, 40th edition

Reference books:

1. Biochemistry by Dr. U. Satyanarayana, Dr. U. Chakrapani, 3rd edition
2. Essentials of Medical Pharmacology by Tripathi DK
3. Pharmcognosy: An Indian Perspective by Mangathayaru K
4. Dispensing for Pharmaceutical Students by Carter S
5. Introduction to Pharmaceutical Dosage Forms by Ansel H C
6. The Theory and Practice of Industrial Pharmacy by Lachman L, Lieberman
7. Inorganic and medicinal and pharmaceutical chemistry – Wilson and sonie
8. Physical chemistry- Bahl and Tuli
9. Text book of physical chemistry - Ashutoskar
10. Organic chemistry by Morrison and Boyd
11. Text book of medicinal chemistry – Dr Alagarsamy- Vol I and II
12. Practical pharmaceutical chemistry by Beckette and stenlake
13. Pharmaceutical titrimetric analysis- A.A.Napoleon
14. Organic spectroscopy - Silverstein
15. Anthony's Textbook of Anatomy & Physiology, by Kevin Patton Gary Thibodeau, 21st Edition.
16. Pathophysiology: Concepts of Altered Health States, by Carol Mattson Porth, Glenn Matfin. Eighth Edition.
17. Practice of Hospital, Clinical and Community Pharmacy Practice by Mohd. Aqil
18. Hospital Pharmacy by Stephens Martin, Second edition

SYLLABUS FOR PHD ADMISSION 2025

SECTION – B

FACULTY OF NURSING

UNIT I: NURSING MANAGEMNT IN COMMUNITY HEALTH.

- Biomedical waste management.
- Nursing management of Communicable diseases and Non Communicable diseases.
- National health and family welfare program.
- Delivery of community health services: Rural and Urban.
- Health schemes: ESI, CGHS, Health insurance.
- Health Care Delivery system
- Health Policy.

UNIT II: INFECTION CONTROL

- Infection control in Clinical settings: Nature of infection, Chain of infection transmission.
- Defenses against infection: Natural and Acquired.
- Hospital acquired infection.
- Concept of asepsis.
- Universal precautions.
- Transmission based precautions.

UNIT III: NURSING MANAGEMENT OF PATIENTS WITH RESPIRATORY PROBLEMS

- Acute and chronic infections
- Asthma
- Chronic Obstructive Pulmonary Diseases
- Bronchiectasis

- Pneumonia
- Tuberculosis
- Lung abscess
- Pleural effusion
- Pulmonary embolism
- Tumors – Larynx and lung.

UNIT IV: NURSING MANAGEMENT OF PATIENTS WITH CARDIOVASCULAR PROBLEMS

- Hypertension
- Arteriosclerosis
- Coronary artery diseases
- Angina pectoris
- Myocardial infarction
- Endocarditis
- Pericarditis
- Myocarditis
- Valvular disorders
- Congenital disorders
- Cardiac dysrhythmias
- Congestive cardiac failure
- Anaemia
- Cardio Pulmonary Resuscitation
- Leukemia

UNIT V: NURSING MANAGEMENT OF PATIENTS WITH DIGESTIVE SYSTEM PROBLEMS

- Peptic and Duodenal ulcer
- Pyloric Stenosis
- Small and large intestinal disorders-inflammation and infection
- Enteritis
- Mal-absorption, Obstruction and perforation
- Hernias

- Liver: Inflammation, Abscess, Cirrhosis, Portal hypertension, Hepatic Failure
- Pancreatitis
- Gall bladder: inflammation, obstruction, stones
- Tumours - Oral, Stomach, Colon, Liver

UNIT VI: NURSING MANAGEMENT OF PATIENTS GENITO-URINARY PROBLEMS

- Urinary tract infections
- Nephritis,
- Nephrotic syndrome
- Renal calculus
- Acute and chronic renal failure
- Dialysis
- Renal transplantation,
- Benign prostate hypertrophy
- Tumours - Renal, Bladder, Prostate.

UNIT VII: NURSING MANAGEMENT OF PATIENTS WITH DISORDERS OF ENDOCRINE SYSTEM

- Thyroid and Parathyroid Disorders
- Diabetes mellitus
- Adrenal disorders
- Pituitary disorders

UNIT VIII: NURSING MANAGEMENT OF PATIENTS WITH NEUROLOGICAL DISORDERS

- Congenital malformations
- Head injuries
- Spinal injuries
- Infections: Meningitis, encephalitis
- Brain abscess
- Brain tumours
- Epilepsies,

- Cerebro Vascular Accidents (CVA)
- Management of unconscious patients
- Rehabilitation

UNIT IX: NURSING MANAGEMENT OF PATIENT WITH DISORDERS OF REPRODUCTIVE SYSTEM

- Menstrual disorders
- Pelvic Inflammatory Disease
- Endometriosis
- Polyps
- Tumours - Cervix, Ovary, Uterus and breast
- Fibroids
- Uterine displacement
- Cystocele
- Urethrocele
- Rectocele
- Vaginal disorders
- Infections
- Fistulas
- Diseases of breasts: Deformities, Infections, Cysts
- Menopause and Hormonal Replacement Therapy
- Infertility
- Contraception

UNIT X: NURSING CARE OF A NORMAL NEONATE

- Neonatal resuscitation
- Low birth weight baby
- Integrated management of neonatal and childhood illnesses (IMNCI)
- Nursing management of childhood diseases
- Nutritional deficiency disorders
- Respiratory disorders and infections

- Gastrointestinal infections, infestations and congenital disorders
- Cardio vascular problem: congenital defects, Rheumatic fever, Rheumatic heart disease,
- Genito-urinary disorders: acute Glomerulo nephritis, Nephrotic syndrome,
- Neurological infections and disorders: Convulsions, Epilepsy, Meningitis, Hydrocephalus, Spina-bifida
- Orthopedic disorders: Club feet, Hip dislocation and fracture

UNIT XI: NURSING MANAGEMENT OF PATIENT WITH SCHIZOPHRENIA

- Mood disorders
- Bipolar disorder
- Mania
- Depression
- Cyclothymia
- dysthymia
- Stress
- somatization disorders
- Anxiety disorder
- Phobias
- Personality disorders
- Obsessive compulsive disorder
- Somatoform disorders
- Post traumatic stress disorder
- Substance use disorders
- Alcohol use disorders
- Mental retardation
- Childhood mental disorders

UNIT XII: ASSESSMENT AND NURSING MANAGEMENT OF NORMAL PREGNANCY

- Labour and puerperium
- High risk pregnancy

- Abortion
- Ectopic Pregnancy
- Ante-partum haemorrage
- Pregnancy induced hypertension & diabetes
- Rh incompatibility
- Multiple pregnancy
- Intra-uterine growth-retardation
- Obstructed Labour
- Postpartum complications

REFERENCE:

1. Huber DL. Leadership and Nursing management, Saunders publishers 4th edition,NewYork 2009.
2. Trained Nurses Association of India.Nursing administration and management, 1st edition, New Delhi 2000.
3. Roussel L. Management and leadership for nurse administrators, 5th edition, Jones and Bartlett publishers.London 2009.
4. Goldsmith SB. Understanding healthcare management – A case study approach, Jones and Bartlett publishers.London 2012.
5. Marquis BL and Huston CJ. Leadership roles and management functions in Nursing Theory and applications, 10th edition, Lippincott Williams and Wilkins 2023.
6. Hockenberry MJ, Wilson D,Rodgers CC. Wong's Essentials of Pediatric Nursing. 10th edition. Elsevier publishers 2016.
7. Marlow D, Kalia R. Marlow’s Textbook of Pediatric Nursing (Adapted For South Asian Edition).Elsevier publishers 2013.
8. Singh M. Care of the Newborn; 9th Edition.CBS publishers 2024.
9. Kline MW, Blaney SM, Giardino AP.Rudolph's Pediatrics. 23rd edition. McGraw-Hill publishers 2018.
10. PillitteriA. Maternal and child health nursing. 7th edition.London: Lippincott Williams and Wilkins publisher;2014.
11. Ward SL, Hisley SM. Maternal child nursing care. 1st Indian edition. New Delhi: Jaypee brothers medical publishers;2010.

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31. Malarvizhi S, Santhi SA. Text book of Medical Surgical Nursing. 2nd ed. Elsevier; 2023.
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35. Reddamma. Advance Concepts of Nursing Practice. India: Jaypee Brothers Medical Publishers; 2021

MALLA REDDY
VISHWAVIDYAPEETH

SYLLABUS FOR Ph.D. ENTRANCE EXAMINATIONS

SECTION - B

FACULTY OF ALLIED HEALTH SCIENCES

UNIT I:

Nervous System Structure and Function

- Divisions: CNS & PNS, major brain regions (Forebrain, Midbrain, Hindbrain)
- Key brain structures: Cerebrum, cerebellum, brainstem, spinal cord
- Cranial nerves, their origin, and pathways
- CSF: Secretion, absorption, composition, and circulation
- Blood-brain barrier and blood supply to the CNS (Circle of Willis)

Neural Communication and Motor Control

- Nerve fibers, synapses, neurotransmitters
- Neuromuscular junction and muscle contraction
- Reflex arc, Broadmann's areas, motor and sensory homunculus

UNIT II:

Head and Neck Anatomy

- Cells, tissues, and cartilages of the head and neck
- Muscles of the neck and face: muscles of the lips, cheeks, and mastication
- Muscles of the tongue: intrinsic and extrinsic muscles, origin, insertion, functions, and nerve innervations
- Muscles of the palate and pharynx: origin, insertion, and nerve innervations
- Velopharyngeal mechanism and larynx: cartilages (paired and unpaired), connections, nerve innervations, and vocal fold physiology
- Paranasal sinuses: frontal, maxillary, ethmoidal, and sphenoidal sinuses, blood supply, and venous drainage

Sensory Organs and Physiology

- Anatomy of the ear: external, middle, and inner ear parts, blood supply, venous drainage, and nerve supply
- Physiology of hearing and balance
- Anatomy of the eye: glands, blood supply, optic nerve, and eye function
- Anatomy of teeth: types, parts, structure, arterial supply, and lymphatic drainage

UNIT III: Muscle and Cardiovascular System

- Muscle tissue types, skeletal muscle functions, contraction, relaxation, muscle tone, and conditioning
- Anatomy of the heart, chambers, cardiac cycle, blood vessels, and blood composition

Respiratory System and Physiological Measures

- Anatomy of the upper and lower respiratory tract, diaphragm, and intercostal muscles
- Mechanism of respiration (internal and external influences)
- Blood pressure regulation and electrocardiogram (ECG)

UNIT IV: Human Development and Fetal Growth

- Development of brachial arches, pouches, and their derivatives
- Stages of neural tube development
- Monthly fetal development and factors affecting fetal growth
- Effects of drugs, hormones, and chemicals on fetal development and birth defects

Genetics and Inheritance

- Basic cell biology, structure, and functions of genes and chromosomes
- Autosomal dominant and recessive inheritance patterns
- Sex-linked inheritance and non-traditional models of inheritance
- Genetic testing: Karyotyping, structural aberrations, and gene therapy
- Clinical genetics and genetic counselling

UNIT V: Pathological Conditions and Inflammation

- Cell injury, adaptation, and death
- Acute and chronic inflammation
- Tissue repair: cell regeneration and fibrosis
- Hemodynamic disorders, thrombosis, and shock
- Characteristics of benign and malignant neoplasms
- Tumors of the head and neck
- Obstructive and restrictive lung diseases
- Diseases of the larynx, oro-pharynx, and voice and speech disorders

Ear, Endocrine, and Nervous System Disorders

- Infections of the ear (otitis externa and otitis media)
- Hearing loss: sensory and conductive
- Endocrine disorders
- Infections and tumors of the nervous system
- Stroke, aphasia, and dysarthria

UNIT VI: Motor and Cognitive Development

- Stages of motor development, manipulative behavior, and complex motor skills
- Handedness, motor development during later childhood, and evolutionary growth of intelligence
- Emotional and social development in children, perception, and memory
- Sensory systems development (vision and hearing)

Language, Feeding, and Developmental Disorders

- Early language development and language development through childhood
- Development of feeding and eating behaviors
- Developmental disorders in children

UNIT VII:

Clinical Psychology Foundations and Assessments

- Definition and historical development of psychology
- Scope of clinical psychology in health science
- Concepts of normality and abnormality

- Methodology in clinical psychology: case history, interview, and observation
- Psychology of learning: classical and operant conditioning, reinforcement strategies
- Piaget's theory of cognitive development and Freud's psychosexual development theory
- DSM and ICD classification of abnormal behavior
- Assessment of primary mental functions: attention, concentration, memory, and intelligence
- Assessment of personality and interpersonal relationships
- Introduction to cognitive behavior therapy and counseling

UNIT VIII:

1. **Foundations of Food, Nutrition, and Health**
    - Definitions of nutrition, health, good nutrition, and malnutrition
    - Diet and health: issues of deficiency, diseases of affluence, food safety (additives and contamination)
    - Digestion and absorption of carbohydrates, fats, proteins, vitamins, and iron
2. **Nutritional Considerations and Challenges**
    - Overweight and obesity: causes and treatment
    - Nutrition at different life stages and in deficiency or diet-related diseases
    - Water and electrolyte balance
    - Food security, organic foods, and technologies for food and nutrition security
    - Nutritional implications of food processing and packaging

UNIT IX:

Introduction and Phases of Counseling

- Definition, scope, origin, and history of counseling
- Phases of counseling: assessment, initiation, and termination
- Individual and group counseling
- Counseling skills: observation, questioning, communication, note-taking, and reflection

Specialized Counseling and Ethical Considerations

- Hospital counseling: terminally ill, pain management, and rehabilitation
- Cultural issues in counseling
- Counseling intellectual exceptionality and sensory handicaps
- Family, personal, and educational counseling
- Ethical codes, client rights, confidentiality, and legal responsibilities

UNIT X:

Fundamentals of Electricity and Electronics

- Current, static electricity, voltage, current, resistance, and their effects on the human body (electric shock)
- Basic electronics: conductors, insulators, semiconductors, passive circuit devices, diodes, transistors, amplifiers, oscillators
- Transducers: microphones, biosensors, piezoelectric transducers, and their applications
- Measuring instruments: multimeter, cathode ray oscilloscope, sound level meter

Sound, Light, Heat, and Electromagnetism

- Sound: production, propagation, and its applications (reflection, diffraction, interference)
- Light: nature, reflection, refraction, and defects of vision
- Heat: types of heat transfer, body temperature regulation, and applications
- Electromagnetism in diagnosis: ECG, EEG, EMG, EGG, CT, MRI procedures
- Electronic equipment in patient care and safety precautions

UNIT XI: Human Body Maintenance and System Functions

- Cardiovascular, lymphatic, respiratory, endocrine, digestive, urinary, and reproductive systems: organs and functions
- Classification and metabolism of carbohydrates, lipids, proteins, enzymes, vitamins, and minerals
- Basic concepts of infection, immunity, sterilization, disinfection procedures, and disease concepts (inflammation, repair, lesion classification)

Diseases, Infections, and Preventive Measures

- Systemic disorders: coronary heart disease, asthma, emphysema, bronchiectasis, autoimmune diseases, and diseases of the urinary, reproductive, and nervous systems
- Hospital-acquired infections: sources, routes, preventive measures, and waste management
- Communicable diseases: tuberculosis, leprosy, HIV/AIDS, hepatitis B and C, food poisoning
- Non-communicable diseases: CHD, obesity, diabetes, hypertension, cancer—risk factors and prevention

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SYLLABUS FOR Ph.D. ENTRANCE EXAMINATIONS

SECTION - B

FACULTY OF PUBLIC HEALTH

UNIT I – Environmental Health and Its Impact

- Environmental hazards, exposure pathways, air and water pollution, sanitation, food safety, vectors, and diseases
- Solid waste management, noise pollution, indoor air quality, and heat exposure
- Climate change and its impact on health, occupational diseases, and environmental disasters
- Emerging environmental issues, global burden of disease, and India's disease estimates

UNIT II – Epidemiology and Biostatistics

- Key concepts: proportion, ratio, incidence, prevalence, odds ratio, relative risk, attributable risk, and attributable fraction
- Study designs: ecological study, cross-sectional study, cohort study, case-control study, and randomized controlled trials
- Biases: selection bias, information bias, and confounding
- Disease surveillance, public health screening, sensitivity and specificity
- Data organization and analysis: mean, median, mode, range, standard deviation, coefficient of variation
- Scales of measurement: continuous and ordinal scales
- Probability, data distribution, sampling techniques, sample size, and probability distributions

UNIT III- Public Health Biology

- Toxic agents, spectrum of undesired effects, characteristics of exposure, and dose-response relationship
- Factors influencing toxicity and toxic responses
- Body composition, fluids, and the functions of cells, organelles, and organs
- Human physiological systems and immunity
- Genetics and environmental health
- Infectious diseases: sources, means of transmission, and reservoirs
- Outbreaks, nutrition-related disorders, and essential nutrients (macronutrients)

UNIT IV – Health Policy and Management

- Globalization and health
- Economic evaluation of health, health economics, cost-benefit, and cost-effectiveness analysis
- Health care systems, health insurance, and financing
- Health sector reforms and national health programs in India
- Policies and program formulation, implementation, and monitoring
- Analyzing program outcomes and resource allocation

UNIT V – Social & Behavioral Sciences

- Demographic and social perspectives on population health
- Population behavior, health disparities, and determinants of health
- Lifestyle, disease, and health equity
- Gender and health, major health indicators
- Behavioral change, intervention, and social marketing

UNIT VI – Occupational Safety and Health

- Types of industrial processes and elements of industrial safety
- Industrial hygiene, chemical, physical, biological, and psychosocial hazards
- Ergonomics and control methods for hazards
- Disaster management and environmental protection acts
- Permissible exposure limits, standards, and guidelines
- Factories Act, OSHA, ACGIH, and environmental management systems

UNIT VII – Environmental and Research Ethics

- Ethical issues in epidemiology and responsible conduct of research
- Conflict of interest, privacy, and confidentiality
- Data access, management, and plagiarism

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3. Ganong‟s Review of Medical Physiology, 25th Edition, Section VI – Circulation, Chapter 27 – Circulating Body Fluids
4. Parks Textbook Of Preventive & Social Medicine- 24th Edition, 2017by Park K
5. Brian P.Hinote and Jason Adam Wasserman (2016) „Social and Behavioral Science for Health Professionals‟ Rowman & Littlefield Publishers, 1st Edition.
6. The occupational Environment: Its Evaluation, Control, and Management, 2nd Edition, AIHA Press, ISBN 1-931504-43-1: Chapter 1, 3, 20, 21, 24, 28, 32
7. ICMR. Ethical guidelines for biomedical research on human participants. https://www.iitm.ac.in/downloads/ICMR_Ethical_Guidelines_2017.pdf Accessed on August 9, 2018

Syllabus For Ph.D. Entrance Examinations

Section - B

FACULTY OF ENGINEERING AND TECHNOLOGY

UNIT I: Engineering Mathematics

Discrete Mathematics and Related Topics

- Propositional and first-order logic, sets, relations, functions, partial orders, lattices
- Monoids, groups, graph theory (connectivity, matching, coloring)
- Combinatorics (counting, recurrence relations, generating functions)
- Linear algebra (matrices, determinants, systems of linear equations, eigenvalues and eigenvectors, LU decomposition)
- Calculus (limits, continuity, differentiability, maxima and minima, mean value theorem, integration)
- Probability and statistics (random variables, distributions, mean, median, mode, standard deviation, conditional probability, Bayes theorem)

UNIT II: Digital Logic

Digital Logic and Arithmetic

- Boolean algebra, combinational and sequential circuits
- Minimization techniques
- Number representations and computer arithmetic (fixed and floating point)

UNIT III: Computer Organization and Architecture

- Machine instructions and addressing modes
- ALU, data path, and control unit
- Instruction pipelining, pipeline hazards

- Memory hierarchy (cache, main memory, secondary storage)
- I/O interface (interrupt and DMA mode)

UNIT IV: Programming and Data Structures

- Programming in C
- Recursion
- Arrays, stacks, queues, linked lists
- Trees, binary search trees, binary heaps
- Graphs

UNIT V: Algorithms

- Searching, sorting, hashing
- Asymptotic worst-case time and space complexity
- Algorithm design techniques: greedy, dynamic programming, divide-and-conquer
- Graph traversals, minimum spanning trees, shortest paths

UNIT VI: Theory of Computation

- Regular expressions and finite automata
- Context-free grammars and push-down automata
- Regular and context-free languages, pumping lemma
- Turing machines and undecidability

UNIT VII: Compiler Design

- Lexical analysis, parsing, syntax-directed translation
- Runtime environments
- Intermediate code generation
- Local optimization
- Data flow analyses: constant propagation, liveness analysis, common subexpression elimination

UNIT VIII: Operating System

- System calls, processes, threads, inter-process communication
- Concurrency and synchronization, deadlock
- CPU and I/O scheduling
- Memory management and virtual memory
- File systems

UNIT IX: Databases

- ER-model, relational model: relational algebra, tuple calculus, SQL
- Integrity constraints, normal forms
- File organization, indexing (B-trees, B+ trees)
- Transactions and concurrency control

UNIT X: Computer Networks

- Layering concept: OSI and TCP/IP protocol stacks
- Packet, circuit, and virtual circuit switching
- Data link layer: framing, error detection, Medium Access Control, Ethernet bridging
- Routing protocols: shortest path, flooding, distance vector, and link state routing
- Fragmentation, IP addressing, IPv4, CIDR notation
- IP support protocols: ARP, DHCP, ICMP, Network Address Translation (NAT)
- Transport layer: flow control, congestion control, UDP, TCP, sockets
- Application layer protocols: DNS, SMTP, HTTP, FTP, Email

Reference Book

1. Higher Engineering Mathematics" by B.S. Grewal
2. "Digital Design" by M. Morris Mano and Michael D. Ciletti
3. Computer Organization and Design: The Hardware/Software Interface" by David A.

Patterson and John L. Hennessy

4. "Fundamentals of Data Structures in C" by Ellis Horowitz, Sartaj Sahni, and Susan Anderson-Freed
5. "Introduction to Algorithms" by Cormen, Leiserson, Rivest, and Stein (CLRS)
6. "Introduction to Automata Theory, Languages, and Computation" by John E. Hopcroft, Rajeev Motwani, and Jeffrey D. Ullman
7. "Compilers: Principles, Techniques, and Tools" by Alfred V. Aho, Monica S. Lam, Ravi Sethi, and Jeffrey D. Ullman
8. "Operating System Concepts" by Abraham Silberschatz, Peter B. Galvin, and Greg Gagne
9. "Computer Networking: A Top-Down Approach" by James F. Kurose and Keith W. Ross
10. "Computer Networking: Principles, Protocols, and Practice" by Olivier Bonaventure

Syllabus For Ph.D. Entrance Examinations

Section - B

FACULTY OF DIGITAL HEALTH

UNIT-1: Digital Health: Introduction

Need and Case Studies: Drivers, benefits, challenges, and real-world examples of mHealth and eHealth implementations. **Health Informatics Standards**: Overview of HL7, IHE, and Vendor Neutral Archives (VNAs) for data exchange and interoperability. **Open Source and Data Innovation**: Benefits of open-source platforms like OpenMRS, the role of big data, AI, and blockchain in healthcare. **IT Infrastructure**: Applications of IoT and cloud computing in healthcare, focusing on security, scalability, and data sharing. **Future Trends and Impact**: The impact of mHealth/eHealth on patient care, cost-efficiency, and global health, with a focus on AI and personalized medicine.

Unit-2: Wearable Devices and Physiological Signal Processing

Signal and Physiological Data Processing: Sampling, Filters, Decimation, Interpolation, STFT, Wavelets; ECG & EEG Acquisition and Analysis; Wearable Health Sensors (Accelerometers, Glucose, ECG, EEG); Speech & Audio Signal Processing

Unit-3: Machine Learning Basics for Real-world

Mathematics for ML, Data & Model Basics, ML Workflow & Applications; Real-World Signal Processing (Text, Speech, Image, Video); Feature Extraction & Robustness; Learning as Optimization; Linear & Logistic Regression; Pattern Recognition & Generative Modeling (Gaussian Models); ML for Physiological Signal Processing; Time Series Modeling

Unit-4: Deep Learning in Digital Health

Deep Learning: Basics, MLPs, Backpropagation, CNNs & RNNs; Deep Learning for Physiological Signal Processing; Practical Considerations & Regularization (Dropout); Sequence Mapping

Architectures; Applications in Healthcare; NLP: LSTMs, Language Models, Knowledge Graphs, Q&A (Demo)

Unit-5: Deep Learning in Imaging/Vision

Methods & Deep Learning; Neuroimaging Challenges; Deep Learning in Vision: Loss Function, Optimization, CNNs, Training, Object Detection & Segmentation; Models: AlexNet, VGG, GoogleNet, ResNet, RNN/LSTM

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3. EEG Signal Processing and Machine Learning; Authors: Saeid Sanei, Jonathon A. Chambers; Publisher: John Wiley & Sons; Year: 2021
4. Basic Mathematics for Machine Learning; Authors: Marc Peter Deisenroth, A. Aldo Faisal, and Cheng Soon Ong; Publisher: Cambridge University Press; Year: 2020
5. Deep Learning for Natural Language Processing; Author: Stephan Raaijmakers; Publisher: Manning Publications; Year: 2019
6. Deep Learning for Medical Image Analysis (2nd Edition); Authors: S. Kevin Zhou, Hayit Greenspan, Dinggang Shen; Publisher: Elsevier; Year: 2021