MD PHARMACOLOGY

Programme outcomes	Course outcome
MD Pharmacology at the end of the MD programme in Pharmacology the student will possess sound knowledge in following areas: ❖ The basic principles of Pharmacology including pharmacokinetic principles, pharmacodynamics, adverse drug reactions, time course of drug action, pathophysiological basis of drug use in various diseases , molecular biology including pharmacogenomics. ❖ Clinical pharmacology. He should know about clinical pharmacokinetics , individualization of drug therapy, drug use in special categories like pregnancy, lactation, hepatic and renal impairment, infants and old patients, adverse drug reactions (types and management), drug-drug interaction and P-drug concept. ❖ Systemic pharmacology, chemotherapy and therapeutics including effects of drugs on different pathophysiological conditions of various systems i.e. CVS, CNS, ANS, GIT , R.S. etc, chemotherapy of parasite infections and microbial diseases, antineoplastic agents, immunomudulators, drugs acting on blood, hormones etc. ❖ Principles of essential drug and rational use of medicines including concept of essential drugs, need of essential drug list, latest essential drug list of india, criteria for selection of essential drugs, role of essential drugs in implementation of national health policies, concept of rational prescribing , irrationalities in prescribing, , benefits of rational use of drugs and challenges occurring due to irrational use of drugs. ❖ Pharmacoeconomics, pharmacoepidemiology, pharmacogenomics,	At the end of the course the student should know about: ❖ Basic principles of Pharmacology. Clinical Pharmacology including drug use in special categories, adverse drug reactions, drug interactions. Principles of essential drug and rational use of medicines. Pharmacoeconomics, Pharmacoepidemiology, Pharmacogenomics, Environmental Pharmacology. Pharmacovigilance and ADR monitoring. ❖ Systemic Pharmacology, Major National Health Problems & Programmes. ❖ Research methodology – process of new drug development, ethical considerations in conducting research, Biostatistics, Commonly used laboratory techniques, analytical methods and instrumentation. ❖ Recent advances, guidelines for conducting clinical trials, ethics in human studies.

environmental pharmacology including the fundamental principles of pharmacogenomics including how specific patient characteristics and genetics can affect the clinical response to particular classes of drugs, and how pharmacogenomics approaches can be used to influence the drug discovery process and the choice of drugs in the treatment of specific diseases; basic concept of pharmacoepidemiology, methodologies (cost effective analysis, cost benefit analysis etc), types of studies, potential benefits and application of the studies ; concept of pharmacoepidemiology, objectives and potential contribution , study design and future prospects of these studies. ❖ Pharmacovigilance and ADR monitoring including terminologies and types of ADR, objectives, benefits and steps of ADR monitoring; concept of pharmacovigilance, objectives , methods , and benefits of pharmacovigilance, pharmacovigilance program of india, governing bodies, present scenario and WHO program for international drug monitoring. ❖ Drug regulations (including different acts and laws related to drugs and chemicals, various forms and applications related to drugs.), drug developmental process and clinical trials (including methods involved in new drug development, preclinical and clinical studies; different types and phases of clinic l trial, various legalities involved in conducting and approval of a clinical trial in India), GCP and GLP, formulation of research topic, study design, protocol writing blinding techniques, ethical principles of animal and human experimentation and publication ethics. ❖ Biostatistics including calculations of basic statistical parameters, sampling techniques and errors, randomization, sample size estimation, scales of measurement, dispersion of data, selection of test, metaanalysis, statistical software etc. ❖ Commonly used laboratory techniques, analytical methods and instrumentation including qualitative testing, trimetric analysis, Beer and	

Lambert's law, basis and working principles of colorimeter, ultraviolet , atomic absorption spectrometers, NMR and mass spectroscopy, different types of chromatography, radio immunoassay; processing of biological materials for drug analysis, GLP, validation of analytic al procedures. ❖ Major national health problems and programs. She/he should be well aware of the current health challenges (national and international), basic understanding of the common diseases and disorders India has, their treatment algorithm as approved by the government ; national health policies and programs like polio eradication program, RNTCP etc, latest drugs and vaccines introduced by the government in ongoing health programs. ❖ Able to constitute and conduct proceedings of various committees like IAEC, IEC etc including bioethical code of ethics and its emergence from past, fundamental principles, laws and rules of ethical research, composition and responsibilities of various committees, informed consent process, recent amendments in laws for ethical research, timelines for conductance of meetings and submission of required documents, documentation and data management. ❖ Self learning and teaching. He should be updated with all the recent advances in the field of Pharmacology and allied fields. He should be competent enough to teach and train undergraduates , future post graduate medical students , junior doctors in Pharmacology as well as nurses and paramedical staff in medical colleges, institutions and other hospitals. ❖ Experimental pharmacology including experimental methodologies, animal handling and care, screening methods, methods involved in testing teratogenicity, carcinogenicity, organ toxicity in animals.	