



Integral University, Lucknow

3339 Effective from Session: 2021-22							
Course Code	ER20-11T	Title of the Course	PHARMACEUTICS	L	T	P	C
Year	I	Semester	ANNUAL	3	1	-	-
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	--				
Course Objectives	1. Basic concepts, types and need 2. Advantages and disadvantages, methods of preparation / formulation 3. Packaging and labeling requirements 4. Basic quality control tests, concepts of quality assurance and good manufacturing practices						

Course Outcomes

CO1	Acquire the knowledge of the profession of Pharmacy in India in relation to pharmacy education, industry, pharmacy practice, and various professional associations.
CO2	Students able to know about Pharmaceutical packaging.
CO3	Students able to know about Pharmaceutical aids & Preservatives.
CO4	Understand the Unit operations, objectives/applications, principles, construction, and workings.
CO5	Students able to know about the Types of Tablet, Capsule formulation development and manufacturing technique. and also understand about liquid oral preparations, topical preparations, powders and granules, sterile formulations, immunological products.
CO6	Able to understand Novel drug delivery systems and basic structure, layout, sections, and activities of pharmaceutical manufacturing plants.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	History of the Pharmacy	History of the profession of Pharmacy in India in relation to Pharmacy education, industry, pharmacy practice, and various professional associations. Pharmacy as a career Pharmacopoeia: Introduction to IP, BP, USP, NF and Extra Pharmacopoeia. Salient features of Indian Pharmacopoeia	07	1
2	Packaging materials	Packaging materials: Types, selection criteria, advantages and disadvantages of glass, plastic, metal, rubber as packaging materials	05	2
3	Pharmaceutical aids & Preservatives	Organoleptic (Colouring, flavouring, and sweetening) agents Preservatives: Definition, types with examples and uses	03	3
4	Unit Operations	Unit operations: Definition, objectives/applications, principles, construction, and workings of: Size reduction: hammer mill and ball mill Size separation: Classification of powders according to IP, Cyclone separator, Sieves and standards of sieves Mixing: Double cone blender, Turbine mixer, Triple roller mill and Silverson mixer homogenizer Filtration: Theory of filtration, membrane filter and sintered glass filter Drying: working of fluidized bed dryer and process of freeze drying Extraction: Definition, Classification, method, and applications	09	4
5	Tablets, Capsules, Liquid oral preparations, Topical preparations, Powders and granules, Sterile formulations, Immunological products	Tablets – coated and uncoated, various modified tablets (sustained release, extended-release, fast dissolving, multilayered, etc.) Capsules - hard and soft gelatine capsules Liquid oral preparations - solution, syrup, elixir, emulsion, suspension, dry powder for reconstitution Topical preparations - ointments, creams, pastes, gels, liniments and lotions, suppositories, and pessaries Nasal preparations, Ear preparations Powders and granules - Insufflations, dusting powders, effervescent powders, and effervescent granules Sterile formulations – Injectables, eye drops and eye ointments Immunological products: Sera, vaccines, toxoids, and their manufacturing methods.	41	5
6	Basic structure, layout, sections, and activities of pharmaceutical manufacturing plants & NDDS	Quality control and quality assurance: Definition and concepts of quality control and quality assurance, current good manufacturing practice (cGMP), Introduction to the concept of calibration and validation Novel drug delivery systems: Introduction, Classification with examples, advantages, and challenges	10	6

Reference Books:

History of Pharmacy in India by Dr. Harikishan Singh

Indian Pharmacopoeia, Govt. of India Publication

A Text book of Pharmaceuticals Formulation by B.M. Mithal, Vallabh Prakashan

Bentleys' Text book of Pharmaceutics, Editor E.A. Rawlins, Elsevier Int.,

The Theory and Practice of Industrial Pharmacy. Leon Lachman, Herbert Lieberman and Joseph Kanig, Editors, Lea and Febiger, Philadelphia. Varghese Publishing House

Responsible Use of Medicines: A Layman's Handbook, www.ipapharma.org / publications



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e-Learning Source:

<https://njppp.com/fulltext/28-1642855379.pdf>

<https://courseware.cutm.ac.in/wp-content/uploads/2020/06/HISTORY-OF-PHARMACY.pdf>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8879473/#:~:text=Compared%20with%20traditional%20drug%20delivery,and%20lower%20toxic%20side%20effects.>

<https://www.jetir.org/papers/JETIR2009205.pdf>

<https://www.fda.gov/drugs/pharmaceutical-quality-resources/current-good-manufacturing-practice-cgmp-regulations>

<https://www.qualitygurus.com/design-review-verification-and-validation/>

<https://pubmed.ncbi.nlm.nih.gov/31882098/>

<http://www.pharmacyjournal.net/archives/2020/vol5/issue3/5-3-15>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	1	2	1	2	2	2	2	3	-	-	1	1	1	-	-	-
CO2	2	2	1	1	1	1	1	1	3	-	-	3	1	1	-	-	-
CO3	2	2	1	1	1	1	1	1	3	-	-	3	1	1	-	-	-
CO4	3	3	1	1	1	1	1	1	3	-	-	3	1	1	-	-	-
CO5	3	3	2	2	2	1	1	1	3	-	-	3	1	1	-	-	-
CO6	3	3	2	2	2	2	2	2	3	-	-	3	1	1	-	-	-

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HOD
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Integral University, Lucknow

Effective from Session: 2021-22										
Course Code	ER20-12T	Title of the Course	PHARMACEUTICAL CHEMISTRY				L	T	P	C
Year	I	Semester	ANNUAL				3	1	-	-
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	--							
Course Objectives	1. Chemical classification, chemical name, chemical structure 2. Pharmacological uses, doses, stability and storage conditions 3. Different types of formulations/dosage forms available and their brand names 4. Impurity testing and basic quality control tests									

Course Outcomes	
CO1	Learn the introduction to pharmaceutical chemistry, sources and types of error, impurity testing in pharmaceuticals, volumetric and gravimetric analysis of the chemical substances given in the official monographs.
CO2	Understand the pharmaceutical formulations, market preparations, storage conditions and uses of inorganic pharmaceuticals. Introduction to nomenclature of organic chemical systems (heterocyclic compounds).
CO3	Discuss the study of the medicinal compounds with respect to drugs acting on central nervous system, autonomic nervous system and cholinergic drugs and related agents.
CO4	Discuss the study of the medicinal compounds with respect to drugs acting on cardiovascular system, and diuretics.
CO5	Describe the study of the medicinal compounds with respect to hypoglycemic agents, analgesic, Anti-inflammatory, and non-steroidal anti-inflammatory agents (NSAIDs).
CO6	Discuss the study of the medicinal compounds with respect to anti-infective agents, antibiotics and antineoplastic agents.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction to pharmaceutical chemistry. Sources and types of errors. Impurities in pharmaceuticals. Volumetric analysis. Gravimetric analysis.	Introduction to pharmaceutical chemistry: Scope and objectives Sources and types of errors: Accuracy, precision, significant figures. Impurities in pharmaceuticals: Source and effect of impurities in pharmacopoeial substances, importance of limit test, principle and procedures of limit tests for chloride, sulphate, iron, heavy metals and arsenic. Volumetric analysis: Fundamentals of volumetric analysis, acid-base titration, non-aqueous titration, precipitation titration, complexometric titration, and redox titration. Gravimetric analysis: Principle and method.	16	1
2	Inorganic pharmaceuticals. Haematinics. Gastrointestinal agents. Topical agents. Dental products. Medicinal gases.	Inorganic pharmaceuticals: Pharmaceutical formulations, market preparations, storage conditions and uses of: Haematinics: Ferrous sulphate, Ferrous fumarate, Ferric ammonium citrate, Ferrous ascorbate, and Carbonyl iron. Gastrointestinal agents: Antacids: Aluminium hydroxide gel, Magnesium hydroxide, Magaldrate, Sodium bicarbonate, Calcium carbonate, Acidifying agents, Adsorbents, Protectives, and Cathartics. Topical agents: Silver nitrate, Ionic silver, Chlorhexidine gluconate, Hydrogen peroxide, Boric acid, Bleaching powder, Potassium permanganate. Dental products: Calcium carbonate, Sodium fluoride, Denture cleaners, Denture adhesives, and Mouth washes. Medicinal gases: Carbon dioxide, nitrous oxide, oxygen. Introduction to nomenclature of organic chemical systems with particular reference to heterocyclic compounds containing up to three rings.	09	2
3	Drugs acting on central nervous system. Drugs acting on autonomic nervous system. Cholinergic drugs and related agents.	Drugs acting on central nervous system Anaesthetics: Thiopental sodium*, Ketamine hydrochloride*, and Propofol. Sedatives and Hypnotics: Diazepam*, Alprazolam*, Nitrazepam, and Phenobarbital*. Antipsychotics: Chlorpromazine hydrochloride*, Haloperidol*, Risperidone*, Sulpiride*, Olanzapine, Quetiapine, and Lurasidone. Anticonvulsants: Phenytoin*, Carbamazepine*, Clonazepam, Valproic acid*, Gabapentin*, Topiramate, Vigabatrin, and Lamotrigine. Antidepressants: Amitriptyline hydrochloride*, Imipramine hydrochloride*, Fluoxetine*, Venlafaxine, Duloxetine, Sertraline, Citalopram, Escitalopram, Fluvoxamine, and Paroxetine. Drugs acting on autonomic nervous system Sympathomimetic agents Direct acting: Norepinephrine*, Epinephrine, Phenylephrine, Dopamine*, Terbutaline, Salbutamol (Albuterol), Naphazoline*, and Tetrahydrozoline. Indirect acting agents: Hydroxyamphetamine, and Pseudoephedrine. Agents with mixed mechanism: Ephedrine, and Metaraminol. Adrenergic antagonists Alpha adrenergic blockers: Tolazoline, Phentolamine, Phenoxybenzamine, and Prazosin. Beta adrenergic blockers: Propranolol*, Atenolol*, and Carvedilol. Cholinergic drugs and related agents Direct acting agents: Acetylcholine*, Carbachol, and Pilocarpine. Cholinesterase inhibitors: Neostigmine*, Edrophonium chloride, Tacrine hydrochloride, Pralidoxime chloride, and Echothiopate iodide.	18	3



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		Cholinergic blocking agents: Atropine sulphate*, and Ipratropium bromide. Synthetic cholinergic blocking agents: Tropicamide, Cyclopentolate hydrochloride, Clidinium bromide, and Dicyclomine hydrochloride*.		
4	Drugs acting on cardiovascular system. Diuretics.	Drugs acting on cardiovascular system Antiarrhythmic drugs: Quinidine sulphate, Procainamide hydrochloride, Verapamil, Phenytoin sodium*, Lidocaine hydrochloride, Lorcaïnide hydrochloride, Amiodarone and Sotalol. Antihypertensive agents: Propranolol*, Captopril*, Ramipril, Methyldopate hydrochloride, Clonidine hydrochloride, Hydralazine hydrochloride, and Nifedipine. Antianginal agents: Isosorbide dinitrate. Diuretics: Acetazolamide, Furosemide*, Bumetanide, Chlorthalidone, Benzthiazide, Metolazone, Xipamide, and Spironolactone.	07	4
5	Hypoglycemic agents. Analgesic and anti-inflammatory agents. Non-steroidal anti-inflammatory agents (NSAIDs).	Hypoglycemic agents: Insulin and its preparations, Metformin*, Glibenclamide*, Glimepiride, Pioglitazone, Repaglinide, Gliflozins, and Gliptins. Analgesic and antiinflammatory agents: Morphine analogues, and Narcotic antagonists. Nonsteroidal antiinflammatory agents (NSAIDs): Aspirin*, Diclofenac, Ibuprofen*, Piroxicam, Celecoxib, Mefenamic Acid, Paracetamol*, and Aceclofenac.	06	5
6	Anti-infective agents. Antibiotics. Antineoplastic agents.	Anti-infective agents Antifungal agents: Amphotericin-B, Griseofulvin, Miconazole, Ketoconazole*, Itraconazole, Fluconazole*, and Naftifine hydrochloride. Urinary tract anti-infective agents: Norfloxacin, Ciprofloxacin, Ofloxacin*, and Moxifloxacin. Antitubercular agents: INH*, Ethambutol, Para amino salicylic acid, Pyrazinamide, Rifampicin, Bedaquiline, Delamanid, and Pretomanid*. Antiviral agents: Amantadine hydrochloride, Idoxuridine, Acyclovir*, Foscarnet, Zidovudine, Ribavirin, Remdesivir, and Favipiravir. Antimalarials: Quinine sulphate, Chloroquine phosphate*, Primaquine phosphate, Mefloquine*, Cycloguanil, Pyrimethamine, and Artemisinin. Sulfonamides: Sulfanilamide, Sulfadiazine, Sulfamethoxazole, Sulfacetamide*, Mafenide acetate, Cotrimoxazole, and Dapsone*. Antibiotics Penicillins: Penicillin G, Amoxicillin*, and Cloxacillin. Amonoglycoside: Streptomycin. Tetracyclines: Doxycycline, and Minocycline. Macrolides: Erythromycin, and Azithromycin. Miscellaneous: Chloramphenicol* and Clindamycin. Antineoplastic agents: Cyclophosphamide*, Busulfan, Mercaptopurine, Fluorouracil*, Methotrexate, Dactinomycin, Doxorubicin hydrochloride, Vinblastine sulphate, Cisplatin*, and Dromostanolone propionate.	19	6

Reference Books:

Medicinal & Pharmaceutical chemistry by Harikishan Singh and VK Kapoor
 Wilson and Griswold's Text book of Organic Medicinal and pharmaceutical Chemistry
 Practical Organic Chemistry by Mann and Saunders
 Practical Pharmaceutical Chemistry, Volume- I & II by Beckett and J. B. Stenlake
 Indian Pharmacopoeia
 Vogel's text book of Practical Organic Chemistry
 Text book of pharmaceutical chemistry - Abhishek Tiwari, Biswa Mohan Sahoo, and Rajesh Shukla
 Text book of pharmaceutical chemistry - Sameer Rastogi, Yogesh Murti, and Nidhi Srivastava
 Text book of pharmaceutical chemistry - VN Raje
 Text book of pharmaceutical chemistry – Venu Gopal Rao

e-Learning Source:

<https://fdspharmacy.in/pharmaceutical>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	1	1	1	1	1	1	1	3	-	-	3	2	1	-	-	-
CO2	3	1	1	1	1	1	1	1	3	-	-	3	2	1	-	-	-
CO3	3	1	1	1	1	1	1	1	3	-	-	3	2	1	-	-	-
CO4	3	1	1	1	1	1	1	1	3	-	-	3	2	1	-	-	-
CO5	3	1	1	1	1	1	1	1	3	-	-	3	2	1	-	-	-
CO6	3	1	2	1	1	1	1	1	3	-	-	3	2	1	-	-	-

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation



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<p>Name & Sign of Program Coordinator</p>	<p>Sign & Seal of HOD</p>
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Effective from Session: 2021-22							
Course Code	ER20-13T	Title of the Course	PHARMACOGNOSY	L	T	P	C
Year	I	Semester	ANNUAL	2	-	-	-
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	--				
Course Objectives	<ol style="list-style-type: none"> 1. Identify the important/common crude drugs of natural origin 2. Describe the uses of herbs in nutraceuticals and cosmaceuticals 3. Discuss the principles of alternative system of medicines 4. Describe the importance of quality control of drugs of natural origin 5. To know the modern extraction techniques, characterization and identification of the herb drugs and phytoconstituents 6. To understand the preparation and development of herbal formulation. 						

Course Outcomes	
CO1	Identify the important/common crude drugs of natural origin
CO2	Describe the uses of herbs in nutraceuticals and cosmaceuticals
CO3	Discuss the principles of alternative system of medicines
CO4	Describe the importance of quality control of drugs of natural origin
CO5	To know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents
CO6	To understand the preparation and development of herbal formulation.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction of Pharmacognosy Classification of drugs:	Definition, history, present status and scope of Pharmacognosy <ul style="list-style-type: none"> ● Alphabetical ● Taxonomical ● Morphological ● Pharmacological ● Chemical Chemo- taxonomical 	6	1
2	Quality control of crude drugs: Introduction to herbal formulations and their functions	Different methods of adulteration of crude drugs Evaluation of crude drugs Brief outline of occurrence, distribution, isolation, identification tests, therapeutic activity and pharmaceutical applications of alkaloids, terpenoids, glycosides, volatile oils, tannins and resins. Introduction to herbal formulations and their functions.	16	2
3	Biological source, chemical constituents and therapeutic efficacy of the following categories of crude drugs.	Laxatives Aloe, Castor oil, Ispaghula, Senna Cardiotonic Digitalis, Arjuna Carminatives and G.I. regulators Coriander, Fennel, Cardamom, Ginger, Clove, Black Pepper, Asafoetida, Nutmeg, Cinnamon Astringents Myrobalan, Black Catechu, Pale Catechu Drugs acting on nervous system Hyoscyamus, Belladonna, Ephedra, Opium, Tea leaves, Coffee seeds, Coca Anti-hypertensive Rauwolfia Anti-tussive Vasaka, Tolu Balsam Anti-rheumatics Colchicum seed Anti-tumour Vinca, Podophyllum Antidiabetics Pterocarpus, Gymnema Diuretics Gokhru, Punarnava Anti-dysenteric Ipecacuanha Antiseptics and disinfectants Benzoin, Myrrh, Neem, Turmeric Antimalarials Cinchona, Artemisia Oxytocic Ergot Vitamins Cod liver oil, Shark liver oil Enzymes Papaya, Diastase, Pancreatin, Yeast Pharmaceutical Aids Kaolin, Lanolin, Beeswax, Acacia, Tragacanth, Sodium alginate, Agar, Guar gum, Gelatine Miscellaneous Squill, Galls, Ashwagandha, Tulsi, Guggul	30	3
4	Plant fibres used as surgical dressings: Basic principles involved in the traditional systems of medicine Method of preparation of Ayurvedic formulations	Cotton, silk, wool and regenerated fibres Sutures – Surgical Catgut and Ligatures Basic principles involved in the traditional systems of medicine like: Ayurveda, Siddha, Unani and Homeopathy Method of preparation of Ayurvedic formulations like: Arista, Asava, Gutika, Taila, Churna, Lehya and Bhasma	11	4



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5	Role of medicinal and aromatic plants in national economy and their export potential Herbs as health food: Herbs as health food:	Role of medicinal and aromatic plants in national economy and their export potential Herbs as health food: Brief introduction and therapeutic applications of: Nutraceuticals, Antioxidants, Pro-biotics, Pre- biotics, Dietary fibres, Omega- 3-fatty acids, Spirulina, Carotenoids, Soya and Garlic · Biological oxidation: Electron transport chain and Oxidative phosphorylation	11	5
6	Herbal cosmetics	Herbal cosmetics: Sources, chemical constituents, commercial preparations, therapeutic and cosmetic uses of: Aloe vera gel, Almond oil, Lavender oil, Olive oil, Rosemary oil, Sandal Wood oil Phytochemical investigation of drugs significance	12	6

Reference Books:

Pharmacognosy by Trease and Evans

Pharmacognosy by Kokate, Purohit and Gokhale

Rangari, V.D., Textbook of Pharmacognosy and Phytochemistry Vol. I, Carrier Pub., 2006

e-Learning Source:

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	-	3	-	1	-	3	1	1	3	3	3	-	-	-
CO2	3	3	3	1	3	1	-	-	3	1	1	3	2	3	-	-	-
CO3	2	3	3	1	3	1	1	-	3	1	1	3	2	3	-	-	-
CO4	3	3	3	1	3	1	1	-	3	1	1	2	3	2	-	-	-
CO5	3	2	2	1	3	1	1	-	3	1	1	2	2	2	-	-	-
CO6	3	2	2	1	3	1	1	-	3	1	1	2	2	2	-	-	-

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HOD
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Integral University, Lucknow

Effective from Session: 2021-22							
Course Code	ER20-14T	Title of the Course	HUMAN ANATOMY AND PHYSIOLOGY	L	T	P	C
Year	I	Semester	ANNUAL	2	-	-	-
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	--				
Course Objectives	1. Structure and functions of the various organ systems and organs of the human body 2. Homeostatic mechanisms and their imbalances in the human body 3. Various vital physiological parameters of the human body and their significances						

Course Outcomes	
CO1	Learn about the scope of anatomy and physiology, the structure, parts and function of cell and various tissues of the human body
CO2	To acquire knowledge about anatomical types of bones, movements and disorders, components of blood, homeostatic regulation.
CO3	To learn about physiology and mechanism of the lymphatic system, anatomy of heart with its physiology including cardiac cycle with heart sounds, ECG, blood pressure and their regulation in human body
CO4	To understand the significance of various anatomy and physiology of respiratory, skeletal and digestive system including mechanism of muscle contraction
CO5	To gain knowledge about the anatomy and vital physiology of sensory organs, nervous system and urinary system and related disorders
CO6	To learn about the anatomy and physiology of male and female reproductive system including spermatogenesis and oogenesis along with the functioning of hormones, significance of menstruation, pregnancy and parturition including pancreas and gonads.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1	Introduction to Anatomy and Physiology	The scope of anatomy and physiology with various terminologies used in different types of organ systems, the structure of cell along with its parts and functions different anatomical features of various tissues of different systems of the human body	8	1
2	Anatomy of bones and blood and its components	Different anatomical types of bones including various types of movements of joints along with disorders related to human body The components of blood (such as RBCs, WBCs and Platelets) along with Functions The various blood groups and their significance along with the process of blood clotting.	14	2
3	Anatomy and Physiology of heart and lymphatic system	The homeostatic mechanism of the lymphatic system including its composition and function, Physiology of lymphatic system along with structure of spleen and other parts of lymphatic system Anatomy of heart with its physiology including cardiac cycle with heart sounds, To acquire knowledge about ECG, blood pressure and their regulation in human body	11	3
4	Anatomy and Physiology of Respiratory, Skeletal and Digestive system with related disorders	The significance various anatomy and physiology of respiratory, skeletal and digestive system The disorders related to respiratory, skeletal and digestive system including respiratory capacities, physiology of digestion and mechanism of muscle contraction	14	4
5	Sensory organs, nervous system and urinary system (their anatomy with disorders)	The anatomy and vital physiology of sensory organs, nervous system and urinary system, Different disorders related to sense organs including nervous system, urinary system and sensory organs	19	5
6	Reproductive system and endocrine system	The anatomy and physiology of male reproductive system including spermatogenesis along with the functioning of hormone including related to pituitary and adrenal gland The anatomy and functioning of female reproductive system including oogenesis along with physiology of hormones related to thyroid and parathyroid glands The significance of menstruation, pregnancy and parturition including pancreas and gonads.	10	6

Reference Books:

Anatomy and Physiology, B. D. Chaurasia, CBS Publishers & Distributors Pvt. Ltd.

Principles of Anatomy and Physiology, Thirteenth Edition by Gerard J. Tortora and Bryan H. Derrickson.

e-Learning Source:

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	-	-	1	-	-	2	-	3	1	1	-	2	2	-	-	-
CO2	3	-	-	1	-	-	2	-	3	1	1	-	2	2	-	-	-
CO3	3	-	-	1	-	-	2	-	3	1	1	-	2	2	-	-	-
CO4	3	-	-	1	-	-	2	-	3	1	1	-	2	2	-	-	-
CO5	3	-	-	1	-	-	2	-	3	1	1	-	2	2	-	-	-
CO6	3	-	-	1	-	-	2	-	3	1	1	-	2	2	-	-	-



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1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HOD
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Effective from Session: 2021-22								
Course Code	ER20-15T	Title of the Course	SOCIAL PHARMACY	SDG Goals	L	T	P	C
Year	I	Semester	ANNUAL		3	1	-	-
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	--					
Course Objective	1. Public health and national health programs. 2. Preventive healthcare. 3. Food and nutrition related health issues. 4. Health education and health promotion. 5. General roles and responsibilities of pharmacists in public health.							

Course Outcomes	
CO1	Discuss about the Social Pharmacy, its scope and role of Pharmacist in Public and private health systems.
CO2	Describe various sources of health hazards and disease preventive measures and effect of environment on Health.
CO3	Discuss the healthcare issues associated with food and nutritional substances.
CO4	Gain knowledge about Epidemiology and its application and learned about terms like pandemic, endemic. Learn about Respiratory infections, Intestinal infections, Arthropod-borne infection, and STDs.
CO5	Learn about the Healthcare system in India and all ongoing national programs.
CO6	Discuss about the Pharmacoeconomics and its application.

UnitNo.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO	SDG Targets
1	Introduction to social pharmacy.	Definition and Scope. Social Pharmacy as a discipline and its scope in improving the public health. Role of Pharmacists in Public Health. Concept of Health -WHO Definition, various dimensions, determinants, and health indicators. National Health Policy - Indian perspective. Public and Private Health System in India, National Health Mission Introduction to Millennium Development Goals, Sustainable Development Goals, FIP Development Goals	09	1	
2	Preventive healthcare - role of pharmacists in the following	Demography and Family Planning Mother and child health, importance of breastfeeding, ill effects of infant milk substitutes and bottle feeding Overview of Vaccines, types of immunity and immunization. Effect of Environment on Health - Water pollution, importance of safe drinking water, waterborne diseases, air pollution, noise pollution, sewage and solid waste disposal, Environmental pollution due to pharmaceuticals. Psychosocial Pharmacy: Drugs of misuse and abuse - psychotropics, narcotics, alcohol, tobacco products	18	2	
3	Nutrition and health	Basics of nutrition - Macronutrients and Micronutrients. Importance of water and fibers in diet. Balanced diet, Malnutrition, nutrition deficiency diseases, ill effects of junk foods, calorific and nutritive values of various foods, fortification of food. Introduction to food safety, adulteration of foods, effects of artificial ripening, use of pesticides, genetically modified foods. Dietary supplements, nutraceuticals, food supplements indications, benefits, Drug-Food Interactions	10	3	
4	Introduction to microbiology and common microorganisms	Epidemiology: Introduction to epidemiology applications. terms such as epidemic, pandemic, endemic, mode of transmission, outbreak, quarantine, isolation, incubation period, contact tracing, morbidity, mortality. Causative agents, epidemiology and clinical presentations and Role of Pharmacists in educating the public in prevention of the following communicable diseases: Respiratory infections - chickenpox, measles, rubella, mumps, influenza (including Avian-Flu, H1N1, SARS MERS, COVID-19), diphtheria, whooping cough, meningococcal meningitis, acute respiratory infections, tuberculosis, Ebola Intestinal infections - poliomyelitis, viral hepatitis, cholera, acute diarrheal diseases, typhoid, amebiasis, worm infestations, food poisoning. Arthropod-borne infections - dengue, malaria, filariasis and, chikungunya, Surface infections - trachoma, tetanus, leprosy, STDs, HIV/AIDS	28	4	
5	Introduction to health systems	Introduction to Health systems. All ongoing National Health programs in India, Objectives, functioning, outcome of Health programs. Role of pharmacists	08	5	
6	Pharmacoeconomics	Introduction to Pharmacoeconomics. Basic terminologies. Importance of Pharmacoeconomics.	02	6	

Reference Books:



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New approach to Social Pharmacy – SPS Khurana.

Fundamentals of Social Pharmacy – Dr Akhil Nagar, Dr Atul R bendale. Everest publishing house

Social and preventive Pharmacy – K Ravi Shankar.

Social pharmacy – Dr Arun K Mishra – Nirali Prakashan

e-Learning Source:

<https://noteskarts.com/>

<https://fdspharmacy.in/>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)

PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	1	1	-	-	1	1	1	-	1	1	-	1	2	-	-	-
CO2	3	1	1	-	-	1	1	1	-	1	1	-	1	2	-	-	-
CO3	3	1	1	-	-	1	1	1	-	1	1	-	1	2	-	-	-
CO4	3	1	1	-	-	1	1	1	-	1	1	-	1	2	-	-	-
CO5	3	1	1	-	-	1	1	1	-	1	1	-	1	2	-	-	-
CO6	3	1	1	-	-	1	1	1	-	1	1	-	2	2	-	-	-

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HOD
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Integral University, Lucknow

Effective from Session: 2020-2021							
Course Code	ER20-11P	Title of the Course	PHARMACEUTICS	L	T	P	C
Year	I	Semester	ANNUAL	-	-	3	-
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	--				
Course Objectives	Calculation of working formula from the official master formula. Formulation of dosage forms based on working formula Appropriate Packaging and labelling requirements Methods of basic quality control tests						

Course Outcomes	
CO1	Calculate the working formula from the given master formula
CO2	Formulate the dosage form and dispense in an appropriate container
CO3	Design the label with the necessary product and patient information
CO4	Perform the basic quality control tests for the common dosage forms

Experiment No.	Content of Unit
	1. Handling and referring the official references: Pharmacopoeias, Formularies, etc. for retrieving formulas, procedures, etc. 2. Formulation of the following dosage forms as per monograph standards and dispensing with appropriate packaging and labelling <ul style="list-style-type: none"> • Liquid Oral: Simple syrup, Piperazine citrate elixir, Aqueous Iodine solution • Emulsion: Castor oil emulsion, Cod liver oil emulsion • Suspension: Calamine lotion, Magnesium hydroxide mixture • Ointment: Simple ointment base, Sulphur ointment • Cream: Cetrimide cream • Gel: Sodium alginate gel • Liniment: Turpentine liniment, White liniment BPC • Dry powder: Effervescent powder granules, Dusting powder • Sterile Injection: Normal Saline, Calcium gluconate Injection • Hard Gelatine Capsule: Tetracycline capsules • Tablet: Paracetamol tablets 3. Formulation of at least five commonly used cosmetic preparations – e.g. cold cream, shampoo, lotion, toothpaste etc 4. Demonstration on various stages of tablet manufacturing processes 5. Appropriate methods of usage and storage of all dosage forms including special dosage such as different types of inhalers, spacers, insulin pens 6. Demonstration of quality control tests and evaluation of common dosage forms viz. tablets, capsules, emulsion, sterile injections as per the monographs

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	-	3	3	-	-	-	-	-	-	2	1	-	1	-	-	-
CO2	3	-	3	3	-	-	-	-	-	-	2	1	-	1	-	-	-
CO3	3	-	3	3	-	-	-	-	-	-	2	1	-	1	-	-	-
CO4	3	-	3	3	-	-	-	-	-	-	2	1	-	1	-	-	-
CO5	3	-	3	3	-	-	-	-	-	-	2	1	-	1	-	-	-
CO6	3	-	3	3	-	-	-	-	-	-	2	1	-	1	-	-	-

1- Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HoD
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Integral University, Lucknow

Effective from Session: 2023-24

Course Code	ER20-12P	Title of the Course	PHARMACEUTICAL CHEMISTRY	L	T	P	C
Year	I	Semester	ANNUAL	-	-	3	-
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	--				
Course Objectives	Limit tests and assays of selected chemical substances as per the monograph Volumetric analysis of the chemical substances Basics of preparatory chemistry and their analysis Systematic qualitative analysis for the identification of the chemical drugs.						

Course Outcomes

CO1	Perform the limit tests for various inorganic elements and report
CO2	Prepare standard solutions using the principles of volumetric analysis
CO3	Test the purity of the selected inorganic and organic compounds against the monograph standards
CO4	Synthesize the selected chemical substances as per the standard synthetic scheme
CO5	Perform qualitative tests to systematically identify the unknown chemical substances

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1.	Introduction to Pharmaceutical Chemistry	To study about general glassware used in chemistry laboratory.	3	1
2.	Limit test	To perform the limit test for chloride.	3	1
3.	Limit test	To perform the limit test for sulphate.	3	1
4.	Limit test	To perform the limit test for iron.	3	1
5.	Limit test	To perform the limit test for heavy metal.	3	1
6.	Fundamentals of volumetric analysis	To prepare and standardize 0.1N NaOH	3	2
7.	Fundamentals of volumetric analysis	To prepare and standardize 0.1N KMnO ₄	3	2
8.	Assay of inorganic compounds	To perform the assay of ferrous sulphate.	3	3
9.	Assay of organic compounds	To perform the assay of calcium gluconate.	3	3
10.	Assay of organic compound	To perform the assay of ibuprofen	3	3
11.	Systematic qualitative analysis of unknown chemical substance	To perform the identification test for carboxylic group	3	5
12.	Systematic qualitative analysis of unknown chemical substance	To perform the identification test for carbohydrates	3	5
13.	Systematic qualitative analysis of unknown chemical substance	To perform the identification test for esters.	3	5
14.	Systematic qualitative analysis of unknown chemical substance	To perform the identification test for alcohols.	3	5
15.	Fundamentals of preparative organic chemistry	To determine the melting point of given sample.	3	3
16.	Fundamentals of preparative organic chemistry	To determine the boiling point of the given sample.	3	3
17.	Identification and test for purity of pharmaceuticals	To perform the identification test for Paracetamol.	3	3
18.	Preparation of organic compounds	To prepare and submit benzoic acid from benzamide.	3	4

e-Learning Source:

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	-	2	3	-	-	2	3	3	-	-	2	-	-	-	-	-
CO2	3	-	2	3	-	-	2	3	3	-	-	2	-	-	-	-	-
CO3	3	-	2	3	-	-	2	3	3	-	-	2	-	-	-	-	-
CO4	3	-	2	3	-	-	2	3	3	-	-	2	-	-	-	-	-
CO5	3	-	2	3	-	-	2	3	3	-	-	2	-	-	-	-	-

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HOD
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Integral University, Lucknow

Effective from Session: 2023-24							
Course Code	ER20-13P	Title of the Course	PHARMACOGNOSY	L	T	P	C
Year	I	Semester	ANNUAL	-	-	3	-
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	--				
Course Objectives	This course will train and provide hands-on experiences on the following <ol style="list-style-type: none"> 1. Identification of the crude drugs based on their morphological characteristics. 2. Various characteristic anatomical characteristics of the herbal drugs studied through transverse section. 3. Physical and chemical tests to evaluate the crude drugs. 						

Course Outcomes	
CO1	Identify the given crude drugs based on the morphological characteristics.
CO2	Identify the given crude drugs based on the morphological characteristics.
CO3	Take a transverse section of the given crude drugs.
CO4	Take a transverse section of the given crude drugs.
CO5	Describe the anatomical characteristics of the given crude drug under microscopical conditions.
CO6	Carry out the physical and chemical tests to evaluate the given crude drugs.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
18.	Morphological Identification of Ispaghula.	To study the morphological identification of Ispaghula.	3	1
19.	Morphological Identification of Senna.	To study the morphological identification of Senna.	3	1
20.	Morphological Identification of Coriander	To study the morphological identification of Coriander.	3	1
21.	Morphological Identification of Fennel.	To study the morphological identification of Fennel.	3	1
22.	Morphological Identification of Cardamom.	To study the morphological identification of Cardamom.	3	1
23.	Morphological Identification of Ginger.	To study the morphological identification of Ginger.	3	2
24.	Morphological Identification of Nutmeg.	To study the morphological identification of Nutmeg.	3	2
25.	Morphological Identification of Black Pepper.	To study the morphological identification of Black Pepper.	3	2
26.	Morphological Identification of Cinnamon.	To study the morphological identification of Cinnamon.	3	2
27.	Morphological Identification of Clove.	To study the morphological identification of Clove.	3	2
28.	Morphological Identification of Ephedra.	To study the morphological identification of Ephedra.	3	3
29.	Morphological Identification of Rauwolfia.	To study the morphological identification of Rauwolfia.	3	3
30.	Morphological Identification of Gokhru.	To study the morphological identification of Gokhru.	3	3
31.	Morphological Identification of Punarnava.	To study the morphological identification of Punarnava.	3	3
32.	Morphological Identification of Cinchona.	To study the morphological identification of Cinchona.	3	3
33.	Morphological Identification of Agar.	To study the morphological identification of Agar.	3	3
34.	Gross anatomical studies (Transverse Section) of the Ajwain.	To study the morphological and microscopical identification of Ajwain.	3	4
35.	Gross anatomical studies (Transverse Section) of the Datura.	To study the morphological and microscopical identification of Datura.	3	4
36.	Gross anatomical studies (Transverse Section) of the Cinnamon.	To study the morphological and microscopical identification of Cinnamon.	3	4



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37.	Gross anatomical studies (Transverse Section) of the Cinchona.	To study the morphological and microscopical identification of Cinchona.	3	4
38.	Gross anatomical studies (Transverse Section) of the Coriander.	To study the morphological and microscopical identification of Coriander.	3	4
39.	Gross anatomical studies (Transverse Section) of the Ashwagandha.	To study the morphological and microscopical identification of Ashwagandha.	3	5
40.	Gross anatomical studies (Transverse Section) of the Liquorice.	To study the morphological and microscopical identification of Liquorice.	3	5
41.	Gross anatomical studies (Transverse Section) of the Clove.	To study the morphological and microscopical identification of Clove.	3	5
42.	Gross anatomical studies (Transverse Section) of the Curcuma.	To study the morphological and microscopical identification of Curcuma.	3	5
43.	Gross anatomical studies (Transverse Section) of the Nux vomica.	To study the morphological and microscopical identification of Nux vomica.	3	5
44.	Gross anatomical studies (Transverse Section) of the Vasaka.	To study the morphological and microscopical identification of Vasaka.	3	5
45.	Identification Test of Benzoin.	To perform the chemical test of Benzoin.	3	6
46.	Identification Test of Castor oil.	To perform the chemical test of Castor oil.	3	6
47.	Identification Test of Acacia.	To perform the chemical test of Acacia.	3	6
48.	Identification Test of Agar.	To perform the chemical test of Agar.	3	6
49.	Identification Test of Gelatin.	To perform the chemical test of Gelatin.	3	6

e-Learning Source:

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	-	3	3	-	-	3	-	3	-	-	-	3	1	-	-	-
CO2	3	-	3	3	-	-	3	-	3	-	-	-	3	1	-	-	-
CO3	3	-	3	3	-	-	3	-	3	-	-	-	3	1	-	-	-
CO4	3	-	3	3	-	-	3	-	3	-	-	-	3	3	-	-	-
CO5	3	-	3	3	-	-	3	-	3	-	-	-	3	3	-	-	-
CO6	3	-	3	3	-	-	3	-	3	-	-	-	3	3	-	-	-

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HOD
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Effective from Session: 2022-23							
Course Code	ER20-14P	Title of the Course	HUMAN ANATOMY & PHYSIOLOGY	L	T	P	C
Year	I	Semester	ANNUAL	-	-	3	-
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	--				
Course Objective	1.This course is designed to impart a fundamental knowledge on the structure and functions of the human body. 2.It also helps in understanding both homeostasis mechanisms and homeostatic imbalances of various body systems. 3.Medicament, which is produced by pharmacist, is used to correct deviations in the human body, it enhances the understanding of how the drugs act on the various body systems in correcting the disease state of the organs.						

Course Outcomes	
CO1	Describe the structure (gross and histology) and functions of various organs of the human body, Elementary tissues of the human body, classification, types of movements of joints and disorders of joints.
CO2	Perform the haematological tests in human subjects and interpret the results
CO3	Describe the various homeostatic mechanisms and their imbalances of various systems and appreciate the coordinated working pattern of different organs of the Urinary system, Cardiovascular system and Respiratory system.
CO4	Appreciate the coordinated working pattern of different organs of the Endocrine system and Reproductive system.
CO5	Appreciate coordinated working pattern of different organs of Digestive system and Nervous system, anatomy physiology of sense organs, physiology of muscle contraction and Sports physiology.
CO6	Recording and monitoring the vital physiological parameters in human subjects and the basic interpretations of the results

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1.	Study of microscope	To study the different parts of compound microscope.	1.30	1
2.	Types of tissues	To study the microscopic examination of Epithelial tissue, Cardiac muscle, Smooth muscle, Skeletal muscle, Connective tissue, and Nervous tissue of ready / pre-prepared slides.	1.30	1
3.	Hematological tests	To record bleeding time of your own blood.	1.30	2
4.	Hematological tests	To determine the clotting time of your own blood.	1.30	2
5.	Hematological tests	To measure the blood pressure with the help of sphygmomanometer.	1.30	2
6.	Hematological tests	To determine the blood group of your own blood.	1.30	2
7.	Hematological tests	To estimate the percentage of haemoglobin of your own blood with the help of haemoglobinometer	1.30	2
8.	Hematological tests	To determine the erythrocyte sediment rate of your own blood.	1.30	2
9.	Hematological tests	To find out the number of red blood cells in one cubic millimeter of blood.	1.30	2
10.	Hematological tests	To find out the number of white blood cells in one cubic millimeter of blood.	1.30	2
11.	Urinary system	To study the urinary system with the help of chart.	1.30	3
12.	Cardiovascular system	To study the cardiovascular system with the help of chart.	1.30	3
13.	Nervous system	To study the nervous system with the help of chart.	1.30	3
14.	Endocrine system	To study the endocrine system with the help of chart.	1.30	3
15.	Reproductive system.	To study the reproductive system with the help of chart.	1.30	3
16.	Digestive system	To study the digestive system with the help of chart.	1.30	3
17.	Respiratory system	To study the respiratory system with the help of chart.	1.30	3
18.	Sense organ	To study the human eye with the help of chart.	1.30	4



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19.	Sense organ	To study the human ear with the help of chart.	1.30	4
20.	Sense organ	To study the human nose with the help of chart.	1.30	4
21.	Skeletal System	To study the axial skeleton with the help of chart.	1.30	5
22.	Skeletal System	To study the appendicular skeleton with the help of chart.	1.30	5
23.	Recording and monitoring the vital physiological parameters	To measure the height, weight and BMI.	1.30	6
24.	Recording and monitoring the vital physiological parameters	To record the body temperature, of your own.	1.30	6
25.	Recording and monitoring the vital physiological parameters	To record the pulse rate, heart rate of your own.	1.30	6
e-Learning Source:				

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	-	3	3	-	-	3	-	3	-	-	-	3	1	-	-	-
CO2	3	-	3	3	-	-	3	-	3	-	-	-	3	1	-	-	-
CO3	3	-	3	3	-	-	3	-	3	-	-	-	3	1	-	-	-
CO4	3	-	3	3	-	-	3	-	3	-	-	-	3	3	-	-	-
CO5	3	-	3	3	-	-	3	-	3	-	-	-	3	3	-	-	-
CO6	3	-	3	3	-	-	3	-	3	-	-	-	3	3	-	-	-

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HOD
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Integral University, Lucknow

Effective from Session: 2022-23							
Course Code	ER20-15P	Title of the Course	Social Pharmacy	L	T	P	C
Year	I	Semester	ANNUAL	-	-	3	-
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	--				
Course Objectives	This course will train the students on various roles of pharmacists in public health and social pharmacy activities in the following areas, 1. National immunization programs 2. Reproductive and child health programs 3. Food and nutrition related health programs 4. Health education and promotion 5. General roles and responsibilities of the pharmacists in public health 6. First Aid for various emergency conditions including basic life support and cardiopulmonary resuscitation.						

Course Outcomes	
CO1	Describe the importance of National immunization programs
CO2	Describe the roles and responsibilities of pharmacists in various National health programs
CO3	Design promotional materials for public health awareness
CO4	Describe various health hazards including microbial sources
CO5	Advice on preventive measures for various diseases
CO6	Provide first aid for various emergency conditions

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
50.	National Immunization Program	National immunization schedule for children, adult vaccine schedule, Vaccines which are not included in the National Immunization Program	2.30	1
51.	National Immunization Program	RCH- reproductive and child health nutritional aspects, relevant national health programmes.	2.30	1
52.	Demography	Family planning devices	2.30	1
53.	Microscopical observation of different microbes	Microscopical observation of different microbes (readymade slides)	2.30	2
54.	Health and Hygiene	Oral Health and Hygiene	2.30	2
55.	Health and Hygiene	Personal hygiene and etiquettes hand washing techniques, Cough and sneeze etiquettes	2.30	2
56.	Types of mask	Vanous types of masks, PPE gear, wearing/using them, and disposal.	2.30	3
57.	Qualitative analysis of Proteins and amino acids	Menstrual hygiene, products used	2.30	3
58.	First Aid	First Aid Theory, basics, demonstration, hands on training, audio-visuals, and practice, BSL (Basic Life Support) Systems (SCA Sudden Cardiac Arrest, FBAO- Foreign Body Airway Obstruction, CPR, Defibrillation (using AED) (Includes CPR techniques, First Responder).	2.30	3
59.	First Aid	Emergency treatment for all medical emergency cases viz snake bite, dog bite, insecticide poisoning, fractures, burns, epilepsy etc.	2.30	4
60.	Role of Pharmacist in Disaster Management.	Role of Pharmacist in Disaster Management.	2.30	4
61.	Disinfectants, antiseptics	Marketed preparations of disinfectants, antiseptics, fumigating agents, antilarval agents, mosquito repellents, etc.	2.30	4
62.	Health Communication	Health Communication: Audio / Video podcasts, Images, Power Point Slides, Short Films, etc. in regional language(s) for mass communication/education/ Awareness on 5 different communicable diseases, their signs and symptoms, and prevention	2.30	5
63.	Water purification techniques	Water purification techniques, use of water testing kit, calculation of Content/percentage of KMnO ₄ , bleaching powder to be used for wells/tanks	2.30	5
64.	Counselling children on junk foods	Counselling children on junk foods, balanced diets using Information, Education and Communication (IEC), counselling, etc. (Simulation Experiments)	2.30	5
65.	Preparation of vanous charts on nutrition	Preparation of vanous charts on nutrition, sources of various nutrients from Locally available foods, calculation of caloric needs of different groups (eg. child, mother, sedentary lifestyle, etc.). Chart of glycemic index of foods	2.30	6
66.	Tobacco cessation	Tobacco cessation, counselling, identifying various tobacco containing products through charts/pictures	2.30	6

e-Learning Source:



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Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO																	
CO1	3	-	-	3	-	-	3	3	3	-	-	-	-	3	-	-	-
CO2	3	-	-	3	-	-	3	3	3	-	-	-	-	3	-	-	-
CO3	3	-	-	3	-	-	3	3	3	-	-	-	-	3	-	-	-
CO4	3	-	-	3	-	-	3	3	3	-	-	-	-	3	-	-	-
CO5	3	-	-	3	-	-	3	3	3	-	-	-	-	3	-	-	-
CO6	3	-	-	3	-	-	3	3	3	-	-	-	-	3	-	-	-

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HOD
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Integral University, Lucknow

Effective from Session: 2022-23								
Course Code	ER20-21T	Title of the Course	PHARMACOLOGY	SDG Goals	L	T	P	C
Year	II	Semester	ANNUAL	3	3	1	-	-
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	General concepts of pharmacology including pharmacokinetics, pharmacodynamics, Routes of administration, etc.					
Course Objective	1. Pharmacological classification and indications of drugs 2. Dosage regimen, mechanisms of action, contraindications of drugs 3. Common adverse effects of drugs							

Course Outcomes	
CO1	Describe the basic concepts of pharmacokinetics and pharmacodynamics
CO2	Students able to know about definition, classification, pharmacological actions, dose, indications, and contraindications of PNS & eye related diseases & their drugs
CO3	Students able to know about definition, classification, pharmacological actions, dose, indications, and contraindications of CNS & CVS related diseases & their drugs
CO4	Students able to know about definition, classification, pharmacological actions, dose, indications, and contraindications of blood & blood forming organ & respiratory system related diseases & their drugs
CO5	Students able to know about definition, classification, pharmacological actions, dose, indications, and contraindications of G.I.T., Kidney & hormones related diseases & their drugs
CO6	Students able to know about definition, classification, pharmacological actions, dose, indications, and contraindications of Autocoids, Chemotherapeutic agents & also know about biological agents

UnitNo.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO	SDG Targets
1	General Pharmacology	Introduction and scope of Pharmacology Various routes of drug administration - advantages and disadvantages. Drug absorption - definition, types, factors affecting drug absorption. Bioavailability and the factors affecting bioavailability. Drug distribution - definition, factors affecting drug distribution. Biotransformation of drugs - Definition, types of biotransformation reactions, factors influencing drug metabolisms. Excretion of drugs - Definition, routes of drug excretion. General mechanisms of drug action and factors modifying drug action	10	1	
2	Drugs Acting on the Peripheral Nervous System & Eye	Steps involved in neurohumoral transmission. Definition, classification, pharmacological actions, dose, indications, and contraindications of a) Cholinergic drugs b) Anti-Cholinergic drugs c) Adrenergic drugs d) Anti-adrenergic drugs e) Neuromuscular blocking agents f) Drugs used in Myasthenia gravis g) Local anaesthetic agents h) Non-Steroidal Anti-Inflammatory drugs (NSAIDs) Definition, classification, pharmacological actions, dose, indications and contraindications of Miotics Mydriatics. Drugs used in Glaucoma	13	2	
3	Drugs Acting on the Central Nervous System & Cardiovascular system	Definition, classification, pharmacological actions, dose, indications, and contraindications of General anaesthetics, Hypnotics and sedatives. Anti-Convulsant drugs, Anti-anxiety drugs, Anti-depressant drugs, Anti-psychotics, Nootropic agents. Centrally acting muscle relaxants, Opioid analgesics. Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-hypertensive drugs, Anti-anginal drugs, Anti-arrhythmic drugs. Drugs used in atherosclerosis and Congestive heart failure. Drug therapy for shock	14	3	
4	Drugs Acting on Blood and Blood Forming Organs & Respiratory system	Definition, classification, pharmacological actions, dose, indications, and contraindications of Hematinic agents, Anti-coagulants, Anti-platelet agents, Thrombolytic drugs. Definition, classification, pharmacological actions, dose, indications, and contraindications of Bronchodilators Expectorants Anti-tussive agents, Mucolytic agents	06	4	
5	Drugs Acting on the Gastro Intestinal Tract & Kidney, & Hormones and Hormone Antagonists	Definition, classification, pharmacological actions, dose, indications, and contraindications of Anti-ulcer drugs, Anti-emetics, Laxatives and purgatives, Anti-diarrheal drugs. Definition, classification, pharmacological actions, dose, indications, and contraindications of Diuretics, Anti-Diuretics. Physiological and pathological role and clinical uses of Thyroid	15	5	



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		hormones, Anti-thyroid drugs, Parathormone, Calcitonin, Vitamin D, Insulin, Oral hypoglycemic agents, Estrogen, Progesterone, Oxytocin, Corticosteroids			
6	Autocoids & Chemotherapeutic Agents & Biologicals	Physiological role of Histamine, 5 HT and Prostaglandins. Classification, clinical uses, and adverse effects of antihistamines and 5 HT antagonists. Introduction, basic principles of chemotherapy of infections, infestations and neoplastic diseases, Classification, dose, indication and contraindications of drugs belonging to following classes: · Penicillins · Cephalosporins · Aminoglycosides · Fluoroquinolones · Macrolides · Tetracyclines · Sulphonamides · Anti-tubercular drugs · Anti-fungal drugs · Anti-viral drugs · Anti-amoebic agents · Anthelmintics · Anti-malarial agents · Anti-neoplastic agents Definition, types, and indications of biological agents with examples	17	6	

Reference Books:

Essential of medical pharmacology, seventh edition by K.D. Tripathi.
 Textbook of pharmacology and toxicology by Atulkabra, P.P. Singh Uppal, Pee Vee publication
 Essentials of pharmacotherapeutics, third edition by F.S.K. Barar.
 Pharmacology, Part 1: Introduction to Pharmacology and pharmacodynamics Geoffrey M. Currie
 Katzung B.G. Basic and clinical pharmacology, Seventh edition, Appelton & Lange, Stanford, 1998.
 Satoskar R.S. et.al Pharmacology and Pharmacotherapeutics, Revised fourteenth edition, popular prakashan, Bombay 1995

e-Learning Source:

- <https://www.sciencecoverage.com/2021/01/d-pharmacy-2nd-year-books-pdf.html>
- <https://pharmonly.net/wp-content/uploads/2022/09/pharmacology-pharmacotherapeutics-by-r.-s.-satoskar.pdf>
- <https://www.pharmanotes.org/2021/09/pharmacology-toxicology-d-pharm-2nd.html>
- <https://www.pdfdrive.com/basic-clinical-pharmacology-e34443843.html>
- <https://www.pdfdrive.com/part-1pharmacology-and-clinical-pharmacv-mcq-e45961192.html>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO																	
CO1	3	1	2	3	1	3	3	2	3	-	-	2	3	3	-	-	-
CO2	2	1	2	3	1	3	3	3	3	-	-	2	3	3	-	-	-
CO3	2	1	2	3	1	3	3	3	3	-	-	2	3	3	-	-	-
CO4	3	1	2	3	1	3	3	3	3	-	-	2	3	3	-	-	-
CO5	3	1	2	3	1	3	3	3	3	-	-	2	3	3	-	-	-
CO6	3	1	2	3	1	3	3	3	3	-	-	2	3	3	-	-	-

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HOD
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Integral University, Lucknow

Effective from Session: 2022-23								
Course Code	ER20-22T	Title of the Course	COMMUNITY PHARMACY AND MANAGEMENT	SDG Goals	L	T	P	C
Year	II	Semester	ANNUAL		3	1		
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	-----					
Course Objective	1. Establishing and running a community pharmacy and its legal requirements 2. Professional aspects of handling and filling prescriptions 3. Patient counselling on diseases, prescription and or non-prescription medicines 4. Scope for performing basic health screening in community pharmacy settings							

Course Outcomes	
CO1	The student will gain the knowledge of community pharmacy history and its development along with his responsibilities as community pharmacist
CO2	Acquire knowledge of prescription and its handling along with the medication adherence benefits
CO3	Enhance the communication skills and personality development.
CO4	Understand various aspects of patient counseling
CO5	Acquire the knowledge of Over the counter medication and general diseases conditions
CO6	Learn the management procedures relating to legal, financial, customer and audit attributes.

UnitNo.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO	SDG Targets
1	Introduction and ethics of community pharmacy	Community Pharmacy Practice – Definition, history and development of community pharmacy - International and Indian scenarios. Professional responsibilities of community pharmacists Introduction to the concept of Good Pharmacy Practice and SOPs.	5	1	
2	Prescription handling and medication adherence	Prescription and prescription handling. Definition, parts of prescriptions, legality of prescriptions, prescription handling, labelling of dispensed medications (Main label, ancillary label, pictograms), brief instructions on medication usage. Dispensing process, Good Dispensing Practices, dispensing errors and strategies to minimize them. Medication Adherence- Definition, factors influencing non-adherence, strategies to overcome non-adherence	9	2	
3	Communication skills and Health Screening	A. Communication skills a. Definition, types of communication skills b. Interactions with professionals and patients c. Verbal communication skills (one-to-one, over the telephone) d. Written communication skills e. Body language f. Patient interview techniques B. Health Screening Services in Community Pharmacy a. Introduction, scope, and importance of various health screening services - for routine monitoring of patients, early detection, and referral of undiagnosed cases	11	3	
4	Patient Counselling	Patient counselling a. Definition and benefits of patient counselling b. Stages of patient counselling - Introduction, counselling content, counselling process, and closing the counselling session c. Barriers to effective counseling - Types and strategies to overcome the barriers d. Patient counseling points for chronic diseases/ disorders- Hypertension, Diabetes, Asthma, Tuberculosis, Chronic obstructive pulmonary disease, and AIDS e. Patient Package Inserts - Definition, importance and benefits, Scenarios of PPI use in India and other countries f. Patient Information leaflets - Definition and uses	10	4	
5	OTC Medication	A. Over The Counter (OTC) Medications a. Definition, need and role of Pharmacists in OTC medication dispensing b. OTC medications in India, counseling for OTC products c. Self-medication and role of pharmacists in promoting the safe practices during self-medication d. Responding to symptoms, minor ailments, and advice for self-care in conditions such as - Pain management, Cough, Cold, Diarrhea, Constipation, Vomiting, Fever, Sore throat, Skin disorders, Oral health (mouth ulcers, dental pain, gum swelling)	15	5	
6	Community Pharmacy Management	A. Community Pharmacy Management a. Legal requirements to set up a community pharmacy b. Site selection requirements c. Pharmacy designs and interiors d. Vendor selection and ordering e. Procurement, inventory control methods, and inventory	25	6	



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		management f. Financial planning and management g. Accountancy in community pharmacy – Day book, Cash book h. Introduction to pharmacy operation softwares – usefulness and availability i. Customer Relation Management (CRM) j. Audits in Pharmacies k. SOP of Pharmacy Management l. Introduction to Digital Health, mHealth and Online pharmacies			
Reference Books:					
Text book of Community Pharmacy and Management, Thakur Publications Pvt. Ltd.					
e-Learning Source:					
https://www.youtube.com/watch?v=jktUZPlcfTs					

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	1	1	-	3	1	-	-	2	-	-	1	1	3	-	-	-
CO2	3	1	1	-	-	1	-	-	2	-	-	-	1	3	-	-	-
CO3	3	1	1	-	-	3	-	-	2	-	-	-	1	1	-	-	-
CO4	3	1	1	-	-	1	3	-	2	-	-	-	1	3	-	-	-
CO5	3	1	1	-	-	1	-	-	2	-	-	-	3	3	-	-	-
CO6	3	2	1	-	-	1	-	-	2	-	-	1	3	1	-	-	-

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HOD
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Integral University, Lucknow

Effective from Session: 2022-23								
Course Code	ER20-23T	Title of the Course	BIOCHEMISTRY & CLINICAL PATHOLOGY	SDG Goals	L	T	P	C
Year	II	Semester	ANNUAL		3	1	-	-
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	-----					
Course Objective	1. Structure and functions of biomolecules 2. Catalytic activity, diagnostic and therapeutic importance of enzymes 3. Metabolic pathways of biomolecules in health and illness (metabolic disorders) 4. Biochemical principles of organ function tests and their clinical significance 5. Qualitative and quantitative determination of biomolecules/metabolites in the biological sample 6. Clinical pathology of blood and urine.							

Course Outcomes	
CO1	Describe the functions of biomolecules
CO2	Discuss the various functions of enzymes in the human system
CO3	Understand the metabolic pathways of biomolecules in both physiological and pathological conditions.
CO4	Describe the principles of organ function tests and their clinical significances
CO5	Describe the biomolecules / metabolites in the given biological samples, both qualitatively and quantitatively
CO6	Discuss the study of clinical pathology of blood and urine

UnitNo.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO	SDG Targets
1	Introduction to biochemistry: Scope of biochemistry in Pharmacy; Cell and its biochemical organization. Carbohydrates	Introduction to biochemistry. Biochemical organization, transport process across the cell membranes Energy rich compounds, ATP, Cyclic AMP, biological significance Enzymes: Definition, Nomenclature IUB classification, Factor affecting enzyme activity Enzyme action, enzyme inhibition Isoenzymes and their therapeutic and diagnostic applications, Coenzymes and their biochemical role and deficiency diseases. Carbohydrate metabolism: Glycolysis, hormonal regulation of carbohydrate metabolism. Citric acid cycle (TCA cycle), HMP shunt	7	1	
2	Proteins Lipids	Proteins Definition, classification of proteins based on composition and solubility with examples. Definition, classification of amino acids based on chemical nature and nutritional requirements with examples. Structure of proteins (four levels of organization of protein structure) Qualitative tests and biological role of proteins and amino acids. Diseases related to malnutrition of proteins. Lipids Definition, classification with examples. Structure and properties of triglycerides (oils and fats). Fatty acid classification - Based on chemical and nutritional requirements with examples. Structure and functions of cholesterol in the body. Lipoproteins - types, composition and functions in the body. Qualitative tests and functions of lipids	10	2	
3	Nucleic acids Enzymes	Nucleic acids Definition, purine and pyrimidine bases Components of nucleosides and nucleotides with examples. Structure of DNA (Watson and Crick model), RNA and their functions Enzymes Definition, properties and IUB and MB classification Factors affecting enzyme activity Mechanism of action of enzymes, Enzyme inhibitors Therapeutic and pharmaceutical importance of enzymes	18	3	
4	Vitamins Metabolism	Vitamins Definition and classification with examples Sources, chemical nature, functions, coenzyme form, recommended dietary requirements, deficiency diseases of fat-and water-soluble vitamins. Metabolism (Study of cycle/pathways without chemical structures) Metabolism of Carbohydrates: Glycolysis, TCA cycle and glycogen metabolism, regulation of blood glucose level. Diseases related to abnormal metabolism of Carbohydrates Metabolism of lipids:	26	4	



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		Lipolysis, β -oxidation of Fatty acid (Palmitic acid) ketogenesis and ketolysis. Diseases related to abnormal metabolism of lipids such as Ketoacidosis, Fatty liver, Hypercholesterolemia Metabolism of Amino acids (Proteins): General reactions of amino acids and its significance– Transamination, deamination, Urea cycle and decarboxylation. Diseases related to abnormal metabolism of amino acids, Disorders of ammonia metabolism, phenylketonuria, alkaptonuria and Jaundice. Biological oxidation: Electron transport chain and Oxidative phosphorylation			
5	Minerals Water and Electrolytes	Minerals: Types, Functions, Deficiency diseases, recommended dietary requirements Water and Electrolytes Distribution, functions of water in the body Water turnover and balance Electrolyte composition of the body fluids, Dietary intake of electrolyte and Electrolyte balance. Dehydration, causes of dehydration and oral rehydration therapy	10	5	
6	Introduction to Biotechnology Organ function tests	Introduction to Biotechnology Organ function tests Functions of kidney and routinely performed tests to assess the functions of kidney and their clinical significances. Functions of liver and routinely performed tests to assess the functions of liver and their clinical significances. Lipid profile tests and its clinical significances Introduction to Pathology of Blood and Urine Lymphocytes and Platelets, their role in health and disease. Erythrocytes - Abnormal cells and their significance. Normal and Abnormal constituents of Urine and their significance	13	6	

Reference Books:

Harpers review of biochemistry – Martin

Text book of biochemistry – D. Satyanarayana

Text book of clinical chemistry- Alex Kaplan & Laverve L. Szabo Principles of biochemistry Lehninger

Text book of biochemistry - Ramarao Practical Biochemistry-David T.Plummer.

e-Learning Source:

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	1	1	1	1	1	1	1	3	-	-	3	2	1	-	-	-
CO2	3	1	1	1	1	1	1	1	3	-	-	3	2	1	-	-	-
CO3	3	1	1	1	1	1	1	1	3	-	-	3	2	1	-	-	-
CO4	3	1	1	1	1	1	1	1	3	-	-	3	2	1	-	-	-
CO5	3	1	1	1	1	1	1	1	3	-	-	3	2	1	-	-	-
CO6	3	1	2	1	1	1	1	1	3	-	-	3	2	1	-	-	-

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HOD
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Integral University, Lucknow

Effective from Session: 2022-23								
Course Code	ER20-24T	Title of the Course	PHARMACOTHERAPEUTICS	SDG Goals	L	T	P	C
Year	II	Semester	ANNUAL		3	1		
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	-----					
Course Objective	1. Etiopathogenesis of selected common diseases and evidence-based medicine therapy. 2. Importance of individualized therapeutic plans based on diagnosis. 3. Basic methods for assessing the clinical outcomes of drug therapy.							

Course Outcomes	
CO1	Discuss about the Pharmacotherapeutics, its scope and objectives, Evidence based medicine and about Standard treatment guidelines (STGs) and Cardiovascular system.
CO2	Help assessing the subjective and objective parameters and planning the rational medicine therapy in common disease conditions like Respiratory system, endocrine system and CNS.
CO3	Gain knowledge about disorders related to GI tract, Blood and musculoskeletal Disorders & planning the rational medicine therapy.
CO4	Help assessing the subjective and objective parameters and planning the rational medicine therapy in certain Infectious diseases.
CO5	Learn about the subjective and objective parameters, planning the rational medicine therapy in common diseases in Dermatology, ophthalmology and psychiatry.
CO6	Gain knowledge about Anti-microbial Resistance and Women's health.

UnitNo.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO	SDG Targets
1	Pharmacotherapeutics and cardiovascular system	Pharmacotherapeutics - Introduction, scope, and objectives. Rational use of Medicines, Evidence Based Medicine, Essential Medicines List, Standard Treatment Guidelines (STGs). Definition, etiopathogenesis, clinical manifestations, non-pharmacological and pharmacological management of the diseases associated with Cardiovascular System Hypertension, Angina and Myocardial infarction, Hyperlipidemia, Congestive Heart Failure	16	1	
2	Respiratory system, endocrine and CNS.	Respiratory System: Asthma, COPD Endocrine System: Diabetes, Thyroid disorders - Hypo and Hyperthyroidism Central Nervous System: Epilepsy, Parkinson's disease, Alzheimer's disease, Stroke, Migraine	17	2	
3	GI disorders, haematological & musculoskeletal disorders.	Gastro Intestinal Disorders Gastro esophageal Reflux disease: Peptic Ulcer Disease, Alcoholic liver disease Inflammatory Bowel Diseases (Crohn's Disease and Ulcerative Colitis) Hematological disorders: Iron deficiency anemia, Megaloblastic anemia Musculoskeletal disorders: Rheumatoid arthritis, Osteoarthritis	15	3	
4	Infectious diseases	Tuberculosis, Pneumonia, Urinary tract infections, Hepatitis, Gonorrhoea and Syphilis, Malaria, HIV and Opportunistic infections, Viral Infections (SARS, CoV2)	12	4	
5	Diseases in dermatology, ophthalmology, psychiatry	Dermatology: Psoriasis, Scabies, Eczema Psychiatric Disorders: Depression, Anxiety, Psychosis Ophthalmology: Conjunctivitis (bacterial and viral), Glaucoma	08	5	
6	AMS & women's health	Anti-microbial Resistance Women's Health: Polycystic Ovary Syndrome, Dysmenorrhoea, Premenstrual Syndrome	06	6	

Reference Books:	
Pharmacotherapeutics – DR Vishal Garg, Thakur publication.	
Essentials of Medical Pharmacology by KD Tripathi.	
Clinical pharmacy and therapeutics by Roger Walker and Cate Whittlesea.	
e-Learning Source:	
https://noteskarts.com/	
https://fdspharmacy.in/	



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Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	1	1	-	-	1	1	1	-	-	-	-	1	2	-	-	-
CO2	3	1	1	-	-	1	1	1	-	-	-	-	1	2	-	-	-
CO3	3	1	1	-	-	1	1	1	-	-	-	-	1	2	-	-	-
CO4	3	1	1	-	-	1	1	1	-	-	-	-	1	2	-	-	-
CO5	3	1	1	-	-	1	1	1	-	-	-	-	1	2	-	-	-
CO6	3	1	1	-	-	1	1	1	-	-	-	-	1	2	-	-	-

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HOD
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Integral University, Lucknow

Effective from Session: 2022-23								
Course Code	ER20-25T	Title of the Course	HOSPITAL AND CLINICAL PHARMACY	SDG Goals	L	T	P	C
Year	II	Semester	ANNUAL		3	1	-	-
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	----					
Course Objective	1. Hospital and pharmacy organization and set-ups 2. Basics of hospital pharmacy services including the procurement supply chain storage of medicines and medical supplies 3. Basics of clinical pharmacy including introduction to comprehensive pharmaceutical care services 4. Basic interpretation of common laboratory results used in clinical diagnosis towards optimizing the drug therapy							

Course Outcomes	
CO1	Hospital Pharmacy. Different Committees in the Hospital
CO2	Supply Chain and Inventory control, Drug distribution
CO3	Compounding in Hospital, Radio Pharmaceuticals
CO4	Application of Computers in hospital Pharmacy practices Electronic health record Software used in Hospital Pharmacy & Clinical Pharmacy
CO5	Clinical laboratory tests used in the evaluation of disease states-significance and interpretation of test results, Poisoning
CO6	Pharmacovigilance, Medication errors, Drug interactions

UnitNo.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO	SDG Targets
1	Hospital Pharmacy Different Committees in the hospital	Hospital Pharmacy • Definition, scope, national and international scenario • Organisational structure • Professional responsibilities, Qualification and experience requirements, job specifications, work-load requirements and inter professional relationships • Good Pharmacy Practice (GPP) in hospital • Hospital Pharmacy Standards (FIP Basel Statements, AHSP) • Introduction to NAQS guidelines and NABH Accreditation and Role of Pharmacists, Different Committees in the Hospital	10	1	
2	Supply Chain and Inventory control Drug distribution	Supply Chain and Inventory Control • Preparation of Drug lists - High Risk drugs, Emergency drugs, Schedule H1 drugs, NDPS drugs, reserved antibiotics • Procedures of Drug Purchases - Drug selection, short term, long term, and tender/e-tender process, quotations, etc. • Inventory control techniques: Economic Order Quantity, Reorder Quantity Level, Inventory Turnover etc. • Inventory Management of Central Drug Store - Storage conditions, Methods of storage, Distribution, Maintaining Cold Chain, Devices used for cold storage (Refrigerator, ILR, Walk-in-Cold rooms) • FEFO, FIFO methods • Expiry drug removal and handling, and disposal. Disposal of Narcotics, cytotoxic drugs • Documentation - purchase and inventory Drug distribution • Drug distribution (in- patients and out - patients) Definition, advantages and disadvantages of individual prescription order method, Floor Stock Method, Unit Dose Drug Distribution Method, Drug Basket Method. •Distribution of drugs to ICCU/ICU/NICU/Emergency wards. Automated drug dispensing systems and devices • Distribution of Narcotic and Psychotropic substances and their storage	21	2	
3	Compounding in Hospital Radio Pharmaceuticals	Compounding in Hospitals. Bulk compounding, IV admixture services and incompatibilities, Total parenteral nutrition Radio Pharmaceuticals - Storage, dispensing and disposal of radiopharmaceuticals	06	3	
4	Application of Computers in hospital Clinical Pharmacy Daily activities of clinical pharmacists Pharmaceutical care	Application of computers in Hospital Pharmacy Practice, Electronic health records, Softwares used in hospital pharmacy Clinical Pharmacy: Definition, scope, and development - in India and other countries Technical definitions, common terminologies used in clinical settings and their significance such as Paediatrics, Geriatric, Anti-natal Care, Post-natal Care, etc. Daily activities of clinical pharmacists: Definition, goal, and procedure	14	4	



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		of <ul style="list-style-type: none"> • Ward round participation • Treatment Chart Review • Adverse drug reaction monitoring • Drug information and poisons information • Medication history • Patient counselling • Interprofessional collaboration Pharmaceutical care: Definition, classification of drug related problems. Principles and procedure to provide pharmaceutical care Medication Therapy Management, Home Medication Review			
5	Clinical laboratory tests used in the evaluation of disease states-significance and interpretation of test results Poisoning	Clinical laboratory tests used in the evaluation of disease states - significance and interpretation of test results <ul style="list-style-type: none"> • Haematological, Liver function, Renal function, thyroid function tests • Tests associated with cardiac disorders • Fluid and electrolyte balance • Pulmonary Function Tests Poisoning: Types of poisoning: Clinical manifestations and Antidotes Drugs and Poison Information Centre and their services Definition, Requirements, Information resources with examples, and their advantages and disadvantages	16	5	
6	Pharmacovigilance Medication errors Drug interactions	Pharmacovigilance <ul style="list-style-type: none"> • Definition, aim and scope • Overview of Pharmacovigilance Medication errors: Definition, types, consequences, and strategies to minimize medication errors, LASA drugs and Tallman lettering as per ISMP Drug Interactions: Definition, types, clinical significance of drug interactions	08	6	

Reference Books:

Concise Course in Hospital and Clinical Pharmacy (Pee Vee Regd.)

A Textbook of Hospital and Clinical Pharmacy (Anees A.Siddiqui)

e-Learning Source:

<https://pvbooks.in/product/hospital-and-clinical-pharmacy/>

<https://pvbooks.in/product/hospital-and-clinical-pharmacy-d-pharm/>

<https://www.slideshare.net/Shivaneeyyas1/hospital-pharmacy-hospital-and-clinical-pharmacy>


Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO																	
CO1	3	1	1	1	1	1	1	1	1	-	-	1	2	3	-	-	-
CO2	3	1	1	1	1	1	1	2	1	2	-	2	2	3	-	-	-
CO3	3	1	1	1	2	1	1	1	1	1	-	-	1	2	3	-	-
CO4	3	1	1	1	1	1	1	1	1	1	-	-	1	2	3	-	-
CO5	3	1	1	1	1	1	2	1	2	-	-	1	2	3	-	-	-
CO6	3	1	1	1	1	1	2	1	1	-	-	1	2	3	-	-	-

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HOD
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Integral University, Lucknow

Effective from Session: 2022-23								
Course Code	ER20-26T	Title of the Course	PHARMACY LAW & ETHICS	SDG Goals	L	T	P	C
Year	II	Semester	ANNUAL		3	-	-	-
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	----					
Course Objective	1. General perspectives, history, evolution of pharmacy law in India 2. Act and Rules regulating the profession and practice of pharmacy in India 3. Important code of ethical guidelines pertaining to various practice standards 4. Brief introduction to the patent laws and their applications in pharmacy							

Course Outcomes	
CO1	Understand and remember the General Principles of Law, History and various Acts related to Drugs and Pharmacy profession. Learn Pharmacy Act-1948 and Rules. Remember Narcotic Drugs and Psychotropic Substances Act 1985.
CO2	Know and understand the Drugs and Cosmetics Act 1940 and Rules 1945 and New Amendments. Know about Drugs and Magic Remedies (Objectionable Advertisements) Act 1954 .Understand the Disaster Management Act.
CO3	Remember the Prevention of Cruelty to Animals Act-1960. Learn about the Poisons Act-1919. Understand the Blood bank. Learn about Consumer Protection Act
CO4	Know and remember the National Pharmaceutical Pricing Authority. Learn about Central Drugs Standards Control Organization (CDSCO), Indian Pharmacopoeia Commission (IPC). Know about Good Regulatory practices. Understand the Clinical Establishment Act and Rules.
CO5	Remember and understand the FSSAI (Food Safety and Standards Authority of India) Act and Rules. Understand the Code of Pharmaceutical Ethics. Learn about Medical Termination of Pregnancy Act and Rules. Biomedical Waste Management Rules 2016
CO6	Understand the Introduction to BCS system of classification. Knowledge about Bioethics. Know and understand the Medical Devices.

UnitNo.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO	SDG Targets
1	History of Pharmacy , Pharmacy Act and Narcotic drugs Act .	General Principles of Law, History and various Acts related to Drugs and Pharmacy profession Pharmacy Act-1948 and Rules: Objectives, Definitions, Pharmacy Council of India; its constitution and functions. Narcotic Drugs and Psychotropic Substances Act 1985 and Rules Objectives, Definitions, Authorities and Officers, Prohibition, Control	9	1	
2	Drug and Cosmetics Act, Drug and Magic Remedies and Disaster Management Act .	Drugs and Cosmetics Act 1940 and Rules 1945 and New Amendments Objectives, Definitions, Legal definitions of schedules to the Act and Rules Import of drugs Drugs and Magic Remedies (Objectionable Advertisements) Act 1954 Objectives, Definitions, Prohibition of certain advertisements, Introduction to the Disaster Management Act	26	2	
3	Prevention of cruelty to Animal Act, Poison Act, Blood bank and Consumer Protection Act.	Prevention of Cruelty to Animals Act-1960: Objectives, Definitions, CPCSEA - brief overview, Institutional Animal Ethics Committee, Breeding and Stocking of Animals, Performance of Experiments, Poisons Act-1919: Introduction, objective, definition, possession, possession for sales Blood bank – basic requirements and functions Introduction to the Consumer Protection Act	7 .	3	
4	National Pharmaceutical Pricing Authority , CDSCO & IPC , Good Regulatory practices and Clinical Establishment Act.	National Pharmaceutical Pricing Authority: Drugs Price Control Order (DPCO) - 2013. Role of all the government pharma regulator bodies CDSCO and IPC Good Regulatory practices (documentation, licenses, renewals, e-governance) in different types of Pharmacy Clinical Establishment Act and Rules – Aspects related to Pharmacy	11	4	
5	FSSAI, Code of Pharmaceutical Ethics, Medical Termination of Pregnancy, Biomedical waste management Rules.	FSSAI (Food Safety and Standards Authority of India) Act and Rules: brief overview Code of Pharmaceutical Ethics: Definition, ethical principles Medical Termination of Pregnancy Act and Rules Biomedical Waste Management Rules 2016 – Basic aspects, and aspects related to pharma	11	5	
6	BCS system, Bioethics, Medical Devices.	Introduction to BCS system of classification, Basic concepts of Clinical Trials, ANDA, NDA, New Drug development, New Drugs Bioethics - Basic concepts, history and principles Medical Devices – Categorization, basic knowledge of manufacture and sale	11	6	

Reference Books:

- History of Pharmacy in India by Dr. Harikishan Singh
- Fundamental of Pharmacy Law and Ethics by ANIKET TIWARI, SONALI, USMAN
- Text Books of Pharmaceutical Jurisprudence by Dr. B.S.KUCHEKAR



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e-Learning Source:

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
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CO2	3	-	-	1	3	1	-	-	3	-	-	-	1	-	-	-	-
CO3	2	-	-	1	3	1	1	-	3	-	-	-	1	-	-	-	-
CO4	3	-	-	1	3	1	1	-	3	-	-	-	1	-	-	-	-
CO5	3	-	-	1	3	1	1	-	3	-	-	-	1	-	-	-	-
CO6	3	-	-	1	3	1	1	-	3	-	-	-	1	-	-	-	-

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

Name & Sign of Program Coordinator	Sign & Seal of HOD
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Integral University, Lucknow

Effective from Session: 2021-2022							
Course Code	ER20-21P	Title of the Course	PHARMACOLOGY-PRACTICAL	L	T	P	C
Year	II	Semester	ANNUAL	-	-	2	-
Pre-Requisite	D.Pharm 1 st year	Co-requisite					
Course Objectives	Study of pharmacological effects of drugs like local anaesthetics, mydriatic and mitotic on rabbit eye Screening the effects of various drugs acting in the central nervous system Study of drug effects on isolated organs / tissues Study of pyrogen testing on rabbit						

Course Outcomes	
CO1	To know about the introduction to experimental pharmacology, laboratory animals and instruments used in experimental pharmacology.
CO2	Students can able to know routes of administration, types of pre-clinical experiments & techniques of blood collection from animals.
CO3	Study and report the local anaesthetic, mydriatic and mitotic effects of the given drug on the rabbit eye
CO4	Choose appropriate animal experiment model to study the effects of the given drugs acting on the central nervous system and submit the report
CO5	Perform the effects of given tissues (simulated) on isolated organs / tissues and interpret the results
CO6	Interpret the dose dependent responses of drugs in various animal experiment models

Exper ment No.	Title of the Experiment	Content of Unit	Contact Hrs.	Mapped CO
1	Experimental pharmacology	Introduction to experimental pharmacology	2	1
2	Laboratory animals	Study of laboratory animals (a) Mice; (b) Rats; (c) Guinea pigs; (d) Rabbits	2	1
3	Basic instruments	Commonly used instruments in experimental pharmacology	2	1
4	Routes of administration	Different routes of administration of drugs in animals	2	2
5	Types of pre-clinical experiments	Types of pre-clinical experiments: In-Vivo, In-Vitro, Ex-Vivo, etc	2	2
6	Techniques of blood collection	Techniques of blood collection from animals	2	2
7	local anaesthetics	Study of local anaesthetics on rabbit eye	2	3
8	Mydriatic effect	Study of Mydriatic effect on rabbit eye	2	3
9	Miotic effect	Study of Miotic effect on rabbit eye	2	3
10	Analgesic activity	Effect of analgesics using Analgesimeter	2	4
11	Analgesic activity	Study of analgesic activity by writhing test	2	4
12	Anti-convulsant activity	Screening of anti-convulsant using Electro Convulsiometer	2	4
13	Muscle relaxants	Screening of Muscle relaxants using Rota-Rod apparatus	2	4
14	CNS stimulants and depressants	Screening of CNS stimulants and depressants using Actophotometer	2	4
15	Anxiolytic activity	Study of anxiolytic activity using elevated plus maze method	2	4
16	Effect of drugs on isolated heart	Study of effect of drugs (any 2) on isolated heart	2	5
17	Ciliary motility	Effect of drugs on ciliary motility on frog's buccal cavity	2	5
18	Pyrogen testing	Pyrogen testing by rabbit method	2	6

e-Learning Source:

https://www.dropbox.com/s/v124abkm3f3154h/5_6104695205468832200.pdf?dl=0

<https://pubmed.ncbi.nlm.nih.gov/7342378/>

<https://www.nature.com/articles/s41467-022-33659-1>

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	2	1	2	-	1	1	1	3	-	1	1	2	1	-	-	-
CO2	2	2	2	1	-	1	2	2	3	-	2	2	2	2	-	-	-
CO3	2	2	1	1	-	1	1	1	3	-	2	1	2	1	-	-	-
CO4	1	2	2	1	1	1	1	2	3	-	2	1	2	2	-	-	-
CO5	2	3	2	1	1	1	1	2	3	-	2	2	3	2	-	-	-
CO6	2	3	2	-	1	1	1	2	3	-	3	1	2	2	-	-	-

1-Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation



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Effective from Session: 2022-23							
Course Code	ER20-22P	Title of the Course	Community Pharmacy and Management	L	T	P	C
Year	2	Semester	ANNUAL	-	-	3	-
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	--				
Course Objectives	Professional handling and filling prescriptions Patient counselling on diseases and minor ailments Patient counselling on prescription and / or non-prescription medicines Preparation of counselling materials such as patient information leaflets Performing basic health screening tests						

Course Outcomes	
CO1	Professional handling and filling prescriptions
CO2	Patient counselling on diseases and minor ailments
CO3	Patient counselling on prescription and / or non-prescription medicines
CO4	Preparation of counselling materials such as patient information leaflets
CO5	Performing basic health screening tests

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
67.	Handling of prescriptions	To perform the study of prescription handling with professional standard	3	1
68.	Identification of drug-drug interactions	To perform study on drug interactions	3	1
69.	Preparation of dispensing labels and auxiliary	To perform the study on dispensing and auxiliary labels	3	1
70.	Providing the following health screening services	To perform the lung Function assessment by insertive and spirometer and capacity blood glucose monitoring Record the blood pressure and BMI of given subject	3	5
71.	Providing counselling	To perform the patient counselling on diabetes To perform the patient counselling on Rheumatoid Arthritis To perform the patient counselling on Hyperlipidemia To perform the patient counselling on headache to a patient To perform the patient counselling on Gastrointestinal disturbances To perform the patient counselling on hypertension To perform the patient counselling on worm infection To perform the patient counselling on pyrexia To perform the study on counselling on teeth disorder	3	2
72.	Appropriate handling of dummy dosage forms	To perform the qualitative analysis of protein & amino acid sample 2	3	2
73.	Use of Community Pharmacy Software and digital health tools	To Record your own capillary oxygen level (spo2)% by pulse oximeter	3	2

e-Learning Source:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6166518/#:~:text=Timely%20counseling%20intervention%20about%20diabetes,progression%20and%20o>
<https://www.pharmaguideline.com/2021/08/definition-parts-handling-and-errors-in-prescription.html>
<https://www.healthrecoveryolutions.com/blog/7-common-remote-patient-monitoring-devices>
www.nura.in

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	1	1	-	3	1	-	-	2	-	-	1	1	3	-	-	-
CO2	3	1	1	-	-	1	-	-	2	-	-	-	1	3	-	-	-
CO3	3	1	1	-	-	3	-	-	2	-	-	-	1	1	-	-	-
CO4	3	1	1	-	-	1	3	-	2	-	-	-	1	3	-	-	-
CO5	3	1	1	-	-	1	-	-	2	-	-	-	3	3	-	-	-

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation



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Effective from Session: 2022-23							
Course Code	ER20-23P	Title of the Course	BIOCHEMISTRY & CLINICAL PATHOLOGY	L	T	P	C
Year	I	Semester	ANNUAL	-	-	3	-
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	--				
Course Objectives	Qualitative determination of biomolecules / metabolites in simulated biological samples Determination of normal and abnormal constituents of simulated blood and urine samples						

Course Outcomes	
CO1	Qualitative determination of carbohydrates in given sample
CO2	Qualitative determination of proteins and amino acids in given sample
CO3	Qualitative determination of lipids in given sample
CO4	Qualitative determination of normal and abnormal constituents in urine samples
CO5	Qualitative determination of constituent of blood serum sample.(simulated)
CO6	Qualitative determination of enzymes in blood/serum (simulated)

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1.	Qualitative analysis of carbohydrates	To perform the qualitative analysis of carbohydrate sample 1	2	1
2.	Qualitative analysis of carbohydrates	To perform the qualitative analysis of carbohydrate sample 2	2	1
3.	Qualitative analysis of carbohydrates	To perform the qualitative analysis of carbohydrate sample 3	2	1
4.	Qualitative analysis of carbohydrates	To perform the qualitative analysis of carbohydrate sample 4	2	1
5.	Qualitative analysis of Proteins and amino acids	To perform the qualitative analysis of protein & amino acid sample 1	2	2
6.	Qualitative analysis of Proteins and amino acids	To perform the qualitative analysis of protein & amino acid sample 2	2	2
7.	Qualitative analysis of Proteins and amino acids	To perform the qualitative analysis of protein & amino acid sample 3	2	2
8.	Qualitative analysis of Proteins and amino acids	To perform the qualitative analysis of protein & amino acid sample 4	2	2
9.	Qualitative analysis of lipids	To perform the qualitative analysis of lipid sample 1	2	3
10.	Qualitative analysis of lipids	To perform the qualitative analysis of lipid sample 2	2	3
11.	Qualitative analysis of urine for normal and abnormal constituents	To perform the qualitative analysis of urine for normal & abnormal constituents sample 1	2	4
12.	Qualitative analysis of urine for normal and abnormal constituents	To perform the qualitative analysis of urine for normal & abnormal constituents sample 2	2	4
13.	Qualitative analysis of urine for normal and abnormal constituents	To perform the qualitative analysis of urine for normal & abnormal constituents sample 3	2	4
14.	Qualitative analysis of urine for normal and abnormal constituents	To perform the qualitative analysis of urine for normal & abnormal constituents sample 4	2	4
15.	Determination of constituents of blood/serum (simulated)	Determination of constituents of blood serum (cholesterol)	2	5
16.	Determination of constituents of blood/serum (simulated)	Determination of constituents of blood serum (calcium)	2	5
17.	Determination of constituents of blood/serum (simulated)	Determination of constituents of blood serum (urea)	2	5
18.	Determination of constituents of blood/serum (simulated)	Determination of constituents of blood serum (glucose, creatinine)	2	5
19.	Determination of constituents of blood/serum (simulated)	Determination of constituents of blood serum (SGOT)	2	6
20.	Study the hydrolysis of starch from acid and salivary amylase enzyme	Determination of constituents of blood serum (SGPT)	2	6
21.	Determination of constituents of blood/serum (simulated)	To study the hydrolysis of starch from acid and salivary amylase enzyme	2	6

e-Learning Source:

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	-	3	3	-	-	3	-	3	-	-	-	3	1	-	-	-
CO2	3	-	3	3	-	-	3	-	3	-	-	-	3	1	-	-	-



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CO3	3	-	3	3	-	-	3	-	3	-	-	-	3	1	-	-	-
CO4	3	-	3	3	-	-	3	-	3	-	-	-	3	3	-	-	-
CO5	3	-	3	3	-	-	3	-	3	-	-	-	3	3	-	-	-
CO6	3	-	3	3	-	-	3	-	3	-	-	-	3	3	-	-	-

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

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Effective from Session: 2022-23							
Course Code	ER20-24P	Title of the Course	PHARMACOTHERAPEUTICS	L	T	P	C
Year	II	Semester	ANNUAL	-	-	1	-
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	--				
Course Objectives	How to prepare a SOAP (Subjective, Objective, Assessment and Plan) note for clinical cases of selected common diseases Patient counselling techniques/methods for common disease conditions						

Course Outcomes	
CO1	Write SOAP (Subjective, Objective, Assessment and Plan) notes for the given clinical cases of selected common diseases
CO2	Counsel the patients about the disease conditions, uses of drugs, methods of handling and administration of drugs, life-style modifications, and monitoring parameters.

Unit No.	Title of the Unit	Content of Unit	Contact Hrs.	Mapped CO
1.	Management of Diseases associated with Cardiovascular system	To study the preparation and discussion of Subjective, Objective Assessment and plan SOAP notes for Hypertension.	1	1
2.	Management of Diseases associated with Cardiovascular system	To study the preparation and discussion of Subjective, Objective Assessment and plan SOAP notes for Angina pectoris.	1	1
3.	Management of Diseases associated with Cardiovascular system	To study the preparation and discussion of Subjective, Objective Assessment and plan SOAP notes for Myocardial infraction.	1	1
4.	Management of Diseases associated with Cardiovascular system	To study the preparation and discussion of Subjective, Objective Assessment and plan SOAP notes for Hyperlipidemia.	1	1
5.	Management of Diseases associated with endocrine system	To study the preparation and discussion of Subjective, Objective Assessment and plan SOAP notes for Diabetes.	1	1
6.	Management Musculoskeletal Disorders	To study the preparation and discussion of Subjective, Objective Assessment and plan SOAP notes for Rheumatoid Arthritis.	1	1
7.	Management of Diseases associated with respiratory system	To study the preparation and discussion of Subjective, Objective Assessment and plan SOAP notes for COPD.	1	1
8.	Management of Psychiatric Disorder	To study the preparation and discussion of Subjective, Objective Assessment and plan SOAP notes for Depression.	1	1
9.	Management of Diseases associated with respiratory system	To study the preparation and discussion of Subjective, Objective Assessment and plan SOAP notes for Asthma.	1	1
10.	Patient counselling on cardiovascular disease	To study the role counselling on Hypertensive patient.	1	2
11.	Patient counselling on cardiovascular disease	To study the role counselling on Angina pectoris patient.	1	2
12.	Patient counselling on musculoskeletal disease	To study the role counselling on Rheumatoid Arthritis patient.	1	2
13.	Patient counselling on dermatological disease	To study the role counselling on Psoriasis patient.	1	2
14.	Patient counselling on endocrine disease	To study the role counselling on Diabetic mellitus patient.	1	2
15.	Simulated case to enable dose calculation	To study the dose calculation in fever of Pediatric patient.	1	2
16.	Simulated case to enable dose calculation	To study the dose calculation in fever of respiratory infection of pediatric patient.	1	2
17.	Patient counselling exercises	To find the reason of Haematemesis in case study and suggestions to resolve.	1	2
18.	Patient counselling exercises	To find the reason of side effect of black stool and suggestions to resolve.	1	2
19.	Patient counselling exercises	To find the reason of decreased appetite, dizziness and reduced urine production and suggestions to resolve.	1	2
20.	Patient counselling exercises	To find out the reason of abdominal pain in vomiting and suggestions to resolve.	1	2



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Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO																	
CO1	3	1	3	3	-	3	3	-	3	-	-	-	3	3	-	-	-
CO2	3	1	3	3	-	3	3	-	3	-	-	-	3	3	-	-	-

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation

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Effective from Session: 2022-23							
Course Code	ER20-25P	Title of the Course	HOSPITAL AND CLINICAL PHARMACY	L	T	P	C
Year	II	Semester	ANNUAL	-	-	3	-
Pre-Requisite	10+2 (PCM/PCB)	Co-requisite	--				
Course Objective	Uses and methods of handling various medical/surgical aids and devices How to interpret drug-drug interactions in the treatment of common diseases. How to interpret common laboratory reports to understand the need for optimizing dosage regimens Methods to systematically approach and respond to drug information queries How to report suspected adverse drug reactions to the concerned authorities						

Course Outcomes	
CO1	Systematic approach to drug information queries using primary / secondary / tertiary resources of information
CO2	Interpretation of laboratory reports to optimize the drug therapy in a given clinical case
CO3	Filling up IPC's ADR Reporting Form and perform causality assessments using various scales and case studies on drug-drug interactions
CO4	Demonstration / simulated / hands-on experience on the identification, types, use / application /administration of Orthopaedic and Surgical Aids, different types of bandages, Needles, syringes, catheters, urine pots, wound dressing, oxygen masks and RYLE's tube
CO5	Vaccination and injection techniques (IV, IM, SC) using mannequins
CO6	Use of Hospital Pharmacy Software and various digital health tools

Unit No.	Title of the Unit	Content of Unit	Contact Hrs	Mapped CO
1.	Systematic approach to drug information queries using primary / secondary / tertiary resources of information	To study the systematic approach to drug information queries using primary / secondary / tertiary resources of information (case-1)	1	1
		To study the systematic approach to drug information queries using primary / secondary / tertiary resources of information (case-2)	1	1
2.	Interpretation of laboratory reports to optimize the drug therapy in a given clinical case	To Interpret the laboratory reports for optimizing the drug therapy in a given clinical case-1	1	2
		To Interpret the laboratory reports for optimizing the drug therapy in a given clinical case-2	1	2
3.	Filling up IPC's ADR Reporting Form and perform causality assessments using various scales and case studies on drug-drug interactions	To study about Filling up IPC's ADR Reporting Form and perform causality assessments using various scales (case-1)	1	3
		To study about Filling up IPC's ADR Reporting Form and perform causality assessments using various scales (case-2)	1	3
		To study the case based on drug-drug interactions (case-1)	1	3
		To study the case based on drug-drug interactions (case-2)	1	3
4.	Demonstration / simulated / hands-on experience on the identification, types, use / application /administration of Orthopaedic and Surgical Aids, different types of bandages, Needles, syringes, catheters, urine pots, wound dressing, oxygen masks and RYLE's tube	To study about the different types of orthopaedic aids (knee cap, LS belts, abdominal belt, walker, walking sticks)	1	4
		To study about the different types of surgical aids (sterile gauze, cotton, crepe bandages)	1	4
		To study about the different types of Needles, syringes, and IV set	1	4
		To study about the different types of urine bag, urine pots, and colostomy bags	1	4
		To study about the different types of RYLE's tube and oxygen masks	1	4
5.	Vaccination and injection techniques (IV, IM, SC) using mannequins	Vaccination and injection techniques (IV, IM, SC) using mannequins	1	5
6.	Use of Hospital Pharmacy Software and various digital health tools	To study about the use of hospital pharmacy software and various digital health tools	1	6

e-Learning Source:

Course Articulation Matrix: (Mapping of COs with POs and PSOs)																	
PO-PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
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CO2	3	-	3	3	-	-	3	-	3	-	-	-	3	1	-	-	-
CO3	3	-	3	3	-	2	3	-	3	-	-	-	3	1	-	-	-
CO4	3	2	3	3	-	-	3	-	3	-	-	-	3	3	-	-	-
CO5	3	2	3	3	-	-	3	-	3	-	-	-	3	3	-	-	-
CO6	3	2	3	3	-	-	3	-	3	-	-	-	3	3	-	-	-

1. Low Correlation; 2- Moderate Correlation; 3- Substantial Correlation



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