Program Structure

of

Diploma in Pharmacy
(D. Pharmacy)

[Applicable w.e.f. Academic Term 2025-27]

JIGYASA UNIVERSITY

Formerly
Himgiri Zee University, Dehradun
(Estd. Under Uttaranchal State Act.No.17, 2003.Approved by UGC Under Sec.2(f))
Post Office Selaqui, Chakrata Road, Dehradun, Uttarakhand,248011

Vision of University

We provide the environment to ignite, nurture, and unleash your potential and talent

Mission Statement

1. Progressive educational proficiencies that stimulate holistic development.
2. Enhancing experiential learning through endorsing an inclusive mindset.
3. Advancing research, nurturing innovations, and catalyzing entrepreneurship.
4. Cultivation of leadership qualities with a strong sense of values and ethics.

Vision of School of Pharmaceutical Sciences (SPS)

To become a global leader in pharmacy education, clinical research, and service, committed towards providing a transformative learning experience in a collaborative and diverse environment focused on improving the health and well-being of the communities.

Mission Statements of SPS

- **M1.** To improve the well-being and quality of life of individuals and communities by educating students.
- **M2.** To prepare students to become pharmacists and pharmaceutical scientists who will be leaders in the pharmacy profession.
- **M3.** Research in the pharmaceutical & clinical sciences and its translation into health care

About the Program

Diploma in Pharmacy (D. Pharm.) is a 2 years undergraduate Course focused on the properties and impacts of pharmaceutical drugs. The programme prepares students to develop the necessary skills to counsel patients about medications and the use of drugs. The curriculum of Diploma in pharmacy Course at School of Pharmaceutical Sciences, Jigyasa University is designed according to Pharmacy Council of India (PCI) the statutory body governing the pharmacy profession in India.

The course equips students with a profound understanding of human anatomy, drug dosage, drug action and reaction, and active ingredients used in the formulation of the drugs and how to maintain their quality in the storage.

PEO's - Program Educational Objectives (D. Pharmacy)

PEO 1: To bestow students different aspects of pharmaceutical sciences, which include different dosage form and their classification, manufacturing process and uses.

PEO 2: To develop an Ability to identify, formulate and solve community & hospital pharmacy problems.

PEO 3: To impart Knowledge of professional and ethical responsibilities as per Pharmaceutical jurisprudence.

PEO 4: To have Ability to work with clinicians, to determine the role of the laboratory in specific situations to optimize patient safety.

PEO 5: To make students understand the various function of hospital and hospital pharmacy, various in- patient and outpatient services, manufacturing within the hospital.

PO's - Program Outcomes (D. Pharmacy)

PO	Outcome
PO1	**Pharmacy knowledge: Illustrate** knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy.
PO2	**Modern tool usage: Choose** and **Interpret** appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an **understanding** of the limitations
PO3	**Leadership skills: Understand** and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. **Assume** participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and wellbeing.
PO4	**Professional Identity: Understand**, **analyze** and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
PO5	**Pharmaceutical Ethics: Justify** personal values and **apply** ethical principles in professional and social contexts. **Demonstrate** behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; **apply** ethical

	principles while **defending** decisions and take responsibility for the outcomes associated with the decisions.
PO6	**Communication: Carryout** projects effectively within the pharmacy community and with society, such as, being able to **Intrepret** and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
PO7	**The Pharmacist and society: Apply (3)** reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
PO8	**Environment and sustainability: Predict (6)** the impact of the professional pharmacy solutions in societal and environmental contexts, **combine (6)** the knowledge of, and need for sustainable development.
PO9	**Life-long learning: Recognize (1)** the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self-**assess (5)** and **use (3)** feedback effectively from others to **Examine(4)** learning needs and to **design(6)** solution for these needs on an ongoing basis.

Program Matrix

D. Pharmacy (D. Pharm.)

S.	Course	Course Name	Category	Numbers of Hours/Week	C

No.	Code		Core / Elective / Others	L	T	P	
YEAR I							
1	ER20-11T	Pharmaceutics –Theory	Major Core Course	3	1	-	4
2	ER20-11P	Pharmaceutics –Practical	Major Core Course	-		3	3
3	ER20-12T	Pharmaceutical Chemistry – Theory	Major Core Course	3	1	-	4
4	ER20-12P	Pharmaceutical Chemistry –Practical	Major Core Course	-		3	3
5	ER20-13T	Pharmacognosy –Theory	Major Core Course	3	1	-	4
6	ER20-13P	Pharmacognosy –Practical	Major Core Course	-	-	3	3
7	ER20-14T	Human Anatomy & Physiology – Theory	Major Core Course	3	1	-	4
8	ER20-14P	Human Anatomy & Physiology – Practical	Major Core Course	-	-	3	3
9	ER20-15T	Social Pharmacy – Theory	Major Core Course	3	1	-	4
10	ER20-15P	Social Pharmacy – Practical	Major Core Course	-	-	3	3
Total				15	5	15	35
YEAR II							
1	ER20-21T	Pharmacology –Theory	Major Core Course	3	1	-	4
2	ER20-21P	Pharmacology – Practical	Major Core Course	-		3	3
3	ER20-22T	Community Pharmacy & Management –Theory	Major Core Course	3	1	-	4
4	ER20-22P	Community Pharmacy & Management –Practical	Major Core Course	-		3	3
5	ER20-23T	Biochemistry & Clinical Pathology – Theory	Major Core Course	3	1	-	4
6	ER20-23P	Biochemistry & Clinical Pathology – Practical	Major Core Course	-	-	3	3
7	ER20-24T	Pharmacotherapeutics – Theory	Major Core Course	3	1	-	4
8	ER20-24P	Pharmacotherapeutics– Practical	Major Core Course	-	-	3	3
9	ER20-25T	Hospital & Clinical Pharmacy – Theory	Major Core Course	3	1	-	4
10	ER20-25P	Hospital & Clinical Pharmacy – Practical	Major Core Course	-	-	3	3
11	ER20-26T	Pharmacy Law & Ethics	Major Core Course	3	1	-	4
Total				18	6	15	39
Cumulative Total				33	11	30	74

Mapping of PEOs & POs in D. Pharm. Matrix

PO→ PEO ↓	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9
PEO-1	3	2		2				1	2
PEO-2	2	2	2			2	3		2
PEO-3	2			2	3		2	1	2
PEO-4	2	2	3	2	2	2	3	1	3
PEO-5	2		2	2	2	1	3		2

Note: *In alignment with Outcome-Based Education (OBE) principles, the mapping of Program Educational Objectives (PEOs) to Program Outcomes (POs) is presented using a* ***quantitative scale (1–3)****, where:*

- ***1*** *indicates a low level of contribution*
- ***2*** *indicates a moderate level of contribution*
- ***3*** *indicates a high level of contribution*

This mapping ensures that each PEO is ***progressively achieved through the attainment of relevant POs****, thereby providing a structured and measurable approach to evaluating the effectiveness of the program in delivering its long-term educational goals.*

Pedagogy, Andragogy, and Unique practices adopted:

Pedagogy refers to the art and science of teaching, particularly in academic and professional domains. In the D.Pharm program, the institute adopts a multifaceted and dynamic teaching approach in line with the Pharmacy Council of India (PCI) syllabus requirements, ensuring both theoretical understanding and practical competence.

Alongside traditional lecture-based instruction, students are engaged through experiential and active learning methods, including:

- Laboratory practicals and experiments- to develop hands-on skills in pharmaceutics, pharmacology, pharmaceutical chemistry, and drug analysis.
- Case studies and problem-solving exercises to enhance clinical reasoning, dosage calculations, and decision-making in real-world pharmacy practice.
- Field visits and community pharmacy exposure- to understand patient care, drug distribution, and public health aspects.
- Group discussions and seminar presentations- to foster communication skills, teamwork, and critical thinking.

- Project-based learning- such as Capstone and Research Projects to integrate knowledge across disciplines, encourage scientific inquiry, and develop research aptitude.

These pedagogical methods are aligned with PCI mandates for D.Pharm programs, which emphasize the integration of theory, practical skills, and professional training. By adopting a combination of lectures, laboratory work, interactive sessions, and research-oriented activities, the pedagogy ensures that students gain a holistic understanding of pharmaceutical sciences, are able to apply knowledge in professional settings, and develop critical and analytical skills required for industry, research, and patient-centered practice

Library and E – Learning Access:

Course faculty actively encourage D.Pharm students to make regular and purposeful use of the University Library, guiding them to effectively utilize its extensive collection of physical books, journals, reference materials, and digital resources. These resources support academic learning, subject-specific research, laboratory work, and the overall enhancement of pharmaceutical knowledge.

In addition, students have access to a wide range of e-learning resources through their individual logins on the University's ERP and digital learning platforms. This facilitates continuous learning beyond classroom instruction, enabling students to engage in self-directed study, online research, simulation exercises, and virtual laboratory learning.

Year – I

Program	**Diploma in Pharmacy**	**Year I**			
Course Name	**PHARMACEUTICS**	**L**	**T**	**P**	**C**
Course Code	**ER 20-11 T**	**3**	**1**	**0**	

Course Objectives:

This course ensures that the students understand how:

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.

5	Understand the parts of a prescription, common Latin terms used, and the legal and ethical considerations in handling prescriptions.

Course Outcomes:

Towards the end of the course, the students will be able to:

CO	Outcome	BT Level
CO1	**Explain** the historical evolution of the pharmacy profession in India with respect to education, industry, and practice; differentiate between various pharmaceutical dosage forms and describe the importance of calibration and validation in manufacturing.	**L2**
CO2	**Analyze** the principles and processes involved in size reduction, size separation, mixing, filtration, drying, and extraction; discuss the concepts and importance of QC, QA, and cGMP in pharmaceutical industries.	**L4**
CO3	**Evaluate and compare** the types and suitability of pharmaceutical packaging materials (glass, plastic, metal, and rubber) based on selection criteria, advantages, disadvantages, and formulation needs.	**L5**
CO4	Classify and explain different types of novel drug delivery systems, highlighting their advantages and challenges in pharmaceutical applications.	**L2**
CO5	**Evaluate** the effectiveness and appropriateness of different unit operations and packaging materials used in pharmaceutical processes**.**	**L5**

Syllabus:

Chapter-1	History of the profession of Pharmacy in India	**Contact Hours: 7**
· 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		
Chapter -2	Packaging materials	**Contact Hours: 5**
Types, selection criteria, advantages and disadvantages of glass, plastic, metal, rubber as packaging materials		
Chapter -3	Pharmaceutical aids & Preservatives	**Contact Hours: 3**
Pharmaceutical aids: Organoleptic (Colouring, flavouring, and sweetening) agents Preservatives: Definition, types with examples and uses		
Chapter -4	Unit operations, Size reduction, Size separation	**Contact Hours: 9**
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		
Chapter -5	Tablets, Capsules, Liquid oral preparations, Topical preparations, Powders and granules, Powders and granules & Immunological products	**Contact Hours:41**

Tablets – coated and uncoated, various modified tablets (sustained release, extended-release, fast dissolving, multilayered, etc.) Capsules - hard and soft gelatin 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 8 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.		
Chapter -6	Basic structure, layout, sections, and activities of pharmaceutical manufacturing plants	**Contact Hours: 5**
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		
Chapter -7	Novel drug delivery systems	**Contact Hours: 5**
Introduction, Classification with examples, advantages, and challenges		

Books:

Text Books:

1. Carter S.J., Cooper and Gunn's. Tutorial Pharmacy, CBS Publications, New Delhi.
2. Pharmaceutics I by gupta A.K , CBS

References:

1. Dosages from degine by Kokate and others, Nirali
2. Pharmaceutics basic principles and formulation by Tripathi D.K , BSP

Assessment Scheme:

Component	Adopted for this Course	Duration	Weightage	Date & Time	Venue	Remarks	Levels
Test I	☑	1.5hr	10			Traditional	Levels 3 to 5
Test II	☑	1.5hr	10			Traditional	Levels 3 to 5
Assignment							
Class Test							
Comprehensive Exam	☑	3hr	80			Traditional	Levels 1 to 5

Course Outcomes – Program Outcomes (CO – PO) Articulation Matrix

Course Outcomes	Program Outcomes (PO)								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	2	2	3	2	1	2	1	2
CO2	3	3	2	2	2	1	3	2	2
CO3	3	3	2	2	2	1	2	3	2

CO4	3	2	1	2	2	1	2	1	2
CO5	3	3	2	2	2	2	2	2	3

Year – I

Program	**Diploma in Pharmacy**	**Year I**			
Course Name	PHARMACEUTICAL CHEMISTRY	**L**	**T**	**P**	**C**
Course Code	ER20-12T	**3**	**1**	**0**	

Course Objectives:

This course ensures that the students understand how:

1	Chemical classification, chemical name, chemical structure
2	Pharmacological uses, doses, stability and storage conditions

3	Different types of formulations/dosage form available and their brand names
4	Impurity testing and basic quality control tests
5	Develop practical laboratory skills, including the safe handling of chemicals, preparation of reagents, and conduct of experiments to analyze pharmaceutical substances.

Course Outcomes:

Towards the end of the course, the students will be able to:

CO	Outcome	
CO1	**Define** the scope and objectives of pharmaceutical chemistry and explain its role and significance in drug discovery and development.	**L2**
CO2	Demonstrate and **evaluate** the importance and procedures of limit tests for chlorides, sulphates, iron, heavy metals, and arsenic in pharmaceutical analysis.	**L5**
CO3	**Compare** and contrast volumetric and gravimetric analytical techniques; classify inorganic pharmaceuticals based on formulation, market preparation, storage, and usage.	**L4**
CO4	**Identify and classify** analgesics and antibiotics by structure and mechanism; analyze the pharmacological differences among narcotic antagonists and their applications.	**L2 & L4**
CO5	**Evaluate** the pharmacological actions and therapeutic applications of cholinergic blocking agents, antianginal drugs, and antineoplastic agents with respect to efficacy and toxicity profiles.	**L5**

Syllabus:

Chapter-1	**Introduction to Pharmaceutical chemistry, Sources and types of errors & Impurities in Pharmaceuticals**	**Contact Hours: 8**
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 chlorides, sulphates, iron, heavy metals and arsenic.		
Chapter -2	**Volumetric analysis & Gravimetric analysis**	**Contact Hours: 8**
Volumetric analysis: Fundamentals of volumetric analysis, Acid-base titration, non-aqueous titration, precipitation titration, complexometric titration, redox titration Gravimetric analysis: Principle and method.		
Chapter -3	**Inorganic Pharmaceuticals**	**Contact Hours: 7**

Inorganic Pharmaceuticals: Pharmaceutical formulations, market preparations, storage conditions and uses of

● Haematinics: Ferrous sulphate, Ferrous fumarate, Ferric ammonium citrate, Ferrous ascorbate, Carbonyl iron

● Gastro-intestinal Agents: Antacids :Aluminium hydroxide gel, Magnesium hydroxide, Magaldrate, Sodium bicarbonate, Calcium Carbonate, Acidifying agents, Adsorbents, Protectives, 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, Mouth washes

● Medicinal gases: Carbon dioxide, nitrous oxide, oxygen.

Chapter -4	**Introduction to nomenclature of organic chemical systems**	**Contact Hours: 2**

Introduction to nomenclature of organic chemical systems with particular reference to heterocyclic compounds containing up to Three rings

Chapter -5	**Drugs Acting on Central Nervous System**	**Contact Hours: 9**

Study of the following category of medicinal compounds with respect to classification, chemical name, chemical structure (compounds marked with*) uses, stability and storage conditions, different types of formulations and their popular brand names

·Anaesthetics: Thiopental Sodium*, Ketamine Hydrochloride*, Propofol

● Sedatives and Hypnotics: Diazepam*, Alprazolam*, Nitrazepam, Phenobarbital*

● Antipsychotics: Chlorpromazine Hydrochloride*, Haloperidol*, Risperidone*, Sulpiride*, Olanzapine, Quetiapine, Lurasidone

● Anticonvulsants: Phenytoin*, Carbamazepine*, Clonazepam, Valproic Acid*, Gabapentin*, Topiramate, Vigabatrin, Lamotrigine

● Anti-Depressants: Amitriptyline Hydrochloride*, Imipramine Hydrochloride*, Fluoxetine*, Venlafaxine, Duloxetine, Sertraline, Citalopram, Escitalopram, Fluvoxamine, Paroxetine

Chapter -6	**Drugs Acting on Autonomic Nervous System**	**Contact Hours: 9**

● Sympathomimetic Agents: Direct Acting: NorEpinephrine*, Epinephrine, Phenylephrine, 9 19 | P a g e Dopamine*, Terbutaline, Salbutamol (Albuterol), Naphazoline*, Tetrahydrozoline. Indirect Acting Agents: Hydroxy Amphetamine, Pseudoephedrine. Agents With Mixed Mechanism: Ephedrine, Metaraminol

● Adrenergic Antagonists: Alpha Adrenergic Blockers: Tolazoline, Phentolamine

● Phenoxybenzamine, Prazosin. Beta Adrenergic Blockers: Propranolol*, Atenolol*, Carvedilol

● Cholinergic Drugs and Related Agents: Direct Acting Agents: Acetylcholine*, Carbachol, And Pilocarpine. Cholinesterase Inhibitors: Neostigmine*, Edrophonium Chloride, Tacrine Hydrochloride, Pralidoxime Chloride, Echothiopate Iodide

● Cholinergic Blocking Agents: Atropine Sulphate*, Ipratropium Bromide

Synthetic Cholinergic Blocking Agents: Tropicamide, Cyclopentolate Hydrochloride, Clidinium Bromide, Dicyclomine Hydrochloride*

Chapter -7	**Drugs Acting on Cardiovascular System**	**Contact Hours: 5**

● Anti-Arrhythmic Drugs: Quinidine Sulphate, Procainamide Hydrochloride, Verapamil, Phenytoin Sodium*, Lidocaine Hydrochloride, Lorcainide Hydrochloride, Amiodarone and Sotalol.

● Anti-Hypertensive Agents: Propranolol*, Captopril*, Ramipril, Methyldopate Hydrochloride, Clonidine Hydrochloride, Hydralazine Hydrochloride, Nifedipine,

● Antianginal Agents: Isosorbide Dinitrate

Chapter -8	**Diuretics**	**Contact Hours: 2**

Acetazolamide, Frusemide*, Bumetanide, Chlorthalidone, Benzthiazide, Metolazone, Xipamide, Spironolactone.		
Chapter -9	**Hypoglycemic Agents**	**Contact Hours: 3**
Insulin and Its Preparations, Metformin*, Glibenclamide*, Glimepiride, Pioglitazone, Repaglinide, Gliflozins, Gliptins		
Chapter -10	**Analgesic And Anti-Inflammatory Agents**	**Contact Hours: 3**
Morphine Analogues, Narcotic Antagonists; Nonsteroidal Anti-inflammatory Agents (NSAIDs) - Aspirin*, Diclofenac, Ibuprofen*, Piroxicam, Celecoxib, Mefenamic Acid, Paracetamol*, Aceclofenac.		
Chapter -11	**Anti-Infective Agents**	**Contact Hours: 8**
● Antifungal Agents: Amphotericin-B, Griseofulvin, Miconazole, Ketoconazole*, Itraconazole, Fluconazole*, Naftifine Hydrochloride ● Urinary Tract Anti-Infective Agents: Norfloxacin, Ciprofloxacin, Ofloxacin*, Moxifloxacin, ● Anti-Tubercular Agents: INH*, Ethambutol, Para Amino Salicylic Acid, Pyrazinamide, Rifampicin, Bedaquiline, Delamanid, Pretomanid* ● Antiviral Agents: Amantadine Hydrochloride, Idoxuridine, Acyclovir*, Foscarnet, Zidovudine, Ribavirin, Remdesivir, Favipiravir ● Antimalarials: Quinine Sulphate, Chloroquine Phosphate*, Primaquine Phosphate, Mefloquine*, Cycloguanil, Pyrimethamine, Artemisinin ● Sulfonamides: Sulfanilamide, Sulfadiazine, Sulfamethoxazole, Sulfacetamide*, Mafenide Acetate, Cotrimoxazole, Dapsone*		
Chapter -12	**Antibiotics**	**Contact Hours: 8**
Penicillin G, Amoxicillin*, Cloxacillin, Streptomycin, Tetracyclines: Doxycycline, Minocycline, Macrolides: Erythromycin, Azithromycin, Miscellaneous: Chloramphenicol* Clindamycin		
Chapter -13	**Anti-Neoplastic Agents**	**Contact Hours: 3**
Cyclophosphamide*, Busulfan, Mercaptopurine, Fluorouracil*, Methotrexate, Dactinomycin, Doxorubicin Hydrochloride, Vinblastine Sulphate, Cisplatin*, Dromostanolone Propionate		

Books:

Text Books:

T1-VN Raje "Pharmaceutical Chemistry" CBS Publisher Edition 2021.

T2-Beekett Practical Pharmaceutical Chemistry 4, CBS Publisher.

References:

R1- Medicinal & Pharmaceutical chemistry by Harikishan Singh and VK Kapoor.

Assessment Scheme:

Component	Adopted for this Course	Duration	Weightage	Date & Time	Venue	Remarks	Levels
Test I	☑	1.5hr	10			Traditional	Levels 3 to 5
Test II	☑	1.5hr	10			Traditional	Levels 3 to 5
Assignment							
Class Test							

Comprehensive Exam	☑	3hr	80			Traditional	Levels 1 to 5

Course Outcomes – Program Outcomes (CO – PO) Articulation Matrix

Course Outcomes	Program Outcomes (PO)								
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**
CO1	3	2	1	3	2	1	2	1	2
CO2	3	3	1	2	2	2	2	1	2
CO3	3	3	1	2	2	2	2	2	2
CO4	3	2	2	2	2	2	3	2	2
CO5	3	3	2	2	2	2	3	2	3

Year – I

Program	**Diploma in Pharmacy**	**Year I**			
Course Name	**Pharmacognosy- Theory**	**L**	**T**	**P**	**C**
Course Code	**ER20-13T**	**3**	**1**	**0**	

Course Objectives:

This course ensures that the students understand how:

1	Occurrence, distribution, isolation, identification tests of common phyto constituents
2	Therapeutic activity and pharmaceutical applications of various natural drug substances and phyto constituents
3	Biological source, chemical constituents of selected crude drugs and their therapeutic efficacy in common diseases and ailments.
4	Basic concepts in quality control of crude drugs and various system of medicines

5	Applications of herbs in health foods and cosmetics

Course Outcomes:

Towards the end of the course, the students will be able to:

CO	Outcome	
CO1	Define Pharmacognosy, explain its historical development and current scope in pharmaceutical sciences. Analyze its significance in drug discovery and development.	**L2 & L4**
CO2	Classify crude drugs using alphabetical, taxonomical, morphological, pharmacological, chemical, and chemo-taxonomical systems.	**L4**
CO3	Perform identification and chemical tests for phytoconstituents like alkaloids, terpenoids, and others. Discuss techniques involved in phytochemical investigations.	**L3**
CO4	Identify biological sources and chemical constituents of selected crude drugs; evaluate their therapeutic efficacy. Also, explain the role of plant fibres (cotton, silk, wool, regenerated) in surgical dressings.	**L2 & L5**
CO5	Describe the preparation methods of Ayurvedic formulations (e.g., Arista, Asava, Taila, Bhasma); introduce herbs as health foods, and evaluate the therapeutic and cosmetic applications of herbal products like aloe vera, spirulina, and garlic.	**L2**

Syllabus:

Chapter-1	**Definition, history, present status and scope of Pharmacognosy**	**Contact Hours: 2**
Definition, history, present status and scope of Pharmacognosy		
Chapter -2	**Classification of drugs**	**Contact Hours: 4**
Classification of drugs: ● Alphabetical ● Taxonomical ● Morphological ● Pharmacological ● Chemical ● Chemo-taxonomical		
Chapter -3	**Quality control of crude drugs**	**Contact Hours: 6**
Quality control of crude drugs: ● Different methods of adulteration of crude drugs ● Evaluation of crude drugs		
Chapter -4	**Brief outline of occurrence, distribution, isolation, identification tests, therapeutic activity and pharmaceutical applications.**	**Contact Hours: 6**
Brief outline of occurrence, distribution, isolation, identification tests, therapeutic activity and pharmaceutical applications of alkaloids, terpenoids, glycosides, volatile oils, tannins and resins.		

Chapter -5	Biological source, chemical constituents and therapeutic efficacy	Contact Hours: 30

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

Chapter -6	Plant fibres used as surgical dressings	Contact Hours: 3

Plant fibres used as surgical dressings: Cotton, silk, wool and regenerated fibres Sutures – Surgical Catgut and Ligatures

Chapter -7	Basic principles involved in the traditional systems of medicine, Method of preparation of Ayurvedic formulations	Contact Hours: 8

● 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

Chapter -8	Role of medicinal and aromatic plants	Contact Hours: 2

Role of medicinal and aromatic plants in national economy and their export potential

Chapter -9	Herbs as health food	Contact Hours: 4

Brief introduction and therapeutic applications of: Nutraceuticals, Antioxidants, Pro-biotics, Pre-biotics, Dietary fibres, Omega-3-fatty acids, Spirulina, Carotenoids, Soya and Garlic.

Chapter -10	Introduction to herbal formulations	Contact Hours: 4

Introduction to herbal formulations

Chapter -11	Herbal cosmetics	Contact Hours: 4

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

Chapter -12	Phytochemical investigation of drugs	Contact Hours: 2

Phytochemical investigation of drugs

Books:

Text Books:

T1: Text book of Pharmacognosy by C.K. Kokate, S.B. Gokhale (2021), First Edition, NiraliPrakashan, New Delhi.

T2: Mohammad Ali. Pharmacognosy and Phytochemistry, Volume I, CBS Publishers & Distributors, New Delhi.

T3: W.C. Evans, Trease and Evans Pharmacognosy, 16th edition, W.B. Sounders & Co., London, 2009.

T4: A.N. Kalia, Textbook of Industrial Pharmacognosy, CBS Publishers, New Delhi, 2005.

References:

R1: Remington's Pharmaceutical Sciences.

R2: P.K. Mukherjee and A. Wahile (2006). Perspectives of Safety for Natural Health Products, In: Herbal Drugs- A Twenty first Century Perspectives, edited by Sharma RK & Arora R, (Jaypee Brothers Medicinal Publishers Ltd., New Delhi).

R3: T.E. Wallis (2005). Textbook of Pharmacognosy, fifth edition, CBS Publishers and Distributors Pvt. Ltd.

Assessment Scheme:

Component	Adopted for this Course	Duration	Weightage	Date & Time	Venue	Remarks	Levels
Test I	☑	1.5hr	10			Traditional	Levels 3 to 5
Test II	☑	1.5hr	10			Traditional	Levels 3 to 5
Assignment							
Class Test							
Comprehensive Exam	☑	3hr	80			Traditional	Levels 1 to 5

Course Outcomes – Program Outcomes (CO – PO) Articulation Matrix

Course Outcomes	Program Outcomes (PO)								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	2	1	3	2	1	2	2	2
CO2	3	2	1	2	1	1	1	1	2
CO3	3	3	1	2	2	2	2	2	2
CO4	3	2	2	2	2	2	3	2	2
CO5	3	2	2	3	2	2	3	3	2

Year – I

Program	Diploma in Pharmacy	Year I			
Course Name	Human Anatomy and Physiology	L	T	P	C
Course Code	ER20-14T	3	1	0	

Course Objectives:

This course ensures that the students understand how:

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 andtheir significances
4	Explore and update the knowledge of special senses and nervous system
5	Gain knowledge about different types of tissues in the human body, including epithelial, connective, muscular, and nervous tissues, along with their characteristics and functions.

Course Outcomes:

Towards the end of the course, the students will be able to:

CO	Outcome	
CO1	Define key anatomical and physiological terms; explain their scope and significance in healthcare.	**L1 & L2**
CO2	Identify and classify various tissues: epithelial, connective, muscular, and nervous.	**L2**
CO3	Discuss blood components, hemopoiesis, and clotting; explain the anatomy and physiology of the heart, cardiac cycle, and ECG basics.mechanisms.	**L2& L4**
CO4	Outline the structure and functions of the GIT, urinary system, and endocrine glands; describe male and female reproductive systems.	**L2 & L2**
CO5	Describe the physiology of muscle contraction and special sense organs (eye, ear, skin, tongue, nose); discuss common muscular disorders.	**L2**

Syllabus:

Chapter-1	**Scope of Anatomy and Physiology Definition of various terminologies**	**Contact Hours: 2**
Scope of Anatomy and Physiology Definition of various terminologies		
Chapter -2	**Structure of Cell**	**Contact Hours: 2**
Structure of Cell: Components and its functions		
Chapter -3	**Tissues of the human body**	**Contact Hours: 4**
Epithelial, Connective, Muscular and Nervous tissues – their sub-types and characteristics.		
Chapter -4	**Osseous system**	**Contact Hours: 6**
Osseous system: structure and functions of bones of axial and appendicular skeleton. Classification, types and movements of joints, disorders of joints.		
Chapter -5	**Haemopoietic system**	**Contact Hours: 8**
● Composition and functions of blood ● Process of Hemopoiesis ● Characteristics and functions of RBCs, WBCs, and platelets ● Mechanism of Blood Clotting ● Importance of Blood groups		
Chapter -6	**Lymphatic system**	**Contact Hours: 3**
● Lymph and lymphatic system, composition, function and its formation. ● Structure and functions of spleen and lymph node.		
Chapter -7	**Cardiovascular system**	**Contact Hours: 8**
● Anatomy and Physiology of heart ● Blood vessels and circulation (Pulmonary, coronary and systemic circulation) ● Cardiac cycle and Heart sounds, Basics of ECG ● Blood pressure and its regulation		
Chapter -8	**Respiratory system**	**Contact Hours: 4**
● Anatomy of respiratory organs and their functions. ● Regulation, and Mechanism of respiration. ● Respiratory volumes and capacities – definitions		
Chapter -9	**Digestive system**	**Contact Hours: 8**
● Anatomy and Physiology of the GIT ● Anatomy and functions of accessory glands ● Physiology of digestion and absorption		
Chapter -10	**Skeletal muscles**	**Contact Hours: 2**
● Histology ● Physiology of muscle contraction ● Disorder of skeletal muscles		
Chapter -11	**Nervous system**	**Contact Hours: 8**
● Classification of nervous system ● Anatomy and physiology of cerebrum, cerebellum, mid brain ● Function of hypothalamus, medulla oblongata and basal ganglia ● Spinal cord-structure and reflexes ● Names and functions of cranial nerves. ● Anatomy and physiology of sympathetic and parasympathetic nervous system (ANS)		
Chapter -12	**Sense organs - Anatomy and physiology**	**Contact Hours: 6**
Sense organs - Anatomy and physiology of ● Eye ● Ear		

● Skin ● Tongue ● Nose		
Chapter -13	**Urinary system**	**Contact Hours: 4**
Urinary system ● Anatomy and physiology of urinary system ● Physiology of urine formation ● Renin - angiotensin system ● Clearance tests and micturition		
Chapter -14	**Endocrine system (Hormones and their functions)**	**Contact Hours: 6**
● Pituitary gland ● Adrenal gland ● Thyroid and parathyroid gland ● Pancreas and gonads		
Chapter -15	**Reproductive system**	**Contact Hours: 4**
● Anatomy of male and female reproductive system ● Physiology of menstruation ● Spermatogenesis and Oogenesis ● Pregnancy and parturition		

1. Books:

Text Books:

1. Essentials of Medical Physiology by K. Sembulingam and P. Sembulingam. Jaypee brothers medical publishers, New Delhi.

Reference Books:

1. Text book of Medical Physiology- Arthur C, Guyton and John. E. Hall. Miamisburg, OH, U.S.A.
2. Human Physiology (vol 1 and 2) by Dr. C.C. Chatterjee, Academic Publishers Kolkata

3. **Assessment Scheme:**

Component	Adopted for this Course	Duration	Weightage	Date & Time	Venue	Remarks	Levels
Test I	☑	1.5hr	10			Traditional	Levels 3 to 5
Test II	☑	1.5hr	10			Traditional	Levels 3 to 5
Assignment							
Class Test							
Comprehensive Exam	☑	3hr	80			Traditional	Levels 1 to 5

Course Outcomes – Program Outcomes (CO – PO) Articulation Matrix

Course Outcomes	Program Outcomes (PO)								
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**
CO1	3	2	1	3	2	2	2	1	2
CO2	3	2	1	2	1	2	2	1	2

CO3	3	2	1	2	1	2	3	1	2
CO4	3	2	1	2	1	2	3	2	2
CO5	3	2	2	2	2	2	2	2	2

Year – I

Program	**Diploma in Pharmacy**	**Year I**			
Course Name	**Social Pharmacy**	**L**	**T**	**P**	**C**
Course Code	**ER20-15**	**3**	**1**	**0**	

Course Objectives:

This course ensures that the students understand how:

1	Public health and national health programs
2	Preventive health care
3	Food and nutrition related health issues
4	Health education & promotion
5	General roles and responsibilities of pharmacists in public health

Course Outcomes:

Towards the end of the course, the students will be able to:

Level	CO	Outcome
L1 & L2	**CO1**	Define Social Pharmacy and explain its scope; discuss WHO health definitions, dimensions, and health indicators.
L2	**CO2**	Describe the pharmacist's role in demography, family planning, public health, and immunization; explain vaccines and types of immunity.
L4& L2	**CO3**	Analyze the impact of environment, pollution, and drug abuse on health and productivity; explain occupational illnesses.
L4 & L2	**CO4**	Explain basics of nutrition including water, fiber, macro- and micronutrients; analyze effects of junk food and nutritional value of foods.
L4	**CO5**	Define epidemiology and communicable diseases; explain pharmacist's role in disease prevention, health programs, and pharmacoeconomics.

Syllabus:

Chapter-1	**Introduction to Social Pharmacy**	**Contact Hours: 9**
· Definition and Scope. Social Pharmacy as a discipline and its scope in improving the public health. Role of Pharmacists in Public Health. (2) · Concept of Health –WHO Definition, various dimensions, determinants, and health indicators. (3) · National Health Policy – Indian perspective (1) · Public and Private Health System in India, National Health Mission (2) · Introduction to Millennium Development Goals, Sustainable		

Development Goals, FIP Development Goals (1)		
Chapter -2	**Preventive healthcare – Role of Pharmacists**	**Contact Hours: 18**
Preventive healthcare – Role of Pharmacists in the following · Demography and Family Planning (3) · Mother and child health, importance of breastfeeding, ill effects of infant milk substitutes and bottle feeding (2) · Overview of Vaccines, types of immunity and immunization (4) · Effect of Environment on Health – Water pollution, importance of safe drinking water, waterborne diseases, air pollution, noise pollution, sewage and solid waste disposal, occupational illnesses, Environmental pollution due to pharmaceuticals (7) · Psychosocial Pharmacy: Drugs of misuse and abuse – psychotropics, narcotics, alcohol, tobacco products. Social Impact of these habits on social health and productivity and suicidal behaviours (2)		
Chapter -3	**Nutrition and Health**	**Contact Hours: 10**
· Basics of nutrition – Macronutrients and Micronutrients (3) · Importance of water and fibres in diet (1) · Balanced diet, Malnutrition, nutrition deficiency diseases, ill effects of junk foods, calorific and nutritive values of various foods, fortification of food (3) · Introduction to food safety, adulteration of foods, effects of artificial ripening, use of pesticides, genetically modified foods (1) · Dietary supplements, nutraceuticals, food supplements – indications, benefits, Drug–Food Interactions (2)		
Chapter -4	**Introduction to Microbiology and common microorganisms**	**Contact Hours: 28**
Epidemiology: Introduction to epidemiology, and its applications. Understanding of terms such as epidemic, pandemic, endemic, mode of transmission, outbreak, quarantine, isolation, incubation period, contact tracing, morbidity, mortality, . (2) 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 (7) · Intestinal infections – poliomyelitis, viral hepatitis, cholera, acute diarrheal diseases, typhoid, amebiasis, worm infestations, food poisoning (7) · Arthropod–borne infections – dengue, malaria, filariasis and, chikungunya (4) · Surface infections – trachoma, tetanus, leprosy (2) · STDs, HIV/AIDS (3)		
Chapter -5	**Introduction to health systems**	**Contact Hours: 8**
Introduction to health systems and all ongoing National Health programs in India, their objectives, functioning, outcome, and the role of pharmacists.		
Chapter -6	**Pharmacoeconomics**	**Contact Hours: 2**
Pharmacoeconomics – Introduction, basic terminologies, importance of pharmacoeconomics		

Books:

Text Books:

1. Dr.S.B Bhise, Mrs. M.S Bhise. Social Pharmacy, First Edition oct 2021, Nirali Prakashan
2. Dr. Pragi Arora, Dr. Varun Arora . Essential of Social Pharmacy, Edition 2022, S.Vikash and Company
3. Short Textbook of Preventive and Social Medicine, Prabhakara GN, 2 nd Edition, 2010, ISBN: 9789380704104, JAYPEE Publications
4. Textbook of Preventive and Social Medicine (Mahajan and Gupta), Edited by Roy Rabindra Nath, Saha Indranil, 4 th Edition, 2013, ISBN: 9789350901878, JAYPEE Publications
5. Review of Preventive and Social Medicine (Including Biostatistics), Jain Vivek, 6 th Edition, 2014, ISBN: 9789351522331, JAYPEE Publications
6. Essentials of Community Medicine—A Practical Approach, Hiremath Lalita D, Hiremath Dhananjaya A, 2 nd Edition, 2012, ISBN: 9789350250440, JAYPEE Publications

Reference Books:

1. Park Textbook of Preventive and Social Medicine, K Park, 21 st Edition, 2011, ISBN-14: 9788190128285, BANARSIDAS BHANOT PUBLISHERS.

Assessment Scheme:

Component	Adopted for this Course	Duration	Weightage	Date & Time	Venue	Remarks	Levels
Test I	☑	1.5hr	10			Traditional	Levels 3 to 5
Test II	☑	1.5hr	10			Traditional	Levels 3 to 5
Assignment							
Class Test							
Comprehensive Exam	☑	3hr	80			Traditional	Levels 1 to 5

Course Outcomes – Program Outcomes (CO – PO) Articulation Matrix

Course Outcomes	Program Outcomes (PO)								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	1	2	3	2	2	3	2	2
CO2	3	2	2	3	2	2	3	2	2
CO3	3	2	2	2	2	2	3	3	2
CO4	3	1	2	2	2	2	2	3	2
CO5	3	2	2	3	3	2	3	2	3

Year – I I

Program	Diploma in Pharmacy	Year II			
Course Name	PHARMACOLOGY	L	T	P	C
Course Code	ER20-21T	3	1	0	

Course Objectives:

This course ensures that the students understand how:

1	General concepts of pharmacology including pharmacokinetics, pharmacodynamics, routes of administration etc.
2	Pharmacological classification and indications of drugs.
3	Dosage regimen, mechanisms of action, contraindications of drugs.
4	Common adverse effects of drugs.
5	Critically assess clinical case studies to determine the most effective and safe drug therapies for individual patients, considering factors like drug efficacy, patient-specific variables, and evidence-based guidelines.

Course Outcomes:

Towards the end of the course, the students will be able to:

CO	Outcome	
CO1	Define pharmacology, explain drug absorption, bioavailability, biotransformation, and factors affecting metabolism.	**L1 & L2**
CO2	Discuss neurohumoral transmission; classify and explain actions and uses of cholinergic, adrenergic, anti-cholinergic, anti-adrenergic drugs, and local anesthetics.	**L2 & L4**
CO3	Define and classify miotics, mydriatics, and anti-glaucoma drugs; describe their pharmacological actions.	**L1 & L2**
CO4	Classify and explain CNS drugs including general anesthetics, sedatives, anti-convulsants, anti-depressants, antipsychotics, and muscle relaxants.	**L2 & L4**
CO5	Explain the physiological roles and pharmacology of histamine, 5-HT, prostaglandins, antihistamines, chemotherapy agents, GIT and renal drugs, and biologicals.	**L2 & L3**

Syllabus:

Chapter-1	**General Pharmacology**	**Contact Hours: 10**
· 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		
Chapter -2	**Drugs Acting on the Peripheral Nervous System**	**Contact Hours: 11**
· 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)		
Chapter -3	**Drugs Acting on the Eye**	**Contact Hours: 2**
Definition, classification, pharmacological actions, dose, indications and contraindications of · Miotics · Mydriatics · Drugs used in Glaucoma		
Chapter -4	**Drugs Acting on the Central Nervous System**	**Contact Hours: 8**
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		
Chapter -5	**Drugs Acting on the Cardiovascular System**	**Contact Hours: 6**
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		
Chapter -6	**Drugs Acting on Blood and Blood Forming Organs**	**Contact Hours: 4**
Definition, classification, pharmacological actions, dose, indications, and contraindications of · Hematinic agents · Anti–coagulants · Anti–platelet agents · Thrombolytic drugs		
Chapter -7	**Definition, classification, pharmacological actions, dose, indications, and contraindications**	**Contact Hours: 2**
Definition, classification, pharmacological actions, dose, indications, and contraindications of		

· Bronchodilators · Expectorants · Anti–tussive agents · Mucolytic agents		
Chapter -8	**Drugs Acting on the Gastro Intestinal Tract**	**Contact Hours: 5**
Definition, classification, pharmacological actions, dose, indications, and contraindications of · Anti–ulcer drugs · Anti–emetics · Laxatives and purgatives · Anti–diarrheal drugs		
Chapter -9	**Drugs Acting on the Kidney**	**Contact Hours: 2**
Definition, classification, pharmacological actions, dose, indications, and contraindications of · Diuretics · Anti–Diuretics		
Chapter -10	**Hormones and Hormone Antagonists**	**Contact Hours: 8**
Physiological and pathological role and clinical uses of · Thyroid hormones · Anti–thyroid drugs · Parathormone · Calcitonin · Vitamin D · Insulin · Oral hypoglycemic agents · Estrogen · Progesterone · Oxytocin · Corticosteroids		
Chapter -11	**Autocoids**	**Contact Hours: 3**
· Physiological role of Histamine, 5 HT and Prostaglandins · Classification, clinical uses, and adverse effects of antihistamines and 5 HT antagonists		
Chapter -12	**Chemotherapeutic Agents**	**Contact Hours: 12**
Chemotherapeutic Agents: 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		
Chapter -13	**Biologicals**	**Contact Hours: 2**
Definition, types, and indications of biological agents with examples		

2. Books:

Text Books:

T1- A concise text book of Pharmacology Merchant S.H. and Dr. J.S.Quadry. A textbook of hospital pharmacy, 4th ed. Ahmadabad: B.S. Shah Prakakshan; 2001

T2- A Text book of Pharmacology by F.S.K.Barar.

Reference Books:

R-1 Essentials of MEDICAL PHARMACOLOGY by KD Tripathi.

R-2 Principles of anatomy & physiology by Tortora's.

Assessment Scheme:

Component	Adopted for this Course	Duration	Weightage	Date & Time	Venue	Remarks	Levels
Test I	☑	1.5hr	10			Traditional	Levels 3 to 5
Test II	☑	1.5hr	10			Traditional	Levels 3 to 5
Assignment							
Class Test							
Comprehensive Exam	☑	3hr	80			Traditional	Levels 1 to 5

Course Outcomes – Program Outcomes (CO – PO) Articulation Matrix

Course Outcomes	Program Outcomes (PO)								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	2	1	1	1	1	1	1	2
CO2	3	2	2	2	1	1	2	1	2
CO3	3	1	1	1	1	1	1	1	1
CO4	3	2	2	2	2	1	2	1	2
CO5	3	2	1	2	2	2	2	2	3

Year – I I

Program	Diploma in Pharmacy	Year II			
Course Name	**Community Pharmacy and Management**	L	T	P	C
Course Code	**ER20-22T**	3	1	0	

Course Objectives:

This course ensures that the students understand how:

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 drugs
4	Scope for performing basic health screening in community pharmacy settings
5	Implement effective management practices in a community pharmacy setting, including inventory management, financial management, personnel management, and regulatory compliance.

Course Outcomes:

Towards the end of the course, the students will be able to:

CO	Outcome	
CO1	Define community pharmacy; describe its history and global/Indian development; outline responsibilities and SOPs.	**L1 & L2**
CO2	Explain prescription components, legality, labeling, dispensing process, and strategies to prevent dispensing errors.	**L2 & L3**
CO3	Demonstrate verbal communication and patient counselling; describe stages, benefits, and strategies to overcome barriers.	**L3 & L4**
CO4	Define medication adherence; explain causes of non-adherence and suggest improvement strategies.	**L2 & L4**

CO5	Describe health screening, OTC medication counseling, digital pharmacy operations, audits, and pharmacy management.	**L2 , L3 & L5**

Syllabus:

Chapter-1	**Community Pharmacy Practice**	**Contact Hours: 2**
Definition, history and development of community pharmacy - International and Indian scenarios		
Chapter -2	**Professional responsibilities of community pharmacists**	**Contact Hours: 3**
Professional responsibilities of community pharmacists Introduction to the concept of Good Pharmacy Practice and SOPs		
Chapter -3	**Prescription and prescription handling**	**Contact Hours: 7**
· 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.		
Chapter -4	**Communication skills**	**Contact Hours: 6**
· Definition, types of communication skills · Interactions with professionals and patients · Verbal communication skills (one–to–one, over the telephone) · Written communication skills · Body language · Patient interview techniques		
Chapter -5	**Patient counselling**	**Contact Hours: 10**
· Definition and benefits of patient counselling · Stages of patient counselling – Introduction, counselling content, counselling process, and closing the counselling session · Barriers to effective counseling – Types and strategies to overcome the barriers · Patient counselling points for chronic diseases/disorders – Hypertension, Diabetes, Asthma, Tuberculosis, Chronic obstructive pulmonary disease, and AIDS · Patient Package Inserts – Definition, importance and benefits, Scenarios of PPI use in India and other countries · Patient Information leaflets – Definition and uses		
Chapter -6	**Medication Adherence**	**Contact Hours: 2**
Medication Adherence Definition, factors influencing non- adherence, strategies to overcome non-adherence.		
Chapter -7	**Health Screening Services in Community Pharmacy**	**Contact Hours: 5**
Introduction, scope, and importance of various health screening services - for routine monitoring of patients, early detection, and referral of undiagnosed cases.		
Chapter -8	**Over The Counter (OTC) Medications**	**Contact Hours: 15**
· Definition, need and role of Pharmacists in OTC medication		

dispensing · OTC medications in India, counseling for OTC products · Self-medication and role of pharmacists in promoting the safe practices during self-medication · 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)

Chapter -9	**Community Pharmacy Management**	**Contact Hours: 25**
· Legal requirements to set up a community pharmacy · Site selection requirements · Pharmacy designs and interiors · Vendor selection and ordering · Procurement, inventory control methods, and inventory management · Financial planning and management · Accountancy in community pharmacy – Day book, Cash book · Introduction to pharmacy operation softwares – usefulness and availability · Customer Relation Management (CRM) · Audits in Pharmacies · SOP of Pharmacy Management · Introduction to Digital Health, mHealth and Online pharmacies		

3. Books:

Text Books:

T1- Sahare yadaorao atish, Sonwane M. sandip, Panpaliya v. Dinesh "Modern Concept in Community Pharmacy and Management" PV Publisher Edition 2022.
T2- Merchant S.H. and Dr. J.S.Quadry. A textbook of hospital pharmacy, 4th ed. Ahmadabad: B.S. Shah Prakakshan; 2001
T3- Parthasarathi G, Karin Nyfort-Hansen, Milap C Nahata. A textbook of Clinical Pharmacy Practice- essential concepts and skills, 1 st ed. Chennai: Orient Longman Private Limited; 2004.
T4- Tipnis Bajaj. Hospital Pharmacy, 1st ed. Maharashtra: Career Publications; 2008.
T5- Parmar N.S. Health Education and Community Pharmacy, 18th ed. India: CBS Publishers & Distributers; 2008.

Reference Books:

R1-William E. Hassan. Hospital pharmacy, 5th ed. Philadelphia: Lea &Febiger; 1986

Assessment Scheme:

Component	Adopted for this Course	Duration	Weightage	Date & Time	Venue	Remarks	Levels
Test I	☑	1.5hr	10			Traditional	Levels 3 to 5
Test II	☑	1.5hr	10			Traditional	Levels 3 to 5
Assignment							
Class Test							

Comprehensive Exam	☑	3hr	80			Traditional	Levels 1 to 5

Course Outcomes – Program Outcomes (CO – PO) Articulation Matrix

Course Outcomes	Program Outcomes (PO)								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	2	1	1	1	1	1	1	2
CO2	3	2	2	2	1	1	2	1	2
CO3	3	1	1	1	1	1	1	1	1
CO4	3	2	2	2	2	1	2	1	2
CO5	3	2	1	2	2	2	2	2	3

Year – II

Program	Diploma in Pharmacy	Year II			
Course Name	BIOCHEMISTRY & CLINICAL PATHOLOGY	L	T	P	C
Course Code	ER20-23T	3	1	0	

Course Objectives:

This course ensures that the students understand how:

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:

Towards the end of the course, the students will be able to:

Level	CO	Outcome
L1 & L2	**CO1**	Explain the scope of biochemistry, biochemical organization of cells, and classification, properties, and tests of carbohydrates.
L2	**CO2**	Define and classify proteins and amino acids; explain their nutritional significance and functions.
L2	**CO3**	Describe classification of fatty acids; explain structure and functions of cholesterol and lipoproteins.
L2	**CO4**	Define and describe structure of nucleic acids, purines, pyrimidines, nucleosides, and nucleotides.
L1 & L2	**CO5**	Explain metabolism of biomolecules (carbohydrates, lipids, amino acids), basics of biotechnology, blood cells (lymphocytes, platelets, RBCs), and liver & kidney functions/tests.

Syllabus:

Chapter-1	**Introduction to biochemistry**	**Contact Hours: 2**
Scope of biochemistry in pharmacy; Cell and its biochemical organization.		
Chapter -2	**Carbohydrates**	**Contact Hours: 5**
Carbohydrates · Definition, classification with examples, chemical properties · Monosaccharides – Structure of glucose, fructose, and galactose · Disaccharides – structure of maltose, lactose, and sucrose · Polysaccharides – chemical nature of starch and glycogen · Qualitative tests and biological role of carbohydrates		
Chapter -3	**Proteins**	**Contact Hours: 5**
· 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.		
Chapter -4	**Lipids**	**Contact Hours: 5**
· 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		
Chapter -5	**Nucleic acids**	**Contact Hours: 4**
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.		
Chapter -6	**Enzymes**	**Contact Hours: 5**
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		
Chapter -7	**Vitamins**	**Contact Hours: 6**
· Definition and classification with examples · Sources, chemical nature, functions, coenzyme form, recommended dietary requirements, deficiency diseases of fat–and water–soluble vitamins		
Chapter -8	**Metabolism**	**Contact Hours: 20**
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: 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.		
Chapter -9	**Minerals**	**Contact Hours: 5**
Minerals:		

Types, Functions, Deficiency diseases, recommended dietary requirements		
Chapter -10	**Water and Electrolytes**	**Contact Hours: 3**
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.		
Chapter -11	**Introduction to Biotechnology**	**Contact Hours: 1**
Introduction to Biotechnology		
Chapter -12	**Organ function tests**	**Contact Hours: 6**
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		
Chapter -13	**Introduction to Pathology of Blood and Urine**	**Contact Hours: 6**
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.		

Books:

Text Books:

T1. Dr. U. Satyanarayana, Dr.Chakrapani, "Biochemistry", Elsevier, Fourth Edition 2013.
T2. Chaudhari And Others,Biochemistry and Clinical Pathology,Delhi, Nirali Publication
T3.Raje V N,Biochemistry Clinical Pathology,CBS Publisher.
T4.Murgesh N,Biochemistry and Clinical Pathology Edition 2018

References:

R1. Dr. Kuntal Das, "Biochemistry", Nirali Prakashan, Edition 2022

Assessment Scheme:

Component	Adopted for this Course	Duration	Weightage	Date & Time	Venue	Remarks	Levels
Test I	☑	1.5hr	10			Traditional	Levels 3 to 5
Test II	☑	1.5hr	10			Traditional	Levels 3 to 5
Assignment							
Class Test							
Comprehensive Exam	☑	3hr	80			Traditional	Levels 1 to 5

Course Outcomes – Program Outcomes (CO – PO) Articulation Matrix

	Program Outcomes (PO)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	2	1	1	1	1	1	1	2
CO2	3	2	2	2	1	1	2	1	2
CO3	3	1	1	1	1	1	1	1	1
CO4	3	2	2	2	2	1	2	1	2
CO5	3	2	1	2	2	2	2	2	3

Year – II

Program	Diploma in Pharmacy	Year II			
Course Name	Pharmacotherapeutics **(Theory)**	**L**	**T**	**P**	**C**
Course Code	ER20-24T	**3**	**1**	**0**	

Course Objectives:

This course ensures that the students understand how:

1	Etiopathogenesis of selected common diseases and evidence-based medicine therapy
2	Importance of individualized therapeutic plan based on diagnosis
3	Basic methods for assessing the clinical outcomes of drug therapy
4	Apply principles of evidence-based medicine to evaluate and select appropriate drug therapies for specific diseases and conditions, considering factors such as efficacy, safety, and patient-specific characteristics.
5	Develop individualized patient care plans that integrate pharmacotherapy with patient education, lifestyle modifications, and monitoring parameters to optimize therapeutic outcomes and promote patient adherence.

Course Outcomes:

Towards the end of the course, the students will be able to:

Level	CO	Outcome
L1 & L2	**CO1**	Explain the scope, objectives of pharmacotherapeutics, rational use of medicines, and essential medicines list.
L2 & L3	**CO2**	Describe and apply principles of evidence-based medicine and standard treatment guidelines (STGs).
L2 & L4	**CO3**	Analyze cardiovascular and respiratory disorders: etiology, symptoms, and management strategies.
L3, L4 & L5	**CO4**	Evaluate therapeutic approaches for endocrine, CNS, and GI disorders using pharmacotherapeutic principles.
L4 & L6	**CO5**	Assess and design treatment plans for infectious diseases including tuberculosis and HIV.

Syllabus:

Chapter-1	**Pharmacotherapeutics**	**Contact Hours: 8**
Pharmacotherapeutics – Introduction, scope, and objectives. Rational use of Medicines, Evidence Based Medicine, Essential Medicines List, Standard Treatment Guidelines (STGs).		
Chapter -2	**Definition, etiopathogenesis, clinical manifestations, nonpharmacological and pharmacological management of the diseases associated with**	**Contact Hours: 8**

Definition, etiopathogenesis, clinical manifestations, nonpharmacological and pharmacological management of the diseases associated with-

Diseases	**Contact Hours**
(a) Cardiovascular System · Hypertension · Angina and Myocardial infarction ·Hyperlipidaemia · Congestive Heart Failure	8
b) Respiratory System · Asthma · COPD	4
(c) Endocrine System · Diabetes · Thyroid disorders – Hypo and Hyperthyroidism	5
(d) Central Nervous System · Epilepsy · Parkinson's disease · Alzheimer's disease · Stroke · Migraine	8
(e) Gastro Intestinal Disorders · Gastro oesophageal reflux disease · Peptic Ulcer Disease · Alcoholic liver disease · Inflammatory Bowel Diseases (Crohn's Disease and Ulcerative Colitis)	8
(f) Haematological disorders · Iron deficiency anaemia · Megaloblastic anaemia	4
(g) Infectious diseases · Tuberculosis · Pneumonia · Urinary tract infections · Hepatitis ·Gonorrhoea and Syphilis	12

	· Malaria · HIV and Opportunistic infections · Viral Infections (SARS, CoV2)		
	(h) Musculoskeletal disorders · Rheumatoid arthritis · Osteoarthritis	3	
	(i) Dermatology · Psoriasis · Scabies · Eczema	3	
	(j) Psychiatric Disorders · Depression · Anxiety · Psychosis	4	
	(k) Ophthalmology · Conjunctivitis (bacterial and viral) · Glaucoma	2	
	(l) Anti-microbial Resistance	2	
	m) Women's Health · Polycystic Ovary Syndrome · Dysmenorrhea · Premenstrual Syndrome	4	

Books:

Suggestive Readings:

Text Books:

1. Clinical Pharmacy and Therapeutics - Roger and Walker, Churchill Livingstone Publication.
2. Applied Therapeutics: The clinical Use of Drugs. Lloyd Young and Koda-Kimble MA Lippincott, Williams and Wilkins Publication.

Reference Books:

1. Clinical Pharmacy and Therapeutics - Eric T. Herfindal, Williams and Wilkins Publication

2. Pharmacotherapy: A Pathophysiologic approach - Joseph T. Dipiro et al. Appleton and Lange Publication.

3. National Formulary of India, Indian Pharmacopoeia Commission, Ghaziabad.

Assessment Scheme:

Component	Adopted for this Course	Duration	Weightage	Date & Time	Venue	Remarks	Levels
Test I	☑	1.5hr	10			Traditional	Levels 3 to 5
Test II	☑	1.5hr	10			Traditional	Levels 3 to 5
Assignment							

Class Test							
Comprehensive Exam	☑	3hr	80			Traditional	Levels 1 to 5

Course Outcomes – Program Outcomes (CO – PO) Articulation Matrix

Course Outcomes	Program Outcomes (PO)								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3	2	1	1	1	1	1	1	2
CO2	3	2	2	2	1	1	2	1	2
CO3	3	1	1	1	1	1	1	1	1
CO4	3	2	2	2	2	1	2	1	2
CO5	3	2	1	2	2	2	2	2	3

Year – II

Program	Diploma in Pharmacy	Year II			
Course Name	Hospital and Clinical Pharmacy	L	T	P	C
Course Code	ER20-25T	3	1	0	

Course Objectives:

This course ensures that the students understand how:

1	Hospital and Hospital 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 interpretations of common laboratory results used in clinical diagnosis towards optimizing the drug therapy.
5	Evaluate medication safety practices within hospital settings, including medication reconciliation, error reporting, and implementation of strategies to prevent medication errors.

Course Outcomes:

Towards the end of the course, the students will be able to:

CO	Outcome	
CO1	Explain the scope, definition, and organizational structure of hospital pharmacy at national and international levels.	**L2**
CO2	Describe professional responsibilities, qualifications, and inter-professional collaboration required for hospital pharmacists.	**L1**
CO3	Analyze Good Pharmacy Practice (GPP), hospital standards (FIP Basel, AHSP), and hospital committees' roles in antimicrobial resistance control.	**L2**
CO4	Apply inventory control and supply chain techniques; evaluate drug distribution systems and hospital compounding procedures including IV admixtures.	**L2 & L4**
CO5	Create a plan for integrating computers in hospital pharmacy (e.g., EHRs) and assess clinical lab tests in disease diagnosis and therapy monitoring.	**L3**

Syllabus:

Syllabus:

Chapter-1	**Hospital Pharmacy**	**Contact Hours: 6**
· Definition, scope, national and international scenario ·Organizational 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		
Chapter -2	**Different Committees in the Hospital**	**Contact Hours: 4**
· Pharmacy and Therapeutics Committee – Objectives, Composition, and functions · Hospital Formulary – Definition, procedure for development and use of hospital formulary · Infection Control Committee – Role of Pharmacist in preventing Antimicrobial Resistance		
Chapter -3	**Supply Chain and Inventory Control**	**Contact Hours: 14**
· 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

Chapter -4	**Drug distribution**	**Contact Hours: 7**

· 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.

Chapter -5	**Compounding in Hospitals**	**Contact Hours: 4**

Compounding in Hospitals. Bulk compounding, IV admixture services and incompatibilities, Total parenteral nutrition.

Chapter -6	**Radio Pharmaceuticals**	**Contact Hours: 2**

Storage, dispensing and disposal of radiopharmaceuticals

Chapter -7	**Application of computers in Hospital Pharmacy Practice**	**Contact Hours: 2**

Application of computers in Hospital Pharmacy Practice, Electronic health records, Softwares used in hospital pharmacy

Chapter -8	**Clinical Pharmacy, Daily activities of clinical pharmacists & Pharmaceutical care**	**Contact Hours: 12**

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 of
· Ward round participation
· Treatment Chart Review
· Adverse drug reaction monitoring
· Drug information and poisons information
· Medication history
· Patient counselling
· Inter professional collaboration
Pharmaceutical care: Definition, classification of drug related problems. Principles and procedure to provide pharmaceutical care Medication Therapy Management, Home Medication Review.

Chapter -9	**Clinical laboratory tests used in the evaluation of disease**	**Contact Hours: 10**

Clinical laboratory tests used in the evaluation of disease states - significance and interpretation of test results
·Haematological, Liver function, Renal function, thyroid function tests
· Tests associated with cardiac disorders

· Fluid and electrolyte balance · Pulmonary Function Tests		
Chapter -10	**Poisoning & Drugs and Poison Information Centre and their services**	**Contact Hours: 6**
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.		
Chapter -11	**Pharmacovigilance**	**Contact Hours: 2**
Pharmacovigilance · Definition, aim and scope · Overview of Pharmacovigilance		
Chapter -12	**Medication errors & Drug Interactions**	**Contact Hours: 8**
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.		

Books:

Text Books:

T1- Dr. Pratibha Nand, Dr. Roop K. Khar. Text book of Hospital and Clinical Pharmacy-Theory and Practical, Birla Publication Pvt. Ltd, Edition 17th 2022-23.

T2- Megha Tiwari, A Textbook of Hospital and Clinical Pharmacy, First Edition 2023, AITBS Publisher India

T3- A Textbook of Clinical Pharmacy Practice - Essential concepts and skills - Parthasarathi G, Karin Nyfort-Hansen and Milap Nahata. Orient Longman Pvt. Ltd. Hyderabad.

T4-Text Book of Hospital and Clinical Pharmacy by Dr. Pratibha Nand and Dr. Roop K Khar, Birla publications, New Delhi.

T5-Gupta B.K and Gupta R.N., GPP in Hospital Pharmacy, Vallabh Prakashan

Reference Books:

R1- Basic skills in interpreting laboratory data - Scott LT, American Society of Health System Pharmacists Inc.

R2- Australian drug information- Procedure manual. The Society of Hospital Pharmacists of Australia.

Assessment Scheme:

Component	Adopted for this Course	Duration	Weightage	Date & Time	Venue	Remarks	Levels
Test I	☑	1.5hr	10			Traditional	Levels 3 to 5
Test II	☑	1.5hr	10			Traditional	Levels 3 to 5
Assignment							
Class Test							
Comprehensive Exam	☑	3hr	80			Traditional	Levels 1 to 5

Course Outcomes – Program Outcomes (CO – PO) Articulation Matrix

	Program Outcomes (PO)

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
CO1	3		1	2	1	1	1		2
CO2	3		3	3	2	2	2		2
CO3	3		2	2	3	2	3	2	2
CO4	3	2	2	2	2	2	2	2	2
CO5	3	3	2	2	2	2	2	2	3

Year – II

Program	Diploma in Pharmacy	Year II			
Course Name	**PHARMACY LAW AND ETHICS**	**L**	**T**	**P**	**C**
Course Code	**ER20-26T**	**3**	**1**	**0**	

Course Objectives:

This course ensures that the students understand how:

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
5	Apply ethical principles and professional codes of conduct in making decisions related to patient care, confidentiality, informed consent, and conflicts of interest.

Course Outcomes:

Towards the end of the course, the students will be able to:

CO	Outcome	
CO1	Explain general legal principles, history, and key objectives of Pharmacy Act 1948 and Drugs & Cosmetics Act 1940.	**L2**
CO2	Analyze key provisions of NDPS Act, Magic Remedies Act, and other related drug laws.	**L1**
CO3	Evaluate responsibilities of pharmacists under Poisons Act, Cruelty to Animals Act, and related legislations.	**L2**
CO4	Apply FSSAI regulations and NPPA guidelines in drug pricing, labeling, and food supplement.	**L4**
CO5	Create ethical frameworks using the Code of Ethics and assess Biomedical Waste Management Rules in pharmacy practice.	**L5**

Syllabus:

Chapter-1	**General Principles of Law**	**Contact Hours: 2**
General Principles of Law, History and various Acts related to Drugs and Pharmacy profession		
Chapter -2	**Pharmacy Act-1948 and Rules**	**Contact Hours: 5**
Pharmacy Act-1948 and Rules: Objectives, Definitions, Pharmacy Council of India; its constitution and functions, Education Regulations, State and Joint state pharmacy councils, Registration of Pharmacists, Offences and Penalties. Pharmacy Practice Regulations 2015		
Chapter -3	**Drugs and Cosmetics Act 1940 and Rules 1945 and New Amendments**	**Contact Hours: 23**
Objectives, Definitions, Legal definitions of schedules to the Act and Rules Import of drugs – Classes of drugs and cosmetics prohibited from import, Import under license or permit. Manufacture of drugs – Prohibition of manufacture and sale of certain drugs, Conditions for grant of license and conditions of license for manufacture of drugs, Manufacture of drugs for test, examination and analysis, manufacture of new drug, loan license and repacking license.		

Study of schedule C and C1, G, H, H1, K, P, M, N, and X. Sale of Drugs – Wholesale, Retail sale and Restricted license, Records to be kept in a pharmacy Drugs Prohibited for manufacture and sale in India Administration of the Act and Rules – Drugs Technical Advisory Board, Central Drugs Laboratory, Drugs Consultative Committee, Government analysts, licensing authorities, controlling authorities, Drug Inspectors.		
Chapter -4	**Narcotic Drugs and Psychotropic Substances Act 1985 and Rules**	**Contact Hours: 2**
Objectives, Definitions, Authorities and Officers, Prohibition, Control and Regulation, Offences and Penalties.		
Chapter -5	**Drugs and Magic Remedies (Objectionable Advertisements) Act 1954**	**Contact Hours: 2**
Objectives, Definitions, Prohibition of certain advertisements, Classes of Exempted advertisements, Offences and Penalties.		
Chapter -6	**Prevention of Cruelty to Animals Act-1960**	**Contact Hours: 2**
Objectives, Definitions, CPCSEA - brief overview, Institutional Animal Ethics Committee, Breeding and Stocking of Animals, Performance of Experiments, Transfer and Acquisition of animals for experiment, Records, Power to suspend or revoke registration, Offences and Penalties.		
Chapter -7	**Poisons Act-1919**	**Contact Hours: 2**
Introduction, objective, definition, possession, possession for sales and sale of any poison, import of poisons		
Chapter -8	**FSSAI (Food Safety and Standards Authority of India) Act and Rules**	**Contact Hours: 2**
Brief overview and aspects related to manufacture, storage, sale, and labelling of Food Supplements.		
Chapter -9	**National Pharmaceutical Pricing Authority**	**Contact Hours: 5**
Drugs Price Control Order (DPCO) - 2013. Objectives, Definitions, Sale prices of bulk drugs, Retail price of formulations, Retail price and ceiling price of scheduled formulations, Pharmaceutical Policy 2002, National List of Essential Medicines (NLEM)		
Chapter -10	**Code of Pharmaceutical Ethics**	**Contact Hours: 5**
Definition, ethical principles, ethical problem solving, registration, code of ethics for Pharmacist in relation to his job, trade, medical profession and his profession, Pharmacist's oath.		
Chapter -11	**Medical Termination of Pregnancy Act and Rules**	**Contact Hours: 2**
Basic understanding, salient features, and Amendments		

Chapter -12	**Role of all the government pharma regulator bodies**	**Contact Hours: 1**
Central Drugs Standards Control Organization (CDSCO), Indian Pharmacopoeia Commission (IPC)		
Chapter -13	**Good Regulatory practices**	**Contact Hours: 3**
Good Regulatory practices (documentation, licenses, renewals, e-governance) in Community Pharmacy, Hospital pharmacy, Pharma Manufacturing, Wholesale business, inspections, import, export of drugs and medical devices.		
Chapter -14	**Introduction to BCS system of classification**	**Contact Hours: 7**
Introduction to BCS system of classification, Basic concepts of Clinical Trials, ANDA, NDA, New Drug development, New Drugs and Clinical Trials Rules, 2019. Brand v/s Generic, Trade name concept, Introduction to Patent Law and Intellectual Property Rights, Emergency Use Authorization		
Chapter - 15	**Blood bank**	**Contact Hours: 2**
Blood bank – basic requirements and functions		
Chapter - 16	**Clinical Establishment Act and Rules**	**Contact Hours: 2**
Clinical Establishment Act and Rules – Aspects related to Pharmacy		
Chapter - 17	**Biomedical Waste Management Rules 2016**	**Contact Hours: 2**
Basic aspects, and aspects related to pharma manufacture to disposal of pharma / medical waste at homes, pharmacies, and hospitals		
Chapter - 18	**Bioethics**	**Contact Hours: 2**
Basic concepts, history and principles. Brief overview of ICMR's National Ethical Guidelines for Biomedical and Health Research involving human participants		
Chapter - 19	**Introduction to the Consumer Protection Act**	**Contact Hours: 1**
Introduction to the Consumer Protection Act		
Chapter - 20	**Introduction to the Disaster Management Act**	**Contact Hours: 1**
Introduction to the Disaster Management Act		
Chapter - 21	**Medical Devices**	**Contact Hours: 2**
Categorization, basic aspects related to manufacture and sale		

Books:

Text Books:
T1- Forensic Pharmacy by B. Suresh.
T2- Text book of Forensic Pharmacy by B.M. Mithal
T3-Hand book of drug law-byM.L. Mehra
T4- Clinical Pharmacy and Therapeutics by Roger Walker, 4th edition, Churchill publisher.

Reference Books:
R1- Drugs and Cosmetics Act/Rules by Govt. of India publications.
R2- Bare Acts of the said laws published by Government. Reference books

Assessment Scheme:

Component	Adopted for this Course	Duration	Weightage	Date & Time	Venue	Remarks	Levels
Test I	☑	1.5hr	10			Traditional	Levels 3 to 5
Test II	☑	1.5hr	10			Traditional	Levels 3 to 5
Assignment							
Class Test							
Comprehensive Exam	☑	3hr	80			Traditional	Levels 1 to 5

Course Outcomes – Program Outcomes (CO – PO) Articulation Matrix

Course Outcomes	Program Outcomes (PO)								
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CO1	3	2	1	1	1	1	1	1	2
CO2	3	2		2	1	1		1	2
CO3	3	1		1	1	1		1	1
CO4	3	2	2	2	2	1		1	2
CO5	3	2	1	2	2	2	2	2	3