



**K. R. MANGALAM UNIVERSITY**

THE COMPLETE WORLD OF EDUCATION

## **School of Medical & Allied Sciences**

**Diploma in Pharmacy  
(D. Pharm)**

**Program Code: 31**

**2022-2024**

**Approved in the 29th Meeting of Academic Council Held on 09 August 2022**



**Registrar**  
K.R. Mangalam University  
Sohna Road, Gurugram, (Haryana)



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## **PREFACE**

The objective of any program at Higher Education Institute is to prepare their students for the society at large. The K. R. Mangalam University envisions all its programs in the best interest of their students and in this endeavour it offers a new vision to all its Under-Graduate courses. The Under-Graduate Programmes will prepare the students for both, academia and employability. Each programme vividly elaborates its nature and promises the outcomes that are to be accomplished by studying the courses. The programmes also state the attributes that it offers to inculcate at the diploma level. The diploma attributes encompass values related to critical thinking and skills for employability. In short, each programme prepares students for sustainability and life-long learning. The PCI approved curriculum of D. Pharmacy offer in depth knowledge of ever changing field of pharmacy with focus on latest developments in drug design and discovery. After D Pharm, students get registered in state pharmacy council and as registered Pharmacist may work at drug stores in Government Hospitals, Private Hospitals, Clinics, Community Health Centers or Private Drug Stores. They may even start their own Drug store (Entrepreneurship) and online Pharmacy. Pharmacist can also work as Medical sales Representative and as Manufacturing and Quality Control Chemist in Pharmaceutical Industries. The K. R. Mangalam University hopes the curriculum of the programme D. Pharmacy will help students in making an informed decision at the time of working in any private or government services.

## **ACKNOWLEDGEMENT**

The development of Curriculum for Undergraduate diploma course in Pharmacy is a result of thoughtful deliberations at various stages of dedicated and specialized experts. This curriculum has been framed to meet the expectations of an academically challenging environment, develop problem-solving skills by students, align with current standards and to enrich the students to make them self-enablers and/or match job requirements on successful completion of their degrees.

I wish to acknowledge all our experts who have been involved in the process of developing this outcome-based curriculum for D. Pharmacy. We are thankful to Dr. Pankaj Gupta, with his team of Academic and Industry experts who were devotedly committed towards framing this curriculum.

I am greatly gratified Ms. Manvi Arora for her supervision contribution, guidance, and support throughout the development of this curriculum.

Special thanks and gratitude to Prof. Aditya Malik, Vice Chancellor, K.R. Mangalam University, who have been instrumental and encouraging throughout the process of developing this curriculum.

Last, but not the least, I also sincerely thank to Mr. Vinod Kumar and Dr. Nitin Kumar who have contributed for development of this curriculum.

**Dean  
School of Medical & Allied Sciences**

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## 1. INTRODUCTION

The K.R. Mangalam Group has made a name for itself in the field of education. The K.R. Mangalam story goes back to the chain of schools that offered an alternative option of world-class education, pitching itself against the established elite schools, which had enjoyed a position of monopoly till then. Having blazed a new trail in school education, the focus of the group was aimed at higher education.

K.R. Mangalam University is the fastest-growing higher education institute in Gurugram, India. K. R. Mangalam University was established under the Haryana Private University Act 2006, received the approval of Haryana Legislature vide Amendment Act # 36 of 2013 and consent of the Hon'ble Governor of Haryana on 11th April 2013, which was published in the Gazette notification vide Leg. No.10/2013, dated 3rd May 2013.

Since its inception in 2013, the University has been striving to fulfil its prime objective of transforming young lives through ground-breaking pedagogy, global collaborations, and world-class infrastructure. Resources at K.R. Mangalam University have been continuously upgraded to optimize opportunities for the students. Our students are groomed in a truly interdisciplinary environment where they grow up with integrative skills through interaction with students from engineering, social sciences, management and other study streams.

### **K. R. Mangalam University is unique because of its**

1. Enduring legacy of providing education to high achievers who demonstrate leadership in diverse fields.
2. Protective and nurturing environment for teaching, research, creativity, scholarship, social and economic justice.

### **Objectives**

1. Enhance leadership qualities among the youth having understanding of ethical values and environmental realities.
2. Foster employability and entrepreneurship through futuristic curriculum and progressive pedagogy with cutting-edge technology.
3. Instill notion of lifelong learning through stimulating research, outcomes-based education and innovative thinking.
4. Integrate global needs and expectations through collaborative programs with premier universities, research centers, industries and professional bodies.

## 2. About School

The School of Medical & Allied Sciences (SMAS) at K. R. Mangalam University started in the year 2013 after being duly approved by the Pharmacy Council of India (PCI). The SMAS comprises of modular laboratories equipped with state-of-the-art facilities and infrastructure. The School of Medical and Allied Sciences currently offers D. Pharm, B. Pharm, M. Pharm and PhD courses in Pharmacy. The Centre for Education Growth and

Research adjudged School of Medical & Allied Sciences, as Best Pharmacy College in India in March 2016 at India International Centre, New Delhi.

### **School Vision**

To contribute towards healthcare needs of the society by producing a skilled, motivated and accessible workforce dedicated towards achieving health for all.

### **School Mission**

M1: To produce self-motivated, self-reliant and socially sensitive young healthcare professionals catering to the needs of academia, industry and research.

M2: To create a centre of excellence for learning and research in the field of pharmaceutical and allied health sciences with inter-disciplinary approach in emerging area of science and technology with focus on industry-academia interaction.

M3: To nurture transformational research for the benefit of the society.

M4: To interlink pharmaceutical and allied health sciences with interdisciplinary life sciences.

## **3. Programs offered by School**

### **3.1. Diploma in Pharmacy**

The School of Medical & Allied Sciences (SMAS) at K. R. Mangalam University started in the year 2013 after being duly approved by the Pharmacy Council of India (PCI). The PCI approved D. Pharmacy program started in the year 2017 and aims to provide an extra edge to our students by teaching and training by leading pharma industry experts to facilitate industry academia interaction, participation in conferences / workshops / skill development programs and career guidance. The students are encouraged to participate in various health camps organized by the School to make general awareness amongst people regarding various diseases like diabetes, hypertension, communicable and non-communicable diseases and lay down the platform for students for getting jobs in various government and private institutions.

### **3.2. D. Pharmacy**

#### **Eligibility Criteria**

The student should have passed the 10+2 examination conducted by the Central Board of Secondary Education or equivalent examination from a recognized Board in Science stream with an aggregate of 50% or more.

**Course Outline:** Inorganic chemistry / Organic chemistry / Pharmaceutics / Analysis / Pharmaceutical Chemistry/Pharmacology/ Pharmacognosy

## Career Opportunities

Students will get themselves registered in the state pharmacy council and the registered Pharmacists may work at drug stores in Government Hospitals, Private Hospitals, Clinics, Community Health Centers or Private Drug Stores. They may even start their own Pharmacy shop (Entrepreneurship) and online Pharmacy. Pharmacist can also work as Medical sales Representative and as Manufacturing and Quality Control Chemist in Pharmaceutical Industries.

## 4. PROGRAM DURATION

The program duration of Diploma in Pharmacy is

Name of the Program	Duration
D. Pharmacy	2 Years

## 5. CLASS TIMINGS

The class will be held from Monday to Friday from 9.10 A.M. to 4.00 P.M.

## 6. SCHEME OF STUDIES AND SYLLABI

The syllabi of the Pharmacy program offered by School of Medical & Allied Sciences are approved by PCI.

### 6.1 Syllabus of Diploma Pharmacy

The PCI approved syllabi of the D. Pharmacy programs offered by School of Medical & Allied Sciences is as follows -

	Year I	Year II
Courses	11	10
Credits	0	0

### Scheme of Studies of D. Pharmacy –

#### D. Pharm- I Year

Subject Code	Course Title	L	P
ER20-11T	Pharmaceutics – Theory	4	
ER20-11P	Pharmaceutics – Practical		3
ER20-12T	Pharmaceutical Chemistry – Theory	4	



<b>ER20-12P</b>	Pharmaceutical Chemistry – Practical		3
<b>ER20-13T</b>	Pharmacognosy – Theory	4	
<b>ER20-13P</b>	Pharmacognosy – Practical		3
<b>ER20-14T</b>	Human Anatomy & Physiology – Theory	4	
<b>ER20-14P</b>	Human Anatomy & Physiology – Practical		3
<b>ER20-15T</b>	Social Pharmacy – Theory	4	
<b>ER20-15P</b>	Social Pharmacy – Practical		3
		<b>20</b>	<b>15</b>
<b>ER20-21T</b>	Pharmacology –Theory	4	
<b>ER20-21P</b>	Pharmacology –Practical		2
<b>ER20-22T</b>	Community Pharmacy & Management	4	
<b>ER20-22P</b>	Community Pharmacy & Management – Practical		3
<b>ER20-23T</b>	Biochemistry & Clinical Pathology – Theory	4	
<b>ER20-23P</b>	Biochemistry & Clinical Pathology – practical		2
<b>ER20-24T</b>	Pharmacotherapeutics	4	
<b>ER20-24P</b>	Pharmacotherapeutics– Practical		1
<b>ER20-25T</b>	Hospital & Clinical Pharmacy – Theory	4	
<b>ER20-25P</b>	Hospital & Clinical Pharmacy – Practical		1
<b>ER20-26T</b>	Pharmacy Law & Ethics	4	-
	<b>Total</b>	<b>24</b>	<b>9</b>

## Programme Outcomes (POs) and Programme Educational Objectives (PEOs)

The entire curriculum of D. Pharmacy is planned to have following programme outcomes

<b>PO 1 Pharmacy Knowledge:</b> Possess the core and basic knowledge associated with the profession of pharmacy.
<b>PO 2 Thinking Abilities:</b> Examine issues rationally and logically; shall acquire, evaluate, and synthesize information and knowledge relevant to an identified problem.
<b>PO3 Planning Abilities:</b> Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills.
<b>PO 4 Leadership Skills:</b> Acquire knowledge of leadership traits and skills through curricular and co-curricular activities and develop skills and abilities that will enable him/her to lead or actively contribute to organizational improvement.
<b>PO 5 Professional Identity:</b> Understand, analyze and communicate the value of their professional roles in society.
<b>PO 6 Pharmacy and Society:</b> Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
<b>PO 7 Environment and sustainability:</b> Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
<b>PO 8 Professional Ethics:</b> Honor personal values and apply ethical principles in professional and social contexts and take responsibility for the outcomes associated with the decisions.
<b>PO 9 Individual or teamwork:</b> Understand the need for leadership and team-building for fulfillment of practice, professional and societal responsibilities.
<b>PO 10 Communication:</b> Develop good communication skills so as to communicate effectively with the pharmacy community and with society at large.
<b>PO 11 Modern &amp; Usage:</b> Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
<b>PO 12 Life-long Learning:</b> Recognize 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 and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.
<b>Programme Specific Outcomes</b> <b>PSO1</b> To impart theoretical & Practical knowledge among students in the various fields of pharmaceutical sciences viz., Pharmaceutics, Pharmaceutical Chemistry,

Pharmacology and Pharmacognosy.

**PSO2** To promote the development of communication skills, leadership qualities among the students.

**PSO3** To effectively communicate with patients in the hospital pharmacy and guide them regarding medication specifications.

**PSO4** To upgrade practical skill of the students in the area of clinical pharmacy and community pharmacy.

**PSO5** To make aware the students with fundamental regulatory aspects of Pharmaceuticals.

### **Programme Educational Objectives (PEOs)**

**PEO1:** To produce pharmacy graduates with profound knowledge and high technical skills to meet various aspects in wide areas of Pharmaceutical industry.

**PEO2:** To enable pharmacy graduates to gain theoretical and practical knowledge in various subjects to discover novel formulation for the benefits of the society.

**PEO3:** To prepare entrepreneurs in Pharma sector with effective communication skills, teamwork and ethical attitude with high integrity for the betterment of the community and the society.

**PEO4:** To promote and train the pharmacy graduates towards contribution of health care system and patient counseling for prevention and treatment of diseases.

**PEO5:** To encourage the pharmacy graduates for lifelong learning and highly competent career prospect related to interdisciplinary pharmaceutical sciences.

### Structure of D. Pharmacy

SMAS	D. PHARMACY (Scheme of Studies)				
YEAR	Subject Code	Course Title		L	P
<b>FIRST</b>	<b>ER20-11T</b>	Pharmaceutics – Theory		4	
	<b>ER20-11P</b>	Pharmaceutics – Practical			3
	<b>ER20-12T</b>	Pharmaceutical Chemistry – Theory		4	
	<b>ER20-12P</b>	Pharmaceutical Chemistry – Practical			3
	<b>ER20-13T</b>	Pharmacognosy – Theory		4	
	<b>ER20-13P</b>	Pharmacognosy – Practical			3
	<b>ER20-14T</b>	Human Anatomy & Physiology – Theory		4	
	<b>ER20-14P</b>	Human Anatomy & Physiology – Practical			3
	<b>ER20-15T</b>	Social Pharmacy – Theory		4	
	<b>ER20-15P</b>	Social Pharmacy – Practical			3
	<b>Total</b>			<b>20</b>	<b>15</b>
<b>SECOND</b>	<b>ER20-21T</b>	Pharmacology –Theory		4	
	<b>ER20-21P</b>	Pharmacology –Practical			2
	<b>ER20-22T</b>	Community Pharmacy & Management		4	
	<b>ER20-22P</b>	Community Pharmacy & Management – Practical			3
	<b>ER20-23T</b>	Biochemistry & Clinical Pathology – Theory		4	
	<b>ER20-23P</b>	Biochemistry & Clinical Pathology – Practical			2
	<b>ER20-24T</b>	Pharmacotherapeutics		4	
	<b>ER20-24P</b>	Pharmacotherapeutics– Practical			1
	<b>ER20-25T</b>	Hospital & Clinical Pharmacy – Theory		4	
	<b>ER20-25P</b>	Hospital & Clinical Pharmacy – Practical			1
	<b>ER20-26T</b>	Pharmacy Law & Ethics		4	-
	<b>Total</b>	<b>Total</b>		<b>24</b>	<b>9</b>

	Year I	Year II
<b>Courses</b>	10	11
<b>Credits</b>	0	0

## Diploma I Year

### ER20-11T: PHARMACEUTICS-I Theory

<b>ER20-11T</b>	Pharmaceutics-I	<b>L</b>	<b>T</b>	<b>P</b>
<b>Version 2.0</b>		3	1	0
<b>Total Contact Hours</b>	75 hours			
<b>Pre-requisites/Exposure</b>				
<b>Co-requisites</b>	Pharmaceutics			

#### Course Objectives

Upon completion of this course the student should be able to:

1. Basic concepts, types and need.
2. Advantages and disadvantages, methods of preparation / formulation.
3. Packaging and labeling requirements.
4. Types of Tablets and Capsules
5. Basic quality control tests, concepts of quality assurance and good manufacturing practices.

#### Course Outcomes (CO)

On completion of this course, the students will be able to:

CO1 Describe about the different dosage forms and their formulation aspects.

CO2 Explain the advantages, disadvantages, and quality control tests of different dosage forms.

CO3 Discuss the importance of quality assurance and good manufacturing practices

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	2	1
CO 2	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	2	1
CO 3	3	3	1	-	3	3	3	3	2	2	2	3	3	2	1	2	1

1=lightly mapped

2= moderately mapped

3=strongly mapped

Unit	Relevance to the local, national, regional and global developmental needs				Relevance To the Employability/ Entrepreneurship/ Skill Development			Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability				SDG	NEP	POE/4 <sup>th</sup> IR
ER2011T	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability			
Unit I	-	-	-	The history of pharmacy in India dates back to ancient times, with modern developments in education, industry,	-	-	Pharmacy in India, rooted in ancient knowledge, saw modernization during British rule, leading to robust	-	-	Pharmacy in India has ancient roots, but modernization began during British rule, leading to robust education, a	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development

				and practice during British rule. Today, pharmacy offers diverse career opportunities. Pharmacopoeias like IP, BP, USP, NF set drug standards, with IP ensuring quality in India's thriving pharmaceutical industry, vital for global health needs.			education, a thriving industry, diverse practice areas, and active professional associations. It offers promising career prospects. Pharmacopoeias like IP, BP, USP, and NF set drug standards, with IP vital for India's skill development and global healthcare needs, ensuring quality medicines.			thriving industry, diverse practice areas, and active professional associations. Pharmacy offers promising careers. Pharmacopoeias like IP, BP, USP, and NF set drug standards, with IP addressing human values by ensuring safe and quality medicines for healthcare needs.				
Unit II				Packaging materials vary, including glass (recyclable,			Packaging materials, including glass (fragile, recyclable),			Packaging materials like glass (recyclable, inert), plastic		Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development

			<p>fragile), plastic (lightweight , environmental concerns), metal (durable, costly), and rubber (flexible, limited use). Selection depends on product characteristics. Sustainable choices align with global developmental needs, reducing waste and environmental impact, fostering eco-friendly packaging solutions.</p>			<p>plastic (lightweight , diverse), metal (durable, costly), and rubber (flexible, specialized), vary based on product needs. Skill development in packaging aligns with industry demands for sustainable materials, innovative design, and efficient manufacturing, crucial for the packaging sector's growth.</p>		<p>(lightweight, versatility), metal (durable, costly), and rubber (flexible, limited use) offer diverse options. Human values need eco-friendly, safe packaging aligning with sustainability, health, and ethics, addressing concerns about waste, pollution, and product safety.</p>				
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Unit - III			<p>Organoleptic agents enhance the sensory qualities of medicines (color, flavor, sweetness). Preservatives prevent microbial spoilage, including parabens and benzalkonium chloride. They ensure global health needs are met by extending product shelf life, reducing waste, and maintaining drug efficacy and safety.</p>		<p>Pharmaceutical aids like organoleptic agents (color, flavor, sweetness) enhance drug appeal. Preservatives, such as parabens and benzalkonium chloride, extend shelf life by inhibiting microbial growth. Skill development involves formulation expertise, ensuring safe and appealing medicines, aligning with industry demands for quality and innovation.</p>		<p>Pharmaceutical aids like organoleptic agents (color, flavor, sweetness) improve medicine's sensory appeal. Preservatives (e.g., parabens, benzalkonium chloride) ensure safety and longevity. Human values need medicines to be palatable and safe, enhancing patient adherence and trust, fostering healthcare ethics and values.</p>				
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Unit-IV			<p>Unit operations are fundamental in pharmaceutical manufacturing. Size reduction (e.g., hammer mill, ball mill) reduces particle size for drug formulation. Size separation (cyclone, sieves) ensures uniformity. Mixing (cone blender, turbine mixer, roller mill, homogenizer) homogenizes ingredients.</p>		<p>Unit operations in pharmaceuticals encompass size reduction (e.g., hammer mill, ball mill), size separation (cyclone, sieves), mixing (double cone blender, turbine mixer, triple roller mill, Silverson mixer homogenizer), filtration theory (membrane, sintered glass), drying (fluidized bed, freeze drying), and extraction.</p>		<p>Unit operations are vital in pharmaceuticals. Size reduction (hammer mill, ball mill) reduces particle size. Size separation (cyclone, sieves) ensures uniformity. Mixing (double cone blender, turbine mixer, triple roller mill, homogenizer) homogenizes ingredients. Filtration (membrane, sintered glass) separates solids. Drying</p>				
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			<p>Filtration (membrane, sintered glass) separates solids from liquids.</p> <p>Drying (fluidized bed, freeze drying) removes moisture.</p> <p>Extraction plays a vital role in obtaining active compounds from natural sources, contributing to drug development and global health needs.</p>			<p>Skill development in these operations is critical for pharmaceutical professionals, ensuring quality, safety, and efficacy in drug manufacturing and contributing to industry growth and innovation.</p>			<p>(fluidized bed, freeze drying) removes moisture. Extraction extracts active compounds, supporting health needs and ethical drug production.</p>				
Unit-V			<p>Pharmaceutical product diversity addresses global healthcare challenges.</p>			<p>The pharmaceutical industry requires a highly skilled workforce</p>			<p>Pharmaceutical products like tablets (coated, uncoated, modified), capsules</p>				

			<p>Skill development in dosage form preparation ensures accessibility, safety, and efficacy. Immunological products, sterile formulations, and diverse drug delivery systems contribute to global health, emphasizing equitable access and quality healthcare.</p>			<p>for the development, manufacturing, and quality control of various dosage forms like tablets, capsules, liquids, topical preparations, powders, sterile formulations, and immunological products. Skill development is crucial to ensure safe and effective drug production, meeting global healthcare standards, and</p>		<p>(hard, soft gelatin), liquid oral preparations, topical products, nasal and ear preparations, powders, sterile formulations, and immunological products cater to human health needs. Ensuring their quality, safety, and efficacy aligns with ethical values in healthcare, prioritizing patient well-being and trust.</p>				
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							fostering innovation in the pharmaceutical sector.							
Unit-VI				Pharmaceutical manufacturing plants have specific layouts and sections for production, quality control, and assurance. Quality control ensures product consistency, while quality assurance focuses on process integrity and regulatory compliance. Compliance with cGMP, calibration, and			Pharmaceutical manufacturing plants have distinct layouts with production, quality control, and assurance sections. Quality control maintains product quality, while quality assurance ensures process integrity, adhering to cGMP. Calibration and validation are crucial skills for			Pharmaceutical manufacturing plants are organized with production, quality control, and assurance sections. Quality control maintains product quality, while quality assurance ensures process integrity, following cGMP. Calibration and validation uphold human values by				

				validation ensures safe and effective medicines, meeting global healthcare standards, fostering patient trust, and advancing global health goals.			pharmaceutical professionals, ensuring safe and effective drug production, supporting industry growth, and fostering expertise in quality management.			guaranteeing safe, effective, and ethical drug production, emphasizing patient well-being and trust.				
Unit-VII				Novel drug delivery systems revolutionize healthcare globally by improving drug effectiveness. Examples include nanomedicine and implantable devices. Benefits include targeted therapy and			Novel drug delivery systems, such as liposomes and microspheres, enhance drug efficacy. Skill development in their design and implementation is vital, aligning with industry			Novel drug delivery systems improve drug effectiveness and patient compliance. They include oral, transdermal, and nanotechnology-based systems. Advantages include precise				

			reduced side effects, but challenges like cost and accessibility remain. Addressing these needs aligns with global healthcare goals for improved treatment outcomes.			demands for innovative drug delivery solutions, supporting pharmaceutical professionals in advancing patient care and treatment outcomes.			dosing and reduced side effects, while challenges involve complexity. Aligning with human values, these systems prioritize patient well-being, safety, and convenience in healthcare.				
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### ER20-11P: PHARMACEUTICS-I Practical

<b>ER20-11P</b>	Pharmaceutics-I - Practical	<b>L</b>	<b>T</b>	<b>P</b>
<b>Version 2.0</b>		<b>0</b>	<b>0</b>	<b>3</b>
<b>Total Contact Hours</b>	75 hr			
<b>Pre-requisites/Exposure</b>				
<b>Co-requisites</b>	Pharmaceutics			
<b>Course Objectives</b>				
Upon completion of this course the student should be able to:				
1. Calculation of working formula from the official master formula				
2. Formulation of dosage forms based on working formula				

3. Appropriate Packaging and labeling requirements

4. Methods of basic quality control tests

**Course Outcomes (CO)**

Upon successful completion of this course, the students will be able to

1. Calculate the working formula from the given master formula
2. Formulate the dosage form and dispense in an appropriate container
3. Design the label with the necessary product and patient information
4. Perform the basic quality control tests for the common dosage forms

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	2	1
CO2	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	2	1
CO3	3	3	1	-	3	3	3	3	2	2	2	3	3	2	1	2	1
CO4	3	3	1	-	3	3	3	3	2	2	2	3	3	2	1	2	1

1=lightly mapped

2= moderately mapped

3=strongly mapped

Unit	Relevance to the local, national, regional and global developmental needs				Relevance To the Employability/ Entrepreneurship/ Skill Development			Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability				SDG	NEP	POE/4 <sup>th</sup> IR
ER201 1P	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability			



Unit I				<p>The history of pharmacy in India dates back to ancient times, with modern developments in education, industry, and practice during British rule. Today, pharmacy offers diverse career opportunities. Pharmacopoeias like IP, BP, USP, NF set drug standards, with IP ensuring quality in India's thriving pharmaceutical industry, vital for</p>	-	<p>Pharmacy in India, rooted in ancient knowledge, saw modernization during British rule, leading to robust education, a thriving industry, diverse practice areas, and active professional associations. It offers promising career prospects. Pharmacopoeias like IP, BP, USP, and NF set drug standards, with IP vital for India's skill development and global</p>			<p>Pharmacy in India has ancient roots, but modernization began during British rule, leading to robust education, a thriving industry, diverse practice areas, and active professional associations. Pharmacy offers promising careers. Pharmacopoeias like IP, BP, USP, and NF set drug standards, with IP addressing human values by ensuring safe and quality</p>	<p>Skills for Decent Work (SDG 4.4)</p>	<p>Professional (Education (17.1-17.5)</p>	<p>Skill Development</p>
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				global health needs.			healthcare needs, ensuring quality medicines.			medicines for healthcare needs.				
Unit II				Packaging materials vary, including glass (recyclable, fragile), plastic (lightweight), environmental concerns), metal (durable, costly), and rubber (flexible, limited use). Selection			Packaging materials, including glass (fragile, recyclable), plastic (lightweight, diverse), metal (durable, costly), and rubber (flexible, specialized), vary based on product needs. Skill development in			Packaging materials like glass (recyclable, inert), plastic (lightweight, versatility), metal (durable, costly), and rubber (flexible, limited use) offer diverse options. Human values need eco-friendly, safe		Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development

				depends on product characteristics. Sustainable choices align with global developmental needs, reducing waste and environmental impact, fostering eco-friendly packaging solutions.			packaging aligns with industry demands for sustainable materials, innovative design, and efficient manufacturing, crucial for the packaging sector's growth.			packaging aligning with sustainability, health, and ethics, addressing concerns about waste, pollution, and product safety.				
Unit - III				Organoleptic agents enhance the sensory qualities of medicines (color, flavor, sweetness). Preservatives prevent microbial spoilage, including parabens and benzalkonium			Pharmaceutical aids like organoleptic agents (color, flavor, sweetness) enhance drug appeal. Preservatives, such as parabens and benzalkonium chloride, extend shelf life by			Pharmaceutical aids like organoleptic agents (color, flavor, sweetness) improve medicine's sensory appeal. Preservatives (e.g., parabens, benzalkonium chloride) ensure				

				<p>m chloride. They ensure global health needs are met by extending product shelf life, reducing waste, and maintaining drug efficacy and safety.</p>			<p>inhibiting microbial growth. Skill development involves formulation expertise, ensuring safe and appealing medicines, aligning with industry demands for quality and innovation.</p>			<p>safety and longevity. Human values need medicines to be palatable and safe, enhancing patient adherence and trust, fostering healthcare ethics and values.</p>				
Unit-IV				<p>Unit operations are fundamental in pharmaceutical manufacturing. Size reduction (e.g., hammer mill, ball mill) reduces particle size for drug</p>			<p>Unit operations in pharmaceuticals encompass size reduction (e.g., hammer mill, ball mill), size separation (cyclone, sieves), mixing (double</p>			<p>Unit operations are vital in pharmaceuticals. Size reduction (hammer mill, ball mill) reduces particle size. Size separation (cyclone, sieves) ensures uniformity. Mixing</p>				

			<p>formulation.  Size separation (cyclone, sieves) ensures uniformity.  Mixing (cone blender, turbine mixer, roller mill, homogenizer) homogenizes ingredients.  Filtration (membrane, sintered glass) separates solids from liquids.  Drying (fluidized bed, freeze drying) removes moisture.  Extraction plays a vital role in obtaining</p>			<p>cone blender, turbine mixer, triple roller mill, Silverson mixer homogenizer), filtration theory (membrane, sintered glass), drying (fluidized bed, freeze drying), and extraction.  Skill development in these operations is critical for pharmaceutical professionals, ensuring quality, safety, and efficacy in drug manufacturing and contributing to industry</p>			<p>(double cone blender, turbine mixer, triple roller mill, homogenizer) homogenizes ingredients.  Filtration (membrane, sintered glass) separates solids.  Drying (fluidized bed, freeze drying) removes moisture.  Extraction extracts active compounds, supporting health needs and ethical drug production.</p>				
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			active compounds from natural sources, contributing to drug development and global health needs.			growth and innovation.							
Unit-V			Pharmaceutical product diversity addresses global healthcare challenges. Skill development in dosage form preparation ensures accessibility, safety, and efficacy. Immunological products, sterile formulations, and diverse drug delivery			The pharmaceutical industry requires a highly skilled workforce for the development, manufacturing, and quality control of various dosage forms like tablets, capsules, liquids, topical preparations, powders, sterile			Pharmaceutical products like tablets (coated, uncoated, modified), capsules (hard, soft gelatin), liquid oral preparations, topical products, nasal and ear preparations, powders, sterile formulations, and immunological products cater to human				

				systems contribute to global health, emphasizing equitable access and quality healthcare.			formulation s, and immunological products. Skill development is crucial to ensure safe and effective drug production, meeting global healthcare standards, and fostering innovation in the pharmaceutical sector.			health needs. Ensuring their quality, safety, and efficacy aligns with ethical values in healthcare, prioritizing patient well-being and trust.				
Unit-VI				Pharmaceutical manufacturing plants have specific layouts and sections for production, quality control, and assurance.			Pharmaceutical manufacturing plants have distinct layouts with production, quality control, and assurance sections.			Pharmaceutical manufacturing plants are organized with production, quality control, and assurance sections.				

			<p>Quality control ensures product consistency, while quality assurance focuses on process integrity and regulatory compliance. Compliance with cGMP, calibration, and validation ensures safe and effective medicines, meeting global healthcare standards, fostering patient trust, and advancing global health goals.</p>			<p>Quality control maintains product quality, while quality assurance ensures process integrity, adhering to cGMP. Calibration and validation are crucial skills for pharmaceuticals, ensuring safe and effective drug production, supporting industry growth, and fostering expertise in quality management.</p>			<p>Quality control maintains product quality, while quality assurance ensures process integrity, following cGMP. Calibration and validation uphold human values by guaranteeing safe, effective, and ethical drug production, emphasizing patient well-being and trust.</p>				
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Unit-VII				<p>Novel drug delivery systems revolutionize healthcare globally by improving drug effectiveness. Examples include nanomedicine and implantable devices. Benefits include targeted therapy and reduced side effects, but challenges like cost and accessibility remain. Addressing these needs aligns with global healthcare goals for improved treatment outcomes.</p>			<p>Novel drug delivery systems, such as liposomes and microspheres, enhance drug efficacy. Skill development in their design and implementation is vital, aligning with industry demands for innovative drug delivery solutions, supporting pharmaceutical professionals in advancing patient care and treatment outcomes.</p>			<p>Novel drug delivery systems improve drug effectiveness and patient compliance. They include oral, transdermal, and nanotechnology-based systems. Advantages include precise dosing and reduced side effects, while challenges involve complexity. Aligning with human values, these systems prioritize patient well-being, safety, and</p>						
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										convenience in healthcare.				
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### ER20-12P: Pharmaceutical Chemistry I – Practical

<b>Subject Code - ER20-12P</b>	<b>Subject Name - Pharmaceutical Chemistry I – Practical</b>	<b>L</b>	<b>T</b>	<b>P</b>
<b>Version 2.0</b>		<b>0</b>	<b>0</b>	<b>3</b>
<b>Total Contact Hours</b>	3 hrs.			
<b>Pre-requisites/Exposure</b>	<b>Inorganic and Medicinal chemistry</b>			
<b>Co-requisites</b>	<b>Analytical chemistry</b>			
<b>Course Objectives</b>				
Upon completion of this course the student should be able to:				
<ol style="list-style-type: none"> <li>1. To know the methods for identification of impurities in inorganic drugs and pharmaceuticals.</li> <li>2. Volumetric analysis of the chemical substances</li> <li>3. Basics of preparatory chemistry and their analysis</li> <li>4. Systematic qualitative analysis for the identification of the chemical drugs</li> </ol>				
<b>Course Outcomes (CO)</b>				
On completion of this course, the students will be able to:				
<b>CO1:</b> Perform the limit tests for various inorganic elements and report				
<b>CO2:</b> Prepare standard solutions using the principles of volumetric analysis				

**C03:** Test the purity of the selected inorganic and organic compounds against the monograph standards

**C04:** Synthesize the selected chemical substances as per the standard synthetic scheme

**C05:** Perform qualitative tests to systematically identify the unknown chemical substances

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	2	--	2	3	--	3	2	--	3	2	3	1	2	1	1
CO2	3	3	2	--	2	1	--	--	2	--	3	2	3	1	2	1	1
CO3	3	3	1	--	1	2	--	2	2	--	2	3	3	1	2	1	1
CO4	2	3	2	--	1	2	2	3	3	1	2	2	3	1	2	1	1
CO5	2	3	2	--	--	3	2	2	1	--	3	2	3	1	2	1	1

1=lightly mapped

2= moderately mapped

3=strongly mapped

Unit	Relevance to the local, national, regional and global developmental needs	Relevance To the Employability/ Entrepreneurship/ Skill Development	Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability	SDG	NEP	POE/4 <sup>th</sup> IR
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	<b>Local</b>	<b>Regional</b>	<b>National</b>	<b>Global</b>	<b>Employability</b>	<b>Entrepreneurship</b>	<b>Skill Development</b>	<b>Professional Ethics</b>	<b>Gender</b>	<b>Human Values</b>	<b>Environment &amp; Sustainability</b>	<b>SDG</b>	<b>NEP</b>	<b>POE/4<sup>th</sup> IR</b>
Unit I	-	-	-	Disciplinary knowledge/ Problem solving/Analytical reasoning		-	Practical skills for performing limit tests	-	-	Right Conduct, Truth – Contains values like accuracy, fairness, honesty, justice, quest for knowledge, determination.	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development
Unit II	-	-	-	Disciplinary knowledge/ Critical thinking/Problem solving/ Analytical reasoning	-	-	The analysis of various drugs in single and combination dosage form, Theoretical and practical skills	-	-	Right Conduct and Truth	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development

Unit III	-	-	-	Research-related skills/ Disciplinary knowledge	-	-	Practical skills	-	-	Right Conduct and Truth	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development
Unit IV	-	-	-	Disciplinary knowledge/ Critical thinking/Problem solving/ Research-related skills/Analytical reasoning	-	-	The analysis of various chemical compounds form using different techniques. Theoretical and practical skills for instrument handling	-	-	Right Conduct, accuracy, fairness, honesty, justice	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Employability
Unit v	-	-	-	Disciplinary knowledge/ Research-related skills/Analytical reasoning		-	Theoretical and practical skills of the instruments	-	-	Right Conduct and Truth	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development,
Unit vi	-	-	-	Disciplinary knowledge/ Research-related skills/Analytical reasoning			Theoretical and practical skills for synthesis of different compounds			Right Conduct, accuracy, fairness, honesty, justice	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development, Employability
Unit vii	-	-	-	Disciplinary knowledge/ Critical thinking/Problem solving/ Research-related skills/Analytical			Develop skills for identification and test for purity of pharmaceuticals in pharmaceutical			Right Conduct, accuracy, fairness, honesty,	-	Skills for Decent Work (SDG	Professional Education (17.1-17.5)	Employability

				reasoning			industries			justice		4.4)		
Unit viii	-	-	-	Disciplinary knowledge/ Critical thinking/Problem solving/ Research-related skills/Analytical reasoning			Qualitative analysis of Drugs			Right Conduct, accuracy, fairness, honesty, justice	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Employability

### ER20-13T: Pharmacognosy Theory

<b>ER20-13T</b>	Pharmacognosy- Theory	<b>L</b>	<b>T</b>	<b>P</b>
<b>Version 2.0</b>		3	1	0
<b>Total Contact Hours</b>	75 hours			
<b>Pre-requisites/Exposure</b>	Herbal Drug Technology			
<b>Co-requisites</b>	Pharmacognosy			

#### Course Objectives

Upon completion of this course the student should be able to:

1. Knowledge of occurrence, distribution, isolation & identification tests of common Phytoconstituents
2. Knowledge of therapeutic potential and pharmaceutical applications of crude drugs
3. To understand the monographs of crude drugs
4. To understand the basic concepts in quality control of crude drugs

#### Course Outcomes (CO)

On completion of this course, the students will be able to:

- CO1. Identification of pharmaceutically important crude drugs  
 CO2. Knowledge of nutraceutical and cosmeceuticals  
 CO3. Understanding the principles of alternative system of medicines  
 CO4. Understanding the importance of quality control of drugs

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	2	-
CO2	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	2	-
CO3	3	3	1	-	3	3	3	3	2	2	2	3	3	2	1	2	-
CO4	3	2	-	2	1	1	3	2	3	2	1	1	2	-	-	-	-

1=lightly mapped

2= moderately mapped

3=strongly mapped

Unit	Relevance to the local, national, regional and global developmental needs		Relevance To the Employability/ Entrepreneurship/ Skill Development			Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability						SDG	NEP	POE/4 <sup>th</sup> IR		
	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability					
ER 2013 P																
Unit I		Study of Crude Drugs development their use as medicinally. Its help to enhance their knowledge											Sustainable Development and Global Citizenship (SDG 4.7)	Towards a More Holistic and Multidisciplinary Education (11.1-11.13)	Global Education Knowledge	



Unit II			They address critical aspects of Raw materials of herbal drugs ,validation and their purpose according to WHO.								"1.3 Implement nationally appropriate social protection systems and measures for all, including floors"	Towards a More Holistic and Multidisciplinary Education (11.1-11.13)	
Unit III											End all forms of malnutrition (SDG 2.2)		Global Education Knowledge
Unit IV			globally relevant because they provide the knowledge and tools necessary to evaluation of medicinal hebal drugs. Senerio of herbal drugs standardization is nessary to significant role of herbs.as global level.								Ensure healthy lives and promote well-being for all at all ages (SDG 3)		
Unit v			health systems and ongoing national								"1.3 Implement nationally appropriate social		

			health programs in India is of national relevance as it directly affects the well-being of the population, healthcare access, and the nation's overall development. It also highlights the important role of herbs and crude drugs used as nutraceuticals.								protection systems and measures for all, including floors"		
Unit-VI				It informs healthcare decision-making, resource allocation, and policy development, ultimately impacting the									

				accessibility, affordability, and quality of healthcare services worldwide.										
Unit VII					By the study of the course as employ bility related to health sector will be enhanced									Global Education Knowledge

### ER20-13P: Pharmacognosy Practical

<b>ER20-13P</b>		Pharmacognosy– Practical										<b>L</b>	<b>T</b>	<b>P</b>			
<b>Version 2.0</b>												0	0	3			
<b>Total Contact Hours</b>		75 hours															
<b>Pre-requisites/Exposure</b>		Herbal Drug Technology															
<b>Co-requisites</b>		Pharmacognosy															
<b>Course Objectives</b>																	
<p>Upon completion of this course the student should be able to:</p> <ol style="list-style-type: none"> <li>1. Practical knowledge of microscopical and macroscopical evaluation crude drugs</li> <li>2. Practical knowledge of extraction of crude drugs</li> </ol>																	
<b>Course Outcomes (CO)</b>																	
<p>On completion of this course, the students will be able to:</p> <p>CO1. Identification of pharmaceutically important crude drugs</p> <p>CO2. Understanding the various processes involved in extraction of crude drugs</p> <p>CO3. Evaluation and quality control of crude drugs</p>																	
<b>CO</b>	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PO 7</b>	<b>PO 8</b>	<b>PO 9</b>	<b>PO 10</b>	<b>PO 11</b>	<b>PO 12</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>
<b>CO 1</b>	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	2	-
<b>CO 2</b>	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	2	-
<b>CO 3</b>	3	3	1	-	3	3	3	3	2	2	2	3	3	2	1	2	-
1=lightly mapped                      2= moderately mapped                      3=strongly mapped																	

Unit	Relevance to the local, national, regional and global developmental needs			Relevance To the Employability/ Entrepreneurship/ Skill Development			Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability					SDG	NEP	POE/4 <sup>th</sup> IR	
	ER 2013 P	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values			Environment & Sustainability	
Unit I		Study of Crude Drugs development their use as medicinal. Its help to enhance their knowledge											Sustainable Development and Global Citizenship (SDG 4.7)	Towards More Holistic and Multidisciplinary Education (11.1-11.13)	Global Education Knowledge
Unit II			They address critical aspects of Raw materials of herbal drugs ,validation and their purpose according to WHO.										"1.3 Implement nationally appropriate social protection systems and measures for all, including floors"	Towards More Holistic and Multidisciplinary Education (11.1-11.13)	Global Education Knowledge
Unit III													End all forms of malnutrition (SDG 2.2)		Global Education Knowledge

Unit IV			globally relevant because they provide the knowledge and tools necessary to evaluation of medicinal herbal drugs. Senerio of herbal drugs standar dization is nessary to signfica nt role of herbs.as global level.								Ensure healthy lives and promote well-being for all at all ages (SDG 3)		
Unit v		health systems and ongoing national health programs in India is of national relevance as it directly affects the well-being of the population, healthcare access, and the nation's									"1.3 Implement nationally appropriate social protection systems and measures for all, including floors"		

			overall development. It also highlights the important role of herbs and crude drugs used as nutraceuticals.											
Unit-VI				It informs healthcare decision-making, resource allocation, and policy development, ultimately impacting the accessibility, affordability, and quality of healthcare services worldwide.										
Unit VII					By the study of the course as employability related to health sector will be enhanced									Global Education Knowledge

### ER20-14T: Human Anatomy & Physiology Theory

<b>ER2014 T</b>	Human Anatomy and Physiology-Theory	<b>L</b>	<b>T</b>	<b>P</b>
<b>Version 2.0</b>		3	1	0
<b>Total Contact Hours</b>	75 Hr			
<b>Pre-requisites/Exposure</b>	Basic knowledge of Biology			
<b>Co-requisites</b>	Knowledge of biology			
<b>Course Objectives</b>				
Upon completion of this course the student should be able to				
<ol style="list-style-type: none"> <li>1. Pedagogical learning of Structure and functions of the various organ systems and organs of the human body</li> <li>2. Understanding Homeostatic mechanisms and their imbalances in the human body</li> <li>3. Explaining various vital physiological parameters of the human body and their significances</li> <li>4. Explain the gross morphology, structure and functions of various organs of the human body.</li> <li>5. Describe the various homeostatic mechanisms and their imbalances.</li> <li>6. Identify the various tissues and organs of different systems of human body.</li> <li>7. Perform the various experiments related to special senses and nervous system.</li> </ol>				
<b>Course Outcomes</b>				
On completion of this course, the students will be able to:				
<b>CO1:</b> This subject is designed to impart fundamental knowledge on the structure and functions of the various systems of the human body.				
<b>CO2:</b> It also helps in understanding both homeostatic mechanisms.				
<b>CO3:</b> The subject provides the basic knowledge required to understand the various disciplines of pharmacy.				
<b>CO4:</b> It enlightens the students about the cells, various types of tissues in human body, skeleton system, skeletal and smooth muscles.				
<b>CO5:</b> It also deals with the composition of blood, blood groups, blood coagulation, various disease causing agents and preventive measures, balanced diet, disorders and treatment involve in				



nutritional deficiency.

Course Code	Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PSO2	PSO3	PSO4	PSO5
ER2014T	CO1	3	2	1	-	3	3	3	3	2	2	2	3	3	2	2	-	-
	CO2	3	2	1	-	3	3	3	3	2	2	2	3	3	2	2	-	-
	CO3	3	2	1	-	3	3	2	3	2	2	2	3	3	2	2	-	-
	CO4	3	2	1	-	2	3	3	3	2	2	2	3	3	2	2	-	-
	CO5	3	2	1	-	3	3	3	3	2	2	2	3	3	2	3	-	-

*1=weakly mapped, 2= moderately mapped, 3=strongly mapped*

Unit	Relevance to the local, national, regional and global developmental needs				Relevance To the Employability/ Entrepreneurship/ Skill Development			Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability				SDG	NEP	POE/4 <sup>th</sup> IR	
	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability				
ER2014T															
Unit I	-	-	-	anatomy and physiology contribute to addressing public health challenges and promoting global health equity. Understanding the human body's structure and functions is essential for	-	-	Education initiatives at the student level often emphasize these subjects to produce healthcare professionals skill.	-	-	-	-	4.1(education and promote lifelong learning opportunities for all)	-		Projects/Assignments

				addressing global health threats such as infectious diseases, non-communicable diseases, and emerging pandemics										
Unit II				Knowledge of cellular processes is crucial for developing personalized treatment plans and implementing targeted therapies tailored to			understanding of cellular mechanisms to diagnose and treat diseases effectively within their communities.					4.1(education and promote lifelong learning opportunities for all)		Projects/Assignments

				individual patients' needs.									
Unit III				The dissemination of knowledge about tissues on a global scale helps in building a common understanding among healthcare professionals and understands the development of therapies, surgeries, and medical technologies that can benefit diverse population			understanding and role of tissues in the human body are relevant across various developmental levels					4.1(education and promote lifelong learning opportunities for all)	Projects/Assignments

				s worldwide										
Unit IV				Understanding bone tissue's structure, function, and health determinants is essential for promoting musculoskeletal wellness, preventing bone-related disorders			Knowledge of bone disorders and precautions and treatment of bone injuries					4.1(education and promote lifelong learning opportunities for all)		Projects/Assignments
Unit v				aimed at improving blood collection and safety, and enhancing the quality of care for			Enhance the skills for the collection of blood and safety measurements.					4.1(education and promote lifelong learning opportunities for all)		Projects/Assignments

				patients with blood disorders and hematologic conditions.									
Unit-VI				Access to diagnostics, treatment options, and supportive care services for lymphatic conditions is essential for reducing disparities in healthcare access, improving patient outcomes, and enhancing health equity across			learning the basic anatomy of the lymphatic system, including its components such as lymph nodes, lymphatic vessels, lymphatic organs (spleen, thymus, tonsils), and lymphatic tissues.					4.1(education and promote lifelong learning opportunities for all)	Projects/Assignments

				diverse populations									
Unit-VII			understanding of cardiac anatomy and physiology to improve cardiovascular health outcomes across the population.	Knowledge of the cardiac cycle helps healthcare professionals interpret symptoms, perform diagnostic tests, and develop treatment plans tailored to individual patients' needs			Developing skills for a comprehensive understanding of cardiac anatomy and physiology is essential for healthcare professionals, researchers, and students interested in cardiovascular health and medicine.					4.1(education and promote lifelong learning opportunities for all)	Projects/Assignments
Unit-VIII				Understanding the			professionals					4.1(education and	Projects/Assignments

				<p>anatomy and physiology of respiratory organs is essential for addressing global health challenges related to respiratory diseases, including infectious diseases like tuberculosis and influenza, as well as chronic conditions like asthma and chronic obstructive pulmonary disease (COPD).</p>			<p>knowledgeable about respiratory anatomy and physiology to provide effective care for patients with respiratory illnesses.</p>					<p>promote lifelong learning opportunities for all)</p>		
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Unit-IX																			4.1(education and promote lifelong learning opportunities for all)					Projects/Assignments
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				countries.										
Unit-X			The skeletal system provides structural support, protects vital organs, and facilitates movement.	focus on preventing skeletal injuries, such as fractures and osteoporosis, through education, lifestyle interventions, and access to adequate healthcare services.			Utilize anatomical models, diagrams, and charts to visualize the skeletal system in three dimensions.					4.1(education and promote lifelong learning opportunities for all)		Projects/Assignments
Unit-XI				Understanding the nervous system is fundamental for diagnosing and treating neurological disorders and mental health			Learn to interpret neuroimaging studies and recognize anatomical structures, functional connectivity					4.1(education and promote lifelong learning opportunities for all)		Projects/Assignments

				conditions, which affect millions of people worldwide. and Facilitate the exchange of knowledge, resources, and expertise, leading to breakthroughs in treatments and interventions for neurological conditions.			patterns, and abnormalities in the nervous system.							
Unit-XII	-	-	Understanding the anatomy and physiology of sense organs is	-	-	Sense organs play a crucial role in detecting environm	-	-	-	-	4.1(education and promote lifelong learning opportunities for	-	Projects/Assignments	

			fundamental for diagnosing and treating sensory impairments and disorders such as vision loss, hearing loss, and balance disorders.			ental stimuli and potential health hazards. Knowledge of sensory function informs public health strategies for preventing injuries and environmental exposures that can affect sensory organs.					all)		
Unit-XIII				Understanding the anatomy and physiology of the urinary		Understanding the physiological functions of the urinary					4.1(education and promote lifelong learning opportunities for		Projects/Assignments

			<p>system is essential for diagnosing and treating urinary tract infections, kidney diseases, and urinary incontinence, which affect millions of people worldwide .and Focus on improving access to kidney care services, including screenings , diagnostic</p>			<p>system, including urine formation, filtration, reabsorption, secretion, and excretion of metabolic waste products.</p>					all)		
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				s, dialysis, and transplantation, particularly in underserved communities where renal diseases are prevalent.										
Unit-XIV				Endocrine disruptors, environmental toxins, and lifestyle factors can impact endocrine gland function and hormone regulation. Knowledge of			Develop skills in reading and critically evaluating scientific literature on hormone physiology, endocrine disorders, and hormone-					4.1(education and promote lifelong learning opportunities for all)		Projects/Assignments

				endocrine physiology informs strategies for preventing endocrine-related diseases, promoting hormonal balance, and reducing the risk factors associated with endocrine disorders.			related research studies.							
Unit-XV	-	-		Education and information about reproductive system and menstruation cycle, pregnancy and parturition			Study the physiological changes that occur during puberty in both males and females, including the		Knowledge about gender (Differentiate between reproductive organs of male and female)			-	-	Projects/Assignments

							development of secondary sexual characteristics, hormonal fluctuations, and reproductive maturity.							
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## ER20-14P: Human Anatomy & Physiology Practical

<b>ER2014 P</b>		Human Anatomy and Physiology-Practical										<b>L</b>	<b>T</b>	<b>P</b>		
<b>Version 2.0</b>												0	0	3		
<b>Total Contact Hours</b>		75 Hr														
<b>Pre-requisites/Exposure</b>		Pharmacology														
<b>Co-requisites</b>		Human Anatomy														
<b>Course Objectives</b>																
<p>1. General blood collection techniques and carrying out various haematological assessments and interpreting the results</p> <p>2. Recording and monitoring the vital physiological parameters in human subjects and the basic interpretations of the results</p> <p>3. Microscopic examinations of the various tissues permanently mounted in glass slides</p> <p>4. Discuss the anatomical and physiological characteristics of various organ systems of the body using models, charts, and other teaching aids.</p>																
<b>Course Outcomes (CO)</b>																
<p>On completion of this course, the students will be able to:</p> <p>CO1. Perform the haematological tests in human subjects and interpret the results</p> <p>CO2. Record, monitor and document the vital physiological parameters of human subjects and interpret the results</p> <p>CO3. Describe the anatomical features of the important human tissues under the microscopically conditions</p> <p>CO4. Discuss the significance of various anatomical and physiological characteristics of the human body</p>																
<b>Course Code</b>	<b>Course Outcome</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>ER20-14P</b>	CO1	2	3	2	-	2	3	--	3	2	--	3	2	2	-	-
	CO2	3	3	2	-	2	1	--	--	2	--	3	2	2	-	-
	CO3	3	3	1	-	1	2	--	2	2	--	2	3	2	-	-
	CO4	2	3	2	-	1	2	2	3	3	1	2	2	1	-	-
<i>1=weakly mapped, 2= moderately mapped, 3=strongly mapped</i>																

Unit	Relevance to the local, national, regional and global developmental needs				Relevance To the Employability/ Entrepreneurship/ Skill Development			Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability				SDG	NEP	POE/4 <sup>th</sup> IR	
	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability				
ER2014P															
Unit I	-	-	-	use microscopy techniques to analyze raw materials, inspect product integrity, assess product purity, and investigate material properties at the microscopic level.	-	-	microscopy techniques into curricula to enhance students' understanding of biological concepts, cell biology, histology, and microbiology.	-	-	-	-	4.1(education and promote lifelong learning opportunities for all)	Institutional Restructuring and Consolidation (10.1-10.14) 4.1	Skills development	
Unit II	-	-	-	The techniques for the collection of blood	-	-	Blood collection centers operate in countries worldwide,	-	-	-	-	4.1(education and promote lifelong learning opportunities for all)	Institutional Restructuring and Consolidation (10.1-	Skills development	

				are crucial components of healthcare systems worldwide, ensuring the safe acquisition of blood samples for diagnostic, therapeutic, and research purposes.			facilitating voluntary blood donations from eligible donors to meet transfusion needs, emergency response efforts, and healthcare demands.					ities for all)	10.14)	
Unit III	-	-	-	Microscopic examination of tissue is a fundamental aspect of medical diagnosis, research, and education worldwide, providing valuable insights	-	-	Microscopic examination of tissue specimens, obtained through biopsies, surgical resections, or autopsies, is essential for diagnosing a wide	-	-	-	-	4.1(education and promote lifelong learning opportunities for all)	Institutional Restructuring and Consolidation (10.1-10.14)	Skills development

				into cellular structures, disease processes, and treatment strategies			range of diseases, including cancer, infectious diseases, autoimmune disorders, and genetic conditions.							
Unit IV				Worldwide, the study of the human skeleton is an integral component of medical education. It forms the basis for understanding anatomy, pathology, and radiology.			the study of the human skeleton, encompassing the axial and appendicular skeleton, transcends geographical boundaries and cultural contexts, offering profound insights into human biology,					4.1(education and promote lifelong learning opportunities for all)	Institutional Restructuring and Consolidation (10.1-10.14)	Skills development

				Healthcare professionals, including doctors, surgeons, radiologists, and physical therapists, globally use skeletal knowledge to diagnose and treat various conditions, plan surgeries, and interpret medical imaging.			evolution, health, and cultural heritage on a global scale.							
Unit v	-	-	-	The determination of	-	-	Blood group data are utilized	-	-	-	-	4.1(education and promote	Institutional Restructuring and	Skills development

				blood groups holds significant global importance across various sectors, including healthcare, transfusion medicine, forensic science, and anthropology.			in epidemiological studies, disease surveillance programs, and public health interventions to monitor infectious diseases, assess disease risk factors, and guide healthcare policy decisions.					lifelong learning opportunities for all)	Consolidation (10.1-10.14)	
Unit-VI	-	-	-	Healthcare professionals around the world utilize ESR testing as a screening tool for a variety of diseases, including			Monitoring changes in ESR levels helps clinicians assess the response to treatment and disease progression					4.1(education and promote lifelong learning opportunities for all)	Institutional Restructuring and Consolidation (10.1-10.14)	Skills development

				infections, autoimmune disorders, inflammatory diseases, and certain cancers.			n in conditions such as rheumatoid arthritis, systemic lupus erythematosus, and giant cell arteritis.							
Unit-VII	-	-	-	the determination of hemoglobin content in blood is a cornerstone of clinical medicine, public health, and biomedical research efforts worldwide.	-	-	Determine Haemoglobin content of blood	-	-	-	-	4.1(education and promote lifelong learning opportunities for all)	Institutional Restructuring and Consolidation (10.1-10.14)	Skills development
Unit-VIII	-	-	Bleeding time assessment is essential for diagnosing and	-	-	Bleeding time assessment	-	-	-	-	-	4.1(education and promote lifelong learning	Institutional Restructuring and Consolidation	Skills development

			monitoring patients with hematologic disorders, such as von Willebrand disease, hemophilia, thrombocytopenia, and platelet function disorders.								opportunities for all)	(10.1-10.14)	
Unit-IX	-	-	-	The determination of clotting time holds significant global prospects across various medical specialties and healthcare settings, contributing to the diagnosis, monitoring,			monitoring, and management of bleeding disorders, coagulopathies, and thrombotic conditions.				4.1(education and promote lifelong learning opportunities for all)	Institutional Restructuring and Consolidation (10.1-10.14)	Skills development



				and management of bleeding disorders, coagulopathies, and thrombotic conditions.										
Unit-X	-	-		Healthcare providers worldwide use WBC count measurements to diagnose and monitor infectious diseases, including bacterial, viral, fungal, and parasitic infections, and to assess the severity and progression			Determination of WBC count of blood and various diseases					4.1(education and promote lifelong learning opportunities for all)	Institutional Restructuring and Consolidation (10.1-10.14)	Skills development

				n of inflammatory conditions.										
Unit-XI	-	-	-	Healthcare providers worldwide use RBC count measurements to assess the severity, etiology, and response to treatment in patients with iron deficiency anemia, vitamin deficiencies, hemolytic anemias, and chronic diseases.	-	-	Determination of RBC count of blood and various diseases	-	-	-	-	4.1(education and promote lifelong learning opportunities for all)	Institutional Restructuring and Consolidation (10.1-10.14)	Skills development
Unit-XII	-	-	Determination of Differential count of blood	Determination of Differential count of	-	-	various systems of the human body	-	-	-	-	4.1(education and promote	Institutional Restructuring and	Skills development

				blood									lifelong learning opportunities for all)	Consolidation (10.1-10.14)	
Unit-XIII				Recording of Blood Pressure in various postures, different arms, before and after exertion and interpreting the results			to optimize blood pressure control and prevent associated complications such as heart disease, stroke, and kidney damage.						4.1(education and promote lifelong learning opportunities for all)	Institutional Restructuring and Consolidation (10.1-10.14)	Skills development
Unit-XIV				Explore the structure and function of human body systems to elucidate disease mechanisms, develop new therapies, and			knowledge of anatomy and physiology to design personalized treatment plans for patients recovering from injuries, surgeries,						4.1(education and promote lifelong learning opportunities for all)	Institutional Restructuring and Consolidation (10.1-10.14)	Skills development

				improve diagnostic tools for diverse medical conditions.			or chronic health conditions.							
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**ER20-15T: Social Pharmacy Theory**

<b>Subject Code: ER20-15T</b>	<b>Social Pharmacy</b>	<b>L 3</b>	<b>T 1</b>	<b>P 0</b>
<b>Version 2.0</b>				
<b>Total Contact Hours</b>	75 hrs.			
<b>Pre-requisites/Exposure</b>	Social Sciences			
<b>Co-requisites</b>	Pharmaceutics			

**Course Objectives**

Upon completion of this course the student should be able to:

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 (CO)**

On completion of this course, the students will be able to:

CO1. Discuss about roles of pharmacists in the various national health programs

CO2. Describe various sources of health hazards and disease preventive measures

CO3. Discuss the healthcare issues associated with food and nutritional substances

CO4. Describe the general roles and responsibilities of pharmacists in public health

CO 5. Provide first aid for various emergency conditions

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	-	3	3	3	3	2	2	2	3	3	2	2	-	-
CO2	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	-	-
CO3	3	3	1	-	3	3	3	3	2	2	2	3	3	2	1	-	-
CO4	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	-	-
CO5	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	-	-

1=lightly mapped

2= moderately mapped

3=strongly mapped

Unit	Relevance to the local, national, regional and global developmental needs				Relevance To the Employability/ Entrepreneurship/ Skill Development			Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability				SDG	NEP	POE/ 4 <sup>th</sup> IR
ER20-15T	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability			
Unit I				It encompasses fundamental principles and practices in public health, healthcare systems, and health policy. The knowledge								Sustainable Development and Global Citizenship (SDG 4.7)	Towards a More Holistic and Multidisciplinary Education (11.1- 11.13)	Global Education Knowledge

			<p>e and insights gained from these areas can be applied across borders to enhance the well-being of people and communities worldwide.</p>										
Unit II			<p>They address critical aspects of public health, reproductive health, disease prevention, environmental sustainability, and the social well-being of the population. A healthy and informed</p>									<p>"1.3 Implement nationally appropriate social protection systems and measures for all, including floors"</p>	<p>Towards a More Holistic and Multidisciplinary Education (11.1- 11.13)</p>

			<p>population is a cornerstone of any nation's development, and pharmacists' roles in these areas are essential for achieving these goals.</p>											
Unit III			<p>these nutrition-related topics are highly relevant to global needs as they address fundamental aspects of health, well-being, and food security that impact populations worldwide.</p> <p>. Proper</p>									End all forms of malnutrition (SDG 2.2)		Global Education Knowledge



				<p>nutrition is a cornerstone of public health, and understanding these principles can contribute to better health outcomes on a global scale.</p>									
Unit IV				<p>globally relevant because they provide the knowledge and tools necessary to prevent, control, and respond to communicable diseases that can affect</p>							<p>Ensure healthy lives and promote well-being for all at all ages (SDG 3)</p>		

			populations across borders. They are essential for promoting global health equity, reducing the spread of infectious diseases, and safeguarding public health on a global scale.										
Unit v			health systems and ongoing national health programs in India is of national relevance as it directly affects the well-being of the population,									"1.3 Implement nationally appropriate social protection systems and measures for all, including floors"	

			healthcare access, and the nation's overall development. It also highlights the important role that pharmacists play in supporting and contributing to these programs.										
Unit -VI				It informs healthcare decision-making, resource allocation, and policy development, ultimately impacting the accessibility, affordability, and quality of healthcare services									

				worldwide													
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## Diploma II Year

### ER2021T: Pharmacology- Theory

<b>ER2021 T</b>	<b>Pharmacology – Theory</b>	<b>L</b>	<b>T</b>	<b>P</b>													
<b>Version 2.0</b>		<b>3</b>	<b>1</b>	<b>0</b>													
<b>Total Contact Hours</b>	75 Hr																
<b>Pre-requisites/Exposure</b>	Pharmacology																
<b>Co-requisites</b>	Pharmacology																
<b>Course Objectives</b>																	
<p>On completion of this course the student should be able to</p> <ol style="list-style-type: none"> <li>1. Understand the mechanism of drug action and its relevance in the treatment of different diseases</li> <li>2. Demonstrate isolation of different organs/tissues from the laboratory by animals simulated experiments</li> <li>3. Demonstrate the various receptor actions using isolated tissue preparation</li> </ol> <p>Appreciate correlation of pharmacology with related medical sciences ER201</p>																	
<b>Course Outcomes</b>																	
<p>On completion of this course, the students will be able to:</p> <p>CO1- The subject is designed to strengthen the basic knowledge in the field of pharmacology and to impart recent advances in the drugs used for the treatment of various diseases.</p> <p>CO-2 In addition, the subject helps the student to understand the concepts of drug action and mechanism involved.</p> <p>CO-3 This subject provides the knowledge of endocrine pharmacology, chemotherapy, antibiotics, and immunology.</p> <p>CO-4 Student is able to understand the diseases like Parkinsonism, cancer, Alzheimer, diabetes mellitus and its treatment &amp; It also deals with the free radical pharmacology, its etiology and pathophysiology in various neurodegenerative diseases.</p>																	
<b>CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
CO1	3	1	2	3	2	1	3	1	2	3	2	3	3	2	1	2	3
CO2	3	2	3	1	2	3	3	3	2	2	1	3	2	2	2	1	1
CO3	2	1	2	3	3	3	3	2	3	2	2	2	1	3	3	3	1
CO4	1	2	3	1	2	2	3	3	1	1	2	3	3	2	1	3	2
1=lightly mapped					2= moderately mapped					3=strongly mapped							

Unit	Relevance to the local, national, regional and global developmental needs				Relevance To the Employability/ Entrepreneurship/ Skill Development			Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability				SDG	NEP	POE/4 <sup>th</sup> IR	
	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability				
Unit I	-	-	-	Drugs can be administered through various routes depending on factors such as the drug's properties, the patient's condition, and the desired onset and duration of	-	-	Interpret the dose-dependent responses of drugs	-	-	-	-	4.1(quality education and promote lifelong learning opportunities)	-		Projects/Assignments/Presentations/soft skills development

				action.										
Unit II	-	-	-	the pharmacological action of drugs on the PNS underscores the importance of equitable access to safe and effective medications, as well as the need for comprehensive healthcare infrastructure and education to optimize patient outcomes worldwide.	-	-	Pharmacological, classification, mechanism of action, uses, contraindications of drug	-	-	-	-	4.1 (quality education and promote lifelong learning opportunities)	Institutional Restructuring and Consolidation (10.1-10.14)	Projects/Assignments/Presentations/soft skills development

Unit III	-	-	-	the development of effective strategies for preventing blindness and preserving vision in populations worldwide.	-	-	Understanding the Pharmacological action, adverse effect and contraindications of various drug	-	-	-	-	4.1(quality education and promote lifelong learning opportunities)	Institutional Restructuring and Consolidation (10.1-10.14)	Projects/Assignments/Presentations/soft skills development
Unit IV	-	-	-	Challenges related to drug safety and misuse of CNS medications, including addiction, dependence, and overdose, require coordinated efforts to implement appropriate prescribing practices,	-	-	Understanding the Pharmacological action, adverse effect and contraindications of various drug	-	-	-	-	4.1(quality education and promote lifelong learning opportunities)	Institutional Restructuring and Consolidation (10.1-10.14)	Projects/Assignments/Presentations/soft skills development



				educate healthcare providers and patients, and promote responsible medication use.										
Unit v	-	-	-	drug action on the cardiovascular system emphasizes the importance of comprehensive approaches to cardiovascular health promotion, disease prevention, and management that address the complex interplay of	-	-	Understanding the Pharmacological action, adverse effect and contraindications of various drug	-	-	-	-	4.1(quality education and promote lifelong learning opportunity)	Institutional Restructuring and Consolidation (10.1-10.14)	Projects/Assignments/Presentations/soft skills development

				biological, behavioral, environmental, and social determinants of health across diverse populations and settings.									
Unit -VI				drugs acting on blood and blood-forming groups underscore the importance of comprehensive approaches to hematological care, including the prevention, diagnosis, and			Understanding the Pharmacological action, adverse effect and contraindications of various drug				4.1(quality education and promote lifelong learning opportunities)		Projects/Assignments/Presentations/soft skills development

				treatment of hematological disorders, as well as the optimization of blood transfusion practices and the promotion of safe and effective pharmacotherapy.									
Unit -VII				a critical role in the symptomatic management of respiratory conditions and improving quality of life for patients with respiratory diseases			Understanding the Pharmacological action, adverse effect and contraindications of various drug				4.1(quality education and promote lifelong learning opportunities)		Projects/Assignments/Presentations/soft skills development

Unit - VIII				healthcare disparities, promoting access to essential medications, and implementing evidence-based treatment strategies to improve patient outcomes and quality of life for individuals affected by gastrointestinal disorders			Understanding the Pharmacological action, adverse effect and contraindications of various drug					4.1(quality education and promote lifelong learning opportunities)		Projects/Assignments/Presentations/soft skills development
Unit -IX				the role of drugs in kidney health emphasizes the importance of comprehensive,			Understanding the Pharmacological action, adverse effect and contraindications of various drug					4.1(quality education and promote lifelong learning		Projects/Assignments/Presentations/soft skills development

				patient-centered care, access to essential medications, pharmacovigilance, and adherence to evidence-based treatment guidelines to optimize outcomes and improve the quality of life for individuals affected by kidney disorders								g opportunity)		
Unit -X				hormones and hormone antagonists have diverse roles in maintaining			Understanding the Pharmacological action, adverse effect and contraindications of various drug					4.1(quality education and promote lifelong)		Projects/Assignments/Presentations/soft skills development

				physiologic al homeostasi s and treating various medical conditions								g learnin g opport unitie)	
Unit -XI				understand ing the pharmacol ogical actions of histamine and serotonin is crucial for the manageme nt of various conditions affecting multiple organ systems			Pharmacologic al,classification , mechanism of action of drug					4.1(qu ality educat ion and promo te lifelon g learnin g opport unitie)	Projects/Assignm ents/Presentation s/soft skills development
Unit -XII				Efforts to improve cancer care infrastructu re, expand access to			Understanding the Pharmacologic al action, advesre effect and containdication s of various					4.1(qu ality educat ion and promo	Projects/Assignm ents/Presentation s/soft skills development

				essential drugs, promote research and development of novel therapies, and address healthcare disparities are essential for advancing cancer treatment and improving patient outcomes on a global scale.			drug					te lifelon g learnin g opport unitie)		
Unit - XIII				biological agents represent a diverse and rapidly expanding class of medications with			Understanding the concept of Biological agents					4.1(quality education and promote lifelon g		Projects/Assignments/Presentations/soft skills development

				broad therapeutic applications across various medical specialties. Their development and use have revolutionized the treatment landscape for numerous diseases, offering new treatment options and improved outcomes for patients								learning opportunity)		
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## ER2021P: Pharmacology Practical

<b>ER2021 P</b>	Pharmacology Practical	<b>L</b>	<b>T</b>	<b>P</b>
<b>Version 2.0</b>		<b>0</b>	<b>0</b>	<b>2</b>
<b>Total Contact Hours</b>	50 hr			
<b>Pre-requisites/Exposure</b>	Human Anatomy and Physiology			
<b>Co-requisites</b>	Pharmacy Practice			

### Course Objectives

is course will demonstrate / provide hands-on experience in the virtual platform using appropriate software on the following

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

4. Study of pyrogen testing on rabbit

### Course Outcome

Upon successful completion of this course, the students will be able to

CO1. Study and report the local anaesthetic, mydriatic and mitotic effects of the given drug on the rabbit eye

CO2. Choose appropriate animal experiment model to study the effects of the given drugs acting on the central nervous system and submit the report

CO3. Perform the effects of given tissues (simulated) on isolated organs / tissues and interpret the results

CO4. Interpret the dose dependent responses of drugs in various animal experiment models

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	2	3	2	1	3	1	2	3	2	3	3	2	1	2	3
CO2	3	2	3	1	2	3	3	3	2	2	1	3	2	2	2	1	1
CO3	2	1	2	3	3	3	3	2	3	2	2	2	1	3	3	3	1
CO4	1	2	3	1	2	2	3	3	1	1	2	3	3	2	1	3	2

1=lightly mapped

2= moderately mapped

3=strongly mapped

Unit	Relevance to the local, national, regional and global developmental needs				Relevance To the Employability/ Entrepreneurship/ Skill Development			Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability				SDG	NEP	POE/4 <sup>th</sup> IR
	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability			
ER2021P														
Unit I	-	-	-	studying the effects of local anesthetics on the rabbit eye serves important scientific, clinical, and regulatory purposes, contributing	-	-	Interpret the dose-dependent responses of drugs	-	-	-	-	4.4(Skills for Decent Work)	-	Soft skills development

				to the development of safe and effective ophthalmic anesthesia techniques, surgical procedures, and ocular drug formulations										
Unit II				studying the mydriatic effects of drugs on rabbit eyes serves important scientific, clinical, and regulatory purposes, contributing to the development of safe and effective mydriatic agents,			Interpret the dose dependent responses of drugs					4.4(Skills for Decent Work)		Soft skills development

				advancing ocular pharmacology, and promoting patient safety in ophthalmic practice									
Unit III				studying the mydriatic and miotic effects on the rabbit eye is essential for advancing our understanding of ocular pharmacology, improving the safety and efficacy of ophthalmic medications			Interpret the dose dependent responses of drugs					4.4(Skills for Decent Work)	Soft skills development
Unit IV				studying the effects of analgesics			experiment model to study the effects of					4.4(Skills for Decent Work)	Soft skills development

				using analgesimeters and animal models is essential for advancing our understanding of pain mechanisms, developing effective pain management strategies, and translating preclinical research findings into clinical practice.			the given drugs acting on the central nervous system					)		
Unit v	-	-	-	-	-	-	Hands on training of different techniques, so that students can learn the in vivo, ex and invivo techniques	-	-	-	-	4.4(Skills for Decent Work)	-	Soft skills development

Unit-VI				<p>Epilepsy encompasses a spectrum of syndromes with varying etiologies and manifestations. Different regions may have higher prevalence rates of specific epilepsy syndromes due to genetic predispositions or environmental factors. A global perspective facilitates the identification of anti-convulsant drugs effective</p>							4.4(Skills for Decent Work)	Soft skills development
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				against various types of seizures and epilepsy syndromes.									
Unit-VII				the screening of muscle relaxants using a Rota-Rod apparatus enables researchers to address the diverse causes, cultural factors, drug responses, and safety considerations associated with muscle spasms and spasticity. This approach supports the development			Hands on training of different techniques, so that students can learn the in vivo, ex and invivo techniques					4.4(Skills for Decent Work)	Soft skills development

				of effective, safe, and accessible treatment options for individuals affected by these conditions across different regions and healthcare settings									
Unit-VIII	-	-	-	the screening of CNS stimulants and depressants using an Actophotometer enhances our understanding of drug effects, individual variability, cultural influences,	-	-	Hands on training of different techniques, so that students can learn the in vivo, ex and invivo techniques	-	-	-	4.4(Skills for Decent Work)	-	Soft skills development



				and public health implications associated with these drugs. This approach facilitates the development of tailored interventions and treatment strategies for CNS disorders that are responsive to the needs of diverse populations around the world.										
Unit-IX	-	-	-	studying anxiolytic activity using the elevated plus maze method is critical for	-	-	Hands on training of different techniques, s that students can learn the in vivo, ex and invivo techniques	-	-	-	-	4.4(Skills for Decent Work )	-	Soft skills development

				advancing our understanding of anxiety disorders, identifying new treatment options, and improving the lives of individuals affected by anxiety-related conditions.									
Unit-X	-	-	-	studying the effect of drugs on isolated heart tissue to enhances understanding of drug-cardiac interactions, informs drug development and safety assessment,			Hands on training of different techniques, s that students can learn the in vivo, ex and invivo techniques	-	-	-	-	4.4(Skills for Decent Work )	Soft skills development

				and contributes to the prevention and treatment of cardiovascular diseases									
Unit-XI				studying the effects of drugs on ciliary motility in the frog's buccal cavity to enhances understanding of fundamental biological processes, informs drug discovery and development , addresses environmental and health concerns, and			Hands on training of different techniques, s that students can learn the in vivo, ex and invivo techniques					4.4(Skills for Decent Work )	Soft skills development

				contributes to the conservation of frog species and their habitats										
Unit-XII				pyrogen testing by the rabbit method is essential for harmonizing regulatory standards, promoting international trade, facilitating cross-border research collaboration, ensuring consistent safety assessments, addressing ethical concerns, and enhancing			Hands on training of different techniques, so that students can learn the in vivo, ex and invivo techniques					4.4(Skills for Decent Work)		Soft skills development

			emergency response capabilities in the global healthcare											
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**ER2022T: Community Pharmacy and Management Theory**

<b>Subject Code: ER20-22T</b>	<b>Community Pharmacy and Management-Theory</b>	<b>L 3</b>	<b>T 1</b>	<b>P 0</b>
<b>Version 2.0</b>				
<b>Total Contact Hours</b>	75 hrs.			
<b>Pre-requisites/Exposure</b>	Social Pharmacy			
<b>Co-requisites</b>	Pharmacy Management			

**Course Objectives**

1. Professional handling and filling prescriptions
2. Patient counseling on diseases and minor ailments
3. Patient counseling on prescription and / or non-prescription medicines
4. Preparation of counseling materials such as patient information leaflets
5. Performing basic health screening tests

**Course Outcomes (CO)**

On completion of this course, the students will be able to:

- CO1. Handle and fill prescriptions in a professional manner.  
 CO2. Counsel patients on various diseases and minor ailments.  
 CO3. Counsel patients on prescription and or non-prescription medicines.  
 CO4. Design and prepare patient information leaflets.  
 CO5. Perform basic health screening tests.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	-	3	3	2	3	3	3	2	3	3	3	2	2	2
CO2	3	3	3	-	3	3	2	3	3	3	2	3	3	3	3	3	-
CO3	3	3	3	-	3	3	2	3	3	3	2	3	3	3	3	3	-
CO4	3	3	2	-	3	3	2	3	2	3	2	3	3	3	2	1	-
CO5	3	1	2	-	3	3	1	3	2	2	2	3	3	2	1	1	-

1=lightly mapped

2= moderately mapped

3=strongly mapped

Unit	Relevance to the local, national, regional and global developmental needs			Relevance To the Employability/ Entrepreneurship/ Skill Development	Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability			SDG	NEP	POE/4 <sup>th</sup> IR				
	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability			
Unit I	-	-	-	The study and understanding of community pharmacy practice, both in international and Indian contexts, have broad implications for addressing global healthcare needs, promoting public health, and contributing to	-	-	The relevance of community pharmacy practice to skill development is evident across a spectrum of clinical, communication, cultural, technological, and collaborative skills. As the healthcare landscape evolves, continuous skill	The comprehensive understanding of the definition, history, and development of community pharmacy in international and Indian contexts is crucial for pharmacists to navigate ethical challeng	-	-	-	Sustainable Development and Global Citizenship (SDG 4.7)	Professional Education (17.1-17.5)	Global Education Knowledge

				the overall efficiency and effectiveness of healthcare systems worldwide.			development is essential for pharmacists to provide high-quality and patient-centered care.	es and uphold the principles of patient-centered care, integrity, and professional responsibility.						
Unit II	-	-	-	The professional responsibilities of community pharmacists, especially when introducing GPP and SOPs, directly contribute to addressing global development needs by enhancing healthcare quality, ensuring regulatory compliance, fostering a skilled workforce, and	-	-	The professional responsibilities of community pharmacists, along with the introduction to GPP and SOPs, are integral to skill development across various domains, including clinical practice, communication, ethics, technology, and continuous learning. These skills contribute to the	They guide pharmacists in ethical decision-making, ensuring the delivery of high-quality, patient-centered care while upholding the integrity and values of the profession.	-	-	-	Sustainable Development and Global Citizenship (SDG 4.7)	Towards a More Holistic and Multidisciplinary Education (11.1-11.13)	Global Education Knowledge



				supporting public health initiatives.			overall competency and effectiveness of community pharmacists in meeting the healthcare needs of the community.						
Unit III	-	the proper handling of prescriptions, adherence to legal and regulatory requirements, and the implementation of Good Dispensing Practices are nationally relevant because they impact patient safety, public health, compliance with	-	-	-	Developing these skills will not only enhance your role as a pharmacist but also contribute to the safe and effective provision of healthcare services at the national level.	-	-	Right Conduct and Truth	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development

			the law, and the overall quality and efficiency of healthcare services											
Unit IV	-	-	-	These skills are critical for fostering understanding, collaboration, and positive outcomes in a world that is increasingly interconnected and diverse.	-	-	These skills are critical for fostering understanding, collaboration, and positive outcomes in a world that is increasingly interconnected and diverse.	-	-	Right Conduct, accuracy, fairness, honesty, justice	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Employability
Unit v	-	-	-	contributes to improving patient outcomes, public health, and the effectiveness of healthcare	-	-	these skills will not only enhance your ability to provide effective patient counselling but	-	-	Right Conduct and Truth	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development, Employability

				systems in diverse global contexts.			also contribute to better patient outcomes and satisfaction, improved public health, and the overall quality of healthcare services.								
Unit v	-	-	-	contributes to improving patient outcomes, public health, and the effectiveness of healthcare systems in diverse global contexts.		-	these skills will not only enhance your ability to provide effective patient counselling but also contribute to better patient outcomes and satisfaction, improved public health, and the overall quality		-	Right Conduct and Truth		-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development, Employability

							of health care services						
Unit-VI	-	-	-	it affects health care outcomes, costs, and the overall well-being of individuals and communities worldwide. Strategies to improve adherence must consider the diverse	-	-	these skills will enable health care professionals to play a pivotal role in improving medication adherence, thereby contributing to better patient outcomes, reduced health care costs, and improved public health on a global scale.	-	-	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development
Unit-VI I	-	-	health screening services in community pharmacies have national	-	-	valuable health screening services , contribute to early disease	-	-	-	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development

			relevance as they promote preventive care, accessibility, early detection, and the overall health and well-being of the population			detection, and promote healthier communities.							
Unit-VI II	-	-	-	It impact the public health, healthcare regulations, and the role of pharmacists in patient care across borders.	-	-	It enable healthcare professionals to provide comprehensive and patient-centered care related to OTC medications, empowering patients to make informed decisions about self-medication while ensuring	-	-	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development

							g their safety and well-being.							
Unit-IX	-	-	Effective management ensures the continued provision of essential pharmaceutical services to the population.	-	-	-	effective management of community pharmacies, provide high-quality patient care, and contribute to the well-being of the community while ensuring regulatory compliance and financial sustainability.	-	-	-	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development

**ER20-22P: Community Pharmacy and Management – Practical**

<b>ER20-22 P</b>	COMMUNITY PHARMACY AND MANAGEMENT – PRACTICAL	<b>L</b>	<b>T</b>	<b>P</b>
<b>Version 2.0</b>		<b>0</b>	<b>0</b>	<b>3</b>
<b>Total Contact Hours</b>	75 Hr.			
<b>Pre-requisites/Exposure</b>	Hospital Products			
<b>Co-requisites</b>	Pharmacy			

**Course Objectives**

1. Professional handling and filling prescriptions
2. Patient counseling on diseases and minor ailments
3. Patient counseling on prescription and / or non-prescription medicines
4. Preparation of counseling materials such as patient information leaflets
5. Performing basic health screening tests

**Course Outcome**

- CO1. Handle and fill prescriptions in a professional manner.  
 CO2. Counsel patients on various diseases and minor ailments.  
 CO3. Counsel patients on prescription and or non-prescription medicines.  
 CO4. Design and prepare patient information leaflets.  
 CO5. Perform basic health screening tests.

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	-	-	-	-	-	-	-	-	-	2	-	-	-	2	3	1
CO 2	3	2	-	-	1	2	-	1	-	3	1	2	-	3	3	3	-
CO 3	2	2	-	-	1	2	-	1	-	3	1	2	-	3	3	3	-
CO 4	2	3	-	-	-	2	-	2	-	-	2	-	-	-	-	3	-
CO 5	2	2	2	-	-	-	-	-	-	1	2	-	-	-	-	3	-

1=lightly mapped

2= moderately mapped

3=strongly mapped

Unit	Relevance to the local, national, regional and global developmental needs	Relevance To the Employability/ Entrepreneurship/ Skill Development	Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability	SDG	NEP	POE/4 <sup>th</sup> IR
<b>Local</b>		<b>Employability</b>	<b>Professional Ethics</b>	<b>&amp;</b>		
<b>Regional</b>		<b>Entrepreneurship</b>	<b>Gender</b>	<b>Environment &amp; Sustainability</b>		
<b>National</b>		<b>Skill Development</b>	<b>Human Values</b>			
<b>Global</b>						

Unit I	- Handling of prescriptions with professional standards, reviewing prescriptions, checking for legal compliance and completeness	-			In future will be able to run a medical retail drug store	Handle and fill prescriptions in a professional manner	Handling the prescriptions ethically	-	-	Providing awareness to the patient for returning the medicines if not in use	Sustainable Development and Global Citizenship (SDG 4.7)	Professional Education (17.1-17.5)	Mentoring by Alumni
Unit II	-	-	Identification of drug-drug interactions is of paramount importance in healthcare globally due to several reasons like patient safety, optimizing treatment outcomes and drug development and regulatory processes	-	-	The identification of drug-drug interactions (DDIs) is highly relevant to skills development in several professional domains, including pharmacy, medicine, nursing, and health care informatics.	-	-	The identification of drug-drug interactions (DDIs) is closely tied to several fundamental human values, reflecting ethical considerations and priorities in healthcare delivery.	-	Sustainable Development and Global Citizenship (SDG 4.7)	Professional Education (17.1-17.5)	Mentoring by Alumni



Unit II	-	-	The preparation of clear, multilingual dispensing labels ensures patient safety, facilitates global healthcare access, and promotes medication adherence across diverse linguistic and cultural contexts.	-	-	Preparation of accurate labels enhances healthcare professionals' skills in communication, attention to detail, and patient safety, fostering proficiency in medication management and adherence promotion.	Ensuring precise labeling aligns with professional ethics, prioritizing patient safety, autonomy, and informed consent while upholding standards of accuracy and transparency in medication administration.	-	-	-	Sustainable Development and Global Citizenship (SDG 4.7)	Professional Education (17.1-17.5)	Mentoring by Alumni
Unit V	Offering diverse health screening services locally promotes preventive care, early detection of health issues, and personalized interventions,	-			-	Conducting health screenings develops healthcare professionals' proficiency in vital sign assessment, respir	Performing thorough health screenings demonstrates commitment to patient welfare, respecting autonomy, ensuring	-	-	-	Sustainable Development and Global Citizenship (SDG 4.7)	Professional Education (17.1-17.5)	Mentoring by Alumni

	fostering community wellness and reducing healthcare disparities.					atory function evaluation, glucose monitoring, and BMI calculation, enhancing comprehensive patient care skills.	g accurate data collection, and maintaining confidentiality, upholding ethical standards in healthcare delivery						
Unit v	Conducting counseling sessions for chronic diseases fosters local development by empowering patients with knowledge for self-management, improving treatment adherence, and reducing healthcare burden through proactive disease management strategies.	-		Offering counseling on chronic diseases and device use enhances healthcare professionals' employability by honing patient communication, education, and device training skills, meeting diverse patient needs and improving overall care quality.	-		Delivering counseling sessions for chronic diseases, incorporating device education, aligns with professional ethics by promoting patient autonomy, informed decision-making, and ensuring comprehensive care tailored to	-	-	-	Sustainable Development and Global Citizenship (SDG 4.7)	Professional Education (17.1-17.5)	Mentoring by Alumn

							individual needs, fostering trust and integrity in healthcare practice.							
University	Conducting counseling sessions for minor ailments supports local development by improving community health literacy, reducing unnecessary healthcare utilization, empowering individuals for self-care, and addressing prevalent health concerns effectively, thus enhancing overall well-being and productivity.	-			Delivering counseling on minor ailments enhances employability by developing communication skills, clinical knowledge, and patient-centered care approaches, fostering competence in addressing diverse health concerns and improving overall patient satisfaction.	-		Providing counseling for minor ailments upholds professional ethics by promoting patient education, autonomy, and informed decision-making, ensuring accurate diagnosis, appropriate treatment, and confidentiality while fostering trust and patient-provider relation	-	-	-	Sustainable Development and Global Citizenship (SDG 4.7)	Professional Education (17.1-17.5)	Mentoring by Alumni

							ships.							
U n i t- V II	Proficient handling of dummy dosage forms and correct administration techniques are crucial for local development as they ensure healthcare practitioners deliver safe and effective care, improve medication adherence, reduce medication errors, and enhance patient outcomes, contributing to the overall health and well-being of the community.	-			-	-	Mastering the handling and administration of various dummy dosage forms enhances skills development by honing proficiency in medication management, dosage calculation, patient education, and device operation, ensuring safe and effective health care delivery across	Competent handling of dummy dosage forms and correct administration techniques align with professional ethics by ensuring patient safety, respecting autonomy, promoting informed consent, maintaining confidentiality, and delivering quality care, thus upholding the principles of beneficence and non-maleficence in healthcare	-	-	-	Sustainable Development and Global Citizenship (SDG 4.7)	Professional Education (17.1-17.5)	Mentoring by Alumni

							diverse clinical settings.	practice.						
Unit-VII	Community pharmacy software and digital health tools improve access to healthcare, enhance patient care, streamline workflow, promote medication safety, and support chronic disease management locally.	-			-	-	The use of community pharmacy software and digital health tools fosters skills development by enhancing proficiency in technology utilization, data analysis, patient engagement, and collaborative health care delivery.	Community pharmacy software and digital health tools uphold professional ethics by promoting patient privacy, informed consent, accurate data management, and equitable healthcare access.	-	-	-	Sustainable Development and Global Citizenship (SDG 4.7)	Professional Education (17.1-17.5)	Mentoring by Alumni

### ER20-23T: Biochemistry and Clinical Pathology – Theory

<b>Subject Code:</b> ER20-23T	<b>Subject Name:</b> Biochemistry and Clinical Pathology – Theory	<b>L</b>	<b>T</b>	<b>P</b>
<b>Version 2.0</b>		<b>3</b>	<b>1</b>	<b>0</b>
<b>Total Contact Hours</b>	75 hr			

<b>Pre-requisites/Exposure</b>	Pharmaceutical Chemistry- Theory																	
<b>Co-requisites</b>	Pharmacology – Theory																	
<b>Course Objectives</b>																		
This course will discuss about basic concepts of																		
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																		
<b>Course Outcomes (CO)</b>																		
Upon successful completion of this course, the students will be able to																		
CO1. Describe the functions of biomolecules																		
CO2. Discuss the various functions of enzymes in the human system																		
CO3. Explain the metabolic pathways of biomolecules in both physiological and pathological conditions																		
CO4. Describe the principles of organ function tests and their clinical significances.																		
CO5. Determine the biomolecules / metabolites in the given biological samples, both qualitatively and quantitatively.																		
CO6. Describe the clinical pathology of blood and urine																		
<b>Course Code</b>	<b>Course Outcome</b>	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PO 7</b>	<b>PO 8</b>	<b>PO 9</b>	<b>PO 10</b>	<b>PO 11</b>	<b>PO 12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
	CO1	3	2	-	-	3	3	1	-	-	-	-	1	3	-	3	1	-
	CO2	3	2	-	-	3	3	1	-	-	-	-	1	3	-	3	1	-
	CO3	3	3	-	-	3	3	1	-	-	-	-	1	3	-	3	1	-
	CO4	3	2	-	-	3	3	1	-	-	-	-	1	3	-	3	1	-
	CO5	3	2	-	-	3	3	1	-	-	-	-	1	3	-	3	1	-
	CO6	3	2	-	-	3	-	1	-	-	-	-	1	3	-	3	1	-
		1=lightly mapped					2= moderately mapped					3=strongly mapped						

Unit	Relevance to the local, national, regional and global developmental needs				Relevance To the Employability/ Entrepreneurship/		Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability					SDG	NEP	POE/4 <sup>th</sup> IR
	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability			
Unit I	-	-	-	-	-	-	-	-	-	-	-	-	Professional Education (17.1-17.5)	Skill Development
Unit II	-	-	-	Carbohydrates are a major source of energy for the human body. Understanding carbohydrate biochemistry is crucial for nutrition and maintaining a healthy diet. Issues related to carbohydrates, such as obesity, diabetes, and metabolic disorders, have global health implications. Research in carbohydrate biochemistry contributes to addressing these health challenges.	-	-	Basics knowledge of biomolecules present in our body	-	-	-	-	Skill for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development

Unit III	-	-	-	Many diseases, including metabolic disorders, are linked to protein function and structure. Research in protein biochemistry contributes to the understanding of disease mechanisms, leading to the development of diagnostics and therapeutics with global health implications.	-	-	Basic knowledge of protein structure which help in drug discovery	-	-	-	-	Skill s for Dec ent Work (S D G 4. 4)	Professiona l Education (17.1-17.5)	Employabilit y
Unit IV	-	-	-	Lipids play a crucial role in drug delivery systems, pharmaceutical formulations, and the development of lipid-based therapies. Advances in lipid research contribute to the global pharmaceutical and biotechnology industries.	-	-	Basics knowledge of biomolecule s present in our body and role of lipids in our body and diseases associated with it.	-	-	-	-	Sk ill s fo r Dec en t W or k (S D G 4. 4)	Professiona l Education (17.1-17.5)	Employabilit y
Unit v	-	-	-	The nucleic acid chapter has profound relevance globally, impacting various aspects of science, medicine, agriculture, biotechnology, and more. Nucleic acids, specifically DNA, carry genetic information. Understanding the structure and function of nucleic	-	-	Basics knowledge of biomolecule s present in our body and role of DNA and RNA in our body.	-	-	-	-	Sk ill s fo r Dec en t W or k (S D G 4. 4)	Professiona l Education (17.1-17.5)	Employabilit y



				acids is fundamental for unraveling the principles of inheritance and genetics on a global scale.										
Unit -VI	-	-	-	Enzymes are essential in the production of biopharmaceuticals, including therapeutic proteins and enzymes used in medical treatments. Global healthcare benefits from research in enzyme biochemistry for the development of new drugs and therapies.	-	-	Basic knowledge of enzyme structure which help in drug discovery	-	-	-	-	Skill s for Dec en t W or k (S D G 4. 4)	Professiona l Education (17.1-17.5)	-
Unit -VII	-	-	-	Vitamins are essential for proper growth, development, and overall health. Understanding vitamin requirements and deficiencies is crucial for addressing global public health challenges related to malnutrition and micronutrient deficiencies.	-	-	Basics knowledge of biomolecule s present in our body and role of vitamins in our body and diseases associated with deficiency of vitamins.	-	-	-	-	Sk ill s fo r D ec en t W or k (S D G 4. 4)	Professiona l Education (17.1-17.5)	Skill Development
Unit - VIII	-	-	-	Metabolism (Study of cycle/pathways without chemical structures) Metabolism of Carbohydrates Metabolism of lipids	-	-	Basics knowledge of metabolism of biomolecule s and involvement	-	-	-	-	Sk ill s fo r D ec en	Professiona l Education (17.1-17.5)	Skill Development

				Metabolism of Amino acids Biological oxidation			of these process in various life process of our body and role of					t W o r k (S D G 4. 4)		
Unit -IX	-	-	-	Minerals are vital for plant growth and development. Research on mineral nutrition in agriculture contributes to optimizing crop yields, improving soil fertility, and ensuring global food security.	-	-	Basics knowledge of minerals, electrolyte present in our body and role of these in our body and diseases associated with deficiency of minerals.	-	-	-	-	Sk i l l s f o r D e c e n t W o r k (S D G 4. 4)	Professiona l Education (17.1-17.5)	Employeabilit y
Unit -X	-	-	-	Organ function tests are integral to medical research, enabling scientists and healthcare professionals to study patterns of organ dysfunction, identify risk factors, and develop strategies for disease prevention and management.	-	-	Laboratory tests which help to diagnose the diseases.	-	-	-	-	Sk i l l s f o r D e c e n t W o r k (S D G 4. 4)	Professiona l Education (17.1-17.5)	

**ER20-23P: BIOCHEMISTRY & CLINICAL PATHOLOGY – PRACTICAL**

<b>Subject Code:</b> ER20-23P	<b>Subject Name:</b> BIOCHEMISTRY & CLINICAL PATHOLOGY – PRACTICAL	<b>L</b>	<b>T</b>	<b>P</b>
<b>Version 2.0</b>		<b>0</b>	<b>0</b>	<b>2</b>
<b>Total Contact Hours</b>	50 hours			
<b>Pre-requisites/Exposure</b>	Pharmaceutical Chemistry-Theory			
<b>Co-requisites</b>	Pharmacology – Theory			

**Course Objectives**

Upon completion of this course the student should be able to:

1. Physical, chemical properties and qualitative tests of lipids, carbohydrates, proteins,
2. Analysis of normal and abnormal constituents of blood and urine
3. Microscopic examination of sputum and faecus
4. Practice in injecting drugs by intramuscular, subcutaneous and intravenous routes.
5. Withdrawal of blood sample

**Course Outcomes (CO)**

This subject is designed to impart fundamental knowledge on

1. The tests involved in detection of different food constituents like carbohydrates, proteins and lipids.
2. Different techniques employed in withdrawal of blood sample
3. Qualitative test for normal and abnormal constituents of urine
4. Chemical examination of sputum at microscopic level.

Course Code	Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
ER20-23P	CO1	2	3	2	--	2	3	--	3	2	--	-	-	3	2	--	--	--
	CO2	3	3	2	--	2	1	--	--	2	--	-	-	3	2	--	--	--
	CO3	3	3	1	--	1	2	--	2	2	--	-	-	2	3	--	--	--
	CO4	2	3	2	--	1	2	2	3	3	1	-	-	2	2	--	--	--
						1=lightly mapped			2= moderately mapped			3=strongly mapped						

Unit	Relevance to the local, national, regional and global developmental needs				Relevance To the Employability/ Entrepreneurship/ Skill Development			Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability				SDG	NEP	POE/4 <sup>th</sup> IR
ER2 0- 23P	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability			
Unit I	-	-	-	Qualitative analysis of carbohydrates Understanding carbohydrate composition is crucial for assessing the nutritional content of foods globally, aiding in dietary planning and addressing issues related to malnutrition. Qualitative analysis of Proteins and amino acids Protein analysis is crucial in the food industry, quality control, and research globally.	-	-	The tests involved in detection of different food constituents like carbohydrates, proteins and lipids.	-	-	Used to identify the pathological Condition of diseases	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development

				<p>Understanding protein content aids in addressing nutritional needs, ensuring food safety, and developing new products.</p> <p>Qualitative analysis of lipids</p> <p>Lipid analysis is critical in understanding dietary fats, ensuring food quality, and promoting heart health globally. It also has applications in industries such as cosmetics and biofuel production, contributing to diverse sectors on a worldwide scale.</p>										
Unit II		-	-	Qualitative analysis of urine for normal and abnormal constituents	-	-	Analysis of normal and abnormal constituents of blood and urine	-	-	Help to diagnose the various disease which ultimately help to treat the patient	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development
Unit -III				Determination of constituents of blood/serum (simulated)			Analysis of normal and abnormal			Help to diagnose the various		Skills for Decent	Professional Education	Employability

				(Creatine, glucose, cholesterol, Calcium, Urea, SGOT /SGPT )			constituents of blood and urine Microscopic examination of sputum and faecus			disease which ultimately help to treat the patient		Work (SD G 4.4)	(17.1-17.5)	
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### ER2024T: Pharmacotherapeutics– Theory

<b>Subject Code:</b> ER20-24T	<b>Subject Name:</b> PHARMACOTHERAPEUTICS - THEORY											<b>L</b>	<b>T</b>	<b>P</b>			
<b>Version 2.0</b>												<b>3</b>	<b>1</b>	<b>0</b>			
<b>Total Contact Hours</b>	75 hours																
<b>Pre-requisites/Exposure</b>	Human Anatomy and Physiology																
<b>Co-requisites</b>	Pharmacology																
<b>Course Objectives</b>																	
Upon completion of this course the student should be able to:																	
<ol style="list-style-type: none"> <li>1. Etiopathogenesis of selected common diseases and evidence-based medicine therapy</li> <li>2. Importance of individualized therapeutic plans based on diagnosis</li> <li>3. Basic methods for assessing the clinical outcomes of drug therapy</li> </ol>																	
<b>Course Outcomes (CO)</b>																	
On completion of this course, the students will be able to:																	
CO1. Help assessing the subjective and objective parameters of patients in common disease conditions																	
CO2. Assist other healthcare providers to analyse drug related problems and provide therapeutic interventions																	
CO3. Participate in planning the rational medicine therapy for common diseases																	
CO4. Design and deliver discharge counselling for patients																	
<b>CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
CO1	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	2	1
CO2	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	2	1
CO3	3	3	1	-	3	3	3	3	2	2	2	3	3	2	1	2	1
CO4	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	2	1
1=lightly mapped                      2= moderately mapped                      3=strongly mapped																	

Unit	Relevance to the local, national, regional and global developmental needs				Relevance To the Employability/ Entrepreneurship/ Skill Development			Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability				SDG	NEP	POE/ 4 <sup>th</sup> IR	
	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability				
ER20 24T															
Unit I	-	-	-	The unit includes the study of medication use in treating medical conditions. It encompasses drug classes, mechanisms of action, pharmacokinetics, adverse reactions, and rational drug use. Healthcare professionals must understand these principles to ensure safe and effective medication therapy, improving patient outcomes and minimizing adverse events.	-	-	Studying pharmacotherapeutics provides essential knowledge for healthcare professionals. It enhances employability by enabling them to make informed medication decisions. Entrepreneurs can establish pharmaceutical ventures. Skill development in evidence-based medicine, essential medicines, and treatment guidelines fosters expertise and innovation, vital for career growth and improving healthcare	-	-	It is deeply intertwined with professional ethics by emphasizing responsible medication use. It also relates to gender, as healthcare should be equitable. Human values are upheld through patient-centered care. Environment considerations include proper disposal of pharmaceuticals. Sustainability involves ensuring ongoing access to essential medications while minimizing environmental impact	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development	

						quality.							
Unit II				<p>The unit includes studying disease management, which involves understanding disease causes, recognizing clinical manifestations, and using interventions. Ethical dimensions involve providing equitable, patient-centered care while respecting autonomy. Gender equity ensures equal access to care, while human values promote empathy and dignity. Environmental concerns include sustainable healthcare practices, ensuring ongoing access to treatments without resource depletion.</p>		<p>Comprehending disease (definition, etiology), recognizing clinical symptoms, and implementing management strategies (nonpharmacological/pharmacological) are pivotal for healthcare professionals. These skills enhance employability by meeting patient needs effectively. Entrepreneurship opportunities arise in healthcare services and pharmaceuticals. Skill development is crucial for career advancement and innovation in healthcare delivery.</p>			<p>Disease understanding (definition, etiology), clinical presentation, and management (nonpharmacological/pharmacological) are vital in healthcare. Ethical care ensures equity, informed consent, and confidentiality. Gender fairness addresses health disparities. Human values uphold patient dignity and empathy. Environment-friendly practices reduce healthcare's ecological footprint. Sustainability means maintaining quality care while conserving resources for future generations</p>	<p>Skills for Decent Work (SDG 4.4)</p>	<p>Professional Education (17.1-17.5)</p>	<p>Skill Development</p>	



## ER2024P: Pharmacotherapeutics - Practical

<b>Subject Code: ER20-24P</b>	<b>Subject Name: Pharmacotherapeutics - Practical</b>	<b>L</b>	<b>T</b>	<b>P</b>													
<b>Version 2.0</b>		<b>0</b>	<b>0</b>	<b>1</b>													
<b>Total Contact Hours</b>	25 hr																
<b>Pre-requisites/Exposure</b>	Human Anatomy and Physiology																
<b>Co-requisites</b>	Pharmacology																
<b>Course Objectives</b>																	
<p>Upon completion of this course the student should be able to:</p> <ol style="list-style-type: none"> <li>1. How to prepare a SOAP (Subjective, Objective, Assessment and Plan) note for clinical cases of selected common diseases</li> <li>2. Patient counselling techniques/methods for common disease conditions</li> </ol>																	
<b>Course Outcomes (CO)</b>																	
<p>On completion of this course, the students will be able to:</p> <p>CO1. Write SOAP (Subjective, Objective, Assessment and Plan) notes for the given clinical cases of selected common diseases</p> <p>CO2. Counsel the patients about the disease conditions, uses of drugs, methods of handling and administration of drugs, life-style modifications, and monitoring parameters.</p>																	
<b>CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
CO1	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	1	1
CO2	3	2	1	-	3	3	3	3	2	2	2	3	3	2	2	2	2
1=lightly mapped					2= moderately mapped					3=strongly mapped							

Unit	Relevance to the local, national, regional and global developmental needs				Relevance To the Employability/ Entrepreneurship/ Skill Development			Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability				SDG	NEP	POE/4 <sup>th</sup> IR
ER2 024P	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability			
Unit I	-	-	-	The unit includes studying and developing SOAP notes for six clinical cases, real or hypothetical, addressing healthcare needs at local, national, regional, and global levels. This process enhances healthcare documentation and communication skills, contributing to improved patient care and bolstering healthcare systems worldwide.	-	-	The unit includes studying and creating SOAP notes for six clinical cases, whether real or hypothetical. This practice enhances employability by refining critical documentation and communication skills. Additionally, it can support entrepreneurship by advocating for healthcare quality and efficiency	-	-	Studying and preparing SOAP notes for six clinical cases, whether real or hypothetical, is crucial for professional ethics, patient confidentiality, gender equity, human values like empathy, and environmentally conscious practices. This contributes to sustainability by improving healthcare efficiency and quality.	-	Good health and well-being (SDG 3.7)	Professional Education (17.1-17.5)	Skill Development
Unit II	-	-	-	Patient counseling through role-playing in real or hypothetical clinical settings is crucial for addressing healthcare needs	-	-	Participating in patient counseling via role plays in actual or hypothetical clinical	-	-	Patient counseling exercises, including role plays, support professional ethics through informed consent and	-	Skills for Decent Work (SDG 3.3)	Towards a More Holistic (and Multidisciplinary) Education (11.1-11.13)	Global Education Knowledge

			at all levels. It improves communication skills among healthcare professionals, ensuring effective patient education, better health outcomes, and stronger healthcare systems to tackle global healthcare challenges.			situations is vital for addressing healthcare needs at various levels. It provides healthcare professionals with vital communication skills, enhancing patient education and health outcomes, bolstering global healthcare systems.			patient autonomy, while promoting gender equity and human values like empathy in communication. Environmentally friendly approaches minimize medication waste, fostering sustainability.				
Unit-III			Employing simulated cases for dosage calculations in pediatrics and geriatrics, considering diverse medical conditions, is			The unit includes practicing simulated cases for dose calculation in pediatrics and geriatrics, covering various pathologies.			The unit includes studying simulated scenarios for dosage calculations in pediatrics and geriatrics, covering diverse medical conditions. This		Skills for Decent Work (SDG 3.3)	Professional Education ((17.1-17.5)	Skill Development

			crucial for meeting local, national, regional, and global healthcare development needs. It enhances healthcare professionals' skills, ensuring safe and effective medication administration, ultimately contributing to improved global healthcare systems and better patient outcomes worldwide.			This enhances employability by equipping healthcare professionals with practical skills.			practice adheres to professional ethics, prioritizing patient well-being and fostering gender equality by addressing individual healthcare needs.				
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**ER2025T: Hospital and Clinical Pharmacy -Theory**

<b>Subject Code:</b> ER20-25T	<b>Subject Name:</b> Hospital and Clinical Pharmacy theory	<b>L</b>	<b>T</b>	<b>P</b>
<b>Version 2.0</b>		<b>3</b>	<b>1</b>	<b>0</b>

<b>Total Contact Hours</b>	75 hr
<b>Pre-requisites/Exposure</b>	Clinical Pharmacy
<b>Co-requisites</b>	Hospital Pharmacy

**Course Objectives**

Upon completion of this course the student should be able to:

1. Learn about infection control measures, especially in the context of sterile compounding and healthcare-associated infections.
2. Learn how to monitor patients' response to medications through laboratory tests and clinical assessments.
3. Develop advocacy skills to ensure patients receive appropriate and affordable medications.
4. Learn how to assess patients' medical conditions and medication needs, considering factors like age, weight, allergies, and comorbidities.

**Course Outcomes (CO)**

Upon completion of this course the student should be able to:

CO1. This entails supervising pharmaceutical services within a hospital environment, which encompasses managing the supply chain and working closely with healthcare providers.

CO2. Hospital pharmacy administrators have the duty of effectively managing the acquisition, storage, and dissemination of medications within the hospital.

CO3. Describe the involvement of other healthcare professionals in monitoring patient drug therapy and resolving drug-related issues.

CO4. Hospital pharmacy administrators guarantee the secure and punctual distribution of medications to different hospital departments.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	2	1
CO2	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	2	1
CO3	3	3	1	-	3	3	3	3	2	2	2	3	3	2	1	2	1
CO4	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	2	1

1=lightly mapped      2= moderately mapped      3=strongly mapped

Unit	Relevance to the local, national, regional and global developmental needs	Relevance To the Employability/ Entrepreneurship/ Skill Development	Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability	SD G	NEP	POE/4 <sup>t</sup> IR
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ER2025T	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability			
Unit I	-	-	-	in systematic drug information queries and laboratory report interpretation prioritize patient safety, evidence-based practice, and ethical conduct. These values ensure accurate information retrieval and informed decision-making to optimize drug therapy and provide high-quality patient care. of patients, ensuring that their needs, preferences, and safety are at the	-	-	Develop skills in systematic drug information queries by mastering search techniques, evaluating primary, secondary, and tertiary resources, and providing evidence-based information. Enhance laboratory report interpretation skills through understanding test results, identifying clinical implications, and tailoring drug therapy for optimal patient care.	-	-	Human values in systematic drug information queries and laboratory report interpretation include patient-centered care, empathy, accuracy, transparency, ethical conduct, and a commitment to evidence-based decision-making. These values ensure safe and effective patient care and respect for individual needs.	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development

				forefront of all pharmacy activities.										
Unit II				PTCs and hospital formulary management should be guided by evidence-based medicine, ensuring that medications and therapies are selected, evaluated, and included in the formulary based on the best available scientific evidence. Prioritizing the well-being and safety of patients is paramount. Medication and therapeutic decisions should always			Stay updated with the latest medical and pharmaceutical information, including emerging therapies and treatment guidelines, to make informed decisions about formulary inclusions and therapeutic recommendations. Enhance skills in critically evaluating scientific evidence, clinical trials, and research studies to make			Recognize and empathize with the needs, concerns, and perspectives of patients and their families when making formulary decisions and therapeutic recommendations. Show respect for the autonomy and dignity of patients by involving them in decision-making processes and respecting their cultural,		Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development

				consider individual patient needs, preferences, and safety.			evidence-based decisions regarding medication selection and use.			religious.				
Unit III				The global values of drug distribution in hospitals encompass principles and ethical standards that transcend national boundaries and guide the practice of pharmacy in healthcare settings worldwide. These values emphasize universal principles and ethical standards that should be upheld by healthcare professionals involved in drug			Skill development in the context of drug distribution in hospitals is essential to ensure that healthcare professionals involved in this process can effectively and safely manage medication distribution.			Drug distribution in hospitals involves a complex process that directly impacts patient care and safety. Upholding human values is essential to ensure that this process is conducted with integrity, compassion, and a focus on patient well-being.		Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development



				distribution in hospitals across diverse cultural and healthcare environments										
Unit IV				Supply chain management in hospital pharmacy involves the procurement, storage, distribution, and management of pharmaceuticals and medical supplies to ensure that healthcare facilities can provide safe and effective patient care. Global values in hospital pharmacy supply chain management encompass principles and ethical			skills in supply chain management is crucial for professionals looking to excel in this field, as it encompasses various aspects of planning, sourcing, production, logistics, and distribution			Supply chain management is not just about logistics and operations; it also involves a set of human values and ethical considerations. These values guide professionals in making responsible decisions and conducting their work in a way that respects the welfare of individuals, communities, and the environment		Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development

				standards that transcend national boundaries and guide the practice of pharmacy in healthcare settings worldwide. These values emphasize universal principles and ethical standards that should be upheld by healthcare professionals engaged in supply chain management in hospitals across diverse cultural and healthcare environments.										
Unit V		-	-	"Compounding" in the context of hospitals typically refers to the process of	-	-	Developing the skills required for pharmaceutical compounding in hospitals	-	-	Compounding in hospitals involves the preparation of customized medications	-	Skills for Decent Work (SDG	Professional Education (17.1-17.5)	Skill Development

				preparing medications or pharmaceuticals by combining different ingredients to create customized medications for individual patients. It is a critical function in healthcare, especially in hospitals, as it ensures that patients receive the right dosage and form of medication to meet their specific medical needs.			involves a combination of knowledge, technical expertise, and attention to detail. Acquire a strong foundation in pharmaceutical science, including pharmacology, pharmaceuticals, and pharmacokinetics.			to meet individual patient needs. The practice of pharmaceutical compounding in hospital settings is guided by several human values and ethical principles, which prioritize patient safety, well-being, and ethical conduct.		4.4)		
Unit VI		-	-	Radiopharmaceuticals is a specialized field within healthcare that involves the use of radioactive	-	-	skills in radiopharmaceuticals encompass radiation safety, patient-centered	-	-	The human values of radiopharmaceuticals prioritize patient well-being, safety, ethics, and	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development

				materials (radioisotopes) for diagnostic and therapeutic purposes. The global values associated with radiopharmaceuticals are shaped by the need to balance the potential benefits of nuclear medicine with safety, ethical considerations, and patient care.			care, regulatory compliance, ethical conduct, quality, and continuous learning. Professionals must excel in these areas to ensure safe, effective, and ethical use of radioactive materials in healthcare.			informed consent. They promote transparency, respect for patient rights, environmental responsibility, and global collaboration, ensuring responsible and ethical use of radioactive materials in healthcare.				
Unit VII		-	-	Global values in clinical pharmacy emphasize patient-centered care, evidence-based practice, ethical conduct, interdisciplinary			Develop skills in clinical pharmacy by mastering patient assessment, drug therapy management, and medication counseling.			Human values in clinical pharmacy prioritize patient well-being, respect for autonomy, empathy, and ethical conduct.		Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development

				ary collaboration, and continuous learning. These values drive high-quality healthcare, improve patient outcomes, and ensure the responsible use of medications worldwide.			Enhance your knowledge of evidence-based medicine, communication, interdisciplinary teamwork, and staying updated with pharmaceutical advances to provide optimal patient care.			Values include transparency, confidentiality, patient education, and collaborative care, ensuring that healthcare professionals provide compassionate and ethical pharmaceutical care.				
Unit VIII		-	-	Pharmacovigilance prioritize patient safety, transparency, ethical conduct, collaboration, and regulatory compliance. These values drive accurate data reporting, continuous learning, timely risk			Develop skills in pharmacovigilance by mastering adverse event reporting, data analysis, regulatory compliance, and signal detection. Enhance communication, critical thinking, and benefit-risk			Human values in pharmacovigilance prioritize patient safety, transparency, and ethical conduct. Values include empathy for patients, responsibility in reporting adverse		Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development

				assessment, and public health protection, ensuring safe medication use and enhanced healthcare quality globally			assessment abilities, along with staying updated with global pharmacovigilance guidelines and emerging drug safety issues			events, integrity in data analysis, and a commitment to public health, ensuring safe and ethical medication use worldwide.				
Unit IX				Global values regarding medication errors prioritize patient safety, transparency, error prevention, quality improvement, education, interdisciplinary collaboration, reporting systems, technology, standardization, patient involvement, and			Skills to prevent medication errors encompass medication management, communication, critical thinking, attention to detail, standardization, continuous learning, interdisciplinary collaboration, patient education, accurate reporting, and active			Human values in preventing medication errors include empathy for patient safety, honesty in reporting errors, responsibility in medication management, respect for patients' rights, integrity in communication, and a commitment		Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Development

				regulatory oversight. These values ensure safe and high-quality healthcare			participation in quality improvement efforts, ensuring safe and effective medication use.			to continuous improvement, ensuring safe and compassionate healthcare.				
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### ER2025P: Hospital and Clinical Pharmacy Practical

<b>Subject Code:</b> ER20-25P	<b>Subject Name:</b> Hospital and Clinical Pharmacy Practical	<b>L</b>	<b>T</b>	<b>P</b>													
<b>Version 2.0</b>		-	-	<b>1</b>													
<b>Total Contact Hours</b>	25hr																
<b>Pre-requisites/Exposure</b>	Hospital and Clinical Pharmacy																
<b>Co-requisites</b>	Pharmacology, social pharmacy																
<b>Course Objectives</b>																	
<p>Upon completion of this course the student should be able to:</p> <ol style="list-style-type: none"> <li>1. Systematic approaches for addressing drug information queries</li> <li>2. Interpretation of routine laboratory reports to optimize dosage regimens</li> <li>3. Reporting procedures for suspected adverse drug reactions to relevant authorities</li> <li>4. Utilization and management of diverse medical/surgical aids and devices</li> </ol>																	
<b>Course Outcomes (CO)</b>																	
<p>Upon completion of this course the student should be able to:</p> <p>CO1. Respond to drug information queries in a professional manner, providing accurate and informed answers.</p> <p>CO2. Understand and analyze routine laboratory reports.</p> <p>CO3. Comprehend the purposes and techniques for managing different medical and surgical tools and equipment.</p> <p>CO4. Analyze and communicate drug-drug interactions in the treatment of prevalent diseases to enhance drug therapy.</p>																	
<b>CO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>	<b>PO11</b>	<b>PO12</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
CO1	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	2	1
CO2	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	2	1
CO3	3	3	1	-	3	3	3	3	2	2	2	3	3	2	1	2	1
CO4	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	2	1
1=lightly mapped                      2= moderately mapped                      3=strongly mapped																	



Unit	Relevance to the local, national, regional and global developmental needs				Relevance To the Employability/ Entrepreneurship/ Skill Development			Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability				SDG	NEP	POE/4 <sup>th</sup> IR
	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability			
Unit I			Implementing this systematic approach to drug information queries, which involves utilizing primary, secondary, and tertiary resources, is pivotal for efficient pharmaceutical information retrieval. This enhances healthcare decision-making, directly benefiting the national healthcare	information queries, utilizing diverse resources, establishes a standardized model for international collaboration. This promotes evidence-based practices, ensuring consistent standards in pharmaceutical knowledge drug information queries through diverse resource utilization becomes a		-	This experiment cultivates critical skills, honing information retrieval proficiency, analytical thinking, and effective reporting. Participants develop expertise in interpreting medical data, enhancing their ability to contribute meaningfully to healthcare decision-making on both national and global scales.					SDG 3: Good Health and Well-Being	Institutional Restructuring and Consolidation (10.1-10.14)	Corporate/Company Trips/Projects

			system and elevating patient care standards.	universal model. This promotes collaborative knowledge sharing, facilitates evidence-based practices, and establishes consistent standards in pharmaceutical information management, contributing to the advancement of global healthcare.									
Unit II			Leveraging laboratory findings to optimize drug treatment in clinical cases is essential for meeting national development needs. This approach	Tailoring drug therapies based on laboratory findings is crucial for national development, enhancing healthcare efficiency, and aligning with global			Developing skills in clinical data interpretation, treatment optimization, and aligning healthcare strategies with national and global priorities is essential for contributing				well-being for all at all ages (SDG 3)	Institutional Restructuring and Consolidation (10.1-10.14)	Corporate/Company Trips/Projects

			enhances healthcare efficacy, refines treatment strategies, and aligns with the broader goals of advancing the nation's healthcare infrastructure and well-being, emphasizing national skills.	health priorities. This approach ensures effective treatment strategies, contributing to the overall advancement of the nation's healthcare sector in harmony with global development imperatives.			effectively to diverse developmental contexts within the healthcare sector.							
Unit III			Implementing this approach, utilizing laboratory findings to optimize drug treatment, aligns with national development goals. It enhances	Utilizing ADR reporting forms and diverse causality assessments globally advances pharmacovigilance, promotes drug safety, and			Implementing ADR reporting forms and causality assessments hones skills in pharmacovigilance, enhancing expertise in drug safety evaluation					Ensure healthy lives and promote	Institutional Restructuring and Consolidation (10.1-10.14)	Corporate/Company Trips/Projects

			healthcare efficacy, refining treatment strategies, and contributes to advancing the nation's healthcare infrastructure. Similarly, integrating ADR reporting forms strengthens pharmacovigilance, supporting evidence-based policies crucial for public health progress and national development.	strengthens international collaboration in healthcare. This proactive approach aligns with global development imperatives for safer and more effective medical treatments.			for better healthcare outcomes.							
Unit IV	-	-	Commencing with this methodology, furnishing	Hands-on training ensures healthcare	-	-	1.Hands-on training in medical aids	-	-	-	-	well-being for all at all ages	Institutional Restructuring and	Corporate/Company Trips/Projects

		<p>practical experience in utilizing orthopedic aids, surgical instruments, and medical supplies cultivates the competence of healthcare professionals, in harmony with national values of skill development . Simulated training on medical equipment and supplies further enriches healthcare providers' proficiency, ensuring enhanced patient care. Enhancing skills in identifying and employing medical aids and supplies fortifies the</p>	<p>professionals worldwide adhere to standardized practices, fostering consistency and elevating global healthcare standard. Proficient use of medical aids promotes collaboration and knowledge exchange among healthcare professionals globally, contributing to a shared understanding of best practices Globally trained professionals can effectively utilize medical aids in emergency situations,</p>										<p>SDG 3)</p>	<p>Consolidation (10.1-10.14)</p>	
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			healthcare infrastructure, reflecting the national value of robust healthcare systems.	leading to a more coordinated and efficient response to health crises on an international scale.										
Unit v			Implementing this approach on a national scale fosters a culture of continuous improvement in healthcare, aligning with the national value of promoting excellence in professional development and ensuring the highest standards of patient care across the country	Simulated wounding scenarios and role-play enhance global healthcare readiness by standardizing protocols, fostering international collaboration, and strengthening emergency response capabilities.								Ensure healthy lives and promote	Institutional Restructuring and Consolidation (10.1-10.14)	Corporate/Company Trips/Projects
Unit-VI			The implementation of mannequin-	Utilizing mannequins for			Global utilization of mannequins					Ensure healthy lives and promote	Institutional Restructuring and	Corporate/Company Trips/Projects

		based vaccination and injection techniques nationally enhances healthcare workforce skills, standardizes administration procedures, and improves immunization program quality, thereby fostering better public health outcomes across the country.	vaccination and injection techniques on a global scale enhances healthcare proficiency, ensuring standardized administration practices and facilitating international training standardization			for vaccination and injection techniques enhances healthcare professionals' skills, ensuring consistent and standardized administration practices worldwide.							Consolidation (10.1-10.14)	
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### ER20-26T: Pharmacy Law and ethics

<b>Subject Code:</b> ER20-26T	<b>Subject Name:</b> Pharmacy Law and ethics	<b>L</b>	<b>T</b>	<b>P</b>
<b>Version 2.0</b>		<b>3</b>	<b>1</b>	<b>0</b>
<b>Total Contact Hours</b>	75 hr			
<b>Pre-requisites/Exposure</b>	Pharmacy Law and ethics			
<b>Co-requisites</b>	Ethics			
<b>Course Objectives</b>				
Upon completion of this course the student should be able to: <ol style="list-style-type: none"><li>1. General perspectives, history, evolution of pharmacy law in India</li><li>2. Act and Rules regulating the profession and practice of pharmacy in India</li><li>3. Important code of ethical guidelines pertaining to various practice standards</li><li>4. Brief introduction to the patent laws and their applications in pharmacy</li></ol>				
<input type="checkbox"/>				
<b>Course Outcomes (CO)</b>				
On completion of this course, the students will be able to: CO1-Describe the history and evolution of pharmacy law in India				



CO2- Interpret the act and rules regulating the profession and practice of pharmacy in India

CO3-Discuss the various codes of ethics related to practice standards in pharmacy

CO4-Interpret the fundamentals of patent laws from the perspectives of pharmacy

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	1	1
CO2	3	2	1	-	3	3	3	3	2	2	2	3	3	2	2	2	2
CO3	2	2	2	-	2	3	2	3	2	3	2	2	2	3	2	1	1
CO4	2	1	2	2	2	4	2	4	2	2	4	4	1	2	2	2	1

1=lightly mapped                      2= moderately mapped                      3=strongly mapped

Chapt er	Relevance to the local, national, regional and global developmental needs				Relevance To the Employability/ Entrepreneurship/ Skill Development			Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability				SDG	NEP	POE /4 <sup>th</sup> IR			
	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability						
ER2026T																	
1-4	-	-	Law provide a framework for regulating the pharmacy profession nationally, with various Acts and historical developments shaping drug regulation and pharmacy practice	-	-	-	-	Provide professional ethics related to the Pharmacy profession. Ex-Prohibition of Unethical Practices	-	-	-	-	Skills for Decent Work (SDG 10.3)	Profes sional Educat ion (17.1-17.5)	Profes sional Ethics		

			worldwide.											
5-8	-	-	Help in improvement and subsequent amendments, establish the legal framework for the regulation and quality control of drugs, prohibition of magic remedies and cruelty of animal.	-	-	-	-	Code of Conduct, Patient Welfare, Confidentiality, Competence and Continuing Education, Regulatory Oversight.	-	-	-	Skills for Decent Work (SDG 10.3)	Professional Education (17.1-17.5)	Professional Ethics
9-12	-	-	Provide fare price, equal distribution and availability of drugs throughout the country. Prohibition of illegal termination of pregnancy.	-	-	-	-	Keep the data confidential of According MTP act. Aware the consumers towered the act.	-	-	-	Skills for Decent Work (SDG 10.3)	Professional Education (17.1-17.5)	Professional Ethics

13-16	-	-	They provide Good Regulatory practices in Community Pharmacy, Hospital pharmacy, Pharma Manufacturing, Wholesale business, inspections, import, export of drugs and medical devices. And also gives basic concept of ANDA, NDA, and clinical trial.	-	-	-	-	Developed ethics to keep the data of confidential of Intellectual Property Rights, Emergency Use Authorization, NDA and ANDA.	-	-	-	Skills for Decent Work (SDG 10.3)	Professional Education (17.1-17.5)	Professional Ethics
17-21	-	-	Blood bank, disaster management, consumer protection, all are regulate and construct by governm	-	-	-	-	Provide professional ethics related to the several acts those are protect human being as well animals.	-	-	-	Skills for Decent Work (SDG 10.3)	Professional Education (17.1-17.5)	Professional Ethics

			ent by providin g acts serval governin g bodies at national level.											
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