

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)

1



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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. 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

CONTENTS

S.	Particulars	Page No.
1.	Introduction	5-5
2.	About School	5-6
3.	Programs Offered by School	6-6
4.	Program Duration	7-7
5.	Class Timings	7-7
6.	Syllabus of D. Pharmacy	9-163

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	Р
ER20-11T	Pharmaceutics – Theory	4	
ER20-11P	Pharmaceutics – Practical		3
ER20-12T	Pharmaceutical Chemistry – Theory	4	

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

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

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

PO 1 Pharmacy Knowledge: Possess the core and basic knowledge associated with the profession of pharmacy.

PO 2 Thinking Abilities: Examine issues rationally and logically; shall acquire, evaluate, and synthesize information and knowledge relevant to an identified problem.

PO3 Planning Abilities: Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills.

PO 4 Leadership Skills: 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.

PO 5 Professional Identity: Understand, analyze and communicate the value of their professional roles in society.

PO 6 Pharmacy and Society: 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.

PO 7 Environment and sustainability: Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development

PO 8 Professional Ethics: Honor personal values and apply ethical principles in professional and social contexts and take responsibility for the outcomes associated with the decisions.

PO 9 Individual or teamwork: Understand the need for leadership and teambuilding for fulfillment of practice, professional and societal responsibilities.

PO 10 Communication: Develop good communication skills so as to communicate effectively with the pharmacy community and with society at large.

PO 11 Modern & Usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.

PO 12 Life-long Learning: 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.

Programme Specific Outcomes

PSO1 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.

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

	Year I	Year II
Courses	10	11
Credits	0	0

Diploma I Year

ER20-11T: PHARMACEUTICS-I Theory

ER20-	-11T						Pha	rmace	utics-I			L	T	1		Р	
Version 2.0 3 1 0 The LOC start H 751																	
Total Contact Hours 75 hours																	
Pre-re	equisi	tes/Ex	posur	e													
Co-requisites Pha									utics								
									v	ectives	5						
Upon	1						shoul	d be a	ble to:								
1.	Basi	c conc	epts, t	ypes a	nd nee	ed.											
2.	Adva	intage	s and o	disadv	antage	s, met	hods o	of prep	oaratio	n / for	mulati	on.					
3.	Pack	aging	and la	beling	requi	rement	ts.										
4.	Туре	s of T	ablets	and C	apsule	s											
5.	Basi	c quali	tv con	trol te	sts. co	ncepts	of au	alitv a	Issurar	ice and	l good	manu	facturir	ng pract	ices.		
		1	J		,	I I	1.	j.			0			01			
							Co	urse (Outcor	nes (C	0)						
On c	comple	etion c	of this	course	, the s	tudent	s will	be abl	e to:								
CO1	Desc	ribe al	oout th	e diffe	erent d	osage	forms	and t	heir fo	rmulat	tion as	pects.					
CO2	2 Expl	ain the	e advai	ntages.	, disad	vantag	ges, an	d qua	lity co	ntrol te	ests of	differ	ent dos	age fori	ns.		
				0		-		-	•	manut				C			
00.) D130	455 th	mpo	rtanee	or que	unty a.	ssuran		1 2000	manu	acturi	ng pro	ietiees				
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PSO	PSO	PSO	PSO	PSO
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	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
]	l=ligh	tly ma	pped		2=1	moder	ately r	nappe	b		3=strong	gly map	ped		

Unit		ance to the al and glob			Relevance To the Employability/ Entrepreneurship/ Skill Development			Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability			SDG	NEP	POE/4 th IR	
ER201 1T	Loc al	Regio nal	Nation al	Global	Employab ility	Entrepreneu rship	Skill Developm ent	Professi onal Ethics	Gend er	Human Values	Environm ent & Sustainab ility			
Unit I	-	-		The history of pharmacy in India dates back to ancient times, with modern developmen ts in education, industry,			Pharmacy in India, rooted in ancient knowledge, saw modernizati on during British rule, leading to robust	_		Pharmacy in India has ancient roots, but modernizati on began during British rule, leading to robust education, a		Decent Work SDG 4.4)	Professio nal Educatio n (17.1- 17.5)	Developm ent

	and practice	education, a	thriving	
	during	thriving	industry,	
	British rule.	industry,	diverse	
	Today,	diverse	practice	
	pharmacy	practice	areas, and	
	offers	areas, and	active	
	diverse	active	professional	
	career	professional	associations.	
	opportuniti	associations	Pharmacy	
	es.	. It offers	offers	
	Pharmacop	promising	promising	
	oeias like IP,	career	careers.	
	BP, USP, NF	prospects.	Pharmacopo	
	set drug	Pharmacop	eias like IP,	
	standards,	oeias like IP,	BP, USP, and	
	with IP	BP, USP,	NF set drug	
	ensuring	and NF set	standards,	
	quality in	drug	with IP	
	India's	standards,	addressing	
	thriving	with IP vital	human	
	pharmaceut	for India's	values by	
	ical	skill	ensuring	
	industry,	developmen	safe and	
	vital for	t and global	quality	
	global	healthcare	medicines	
	health	needs,	for	
	needs.	ensuring	healthcare	
		quality	needs.	
		medicines.		
Unit II -	- Packaging	Packaging -	- Packaging -	Skills for Professio Skill
	materials	materials,	materials	Decent nal Developm
	vary,	including	like glass	Work (Educatio ent
	including	glass	(recyclable,	SDG 4.4) n (17.1-
	glass	(fragile,	inert),	17.5)
	(recyclable,	recyclable),	plastic	

fragile),	plastic	(lightweight,	
plastic	(lightweight	versatility),	
(lightweight	, diverse),	metal	
	metal	(durable,	
environmen	(durable,	costly), and	
tal	costly), and	rubber	
concerns),	rubber	(flexible,	
metal	(flexible,	limited use)	
(durable,	specialized),	offer diverse	
costly), and	vary based	options.	
rubber	on product	Human	
(flexible,	needs. Skill	values need	
limited use).	developmen	eco-friendly,	
Selection	t in	safe	
depends on	packaging	packaging	
product	aligns with	aligning with	
characteristi	industry	sustainabilit	
cs.	demands	y, health,	
Sustainable	for	and ethics,	
choices	sustainable	addressing	
align with	materials,	concerns	
global	innovative	about	
developmen	design, and	waste,	
tal needs,	efficient	pollution,	
reducing	manufacturi	and product	
waste and	ng, crucial	safety.	
environmen	for the		
tal impact,	packaging		
fostering	sector's		
eco-friendly	growth.		
packaging			
solutions.			

Unit -	Organolepti	Pharmaceut	Pharmaceuti	
111	c agents	ical aids like	cal aids like	
	enhance the	organolepti	organoleptic	
	sensory	c agents	agents	
	qualities of	(color,	(color,	
	medicines	flavor,	flavor,	
	(color,	sweetness)	sweetness)	
	flavor,	enhance	improve	
	sweetness).	drug appeal.	medicine's	
	Preservative	Preservative	sensory	
	s prevent	s, such as	appeal.	
	microbial	parabens	Preservative	
	spoilage,	and	s (e.g.,	
	including	benzalkoniu	parabens,	
	parabens	m chloride,	benzalkoniu	
	and	extend shelf	m chloride)	
	benzalkoniu	life by	ensure	
	m chloride.	inhibiting	safety and	
	They ensure	microbial	longevity.	
	global	growth. Skill	Human	
	health	developmen	values need	
	needs are	t involves	medicines to	
	met by	formulation	be palatable	
	extending	expertise,	and safe,	
	product	ensuring	enhancing	
	shelf life,	safe and	patient	
	reducing	appealing	adherence	
	waste, and	medicines,	and trust,	
	maintaining	aligning	fostering	
	drug	with	healthcare	
	efficacy and	industry	ethics and	
	safety.	demands	values.	
		for quality		
		and		
		innovation.		

Unit-	Unit	Unit	Unit	
IV	operations	operations	operations	
	are	in	are vital in	
	fundamenta	pharmaceut	pharmaceuti	
	l in	icals	cals. Size	
	pharmaceut	encompass	reduction	
	ical	size	(hammer	
	manufacturi	reduction	mill, ball	
	ng. Size	(e.g. <i>,</i>	mill) reduces	
	reduction	hammer	particle size.	
	(e.g. <i>,</i>	mill, ball	Size	
	hammer	mill), size	separation	
	mill, ball	separation	(cyclone,	
	mill)	(cyclone,	sieves)	
	reduces	sieves),	ensures	
	particle size	mixing	uniformity.	
	for drug	(double	Mixing	
	formulation.	cone	(double	
	Size	blender,	cone	
	separation	turbine	blender,	
	(cyclone,	mixer, triple	turbine	
	sieves)	roller mill,	mixer, triple	
	ensures	Silverson	roller mill,	
	uniformity.	mixer	homogenize	
	Mixing	homogenize	r)	
	(cone	r), filtration	homogenize	
	blender,	theory	s	
	turbine	(membrane,	ingredients.	
	mixer, roller	sintered	Filtration	
	mill,	glass),	(membrane,	
	homogenize	drying	sintered	
	r)	(fluidized	glass)	
	homogenize	bed, freeze	separates	
	s	drying), and	solids.	
	ingredients.	extraction.	Drying	

	Filtration	Skill	(fluidized	
	(membrane,	developmen	bed, freeze	
	sintered	t in these	drying)	
	glass)	operations	removes	
	separates	is critical for	moisture.	
	solids from	pharmaceut	Extraction	
	liquids.	ical	extracts	
	Drying	professional	active	
	(fluidized	s, ensuring	compounds,	
	bed, freeze	quality,	supporting	
	drying)	safety, and	health	
	removes	efficacy in	needs and	
	moisture.	drug	ethical drug	
	Extraction	manufacturi	production.	
	plays a vital	ng and		
	role in	contributing		
	obtaining	to industry		
	active	growth and		
	compounds	innovation.		
	from			
	natural			
	sources,			
	contributing			
	to drug			
	developmen			
	t and global			
	health			
	needs.			
Unit-V	Pharmaceut	The	Pharmaceuti	
	ical product	pharmaceut	cal products	
	diversity	ical industry	like tablets	
	addresses	requires a	(coated,	
	global	highly	uncoated,	
	healthcare	skilled	modified),	
	challenges.	workforce	capsules	

ci ::ii	for the	(house coff	
Skill	for the	(hard, soft	
developmen	developmen	gelatin),	
t in dosage	t,	liquid oral	
form	manufacturi	preparations	
preparation	ng, and	, topical	
ensures	quality	products,	
accessibility,	control of	nasal and	
safety, and	various	ear	
efficacy.	dosage	preparations	
Immunologi	forms like	, powders,	
cal	tablets,	sterile	
products,	capsules,	formulations	
sterile	liquids,	, and	
formulation	topical	immunologi	
s, and	preparation	cal products	
diverse drug	s, powders,	cater to	
delivery	sterile	human	
systems	formulation	health	
contribute	s, and	needs.	
to global	immunologi	Ensuring	
health,	cal	their quality,	
emphasizing	products.	safety, and	
equitable	Skill	efficacy	
access and	developmen	aligns with	
quality	t is crucial	ethical	
healthcare.	to ensure	values in	
	safe and	healthcare,	
	effective	prioritizing	
	drug	patient well-	
	production,	being and	
	meeting	trust.	
	global		
	healthcare		
	standards,		
	and		
	unu		

		fostering		
		innovation		
		in the		
		pharmaceut		
		ical sector.		
Init-	Pharmaceut	Pharmaceut	Pharmaceuti	
I	ical	ical	cal	
	manufacturi	manufacturi	manufacturi	
	ng plants	ng plants	ng plants	
	have	have	are	
	specific	distinct	organized	
	layouts and	layouts with	with	
	sections for	production,	production,	
	production,	quality	quality	
	quality	control, and	control, and	
	control, and	assurance	assurance	
	assurance.	sections.	sections.	
	Quality	Quality	Quality	
	control	control	control	
	ensures	maintains	maintains	
	product	product	product	
	consistency,	quality,	quality,	
	while	while	while quality	
	quality	quality	assurance	
	assurance	assurance	ensures	
	focuses on	ensures	process	
	process	process	integrity,	
	integrity	integrity,	following	
	and	adhering to	cGMP.	
	regulatory	cGMP.	Calibration	
	compliance.	Calibration	and	
	Compliance	and	validation	
	with cGMP,	validation	uphold	
	calibration,	are crucial	human	
	and	skills for	values by	

	validation	pharmaceut	guaranteein	
	ensures safe	ical	g safe,	
	and	professional	effective,	
	effective	s, ensuring	and ethical	
	medicines,	safe and	drug	
	meeting	effective	production,	
	global	drug	emphasizing	
	healthcare	production,	patient well-	
	standards,	supporting	being and	
	fostering	industry	trust.	
	patient	growth, and		
	trust, and	fostering		
	advancing	expertise in		
	global	quality		
	health	managemen		
	goals.	t.		
Unit-	Novel drug	Novel drug	Novel drug	
VII	delivery	delivery	delivery	
	systems	systems,	systems	
	revolutioniz	such as	improve	
	e healthcare	liposomes	drug	
	globally by	and	effectivenes	
	improving	microspher	s and	
	drug	es, enhance	patient	
	effectivenes	drug	compliance.	
	s. Examples	efficacy.	They include	
	include	Skill	oral,	
	nanomedici	developmen	transdermal,	
	ne and	t in their	and	
	implantable	design and	nanotechnol	
	devices.	implementa	ogy-based	
	Benefits	tion is vital,	systems.	
	include	aligning	Advantages	
	targeted	with	include	
	therapy and	industry	precise	

reduced	demands	dosing and
side effects,	for	reduced side
but	innovative	effects,
challenges	drug	while
like cost and	delivery	challenges
accessibility	solutions,	involve
remain.	supporting	complexity.
Addressing	pharmaceut	Aligning
these needs	ical	with human
aligns with	professional	values,
global	s in	these
healthcare	advancing	systems
goals for	patient care	prioritize
improved	and	patient well-
treatment	treatment	being,
outcomes.	outcomes.	safety, and
		convenience
		in i
		healthcare.

ER20-11P: PHARMACEUTICS-I Practical

ER20-11P	L	Т	P				
Version 2.0	0	0	3				
Total Contact Hours 75 hr							
Pre-requisites/Exposure							
Co-requisites	Pharmaceutics						
Course Objectives							
Upon completion of this course the student show	uld 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

СО	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			e local, nat bal develo	/	Relevance To the Employability/ Entrepreneurship/ Skill Development		Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability		man Values, Environment & Sustainability			NEP	POE/4 th IR	
ER201 1P	Loc al	Regio nal	Nation al	Global	Employab ility	Entrepreneu rship	Skill Developm ent	Professi onal Ethics	Gend er	Human Values	Environm ent & Sustainab ility			

Unit I	- The history-	- Pharmacy in-	- Pharmacy in-	Skills for Professio Skill
	of pharmacy	India,	India has	Decent nal Developm
	in India	rooted in	ancient	Work (Educatio ent
	dates back	ancient	roots, but	SDG 4.4) n (17.1-
	to ancient	knowledge,	modernizati	17.5)
	times, with	saw	on began	
	modern	modernizati	during	
	developmen	on during	British rule,	
	ts in	British rule,	leading to	
	education,	leading to	robust	
	industry,	robust	education, a	
	and practice	education, a	thriving	
	during	thriving	industry,	
	British rule.	industry,	diverse	
	Today,	diverse	practice	
	pharmacy	practice	areas, and	
	offers	areas, and	active	
	diverse	active	professional	
	career	professional	associations.	
	opportuniti	associations	Pharmacy	
	es.	. It offers	offers	
	Pharmacop	promising	promising	
	oeias like IP,	career	careers.	
	BP, USP, NF	prospects.	Pharmacopo	
	set drug	Pharmacop	eias like IP,	
	standards,	oeias like IP,	BP, USP, and	
	with IP	BP, USP,	NF set drug	
	ensuring	and NF set	standards,	
	quality in	drug	with IP	
	India's	standards,	addressing	
	thriving	with IP vital	human	
	pharmaceut	for India's	values by	
	ical	skill	ensuring	
	industry,	developmen	safe and	
	vital for	t and global	quality	

	global health needs.	healthcare needs, ensuring quality medicines.	medicines for healthcare needs.	
Unit II -	- Packaging materials vary, including glass (recyclable, fragile), plastic (lightweight , environmen tal concerns), metal	Packaging materials, including glass (fragile, recyclable), plastic (lightweight , diverse), metal (durable, costly), and rubber (flexible,	- Packaging materials like glass (recyclable, inert), plastic (lightweight, versatility), metal (durable, costly), and rubber (flexible, limited use)	Skills for Professio Skill Decent nal Developm Work (Educatio ent SDG 4.4) n (17.1- 17.5)
	(durable,	specialized),	offer diverse	
	costly), and	vary based	options.	
	rubber	on product	Human	
	(flexible,	needs. Skill	values need	
	limited use).	developmen	eco-friendly,	
	Selection	t in	safe	

	depends on	packaging	packaging	
	product	aligns with	aligning with	
	characteristi	industry	sustainabilit	
		demands		
	cs. Sustainable	for	γ, health, and ethics,	
	choices	sustainable	addressing	
			_	
	align with	materials,	concerns	
	global	innovative	about	
	developmen	design, and	waste,	
	tal needs,	efficient	pollution,	
	reducing	manufacturi	and product	
	waste and	ng, crucial	safety.	
	environmen	for the		
	tal impact,	packaging		
	fostering	sector's		
	eco-friendly	growth.		
	packaging			
	solutions.			
Jnit -	Organolepti	Pharmaceut	Pharmaceuti	
II	c agents	ical aids like	cal aids like	
	enhance the	organolepti	organoleptic	
	sensory	c agents	agents	
	qualities of	(color,	(color,	
	medicines	flavor,	flavor,	
	(color,	sweetness)	sweetness)	
	flavor,	enhance	improve	
	sweetness).	drug appeal.	medicine's	
	Preservative	Preservative	sensory	
	s prevent	s, such as	appeal.	
	microbial	parabens	Preservative	
	spoilage,	and	s (e.g.,	
	including	benzalkoniu	parabens,	
	parabens	m chloride,	benzalkoniu	
	and	extend shelf	m chloride)	
	benzalkoniu	life by	ensure	

	m chloride.			
		inhibiting	safety and	
	They ensure	microbial	longevity.	
	global	growth. Skill	Human	
	health	developmen	values need	
	needs are	t involves	medicines to	
	met by	formulation	be palatable	
	extending	expertise,	and safe,	
	product	ensuring	enhancing	
	shelf life,	safe and	patient	
	reducing	appealing	adherence	
	waste, and	medicines,	and trust,	
	maintaining	aligning	fostering	
	drug	with	healthcare	
	efficacy and	industry	ethics and	
	safety.	demands	values.	
		for quality		
		and		
		innovation.		
Unit-	Unit	Unit	Unit	
IV	operations	operations	operations	
	are	in	are vital in	
	fundamenta	pharmaceut	pharmaceuti	
	l in	icals	cals. Size	
	pharmaceut	encompass	reduction	
	ical	size	(hammer	
	manufacturi	reduction	mill, ball	
	ng. Size	(e.g.,	mill) reduces	
	reduction	hammer	particle size.	
	(e.g.,	mill, ball	Size	
	hammer		separation	
			-	
	mill)	cyclone,	sieves)	
	reduces		ensures	
	-	sieves), mixing		
	fundamenta I in pharmaceut ical manufacturi ng. Size reduction (e.g., hammer mill, ball	in pharmaceut icals encompass size reduction (e.g., hammer mill, ball mill), size separation	are vital in pharmaceuti cals. Size reduction (hammer mill, ball mill) reduces particle size. Size separation (cyclone,	

formulation.	cone	(double
Size	blender,	cone
separation	turbine	blender,
(cyclone,	mixer, triple	turbine
sieves)	roller mill,	mixer, triple
ensures	Silverson	roller mill,
uniformity.	mixer	homogenize
Mixing	homogenize	r)
(cone	r), filtration	homogenize
blender,	theory	s
turbine	(membrane,	ingredients.
mixer, roller	sintered	Filtration
mill,	glass),	(membrane,
homogenize	drying	sintered
r)	(fluidized	glass)
homogenize	bed, freeze	separates
s	drying), and	solids.
ingredients.	extraction.	Drying
Filtration	Skill	(fluidized
(membrane,	developmen	bed, freeze
sintered	t in these	drying)
glass)	operations	removes
separates	is critical for	moisture.
solids from	pharmaceut	Extraction
liquids.	ical	extracts
Drying	professional	active
(fluidized	s, ensuring	compounds,
bed, freeze	quality,	supporting
drying)	safety, and	health
removes	efficacy in	needs and
moisture.	drug	ethical drug
Extraction	manufacturi	production.
plays a vital	ng and	
role in	contributing	
obtaining	to industry	

	active	growth and		
	compounds	innovation.		
	from			
	natural			
	sources,			
	contributing			
	to drug			
	developmen			
	t and global			
	health			
	needs.			
Unit-V	Pharmaceut	The	Pharmaceuti	
	ical product	pharmaceut	cal products	
	diversity	ical industry	like tablets	
	addresses	requires a	(coated,	
	global	highly	uncoated,	
	healthcare	skilled	modified),	
	challenges.	workforce	capsules	
	Skill	for the	(hard, soft	
	developmen	developmen	gelatin),	
	t in dosage	t <i>,</i>	liquid oral	
	form	manufacturi	preparations	
	preparation	ng, and	, topical	
	ensures	quality	products,	
	accessibility,	control of	nasal and	
	safety, and	various	ear	
	efficacy.	dosage	preparations	
	Immunologi	forms like	, powders,	
	cal	tablets,	sterile	
	products,	capsules,	formulations	
	sterile	liquids,	, and	
	formulation	topical	immunologi	
	s, and	preparation	cal products	
	diverse drug	s, powders,	cater to	
	delivery	sterile	human	

	systems	formulation	health	
	contribute	s, and	needs.	
	to global	immunologi	Ensuring	
	health,	cal	their quality,	
	emphasizing	products.	safety, and	
	equitable	Skill	efficacy	
	access and	developmen	aligns with	
	quality	t is crucial	ethical	
	healthcare.	to ensure	values in	
		safe and	healthcare,	
		effective	prioritizing	
		drug	patient well-	
		production,	being and	
		meeting	trust.	
		global		
		healthcare		
		standards,		
		and		
		fostering		
		innovation		
		in the		
		pharmaceut		
		ical sector.		
Unit-	Pharmaceut	Pharmaceut	Pharmaceuti	
VI	ical	ical	cal	
	manufacturi	manufacturi	manufacturi	
	ng plants	ng plants	ng plants	
	have	have	are	
	specific	distinct	organized	
	layouts and	layouts with	with	
	sections for	production,	production,	
	production,	quality	quality	
	quality	control, and	control, and	
	control, and	assurance	assurance	
	assurance.	sections.	sections.	

Quality	Quality	Quality	
control	control	control	
	maintains	maintains	
ensures			
product	product	product	
consistency,	quality,	quality,	
while	while	while quality	
quality	quality	assurance	
assurance	assurance	ensures	
focuses on	ensures	process	
process	process	integrity,	
integrity	integrity,	following	
and	adhering to	cGMP.	
regulatory	cGMP.	Calibration	
compliance.	Calibration	and	
Compliance	and	validation	
with cGMP,	validation	uphold	
calibration,	are crucial	human	
and	skills for	values by	
validation	pharmaceut	guaranteein	
ensures safe	ical	g safe,	
and	professional	effective,	
effective	s, ensuring	and ethical	
medicines,	safe and	drug	
meeting	effective	production,	
global	drug	emphasizing	
healthcare	production,	patient well-	
standards,	supporting	being and	
fostering	industry	trust.	
patient	growth, and		
trust, and	fostering		
advancing	expertise in		
global	quality		
health	managemen		
goals.			
guais.	t		

Unit-	Novel drug	Novel drug	Novel drug	
VII	delivery	delivery	delivery	
	systems	systems,	systems	
	revolutioniz	such as	improve	
	e healthcare	liposomes	drug	
	globally by	and	effectivenes	
	improving	microspher	s and	
	drug	es, enhance	patient	
	effectivenes	drug	compliance.	
	s. Examples	efficacy.	They include	
	include	Skill	oral,	
	nanomedici	developmen	transdermal,	
	ne and	t in their	and	
	implantable	design and	nanotechnol	
	devices.	implementa	ogy-based	
	Benefits	tion is vital,	systems.	
	include	aligning	Advantages	
	targeted	with	include	
	therapy and	industry	precise	
	reduced	demands	dosing and	
	side effects,	for	reduced side	
	but	innovative	effects,	
	challenges	drug	while	
	like cost and	delivery	challenges	
	accessibility	solutions,	involve	
	remain.	supporting	complexity.	
	Addressing	pharmaceut	Aligning	
	these needs	ical	with human	
	aligns with	professional	values,	
	global	s in	these	
	healthcare	advancing	systems	
	goals for	patient care	prioritize	
	improved	and	patient well-	
	treatment	treatment	being,	
	outcomes.	outcomes.	safety, and	

					convenience		
					in		
					healthcare.		

ER20-12P: Pharmaceutical Chemistry I – Practical

Subject Code - ER20-12P	Subject Name - Pharmaceutical Chemistry I – Practical	L	Т	Р							
Version 2.0		0	0	3							
Total Contact Hours	3 hrs.										
Pre-requisites/Exposure	Inorganic a	and Med	icinal chemistry								
Co-requisites Analytical chemistry											
Course Objectives											
Upon completion of this course the	student should be able to:										
1. To know the methods for it	dentification of impurities in inorganic drugs and pharm	naceuticals	5.								
2. Volumetric analysis of the	chemical substances										
3. Basics of preparatory chem	istry and their analysis										
4. Systematic qualitative anal	ysis for the identification of the chemical drugs										
	Course Outcomes (CO)									
On completion of this course, th	e students will be able to:										
CO1: Perform the limit tests for	various inorganic elements and report										
CO2: Prepare standard solution	s using the principles of volumetric analysis										
				33							

CO3: Test the purity of the selected inorganic and organic compounds against the monograph standards **CO4:** Synthesize the selected chemical substances as per the standard synthetic scheme **CO5:** Perform qualitative tests to systematically identify the unknown chemical substances

00011		quan	0010110		00,00	01110.010	<i>f</i> and <i>f</i> an	.on only	0110 01								
со	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			oped	3=strongly mapped									

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 NEP NEP	
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	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability	SDG	NEP	POE/4 th IR
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	1	-	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			Theoreticalandpractical skillsforsynthesisofdifferentcompounds			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 -	-	-	-	Disciplinary		Qualitative		Right	-	Skills	Professional	Employability
viii				knowledge/		analysis of Drugs		Conduct,		for	Education	
				Critical				accuracy,		Decent	(17.1-17.5)	
				thinking/Problem				fairness,		Work		
				solving/				honesty,		(SDG		
				Research-related				justice		4.4)		
				skills/Analytical								
				reasoning								

ER20-13T: Pharmacognosy Theory

ER20-13T	Pharmacognosy- Theory	L	Т	Р			
Version 2.0		3	1	0			
Total Contact Hours	75 hours						
Pre-requisites/Exposure	Herbal Drug Technology						
Co-requisites	Pharmacognosy	Pharmacognosy					
	Course Objectives						

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

	PO	PO	PO	PO	PO	PSO	PSO	PSO	PSO	PSO							
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	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 local, nationaregional and development needs	al, global	E Entre	elevance To the Employability/ preneurship/ Ski Development	11	Relevance	e to the Pro		nics, Gender, Hu ustainability	man Values, Er	vironment	SDG	NE P	POE/4 th	IR
ER 2013 P	Local	Regio nal	Nationa l	Global	Emp loya bility	Entrep reneurs hip	Skill Develo pment	Professi onal Ethics	Gender	Human Values	Environme Sustainabil				
Unit I		Study of Crude Drugs develop ment their use as medicina lly.Its help to enhance their knowled ge											Global Citizenship (SDG 4.7)	More Holistic and	Educatio n Knowled ge

1		
Unit II	They	"1.3 Towards a
	address	Implement More
	critical	nationally Holistic
	aspects of	appropriat and
	Raw	e social Multidisci
	materials	protection plinary
	of herbal	systems Education
	drugs	and
	,validation	measures (11.1-
	and their	for all, 11.13)
	purpose	including
	according	floors"
	to WHO.	
Unit III		End all Global
		forms of Educatio
		malnutritio n
		n (SDG Knowled
		2.2) ge
Unit IV	globally	Ensure
	relevant	healthy
	because they	lives and
	provide the	
	knowledge and	promote
	tools necessary	well-being
	to evaluation of	for all at
	medicinal hebal	all
	drugs. Senerio	ages (S
	of herbal drugs	DG 3)
	standardization	
	is nessary to	
Unit v	health	"1.3
	national	e social
Unit v	significant role of herbs.as global level. health systems and ongoing	Implement nationally appropriat

	т т		1 1		1		1	
		health					protection	
		programs					systems	
		in India is	b l				and	
		of nationa					measures	
		relevance					for all,	
		as it					including	
		directly					floors"	
		affects the						
		well-being						
		well-being of the						
		population						
		population						
		, 1- 1-1						
		healthcare						
		access,						
		and the	2					
		nation's						
		overall						
		developm						
		ent. It also						
		highlights						
		the						
		important						
		role of						
		herbs and						
		crude						
		drugs						
		used as						
		neutraceu						
		ticals.						
Unit-VI	<u> </u>		lt informs				<u>├</u>	
Unit-vi			healthcare					
			decision-					
			making,					
			resource					
			allocation, and					
			policy					
			development,					
			ultimately					
			impacting the					

	accessibility, affordability, and quality of healthcare services worldwide.					
Unit VII		By the				Global
		study of				Educatio
		the				n
		course				Knowled
		as				ge
		employ				
		bility				
		related				
		to				
		health				
		sector				
		will be				
		enhanc				
		ed				

ER20-13P: Pharmacognosy Practical

ER20-13P	Pharmacognosy– Practical	L	Т	Р					
Version 2.0		0	0	3					
Total Contact Hours	75 hours								
Pre-requisites/Exposure	Herbal Drug Technology								
Co-requisites Pharmacognosy									
Course Objectives									

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

1. Practical knowledge of microscopical and macroscopical evaluation crude drugs

2. Practical knowledge of extraction 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. Understanding the various processes involved in extraction of crude drugs

CO3. Evaluation and quality control of crude drugs

СО	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	РО 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	2	1	I	3	3	3	3	2	2	2	3	3	2	1	2	-
CO 2	3	2	1	-	3	3	3	3	2	2	2	3	3	2	1	2	-
CO 3	3	3	1	-	3	3	3	3	2	2	2	3	3	2	1	2	-
	1=lightly mapped							moder	ately	mappe	d	3	=strong	ly map	ped		

nit	the l natio regio glob	onal and al elopment	Em Entre	vance To ployabili epreneurs Developr	ty/ hip/	Relevance to Human Value						NEP	POE/4 th IR	
ER 2013 P	Lo ca l	Regi onal	Natio nal	Glob al	Emplo yabilit y	Entrepre neurship	Skill Develo pment	Profe ssion al Ethic s	Ge nd er	Hu ma n Va lue s	Enviro nment & Sustain ability			
Unit I		Study of Crude Drugs develop ment their use as medicin ally.Its help to enhance their knowle dge										Sustainable Development and Globa Citizenship (SDG 4.7)	More Holistic and Multidisciplina	tion Knowl edge
Unit II			They address critical aspects of Raw material s of herbal drugs ,validati on and their purpose accordin g to WHO.									"1.3 Implement nationally appropriate social protection systems and measures for all, including floors"	11.13)	
Unit III												End all forms of malnutrition (SDG 2.2)		Global Educa tion Knowl edge

· · ·		 · · ·		
Unit	globally		Ensure	
IV	relevant		healthy lives	
	because			
	they		and promote	
	provide		well-being for	
	the		all at all	
			ages (SDG	
	knowled		3)	
	ge and		57	
	tools			
	necessar			
	y to			
	evaluati			
	on of			
	medicin			
	al hebal			
	drugs.			
	Senerio			
	of			
	herbal			
	drugs			
	standar			
	dization			
	is			
	nessary			
	to			
	significa			
	nt role			
	of			
	herbs.as			
	global			
	level.			
Unit	health		"1.3	
v	systems		Implement	
v	and		nationally	
	ongoing		appropriate	
	national		social	
	health		protection	
	program		systems and	
	s in India		measures for	
	is of		all, including	
	national		floors"	
	relevanc			
	e as it			
	directly			
	affects			
	the well-			
	being of			
	the			
	populati			
	on,			
	healthca			
	re			
	access,			
1 1 1	ducess.			
	and the nation's			

						1			r	
	overall									
	develop									
	ment. It									
	also									
	highlight									
	s the									
	importa									
	nt role									
	of herbs									
	and									
	crude									
	drugs									
	used as									
	neutrace									
	uticals.									
Linit		1+								
Unit-		lt · ·								
VI		informs								
		healthca								
		re								
		decision								
		-making,								
		resource								
		allocatio								
		n, and								
		policy								
		develop								
		ment,								
		ultimate								
		ly								
		impactin								
		g the								
		accessibi								
		lity,								
		affordab								
		ility, and								
		quality								
		of								
		healthca								
		re								
		services								
		worldwi								
		de.								
Unit			By the							Global
VII			study of							Educa
			the							tion
			course as							Knowl
			employbil							edge
			ity related							
			to health							
			sector will							
			be							
			enhanced							
	1	1	u		1		L		I	L

ER20-14T: Human Anatomy & Physiology Theory

ER2014 T	Human Anatomy and Physiology- Theory	L	Т	P
Version 2.0		3	1	0
Total Contact Hours	75 Hr		1	
Pre-requisites/Exposure	Basic knowledge of Biology			
Co-requisites	Knowledge of biology			
	Course Objectives			
Upon completion of this course the stude	ent should be able to			
1. Pedagogical learning of Structure an	d functions of the various organ systems a	nd or	gans	s of
the human body				
2. Understanding Homeostatic mechani	isms and their imbalances in the human boo	ły		
3. Explaining various vital physiologica	l parameters of the human body and their s	ignific	ance	es
4. Explain the gross morphology, struct	ure and functions of various organs of the h	uman	bod	y.
5. Describe the various homeostatic me	chanisms and their imbalances.			
6. Identify the various tissues and organ	ns of different systems of human body.			
7. Perform the various experiments rela	ated to special senses and nervous system.			
(Course Outcomes			
On completion of this course, the students	will be able to:			
CO1: This subject is designed to impart fu	undamental knowledge on the structure and fu	inction	s of	
the various systems of the human body.				
CO2: It also helps in understanding both h	omeostatic mechanisms.			
CO3: The subject provides the basic know pharmacy.	wledge required to understand the various disc	cipline	s of	
CO4. It anlightens the students about the	calls various types of tissues in human body	r alval	aton	

CO4: It enlightens the students about the cells, various types of tissues in human body, skeleton system, skeletal and smooth muscles.

CO5: 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	PS05
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	-	-

Unit	and g	lobal deve	elopmental no		Entreprene	ce To the Emplo eurship/ Skill De	velopment	Gender, H	ce to the Pro Iuman Value Sustainal	es, Env bility	ironment &	SDG	NEP	POE/4 th IR
ER201 4T	Loc al	Regio nal	National	Global	Employa bility	Entrepreneu rship	Skill Develop ment	Professi onal Ethics	Gender	Hu ma n Va lue s	Environ ment & Sustainab ility			
Unit I	-	-		anatomy and physiology contribute to addressing public health challenges and promoting global health equity. Understand ing the human body's structure and functions is essential for	-		Education initiatives at the student level often emphasiz e these subjects to produce healthcare profession als skill.		-		-	4.1(educa tion and promote lifelong learning opportun ities for all)	-	Projects/Assig nments

Unit II	addressing global health threats such as infectious diseases, non- communica ble diseases, and emerging pandemics Knowledg e of	understan ding of	- 4.1(educa - tion and	Projects/Assig nments
	e of cellular processes is crucial for developin g personaliz ed treatment plans and implemen ting targeted therapies tailored to	cellular mechanis ms to diagnose and treat diseases effectively within their communit ies.	promote lifelong learning opportun ities for all)	

	individual patients' needs.			
Unit	The	understan - ding and role of tissues in the human body are relevant across various developm ental levels	- 4.1(educa - tion and promote lifelong learning opportun ities for all)	Projects/Assig nments

	s worldwide			
Unit - IV	- Understand- ing bone tissue's structure, function, and health determinan ts is essential for promoting musculosk eletal wellness, preventing bone- related disorders	Knowledge	- 4.1(educa ⁻ tion and promote lifelong learning opportun ities for all)	Projects/Assig nments
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 measurem ents.	- 4.1(educa- tion and promote lifelong learning opportun ities for all)	Projects/Assig nments

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

1 1	population			
Unit	understa Knowledge	Developin	4.1(educa	Projects/Assig
VII	nding of of the	g skills for	tion and	nments
	cardiac cardiac		promote	
	anatomy cycle helps	comprehe	lifelong	
	and healthcare	nsive		
		understan	learning	
	physiolog professiona		opportun	
	y to ls interpret	ding of	ities for	
	improve symptoms,	cardiac	all)	
	cardiovas perform	anatomy		
	cular diagnostic	and		
	health tests, and	physiolog		
	outcomesdevelop	y is		
	across treatment	essential		
	the plans	for		
	populatio tailored to	healthcare		
	n. individual	profession		
	patients'	als,		
	needs	researcher		
		s, and		
		students		
		interested		
		in		
		cardiovasc		
		ular		
		health		
		and		
		medicine.		
Unit	- Understand	profession-	4.1(educa-	Projects/Assig
VIII	ing the	als	tion and	nments

anatomy	knowlodg	promoto
anatomy	knowledg	promote
and	eable	lifelong
physiology	about	learning
of	respirator	opportun
respiratory	y anatomy	ities for
organs is	and	all)
essential	physiolog	
for	y to	
addressing	provide	
global	effective	
health	care for	
challenges	patients	
related to	with	
respiratory	respirator	
diseases,	y illnesses.	
including		
infectious		
diseases		
like		
tuberculosi		
s and		
influenza,		
as well as		
chronic		
conditions		
like asthma		
and		
chronic		
obstructive		
pulmonary		
disease		
(COPD).		

Unit	- Many	Understan -	 4.1(educa [_]	Projects/Assig
IX	infectious	ding how	tion and	nments
	diseases,	the GIT	promote	
	such as	processes	lifelong	
	diarrheal	and	learning	
	diseases	absorbs	opportun	
	and	nutrients	ities for	
	parasitic	is	all)	
	infections,	essential		
	affect the	for		
	GIT.	addressin		
	Understand	g global		
	ing GIT	issues		
	anatomy	related to		
	and	malnutriti		
	physiology	on and		
	is critical	food		
	for	insecurity.		
	preventing,			
	diagnosing,			
	and			
	treating			
	these			
	diseases,			
	which			
	disproporti			
	onately			
	affect			
	population			
	s in low-			
	and			
	middle-			
	income			

		countries.			
Unit	- The	focus on -	- Utilize -	 4.1(educa⁻	Projects/Assig
x	skeletal	preventing	anatomica	tion and	nments
	system	skeletal	l models,	promote	
	provides	injuries,	diagrams,	lifelong	
	structural	such as	and charts	learning	
	support,	fractures	to	opportun	
	protects	and	visualize	ities for	
	vital	osteoporos	the	all)	
	organs,	is, through	skeletal		
	and	education,	system in		
	facilitates	lifestyle	three		
	movemen	interventio	dimension		
	t.	ns, and	s.		
		access to			
		adequate			
		healthcare			
		services.			
Unit		Understand [_]	- Learn to -	 4.1(educa ⁻	Projects/Assig
XI		ing the	interpret	tion and	nments
		nervous	neuroima	promote	
		system is	ging	lifelong	
		fundament	studies	learning	
		al for	and	opportun	
		diagnosing	recognize	ities for	
		and	anatomica	all)	
		treating			
		neurologic	structures,		
		al disorders	functional		
		and mental	connectivi		
		health	ty		

	conditions, which affect millions of people worldwide. and Facilitate the exchange of knowledge, resources, and expertise, leading to breakthrou ghs in treatments and interventio ns for neurologic al	patterns, and abnormali ties in the nervous system.	
Unit	conditions. Understa -	- Sense	4.1(educa - Projects/Assi
XII	ndersta - nding the anatomy and physiolog y of sense	sense organs play a crucial role in detecting	4.1(educa - Projects/Assi tion and nments promote lifelong learning opportun

	physiolog y of the urinary	of the urinary	opportun ities for	
	and	cal	lifelong learning	
	anatomy	physiologi	promote	
XIII	ding the	d the	tion and	nments
Unit	- Understan -	organs. Understan	4.1(educa	Projects/Assig
		sensory		
		affect		
		that can		
		exposures		
		ental		
		environm		
		and		
		g injuries		
	disorders.	preventin		
	balance	for		
	loss, and	strategies		
	hearing	health		
	loss,	public		
	vision	informs		
	such as	function		
	disorders	sensory		
	nts and	e of		
	impairme	Knowledg		
	sensory	hazards.		
	treating	health		
	diagnosin g and	and potential		
	ntal for	stimuli		
	fundame	ental	all)	

system is	system,	all)
essential	including	
for	urine	
diagnosin	formation,	
g and	filtration,	
treating	reabsorpti	
urinary	on,	
tract	secretion,	
infections,	and	
kidney	excretion of	
diseases,	metabolic	
	waste	
and	products.	
urinary	products.	
incontinen		
ce, which		
affect		
millions of		
people		
worldwide		
and Focus		
on		
improving		
access to		
kidney		
care		
services,		
including		
screenings		
,		
diagnostic		

	s, dialysis, and transplant ation, particularl y in underserv ed communit ies where renal diseases are prevalent.		
Unit XIV	Endocrine disruptors, environme ntal toxins, and	Develop skills in reading and critically	- 4.1(educa - Projects/Assig tion and nments promote lifelong learning
	lifestyle	evaluating	opportun
	factors can	scientific	ities for
	impact	literature	all)
	endocrine	on	
	gland	hormone	
	function	physiolog	
	and	y,	
	hormone	endocrine	
	regulation. Knowledge	disorders, and	
	of		
		hormone-	

			· · · · · ·			<u> </u>
		endocrine	related			
		physiology	research			
		informs	studies.			
		strategies				
		for				
		preventing				
		endocrine-				
		related				
		diseases,				
		promoting				
		hormonal				
		balance,				
		and				
		reducing				
		the risk				
		factors				
		associated				
		with				
		endocrine				
		disorders.				
Unit	-	Education	Study the		-	- Projects/Assig
XV		and	physiologi	Knowledge		nments
		informatio	cal	about		
		n about	changes	gender		
		reproductiv	that occur	(Differntiat		
		e system	during	e between reproducti		
		and	puberty in	ve organs		
		menstruati	both	of male		
		on cycle,	males and	and		
		pregnancy	females,	female)		
		and	including			
		parturition	the			

			developm				
			ent of				
			secondary				
			sexual				
			characteri				
			stics,				
			hormonal				
			fluctuatio				
			ns, and				
			reproducti				
			ve				
			maturity.				

ER20-14P: Human Anatomy & Physiology Practical

ER2014 P	Human Anatomy and Physiology-Practical	L	Т	Р
Version 2.0		0	0	3
Total Contact Hours	75 Hr			
Pre-requisites/Exposure	Pharmacology			
Co-requisites	Human Anatomy			
	Course Objectives			

1. General blood collection techniques and carrying out various haematological assessments and interpreting the results

2. Recording and monitoring the vital physiological parameters in human subjects and the basic interpretations of the results

3. Microscopic examinations of the various tissues permanently mounted in glass slides

4. Discuss the anatomical and physiological characteristics of various organ systems of the body using models, charts, and other teaching aids.

Course Outcomes (CO)

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

CO1. Perform the haematological tests in human subjects and interpret the results

CO2. Record, monitor and document the vital physiological parameters of human subjects and interpret the results

CO3. Describe the anatomical features of the important human tissues under the microscopically conditions

CO4. Discuss the significance of various anatomical and physiological characteristics of the human body

Course Code	Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5
ER20- 14P	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>l=w</i>	eakly i	mappe	d, 2=	= mode	erately	mapp	ed,	3=stro	ngly ma	pped			

Unit			e local, nationa nental needs	l, regional and		nce To the Emple eurship/ Skill De			Human V		onal Ethics, Invironment	SDG	NEP	POE/4 th IR
ER201 4P	Loc al	Regio nal	National	Global	Employa bility	Entrepreneu rship	Skill Developm ent	Professi onal Ethics	Gen der	Hu man Valu es	Environ ment & Sustainab ility			
Unit I	-	-	-	use microscopy techniques to analyze raw materials, inspect product integrity, assess product purity, and investigate material properties at the microscopi c level.	-		microscopy techniques into curricula to enhance students' understand ing of biological concepts, cell biology, histology, and microbiolo gy.		-		-	promote lifelong learning opportun	nal Restructu ring and Consolida	developm ent
Unit II	-	-	-	The techniques for the collection of blood	-	-	Blood collection centers operate in countries worldwide,	-	-	-	-	promote lifelong	nal Restructu ring and Consolida	developm ent

					f = _: :+ ('		l			10 1 4	
				are crucial	facilitating					10.14)	
				component	voluntary				all)		
				s of	blood						
				healthcare	donations						
				systems	from						
				worldwide,	eligible						
				ensuring	donors to						
				the safe	meet						
				acquisition	transfusion						
				of blood	needs,						
				samples for	emergency						
				diagnostic,	response						
				therapeutic	efforts, and						
				, and	healthcare						
				research	demands.						
				purposes.							
Unit	-	-	-		Microscopi			-	4.1(educa	Institutio	Skills
Ш				Microscopi	c				tion and	nal	developm
				с	examinatio					Restructu	ent
				examinatio	n of tissue				lifelona	ring and	
				n of tissue	specimens,				learning	Consolida	
				is a	obtained					tion	
				fundament	through				··· · · · · ·	(10.1- 10.14)	
				al aspect of	biopsies,				all)	10.14)	
				medical	surgical				- /		
				diagnosis,	resections,						
				research,	or						
				and	autopsies,						
				education	is essential						
1				worldwide,	for						
				providing	diagnosing						
				valuable	a wide						
				insights							
			I	insights							

	into cellular structures, disease processes, and treatment strategies	range of diseases, including cancer, infectious diseases, autoimmun e disorders, and genetic conditions.
Unit	Worldwid - e, the study of the human skeleton is an integral compone nt of medical education. It forms the basis for understan ding anatomy, pathology, and radiology.	the study 4.1(educa Institutio Skills of the human skeleton, encompass ing the axial and appendicul ar skeleton, transcends geographic al boundaries and cultural contexts, offering profound insights into human biology,

г г			<u>г</u>	<u>г</u>	1	1				
			Healthcar	evolution,						
			е	health, and						
			profession	cultural						
			als,	heritage on						
			including	a global						
			doctors,	scale.						
			surgeons,							
			radiologist							
			s, and							
			physical							
			therapists,							
			globally							
			use							
			skeletal							
			knowledg							
			e to							
			diagnose							
			and treat							
			various							
			conditions							
			, plan							
			surgeries,							
			and							
			interpret							
			medical							
			imaging.							
			iniuging.							
Unit v –	-	-	The	 Blood ·		-	-	4.1(educa	Institutio	Skills
			determinati	group data				tion and	nal	developm
			on of	are utilized					Restructu	ent
									ring and	

	blood	in	lifelong Consolida
	groups	epidemiolo	learning tion
	holds	gical	opportun (10.1-
	significant	studies,	ities for 10.14)
	global	disease	all)
	importance	surveillance	
	across	programs,	
	various	and public	
	sectors,	health	
	including	interventio	
	healthcare,	ns to	
	transfusion	monitor	
	medicine,	infectious	
	forensic	diseases,	
	science,	assess	
	and	disease risk	
	anthropolo	factors, and	
	gy.	quide	
	55	healthcare	
		policy	
		decisions.	
Unit	Healthcare -	- Monitoring	- 4.1(educa Institutio Skills
VI	professiona	changes in	tion and nal developm
	ls around	ESR levels	promote Restructuent
	the world	helps	lifelong ring and
	utilize ESR	clinicians	learning Consolida
	testing as a	assess the	tion
	screening	response	ities for (10.1- 10.14)
	tool for a	to	all)
	variety of	treatment	
	diseases,	and disease	
	including	progressio	

	infections, autoimmun e disorders, inflammato ry diseases, and certain cancers.	such as rheuma arthritis system lupus eryther sus, and giant co arteritis	toid , c nato d ell			
Unit- VII	the determinati on of hemoglobi n content in blood is a cornerston e of clinical medicine, public health, and biomedical research efforts worldwide.	- Detern Haemog n conte blood	lobi	tion pro lifel lear opp	educa Institutio Skil and nal dev mote Restructu ent ring and Consolida tion (10.1- 10.14)	velopm
Unit VIII	- Bleeding time- assessment is essential for diagnosing and	- Bleedin time assessm		tion pro lifel	educa Institutio Skil and nal dev mote Restructu ^{ent} ong Consolida tion	velopm

	monitoring patients with hematologic disorders, such as von Willebrand disease, hemophilia, thrombocyto penia, and platelet function disorders.					all)	10.14)	
Unit IX	on of clotti time signif globa prosp acros variou medi speci and healt settin contr g to t diagr	ng holds ficant al bects is us cal alties hcare ngs, ibutin the	monitoring, and manageme nt of bleeding disorders, coagulopat hies, and thrombotic conditions.	- -		promote lifelong learning opportun	nal Restructu ring and Consolida	developm ent

	and manageme nt of bleeding disorders, coagulopat hies, and thrombotic conditions.						
Unit-X	Healthcare providers worldwide use WBC count measureme nts to diagnose and monitor infectious diseases, including bacterial, viral, fungal, and parasitic infections, and to assess the severity and progressio	Determinati - on of WBC count of blood and various diseases			promote lifelong learning opportun	Institutio nal Restructu ring and Consolida tion (10.1- 10.14)	developm ent

					[[I			r	1
		n of								
	i	nflammato								
		у								
		conditions.								
Unit		Healthcare		Determinati			-	4.1(educa		Skills
XI	r	providers		on of RBC				tion and		developm
	v	worldwide		count of				promote	Restructu	ent
	L	use RBC		blood and				lifelong	ring and	
	c	count		various				learning	Consolida	
	r	neasureme		diseases				opportun	tion (10.1-	
	r	nts to						ities for	10.14)	
	a	assess the						all)	10.14)	
	s	severity,								
		etiology,								
		and								
	r	response								
	t	reatment								
	i	n patients								
		, with iron								
		deficiency								
		anemia,								
		/itamin								
	c	deficiencies								
		hemolytic								
		anemias,								
		and								
		chronic								
		diseases.								
Unit	Determination			various			-	4.1(educa	Institutio	Skills
хн	of Differential			systems of				tion and	nal	developm
		Differential		, the human					Restructu	ent
	blood	count of		body				p. 0.110 (C	ring and	

	blood	lifelong Consolida	
		learning tion	
		opportun (10.1-	
		ities for 10.14)	
		all)	
Unit XIII	Recording of- Blood Pressure in various postures, different arms, before and after exertion and interpreting the results	to optimize 4.1(educa Institutio Sk blood nal de pressure control and prevent associated complicatio ns such as heart disease, stroke, and	levelopm
		kidney damage.	
Unit	Explore the -	nowledge 4.1(educa Institutio Sk	skills
XIV	structure and function of human body systems to elucidate disease mechanism s, develop new therapies, and	of anatomy and physiology to design personalize d treatment plans for patients recovering from injuries, surgeries,	levelopm

improve	or chronic			
diagnostic	health			
tools for	conditions.			
diverse				
medical				
conditions.				

ER20-15T: Social Pharmacy Theory

Subject	Code	: ER20	-15T				9	Social	Pharm	асу			L 3		Т 1		P 0
Version	n 2.0																
Total Co	ontact	Hours	5				7	75 hrs.					•	·		•	
Pre-req	uisite	s/Expo	sure									Social S	Sciences				
Co-requ	uisites							Pharmaceutics									
								Cour	se Obj	ectives							
Upon co	omplet	tion of	this co	ourse t	he stud	lent sh	ould b	e able	to:								
1.	Public	: healt	h and i	nation	al heal	th pro	grams										
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5.	Gene	rai role	es and	respor	ISIDIIITI	es ot p				ic health omes (C							
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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	-	-
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1=lightly mapped 2= moderately mapped 3=strongly mapped																	

Unit		elevance to the local, national, gional and global developmental eeds Relevance To the Employability/ Entrepreneurship/ Skill Development						Iuman V		onal Ethics, nvironment	SDG	NEP	POE/ 4 th IR	
ER2 0- 15T	Loc al	Regio nal	Nation al	Global	Employa bility	Entrepreneu rship	Skill Develop ment	Professi onal Ethics	Gen der	Hu man Val ues	Environ ment & Sustaina bility			
Unit				It encompas ses fundament al principles and practices in public health, healthcare systems, and health policy. The knowledg								Sustainable Development and Global Citizenship (SDG 4.7)		eGlobal IEducati on Knowle dge

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Unit They "1.3 Implement	Fowards a More	
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Unit		health					"1.3 Implement	
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Unit	It informs
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		worldwide					

Diploma II Year

ER2021T: Pharmacology- Theory

ER202	21 T					Phari	nacol	ogy –	Theo	ry			L	т			Р
Versio	n 2.0												3	1	L		0
Total C	ontact	Hours	5			75 Hr											
Pre-ree	quisite	s/Expo	osure								Pha	rmacol	ogy				
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								Co	ourse O	utcome	s						
	mplet			,													
CO1- T	The sub	ject is	design	ed to s	strengt	hen the	e basic	know	ledge i	n the fie	eld of pl	narmacc	ology an	id to imp	part reco	ent adva	inces in
the dru	igs used	d for tl	ne treat	tment	of vari	ous dis	seases.										
CO-2Iı	n additi	ion, th	e subje	ect help	os the s	student	to uno	derstar	nd the	concepts	s of drug	g action	and me	chanisn	n involv	ved.	
CO-3T	his sub	oject p	rovides	s the k	nowled	lge of	endocı	rine ph	narmac	ology, c	hemoth	erapy, a	ntibioti	cs, and i	mmuno	ology.	
CO-4S	tudent	is able	e to uno	derstar	d the	disease	s like	Parkin	isonisn	n, cance	r, Alzhe	imer, di	abetes 1	nellitus	and its	treatme	nt & It
also de	als wit	h the f	ree rac	lical pl	harmac	cology,	its eti	ology	and pa	thophys	siology i	in vario	us neuro	odegene	rative d	iseases.	
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CO1	3	1	2	3	2	1	3	1	2	3	2	3	3	2	1	2	3
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Uni t	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 & Suctainability			SDG	NEP	POE/4 th IR
	Local	Regional	National	Global	Employability	Entrepreneurshi p	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability			
Unit	-	-	-	Drugs can be administere d 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(qu ality educat ion and promo te lifelon g learnin g opport unitie)	-	Projects/Assignm ents/Presentation s/soft skills development

			action.							
Unit II	-		the pharmacol ogical action of drugs on the PNS underscore s the importance of equitable access to safe and effective medication s, as well as the need for comprehen sive healthcare infrastructu re and education to optimize patient outcomes worldwide.		Pharmacologic al,classification , mechanism of action,uses,cont raindications of drug	-		4.1(qu ality educat ion and promo te lifelon g learnin g opport unitie)	Institutional Restructuri ng and Consolidati on (10.1- 10.14)	Projects/Assignm ents/Presentation s/soft skills development

Unit	-	-	-	the developme nt of effective strategies for preventing blindness and preserving vision in populations worldwide.	 Understanding the Pharmacologic al action, advesre effect and containdication s of various drug	-	_	-	-	4.1(qu ality educat ion and promo te lifelon g learnin g opport unitie)	Institutional Restructuri ng and Consolidati on (10.1- 10.14)	Projects/Assignm ents/Presentation s/soft skills development
Unit	-	-	-	Challenges related to drug safety and misuse of CNS medication s, including addiction, dependenc e, and overdose, require coordinate d efforts to implement appropriate prescribing practices,	Understanding the Pharmacologic al action, advesre effect and containdication s of various drug	-	-	-	-	4.1(qu ality educat ion and promo te lifelon g learnin g opport unitie)	Institutional Restructuri ng and Consolidati on (10.1- 10.14)	Projects/Assignm ents/Presentation s/soft skills development

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Unit - v	on ca lar en the im of co siv ap to ca lar pri dis pri an ma nt ad co	ardiovascu r health comotion, sease revention,	Understanding the Pharmacologic al action, advesre effect and containdication s of various drug		4.1(qu ality educat ion and promo te lifelon g learnin g opport unitie)	Institutional Restructuri ng and Consolidati on (10.1- 10.14)	Projects/Assignm ents/Presentation s/soft skills development

	biological, behavioral, environme ntal, and social determinan ts of health across diverse populations and settings.			
Unit -VI	drugs acting on blood and blood- forming groups underscore s the importance of comprehen sive approaches to hematologi cal care, including the prevention, diagnosis, and	Understanding the Pharmacologic al action, advesre effect and containdication s of various drug	4.1(qu ality educat ion and promo te lifelon g learnin g opport unitie)	Projects/Assignm ents/Presentation s/soft skills development

	treatment of hematologi cal disorders, as well as the optimizatio n of blood transfusion practices and the promotion of safe and effective pharmacot herapy.			
Unit -VII	a critical role in the symptomati c manageme nt of respiratory conditions and improving quality of life for patients with respiratory diseases	Understanding the Pharmacologic al action, advesre effect and containdication s of various drug	4.1(qu ality educat ion and promo te lifelon g learnin g opport unitie)	

Unit - VIII	healthcare disparities, promoting access to essential medication s, and implementi ng evidence- based treatment strategies to improve patient outcomes and quality of life for individuals affected by	Understanding the Pharmacologic al action, advesre effect and containdication s of various 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	gastrointest inal disorders the role of	Understanding	4.1(qu	Projects/Assignm
-IX	drugs in kidney health emphasizes the importance of comprehen sive,	the Pharmacologic al action, advesre effect and containdication s of various drug	ality educat ion and promo te lifelon g learnin	ents/Presentation s/soft skills development

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	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

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ER2021P: Pharmacology Practical

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Version 2.0												0	()	2	2
Total Conta	ct Hours	6								ļ	50 hr					
Pre-requisi	tes/Expo	osure							Human	Anator	ny and	Physic	ology			
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Unit		nce to the l obal develo		nal, regional eeds		nce To the Employ eurship/ Skill Devo		Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability		SDG	NE P	POE/4 th IR		
ER202 1P	Loca l	Region al	Nation al	Global	Employabil ity	Entrepreneurs hip	Skill Developm ent	Professio nal Ethics	Gend er	Hum an Value s	Environme nt & Sustainabil ity			
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(Ski lls for Decent Work)		Soft skills developm ent

	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,	th de re	iterpret - ne dose ependent esponses of rugs			4.4(Ski lls for Decent Work)	Soft skills developm ent

	advancing ocular pharmacolog y, and promoting patient safety in ophthalmic practice		
Unit III -	studying the - mydriatic and miotic effects on the rabbit eye is essential for advancing our understandin g of ocular pharmacolog y, improving the safety and efficacy of ophthalmic medications	Interpret the dose dependent responses of drugs	- 4.4(Ski - Soft skills lls for developm Decent ent Work)
Unit IV -	studying the - effects of analgesics	experiment model to study the effects of	- 4.4(Ski - Soft skills lls for developm Decent ent Work

	using analgesiomet	the given) drugs acting
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	animal models is essential for	central nervous system
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	findings into clinical	
Unit v	practice.	Hands on 4.4(Ski - Soft skills
		Hands on training of different4.4(Ski -Soft skillsIls for Decentdevelopm ent
		techniques, s that students
		can learn the in vivo, ex
		and invivo techniques

Unit-VI	- Epilepsy encompasses a spectrum of syndromes with varying etiologies and manifestatio ns. Different regions may have higher prevalence rates of specific epilepsy syndromes	Hands on training of different techniques, s that students can learn the in vivo, ex and invivo techniques	4.4(Sk lls for Decen Work)	developm
	genetic predispositio ns or environment al factors. A global perspective facilitates the identification of anti- convulsant drugs effective			

Unit	 va O a Sj	gainst arious types f seizures nd epilepsy yndromes. :he	_	 Hands on	-	_	_	_	4.4(Ski	 Soft skills
VII	s m re u R a re to to th ca to th ca co fa co s s W S I S I S I S I S I S I S I S I S I S	rife creening of nuscle elaxants sing a Rota- cod pparatus nables esearchers o address he diverse auses, ultural actors, drug esponses, nd safety onsideration associated <i>v</i> ith muscle pasms and pasticity. his pproach upports the levelopment		training of different techniques, s that students can learn the in vivo, ex and invivo techniques					lls for Decent Work)	developm ent

		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		
Unit-IX -	-	world. - studying - anxiolytic activity using the elevated plus maze method is critical for	- Hands on training of different techniques, s - - - 4.4(Ski - Is for different techniques, s - - - - 4.4(Ski - Is for different techniques, s - - - - 4.4(Ski - Is for different techniques, s - - - - - 4.4(Ski - Is for different techniques, s - - - - - - - 4.4(Ski - Is for different techniques, s -	Soft skills developm ent

Unit-X	advancingourunderstanding of anxietydisorders,identifyingnewtreatmentoptions, andimprovingthe lives ofindividualsaffected byanxiety-relatedconditionsstudying theeffect ofdrugs onisolatedheart tissueto enhancesunderstanding of drug-cardiacinforms drugdevelopmentand safetyassessment,	- Hands on training of different techniques, s that students can learn the in vivo, ex and invivo techniques	4.4(Ski - lls for Decent Work)	Soft skills developm ent
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	and contributes to the prevention and treatment of cardiovascula r diseases	
Unit-XI	studying the	Hands on 4.4(Ski - Soft skills training of different techniques, s that students can learn the in vivo, ex and invivo techniques

Unit	contributes to the conservation of frog species and their habitats pyrogen	Hands on	 4.4(Ski - Soft skills
	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	training of different techniques, s that students can learn the in vivo, ex and invivo techniques	lls for Decent Work)

en en	mergency					
re	esponse					
са	apabilities in					
th	ne global					
he	ealthcare					

ER2022T: Community Pharmacy and Management Theory

Subject	t Code:	: ER20	-22T				ommu heory	nity P	harma	cy and I	Manage	ment-	L 3		T 1		5 0
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Total C		Hours	5			7	′5 hrs.										
Pre-rec								harma	асу								
Co-req	-	-						cy Mai		ent							
										jectives							
1. Prof	fession	al har	ndling	and fi	lling	orescr	iption										
2. Pati			-			-	-										
3. Pati	ent co	unseli	ng on	presci	ription	and /	or no	n-pres	scripti	on med	icines						
-				0			h as p	atient	inform	nation l	eaflets						
5. Perf	Preparation of counseling materials such as patient information leaflets Performing basic health screening tests																
	. Performing basic health screening tests																
							C	Course	Outco	omes (C	D)						
On con	mpleti	on of	this co	ourse,	the stu	idents	will t	be able	e to:								
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CO2. C																	
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CO4. [leaflet	s.									
CO5. P	erform	basic	health	screer	iing te	sts.											
со	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	-
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Un it	Relevance to the	local, national,	tegional 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 th IR
	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability			
Un it I				The study and understa nding of commun ity pharmac y practice, both in internati onal and Indian contexts, have broad implicati ons for addressi ng global healthca re needs, promoti ng public health, and contribut ing to			The relevance of communit y pharmacy practice to skill developm ent is evident across a spectrum of clinical, communi cation, cultural, technolog ical, and collaborat ive skills. As the healthcar e landscape evolves, continuou s skill	The compre hensive understa nding of the definitio n, history, and develop ment of commu nity pharma cy in internati onal and Indian contexts is crucial for pharma cists to navigate ethical challeng		-		Sustainable Development and Global Citizenship (SDG 4.7)	Professional Education (17.1-17.5)	Global Education Knowledg e

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	the	developm	es and						
	overall	ent is	uphold						
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	y and	for	principl						
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	de.	patient-	, and professi						
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		care.	responsi						
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II	onal	nal	pharma				and Global	and	Knowledg
	responsi	responsi	cists in				Citizenship	Multidisciplina	е
	bilities	bilities	ethical				(SDG	ry	
	of	of	decisio				4.7)	Education	
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	ity	ity	making					11.13)	
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	and	GPP and	-						
			quality,						
	SOPs,	SOPs,	patient-						
	directly	are	centere						
	contribut	integral	d care						
	e to	to skill	while						
	addressi	develop	upholdi						
	ng	ment	ng the						
	global	across	integrit						
	develop	various	y and						
	ment	domains,	values						
	needs by	includin	of the						
	enhancin	g clinical	profess						
	g	practice,	ion.						
	healthca	commun							
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			supporti ng public health initiative s.		overall compete ncy and effective ness of commun ity pharmac ists in meeting the healthcar e needs of the commun ity.					
Un it III		the proper handling of prescript ions, adheren ce to legal and regulato ry require ments, and the impleme ntation of Good Dispensi ng Practice s are nationall y relevant because they impact patient safety, public health, complia nce with			Develop ing these skills will not only enhance your role as a pharma cist but also contribu te to the safe and effectiv e provisio n of healthca re services at the national level.		Righ t Con duct and Trut h	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Develop ment

			the law, and the overall quality and efficienc y of healthca re services										
Un it IV			-	These skills are critical for fosterin g underst anding, collabor ation, and positive outcom es in a world that is increasi ngly intercon nected and diverse.	-	These skills are critical for fosterin g understa nding, collabor ation, and positive outcom es in a world that is increasi ngly intercon nected and diverse.		-	Righ t Con duct, accu racy, fairn ess, hone sty, justi ce		Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Employ ability
Un it v	-	-	-	contrib utes to improvi ng patient outcom es, public health, and the effectiv eness of healthc are	-	these skills will not only enhance your ability to provide effectiv e patient counsell ing but	-	-	Righ t Con duct and Trut h	-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Develop ment, Employ ability

			systems in diverse global context s.		also contribu te to better patient outcom es and satisfact ion, improve d public health, and the overall quality of healthca re services					
Un it v		-	contrib utes to improvi ng patient outcom es, public health, and the effectiv eness of healthc are systems in diverse global context s.		these skills will not only enhance your ability to provide effectiv e patient counsell ing but also contribu te to better patient outcom es and satisfact ion, improve d public health, and the overall quality	-	Righ t Con duct and Trut h	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Develop ment, Employ ability

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				are			enable healthca					(SDG 4.4)		
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1			ity				, contribu							
			pharmac				te to							
			ies have				early							
			national				disease							

		relevanc e as they promote preventi ve care, accessib ility, early detectio n, and the overall health and well- being of the populati on			detectio n, and promote healthie r commu nities.					
Un it- VI II		-	It impact the public health, healthc are regulati ons, and the role of pharma cists in patient care across borders.		It enable healthca re professi onals to provide compre hensive and patient- centered care related to OTC medicat ions, empowe ring patients to make informe d decision s about self- medicat ion while ensurin		-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Develop ment

				g their safety and well-					
				being.					
Un it- IX		Effectiv e manage ment ensures the continue d provisio n of essential pharmac eutical services to the populati on.		being. effectiv e manage ment of commu nity pharma cies, provide high- quality patient care, and contribu te to the well- being of the commu nity while ensurin g regulato ry complia nce and financia l sustaina		-	Skills for Decent Work (SDG 4.4)	Professional Education (17.1-17.5)	Skill Develop ment
				bility.					

ER20-22P: Community Pharmacy and Management – Practical

ER20-	-22 P										MACY ACTIC)		L	Г			P
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Total	Contact	Hour	s			,	75 Hr.										l		
Pre-re	equisites	/Expo	sure										Hospita	l Pro	ducts				
Co-re	quisites												Pha	rmac	y				
								Co	ourse	Obje	ctives								
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	paration forming					as pati	ent info	ormat	10n le	aflets									
	0			<u></u>				С	ourse	e Out	come								
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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	-
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	keleva local, region	develo						L ^o d	En	Entr			Rel Profé	, G	Value & S				
	LOCAI	Regional	National Global					Employability		Entrepreneurship	Skill Development		Professional Ethics	Gender	Human Values	Environment &	Nustamability		

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U	-	-	Identification of drug-drug	-	re -	The	_	_	The	-	Susta	Profes	Ment
ni			interactions is of paramount			identif			identifi		inabl	sional	oring
t			importance in healthcare			icatio			cation		e	Educa	by
II			globally due to several reasons like patient safety,			n of drug-			of drug-		Deve lopm	tion (17.1-	Alum n
			optimizing treatment			drug			drug		ent	17.5)	
			outcomes and drug			intera			interact		and		
			development and regulatory processes			ctions (DDIs			ions (DDIs)		Glob al		
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II				facilitates global healthcare			accura	labelin				Deve	tion	Alum
				access, and promotes			te	g				lopm	(17.1-	n
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	the					operat	thus						
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	health					ensuri	ng the						
	and well-					ng safe	principl es of						
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V	У					unity	cy				Deve	tion	Alum
II	software					pharm	softwar				lopm	(17.1-	n
Ι	and					acy	e and				ent	17.5)	
	digital					softw	digital				and		
	health					are	health				Glob		
	tools					and	tools				al		
	improve					digital	uphold				Citiz		
	access to					health					enshi		
							profess						
	healthcar					tools	ional				p		
	е,					foster	ethics				(SD		
	enhance					S	by				G		
	patient					skills	promot				4.7)		
	care,					devel	ing						
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	safety,					techn	accurat						
	and					ology	e data						
	support					utiliza	manage						
	chronic					tion,	ment,						
	disease					data	and						
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ER20-23T: Biochemistry and Clinical Pathology – Theory

Subject Code: ER20-23T	Subject Name: Biochemistry and Clinical Pathology – Theory	L	Т	Р
Version 2.0		3	1	0
Total Contact Hours	75 hr			

Pre-requisites/E	xpos	ure				Ph	arm	aceu	itical	l Che	emis	try- '	Theory	1			
Co-requisites							arma										
						Co	ours	e Ot	oject	tives							
This course will	discus	ss ab	out ł	oasio	c cor	ncep	ts of	•									
1. Structure and l	Funct	ions	of bi	iomo	oleci	ıles											
Catalytic activ		0				-		-									
1														,			
1	Qualitative and quantitative determination of biomolecules / metabolites in the biological sample Clinical pathology of blood and urine Course Outcomes (CO) Course for this course, the students will be able to O1. Describe the functions of biomolecules Course for the students will be able to																
Biochemical principles of organ function tests and their clinical significance Qualitative and quantitative determination of biomolecules / metabolites in the biological sample Clinical pathology of blood and urine Course Outcomes (CO) pon successful completion of this course, the students will be able to O1. Describe the functions of biomolecules																	
. Qualitative and quantitative determination of biomolecules / metabolites in the biological sample . Clinical pathology of blood and urine Course Outcomes (CO) Ipon successful completion of this course, the students will be able to CO1. Describe the functions of biomolecules																	
5. Clinical pathol	ogy c	of blo	bod a	and u						(0	<u></u>						
Course Outcomes (CO) Jpon successful completion of this course, the students will be able to CO1. Describe the functions of biomolecules																	
Jpon successful completion of this course, the students will be able to CO1. Describe the functions of biomolecules																	
Course Outcomes (CO) 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																	
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																	
 pon successful completion of this course, the students will be able to O1. Describe the functions of biomolecules O2. Discuss the various functions of enzymes in the human system O3. Explain the metabolic pathways of biomolecules in both physiological and pathological 																	
conditions																	
	Course Outcomes (CO) pon successful completion of this course, the students will be able to O1. Describe the functions of biomolecules O2. Discuss the various functions of enzymes in the human system O3. Explain the metabolic pathways of biomolecules in both physiological and pathological onditions																
CO4. Describe th																	
CO5.Determine t	he bi	omol	lecul	les /	met	abol	ites	in th	e giv	ven l	biolo	ogica	l samp	les, bo	th qual	itative	ly and
quantitatively.					0												
CO6.Describe the	e clin	ical j	patho	olog	y of	bloo	od ar	nd ui	rine								
CourseCourse	PO	ΡΛ	ΡΛ	ΡΛ	ΡΛ	ΡΛ	ΡΛ	ΡΛ	ΡΛ	ΡΛ	ΡΛ	ΡΛ	PSO1	PSO2	PSU3	DSU1	PSA
Code Outcom		2	3	4	5	6	7	8	9	10	11	12		1502	1 505	1004	1 500
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	-
001	3	2	-	-	3	3	1	-	-	-	-	1	3	-	3	1	
CO4	2						1	1	+	1	<u> </u>			1			-
CO4 CO5	3	2	-	-	3	3	1	-	-	-	-	1	3	-	3	1	-
		2 2	-	-	3 3	3	1	-	-	-	-	1	3	-	3	1 1	- - -

Unit	Relevance to the	local, national, regional and global	developmental needs		Relevance To the	Employaounty/ Entrepreneurship/	Relevance to the Professional Ethics, Gender, Human Values, Environment	& Sustainability				SDG	NEP	POE/4 th IR
	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment &			-
Unit I	-	-	-	-	-	-	-	-	-	-	-	-	Professiona 1 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 biomolecule s present in our body				-	Sk ill s fo r D ec en t W or k (S D G 4. 4)	Professiona 1 Education (17.1-17.5)	Skill Development

Unit		1		Many diseases,			Basic					Sk	Professiona	Employabilit
	-	-	-	•	-	-		-	-	-	-			
III				including metabolic			knowledge					ill	1 Education	У
				disorders, are linked			of protein					S	(17.1-17.5)	
				to protein function			structure					fo		
				and structure.			which help					r		
				Research in protein			in drug					D		
				biochemistry			discovery					ec		
				contributes to the			·					en		
				understanding of								t		
				disease mechanisms,								W		
				,										
				leading to the								or		
				development of								k		
				diagnostics and								(S		
				therapeutics with								D		
				global health								G		
				implications.								4.		
												4)		
Unit	-	-	-	Lipids play a crucial	-	-	Basics	-	-	-	-	Sk	Professiona	Employabilit
IV				role in drug delivery			knowledge					ill	1 Education	y
1.				systems,			of					s	(17.1-17.5)	5
							biomolecule					s fo	(1/.1-1/.3)	
				pharmaceutical										
				formulations, and			s present in					r		
				the development of			our body					D		
				lipid-based			and role of					ec		
				therapies. Advances			lipids in our					en		
				in lipid research			body and					t		
				contribute to the			diseases					W		
				global			associated					or		
				pharmaceutical and			with it.					k		
				biotechnology			with it.					к (S		
				industries.								D		
												G		
												4.		
												4)		
Unit	-	-	-	The nucleic acid	-	-	Basics	-	-	-	-	Sk	Professiona	Employabilit
v				chapter has			knowledge					ill	1 Education	у
				profound relevance			of					s	(17.1-17.5)	
				globally,			biomolecule					fo		
				impacting various			s present in					r		
				aspects of science,			our body					D		
				medicine,			•							
				agriculture,			and role of					ec		
				biotechnology, and			DNA and					en		
							RNA in our					t		
				more.			body.					W		
				Nucleic acids,								or		
				specifically DNA,								k		
				carry genetic								(S		
				information.								D		
				Understanding the								G		
				-										
				structure and								4.		
			L	function of nucleic								4)		
	•		•	•	•	•		•	•		•		•	

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				acids is										
				fundamental for										
				unraveling the										
				principles of										
				inheritance and										
				genetics on a										
				global scale.										
Unit	-	-	_	Enzymes are	-	-	Basic	-	-	-	_	Sk	Professiona	
-VI				essential in the			knowledge					ill	1 Education	
• •							of enzyme					s	(17.1-17.5)	
				1			structure					fo	(1/11/1/10)	
				biopharmaceutical			which help					r		
				s, including			in drug					D		
				therapeutic			discovery					ec		
				proteins and			ansestery					en		
				enzymes used in								t		
				medical								W		
				treatments. Global								or		
				healthcare benefits								k		
				from research in								(S		
												Ď		
				enzyme								G		
				biochemistry for								4.		
				the development of								4)		
				new drugs and								<i>,</i>		
				therapies.										
Unit	-	-	-	Vitamins are	-	-	Basics	-	-	-	-	Sk	Professiona	Skill
-VII				essential for proper			knowledge					ill	1 Education	Development
				growth,			of					S	(17.1-17.5)	
				development, and			biomolecule					fo		
				overall health.			s present in					r		
				Understanding			our body					D		
				vitamin requirements and			and role of					ec		
				deficiencies is			vitamins in					en		
				crucial for			our body					t		
				addressing global			and diseases					W		
				public health			associated					or		
				challenges related			with					k		
				to malnutrition and			deficiency					(S		
				micronutrient			of vitamins.					D		
				deficiencies.								G		
												4.		
Unit	-			Matabalian (Stal		-	Basics	-	_			4) Sk	Professiona	Skill
Unit	-	-	-	Metabolism (Study	-	-		-	-	-	-	SK ill	1 Education	
- VIII				of cycle/pathways without chemical			knowledge of						(17.1-17.5)	Development
VIII				structures)			oi metabolism					s fo	(17.1-17.3)	
				Metabolism of			of							
				Carbohydrates			oi biomolecule					r D		
				Metabolism of										
1														
				lipids			s and involvement					ec en		

			1		1	1				1		1		
				Metabolism of			of these					t		
				Amino acids			process in					W		
				Biological			various life					or		
				oxidation			process of					k		
							our body					(S		
							and role of					D		
							und foie of					G		
												4.		
												4)		
Unit	-	-	-	Minerals are vital	-	-	Basics	-	-	-	-	Sk	Professiona	Employebilit
-IX				for plant growth			knowledge					ill	1 Education	у
				and development.			of minerals,					S	(17.1-17.5)	
				Research on			electrolyte					fo		
				mineral nutrition			present in					r		
				in agriculture			our body					D		
				contributes to			and role of							
				optimizing crop								ec		
				yields, improving			these in our					en		
				soil fertility, and			body and					t		
							diseases					W		
				ensuring global			associated					or		
				food security.			with					k		
							deficiency					(S		
							of minerals.					D		
							or minerals.					G		
												4.		
												4)		
Unit	-	-	-	Organ function	-	-	Laboratory	-	-	-	-	Sk	Professiona	
-X				tests are integral to			tests which					ill	1 Education	
				medical research,			help to					S	(17.1-17.5)	
				enabling scientists			diagnose the					fo		
				and healthcare			diseases.					r		
				professionals to			discuses.					D		
				study patterns of										
				organ dysfunction,								ec		
				identify risk								en		
				factors, and								t		
												W		
				develop strategies								or		
				for disease								k		
				prevention and								(S		
				management.								D		
												G		
												4.		
												4)		

ER20-23P: BIOCHEMISTRY & CLINICAL PATHOLOGY – PRACTICAL

Subject 23P	t Code: ER2		Subjec PATH						& C	CLIN	NICAI				L		Т	Р
Version	n 2.0						-								0		0	2
Total C	Contact Hou	irs			50	hours	5											
Pre- requisit	tes/Exposu	•	Pharma Chemis Theory	stry-	al													
Co-req	uisites		¥		Pha	irmaco	ology -	- The	ory									
					Со	urse	Objec	ctive	s									
1. 1 2. 4. 1	ompletion o Physical, ch Analysis of Microscopio Practice in i Withdrawal	emical normal c exami njecting	proper and ab nation g drugs	ties and onormal of sput by intr	l qualit consti um and	ative tuent l faec	tests of bl	of lip lood	and	urine	e				,			
							itcom		C O)									
,	bject is desig 1. The tests in 2.Different te 3.Qualitative 4. Chemical of	nvolved chnique test for	in detee es emplo normal	ction of byed in and abr	differen withdra hormal o	nt foo wal o consti	d cons f blood tuents	tituer l sam of ur	ple	ke ca	rbohyć	lrate	es, pi	roteins	and l	ipids.		
Course Code	Course Outcom	PO1	PO2	PO3	PO4	P O 5	PO 6	P O 7	P O 8	P O 9	PO 10	P 0 1	P 0 1	PSO 1	P S O	PS O3	P S O	PSO5

Code	e					5		/	0	9		1 1	2		2		4	
	CO1	2	3	2		2	3		3	2		-	-	3	2			
ER20	CO2	3	3	2		2	1			2		-	-	3	2			
23P	CO3	3	3	1		1	2		2	2		-	-	2	3			
	CO4	2	3	2		1	2	2	3	3	1	-	-	2	2			
		•	1=lig	ghtly m	apped	•	2=	= mo	derat	ely 1	nappe	ed	•	3=	stro	ngly m	appe	ed

Unit	Relevance to the	Relevance to the local, national, regional and global developmental needs				Employability/	Skill Development	Relevance to the	Professional	Etuncs, Gender, Human Values, Environment & Sustainability		SDG	NEP	POE/4 th IR
ER2 0- 23P	Local	Regional	National	Global	Employability	Entrepreneurship	Skill Development	Professional Ethics	Gender	Human Values	Environment & Sustainability			
Unit				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 constituen ts like carbohydr ates, proteins and lipids.			Used to identify the patholog ical Conditio n of diseases		Skill s for Dec ent Wor k (SD G 4.4)	Professi onal Educati on (17.1- 17.5)	Skill Develop ment

	Understanding protein content aids in addressing nutritional needs, ensuring food safety, and developing new products. Qualitative analysis of lipids 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.			01-211	Drofossi	51-11
Unit II	Qualitative - analysis of urine for normal and abnormal constituents	- Analysis of normal and abnormal constituen ts of blood and urine	 Help to diagnos e the various disease which ultimate ly help to treat the patient	- Skill s for Dec ent Wor k (SD G 4.4)	Professi onal Educati on (17.1- 17.5)	Skill Develop ment
Unit -III	Determination of constituents of blood/serum (simulated)	Analysis of normal and abnormal	Help to diagnos e the various	Skill s for Dec ent	Professi onal Educati on	Employa bility

(Cre gluc	choles terol, Calciu m, Urea, SGOT	constituen ts of blood and urine Microsco pic examinati on of sputum	disease which ultimate ly help to treat the patient	Wor k (SD G 4.4)	(17.1- 17.5)	
			Parlon			

ER2024T: Pharmacotherapeutics– Theory

Subject Code: ER20-24T	Subject Name: PHARMACOTHERAPEUTICS - THEORY	L	Т	Р
Version 2.0		3	1	0
Total Contact Hours	75 hours			
Pre-requisites/Exposure	Human Anatomy and Physiology			
Co-requisites	Pharmacology			
	Course Objectives			

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

1. Etiopathogenesis of selected common diseases and evidence-based medicine therapy

2. Importance of individualized therapeutic plans based on diagnosis

3. Basic methods for assessing the clinical outcomes of drug therapy

Course Outcomes (CO)

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

со	PO1	PO2	PO3	PO4	PO5	PO6	P07	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 mapped2= moderately mapped3=strongly mapped								ped									

Unit		onal and		al, national, developmental		elevance To the Employability/ epreneurship/ Skill Development Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability					SDG	NEP	POE/ 4 th IR	
ER20 24T	Lo cal	Regi onal	Nati onal	Global	Empl oyabi lity	Entrep reneur ship	Skill Development	Profes sional Ethics	Gen der	Human Values	Enviro nment & Sustain ability			
Unit	-	-	-	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)	Educati	Develop

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

ER2024P: Pharmacotherapeutics - Practical

Subjec	t Code	: ER20-	-24P			Subj	ject Na	ame: P	harma	acothe	rapeuti	cs - Pra	ctical	L	т		Р
Versio	n 2.0													0	0		1
Total (Contact	Hours	;									25 hr					
Pre-re	quisite	s/Expo	sure			Hun	nan An	atomy	and P	hysiolog	<u>s</u> y						
Co-req	luisites					Pha	rmaco	logy									
								Cour	se Obj	ectives							
Upon (comple	tion of	this co	ourse tl	he stud	lent sh	ould b	e able	to:								
	1 C0	. Hov ommoi	-	-	a SOAF	o (Subj	ective,	, Objec	tive, A	ssessme	ent and	Plan) nc	ote for c	clinical c	ases of	selecte	d
	2	. Pati	ent co	unselli	ng tecl	hnique	es/met	hods f	or com	mon di	sease co	ondition	s				
ļ																	
								Course	Outco	mes (CC)						
□ On co	mpleti	on of t	this co	ourse, 1	the stu	Idents				mes (CO	0)						
CO1. V disease CO2. C	Vrite SC es Counsel	DAP (Sเ the pa	ubjecti tients	ve, Ob about	jective the dis	e, Asses sease o	will t ssmen conditi	be able t and F	e to: Plan) no	otes for	the give	en clinic of hanc					ugs, life-
CO1. V disease CO2. C	Vrite SC es	DAP (Su the pa ations,	ubjecti tients and m	ve, Ob about	jective the dis	e, Asses sease o	will b ssmen conditi ers.	be able t and F ons, us	e to: Plan) no	otes for	the give						ugs, life-
CO1. V disease CO2. C style m CO	Vrite SC es Counsel nodifica	DAP (Su the pa ations,	ubjecti tients and m	ve, Ob about onitor	jective the dis	, Asse sease o amete	will b ssmen conditi ers.	be able t and F ons, us	e to: Plan) no ses of o	otes for drugs, n	the give	of hand	lling an	d admir	nistratio	n of dru	
CO1. V disease CO2. C style m	Vrite SC es Counsel nodifica	DAP (Su the pa ations,	ubjecti tients and m	ve, Ob about onitor	jective the dis	e, Asses sease o ramete PO6 3	will b ssmen conditi ers.	be able t and F ons, us	e to: Plan) no ses of o	otes for drugs, n	the give	of hand	lling an	d admir	nistratio	n of dru	

Unit	Relevance to the local, national, regional and global developmental needsLRegNatGlobal						Employability/ kill Development	Relevan		rofessional Ethics, Gen vironment & Sustainab		SDG	NEP	POE/4 th IR
ER2 024P		Reg iona l	Nat ion al	Global	Emplo yabilit y	Entrepren eurship	Skill Development	Profess ional Ethics	Gender	Human Values	Environment & Sustainability	:		
Unit		-	-	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	(17.1-17.5)	Skill Develop ment
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		Decent	More Holisti and Multidisciplina ry Education (11.1 11.13)	n Knowled ge

	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	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	systems. 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 Professional Skill Decent Education Develop Work ((17.1-17.5) ment SDG 3.3)

crucial fo	or This enhances	practice adheres	
		to professional	
national,	by equipping	ethics, prioritizing	
regional, an		patient well-being	
global	professionals	and fostering	
healthcare	with practical	gender equality by	
development	skills.	addressing	
needs.	It	individual	
enhances		healthcare needs.	
healthcare			
professionals'			
skills, ensurin	q		
safe an	_		
effective			
medication			
administration			
ultimately	· ·		
contributing t			
improved			
global			
healthcare			
systems an			
better patier	זנ		
outcomes			
worldwide.			

ER2025T: Hospital and Clinical Pharmacy - Theory

Subject Code: ER20-25T	Subject Name: Hospital and Clinical Pharmacy theory	L	Т	Р
Version 2.0		3	1	0

Total Contact Hours						75 hr											
Pre-requisites/Exposure							Clinic	Clinical Pharmacy									
Co-requisites Hospita								lospital Pharmacy									
Course Objectives																	
Upon c	completio	n of this	course t	he stude	nt shou	ild be able	e 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.																
				ow to ass	sess pat	tients' med	dical cor	nditions	and mee	lication r	needs, cons	idering fa	ctors like	age, weigł	nt, allergie	es, and	
	como	rbidities.															
								Cours	e Outco	omes (CO))						
Upon o	completio	n of this	course t	he stude	nt shou	ild be able	e 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. I	Describe t	he involv	vement o	of other l	healthc	are profes	sionals	in monit	oring pa	atient dru	g therapy a	nd resolv	ing drug-r	elated issu	ies.		
	Joenital n	harmaoy	adminic	trators o	morant	aa tha sac	ura and	nunctua	1 distrib	ution of r	nedications	to differ	ant hospit	al denartm	onte		
CO4. I	iospitai p	mar mae y	aummis		guaram	ee me see	ure anu	punctua	i uisuito		neureations		ent nospita	ai departin	ents.		
				_						-							
СО	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=ligh	tly mappe	d	2= mo	derately	mapped	3=	strongly 1	mapped				
TT	D - 1		. 11			D -1		de E		· 4 /	D -1		Durford	-1 E41	(D)	NED	
Unit		nce to the	,	,	tal				ployability/Relevance to the Professional Ethics,SDNEPDevelopmentGender, Human Values, Environment &G					POE/4 ^t			
regional and global developmental needs					Lincepic	neu sinj	p, omit 1	corerop		Sustainability							

ER202 5T	Loc al	Regio nal	Natio nal	Global	Employa bility	Entreprene urship	Skill Developm	Profess ional	Gen der	Human Values	Environ ment &			
							ent	Ethics			Sustaina bility			
Unit I	-	-	-	in systematic	-	-	Develop	-	-	Human	-	Skills	Professi	Skill
				drug			skills in			values in		for	onal	Develop
				information			systematic			systematic		Decen	Educati	ment
				queries and			drug			drug		t	on	
				laboratory			information			information		Work	`	
				report			queries by			queries and			17.5)	
				interpretation			mastering			laboratory		(SDG		
				prioritize			search			report		4.4)		
				patient			techniques,			interpretatio				
				safety,			evaluating			n include				
				evidence-			primary,			patient-				
				based			secondary,			centered				
				practice, and			and tertiary			care,				
				ethical			resources,			empathy,				
				conduct.			and			accuracy,				
				These values			providing			transparency,				
				ensure			evidence-			ethical				
				accurate			based			conduct, and				
				information			information.			а				
				retrieval and			Enhance			commitment				
				informed			laboratory			to evidence-				
				decision-			report			based				
				making to			interpretatio			decision-				
				optimize drug			n skills			making.				
				therapy and			through			These values				
				provide high-			understandin			ensure safe				
				quality			g test results,			and effective				
				patient care.			identifying			patient care				
				of patients,			clinical			and respect				
				ensuring that			implications,			for				
				their needs,			and tailoring			individual				
				preferences,			drug therapy			needs.				
				and safety are			for optimal							
				at the			patient care.							

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

	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 Professi Skill for onal Develop Decen Educati ment t on Work (17.1- 17.5) (SDG 4.4)

	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 pharmaceutic als 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 consideratio ns. 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 Professi Skill for onal Develop Decen Educati ment t on Work (17.1- 17.5) (SDG 4.4)

	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	· "Compoundi	Developing	Compoundin -	Skills Professi Skill
V	ng" in the	the skills	g in hospitals	for onal Develop
	context of	required for	involves the	Decen Educati ment
	hospitals	pharmaceuti	preparation	t on
	typically	cal	of	Work (17.1-
	refers to the	compoundin	customized	17.5)
	process of	g in hospitals	medications	(SDG

	preparing medications or pharmaceutic als 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 pharmaceuti cal science, including pharmacolog y, pharmaceuti cs, and pharmacokin etics.	to meet individual patient needs. The practice of pharmaceuti cal compoundin g in hospital settings is guided by several human values and ethical principles, which prioritize patient safety, well- being, and ethical conduct.	
Unit VI	 Radiopharma - ceutics is a specialized field within healthcare that involves the use of radioactive	- skills in - radiopharma ceutics encompass radiation safety, patient- centered	- The human - values of radiopharma ceutics prioritize patient well- being, safety, ethics, and	Skills Professi Skill for onal Develop Decen Educati ment t on Work (17.1- 17.5) (SDG 4.4)

	materials (radioisotope s) for diagnostic and therapeutic purposes. The global values associated with radiopharmac eutics are shaped by the need to balance the potential benefits of	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	informed consent. They promote transparency, respect for patient rights, environment al responsibilit y, and global collaboration , ensuring responsible and ethical use of radioactive	
Unit VII	need to balance the potential	and ethical use of radioactive	responsible and ethical use of	Skills Professi Skill for onal Develop Decen Educati ment
	emphasize patient- centered care, evidence- based practice, ethical conduct, interdisciplin	pharmacy by mastering patient assessment, drug therapy management, and medication counseling.	pharmacy prioritize patient well- being, respect for autonomy, empathy, and ethical conduct.	t on Work (17.1- 17.5) (SDG 4.4)

				X 7 1	
		ary	Enhance	Values	
		collaboration,	your	include	
		and	knowledge	transparency,	
		continuous	of evidence-	confidentialit	
		learning.	based	y, patient	
		These values	medicine,	education,	
		drive high-	communicati	and	
		quality	on,	collaborative	
		healthcare,	interdisciplin	care,	
		improve	ary	ensuring that	
		patient	teamwork,	healthcare	
		outcomes,	and staying	professionals	
		and ensure	updated with	provide	
		the	pharmaceuti	compassiona	
		responsible	cal advances	te and ethical	
		use of	to provide	pharmaceuti	
		medications	optimal	cal care.	
		worldwide.	patient care.		
Unit	-	- Pharmacovig	Develop	-	Skills Professi Skill
VIII		ilance	skills in	Human	for onal Develop
		prioritize	pharmacovig	values in	Decen Educati ment
		patient	ilance by	pharmacovig	t on
		safety,	mastering	ilance	Work (17.1-
		transparency,	adverse	prioritize	17.5)
		ethical	event	patient	(SDG
		conduct,	reporting,	safety,	4.4)
		collaboration,	data	transparency,	
		and	analysis,	and ethical	
		regulatory	regulatory	conduct.	
		compliance.	compliance,	Values	
		These values	and signal	include	
		drive	detection.	empathy for	
		accurate data	Enhance	patients,	
		reporting,	communicati	responsibilit	
1					
		continuous	on, critical	y in	
		continuous learning,	on, critical thinking, and	y in reporting	

	- Global	assessment abilities, along with staying updated with global pharmacovig ilance 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	Skills to - prevent	 Human	Skills Professi Skill for onal Develop
	regarding	medication	values in	Decen Educati ment
	medication	errors	preventing	t on
	errors	encompass	medication	Work (17.1-
	prioritize	medication	errors	17.5)
	patient	management,	include	(SDG
	safety,	communicati	empathy for	4.4)
	transparency,	on, critical	patient	
	error	thinking,	safety,	
	prevention,	attention to	honesty in	
	quality	detail,	reporting	
	improvement,	standardizati	errors,	
	education,	on,	responsibilit	
	interdisciplin	continuous	y in	
	ary collaboration,	learning,	medication	
		interdisciplin	management, respect for	
	reporting systems,	ary collaboration	patients'	
	technology,	, patient	rights,	
	standardizati	education,	integrity in	
	on, patient	accurate	communicati	
	involvement,	reporting,	on, and a	
	and	and active	commitment	

regulatory	participation	to
oversight.	in quality	continuous
These values	improvement	improvement
ensure safe	efforts,	, ensuring
and high-	ensuring safe	safe and
quality	and effective	compassiona
healthcare	medication	te
	use.	healthcare.

ER2025P: Hospital and Clinical Pharmacy Practical

Subjec	t Code:	ER20-25	Р					Subje Practio		: Hospita	l and Clini	cal Pharma	acy	L	Т		Р					
Versio	n 2.0													-	-		1					
Total (Contact I	Hours										25	hr									
Pre-rec	uisites/l	Exposur	e		Hospital and Clinical Pharmacy																	
Co-req	uisites							Pharm	acology	, social pha	armacy											
								Cour	se Obje	ctives												
Upon c	ompletio	n of this	course th	he studer	t should	be able	to:															
		1. Syster	natic app	proaches	for addre	essing dr	ug infor	mation c	ueries													
		2.Interpr	etation o	of routine	laborato	ry repor	ts to opt	imize do	sage reg	imens												
		3.Report	ing proc	edures fo	r suspec	ted adve	rse drug	reaction	s to relev	vant autho	rities											
		4.Utiliza	tion and	manager	nent of d	liverse n	nedical/s	urgical a	ids and o	devices												
								Course	Outcom	es (CO)												
CO1. R CO2. U CO3. C	espond t inderstan omprehe nalyze a	o drug in d and an end the pund comm	formatic alyze rou urposes a nunicate	atine labo and techr drug-dru	s in a pro pratory re iques for g interac	ofessiona eports. r managi tions in	l manne ng diffe the treat	rent med ment of j	ical and prevalen	surgical to	1	uipment. drug thera	apy.									
СО	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 = mode	erately m	apped	3=str	ongly map	ped									

Un it		nal and g	he local, natio lobal develop			Relevance To the Employability/ Entrepreneurship/ Skill Development			Relevance to the Professional Ethics, Gender, Human Values, Environment & Sustainability			SDG	NEP	POE/4 th IR
	Loc al	Regio nal	National	Global	Employa bility	Entreprene urship	Skill Developm ent	Profess ional Ethics	Gen der	Hu man Val ues	Environ ment & Sustaina bility			
Un it I	-		retrieval. This enhances healthcare decision- making, directly benefiting the national	information queries, utilizing diverse resources, establishes a standardized model for international collaboration . This promotes evidence- based practices, ensuring consistent standards in pharmaceutic al 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	nal Restructu	Corporate/Co mpany Trips/Project s

	_		I				r	ı			I
	~	universal									
		model. This									
	patient care	promotes									
	standards.	collaborative									
		knowledge									
		sharing,									
		facilitates									
		evidence-									
		based									
		practices,									
		and									
		establishes									
		consistent									
		standards in									
		pharmaceutic									
		al									
		information									
		management,									
		contributing									
		to the									
		advancement									
		of global									
		healthcare.									
TT		TT '1 '			D 1 '				11	T (') ('	<u> </u>
Un -	Leveraging	Tailoring	- ·	-	Developing	-	-	-			Corporate/Co
it	laboratory	drug			skills in				being for		mpany
II	findings to	therapies			clinical data						Trips/Project
	optimize	based on			interpretatio					ring and	S
	drug	laboratory			n, treatment					Consolid	
	treatment in	findings is			optimization,					ation	
	clinical cases	crucial for			and aligning					(10.1-	
	is essential	national			healthcare					10.14)	
	for meeting	development			strategies						
	national	, enhancing			with national						
	development	healthcare			and global						
	needs. This	efficiency,			priorities is						
	approach	and aligning			essential for						
	-PPI Outil	with global			contributing						

	[[enhances	health	1	effectively to		[[
			healthcare	priorities.		diverse							
				This									
			efficacy, refines			development al contexts							
				approach		within the							
			treatment	ensures									
			strategies,	effective		healthcare							
			and aligns	treatment		sector.							
			with the	strategies,									
			broader	contributing									
			goals of	to the overall									
				advancement									
			the nation's	of the									
			healthcare	nation's									
			infrastructure										
			and well-	sector in									
			being,	harmony									
			emphasizing	with global									
			national	development									
			skills.	imperatives.									
Un		-	Implementin	Utilizing -		Implementin	-		-	-	Ensure	Institutio	Corporate/Co
it			g this	ADR		g ÂDR							mpany
III			approach,	reporting		reporting					lives and		Trips/Project
			uppi ouon,	forms and		forms and						ring and	s
			laboratory	diverse		causality						Consolid	
			findings to	causality		assessments						ation	
				assessments		hones skills						(10.1-	
			opumize	globally		in						10.14)	
			ulus	advances		pharmacovig						/	
			ci cucificite,	pharmacovig		ilance,							
			congino michi	ilance,		enhancing							
			development			expertise in							
			goals. It	drug safety,		drug safety							
			Source It	and		evaluation							
			ennances										

r	· · · · ·		r	1	1	,			1
		engthens		or better					
		ernational	h	ealthcare					
		llaboration	о	utcomes.					
		healthcare.							
	strategies, Thi	is							
	and pro	pactive							
	contributes app	proach							
	to advancing alig	gns with							
	the nation's glo	obal							
	healthcare dev	velopment							
	infrastructureim	peratives							
		safer and							
	integrating mo	ore							
	ADR effe	fective							
	reporting me	edical							
		atments.							
	strengthens								
	pharmacovig								
	ilance,								
	supporting								
	evidence-								
	based								
	policies								
	crucial for								
	public health								
	progress and								
	national								
	development								
Un		inds-on					 well-	Institutio	Corporate/Co
it	Commencin Han	ining	1	.Hands-on	Γ	Γ	being for		mpany
IV				aining in					Trips/Project
T A A	methodology ens	althcare		nedical aids				ring and	
	, furnishing hea	anneare	11	icultar alus			ages (ing and	0

practical professionals	cultivates	SDG Consolid
experience inworldwide	essential	
utilizing adhere to	skills in	(10.1-
orthopedic standardized	healthcare	10.14)
aids, surgical practices,	professionals	
instruments, fostering	,	
and medical consistency	encompassin	
supplies and elevating	g the	
cultivates the global	identification	
competence healthcare	, application,	
of healthcare standard.	and	
professionals Proficient	management	
, in harmony use of	of diverse	
with national medical aids	medical	
values of promotes	equipment	
skill collaboration	for	
development and	comprehensi	
. Simulated knowledge	ve patient	
training on exchange	care	
medical among		
equipment healthcare		
and supplies professionals		
further globally,		
enriches contributing		
healthcare to a shared		
providers' understandin		
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ensuring practices		
enhanced Globally		
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Enhancing professionals		
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and utilize		
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medical aids in		
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	healthcare leading to a infrastructuremore , reflecting coordinated the national and efficient value of response to robust health crises healthcare on an systems. international scale.				
Un - it v	Implementin g thisSimulated wound approach on dressing a national scale fosters and role-play a culture of enhance continuous global improvement healthcare in healthcare, readiness by aligning with standardizin the national g protocols, value of fostering promoting international excellence in collaboration professional , and development standards of capabilities. patient care across the country			healthy lives and promote	Institutio Corporate/Co mpany Restructu Trips/Project cing and Consolid ation (10.1- 10.14)
Un - it- VI	The implementati Utilizing on of mannequins mannequin- for	l	- Global utilization of mannequins	 healthy lives and	Institutio Corporate/Co nal mpany Restructu Trips/Project ring and s

based	vaccination	for			Consolid	
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and injection		and injection			(10.1-	
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ER20-26T: Pharmacy Law and ethics

Subject Code:	ER20-26T	Subject Name: Pharmacy Law and	L	Т	Р				
		ethics							
Version 2.0			3	1	0				
Total Contact	Hours	75 hr							
Pre-requisites	/Exposure	Pharmacy Law and ethics							
Co-requisites		Ethics							
Course Objec	tives								
Upon completi	on of this course the student should be able to:								
1.	General perspectives, history, evolution of phan	rmacy law in India							
2.	Act and Rules regulating the profession and pra	actice of pharmacy in India							
3.	Important code of ethical guidelines pertaining	to various practice standards							
4.	Brief introduction to the patent laws and their a	pplications in pharmacy							
Course Outco	mes (CO)								
O	n completion of this course, the students will	be able to:							
CO1-Describe	the history and evolution of pharmacy law in Ind	lia							

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
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ER2 026T	Lo cal	Regi onal	Natio nal	Gl ob al	Emplo yability	Entrepre neurship	Skill Develo pment	Profes sional Ethics	Ge nde r	Hu ma n Va lue s	Enviro nment & Sustain ability			
1-4	-	-	Law provide a framewo rk for regulatin g the pharmac y professi on nationall y, with various Acts and historica l develop ments shaping drug regulatio n and pharmac y practice			_	-	Provide professio nal ethics related to the Pharmac y professio n. Ex- Prohibiti on of Unethica l Practices			-	Skills for Decent Work (SDG 10.3)	sional Educat	sional

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