

Name of the	B.R.I. T			Year/ Semester: IV							
Program Course Name	Clinical Radiography Positioning -ll	Course Code: BRT 402		Type: Semester	Theory						
Credits	0	3		<b>Total Sessions Hours:</b>	60						
Evaluation Spread	Internal Continuous Assessment:	30		End Term Exam:	70						
Type of Course	C Compulsory	Core		C Creative	O Life Skill						
Course Objectives	This course is designed to provide the students the basic knowledge in Radiography. At the end of the course, the student should be able to:										
Course Outco attributes:	omes (CO): After the s	successful c	ourse comp	pletion, learners will develo	p the follo	wing					
Course Outcome (CO)											
CO1	Explain the role of the radiographer and the positioning of various body parts, the normal functioning of various organ systems of the body, and their interactions.										
CO2	Elucidate the radiol	ogical asp	ects of nor	mal growth and develop	ment.						
CO3	Describe the patient	t's response	e and adap	tations to environmental	stresses.						
Pedagogy	Explanations by the Practical, Presentation	Instructor, ons.	Group/Pair	Work, Discussion, Assign	ment,						
Internal Evaluation Mode	Terminal Exam, Att Bedside behavior or	endance, Pr Interaction	oject/Assig in class.	gnment, Class participation	, Class pr	esentation,					
Session Details		r	Горіс		Hours	Mapped CO					

Unit 1	Radiography technique comprising the complete. Radiography of Skull and Radiography of cranial bones; including special techniques for sella turcica, orbits, optic foramina, superior orbital fissure, and inferior orbital fissure, etc. Facial bones; Paranasal sinuses, Temporal bone and Mastoids. Dental Radiography: Radiography of teeth-intra oral, extraoral, and occlusal view.	22	CO1 ,CO 2
Unit 2	Abdomen: Preparation of patient. General abdominal radiography and positioning for fluid and air levels. Plain film examination. Radiography of female abdomen to look for pregnancy. Radiography in case of acute abdomen. Macroradiography: Principle, advantage, technique, and applications. Stereography - Procedure - presentation, for viewing, stereoscopes, stereometry.	22	CO2 ,CO 3

Unit 3	3	Locali Ward radiati be foll	bcalization of foreign bodies. Various techniques22CO2,COard /mobile radiography - electrical supply, diation protection, equipment, and instructions to followed for portable/ward radiography.3											
Unit 4	it 4Preparation theatre techniques: General precautions, Asepsis in techniques - Checking of mains supply and functions of equipment, selection of exposure factors, explosion risk, radiation protection, and rapid 													
COP	O and I	DSO M	anning											
CO-1	$\frac{0}{1}$ PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	3	2	2	2	1	3	2	1	2	1	3	1	2
CO2	2	2	1	2	3	2	2	1	2	3	2	2	2	2
CO3	2	3	2	1	2	2	2	2	3	3	2	1	2	3
Strong c		n-3,	Avera	ge contru	bution	-2, L	.ow contru	ution-1,						
Text- Books       1. Clark's Radiography- Clark/Textbook of radiology for residents and technicians- s k         Bhargava.       2. Radiographic positioning- Garkal         3. Radiology- Special investigation -champman.         Recapitulation & Examination Pattern														
Interr	hai Con	unuous	S Assess	ment:	1	D 44								
Comp	onent			Mar	KS	Pattern					2.4			
Terminal Examination121. Contains a descriptive question of 4 marks 2. Contains 4 MCQs Contains 2 short answer questions. Each question carries 2							rries 2	marks						
Attend	lance			4										
Projec	ts/Assig	gnments	5	4										

Assignment/ Presentation	2	
Attendance	2	
Total Marks	30	



Name of the	B.R.I. T			Year/ Semester:	IV						
Program											
Course	Clinical	Course	BRP 402	Type: Semester	Practical						
Name	Radiography	Code:									
	Positioning -II										
Credits	0	3		<b>Total Sessions Hours:</b>	60						
Evaluation	Internal	30		End Term Exam:	70						
Spread	Continuous										
	Assessment:										
Type of Course	C Compulsory	Core		O Creative	O Life Skill						
Course	This course is designed to provide the students the basic knowledge in										
Objectives	Padiography. At the end of the course, the student should be able to:										
	Caulography. At the end of the course, the student should be able to:										
Correct Orate		C 1		1 (* 1 *11 1	4 ( 11 '						
Course Outco	omes (CO): After the s	successful c	ourse comp	oletion, learners will develo	p the following						
attributes:	1										
Course											
Outcome											
(CO)											
COI	Evaluia the sole of t	handiaa	ombon ond	the positioning of variou	na hadr						
	Explain the role of	ine radiogi		the positioning of variou	is body						
	parts, the normal fu	nctioning	of various	organ systems of the boo	ly, and						
	their interactions.										
CO2	Elucidate the radiol	ogical asp	ects of nor	mal growth and develop	ment.						
CO3	Describe the patient	t's respons	e and adap	tations to environmental	stresses.						
Pedagogy	Explanations by the Practical, Presentation	Instructor, ons.	Group/Pair	Work, Discussion, Assign	ment,						

Internal Evaluation Mode	Terminal Exam, Attendance, Project/Assignment, Class participation Bedside behavior or Interaction in class.	, Class pr	esentation,
Session Details	Торіс	Hours	Mapped CO
Unit 1	Radiography technique comprising the complete. Radiography of Skull and Radiography of cranial bones; including special techniques for sella turcica, orbits, optic foramina, superior orbital fissure, and inferior orbital fissure, etc. Facial bones; Paranasal sinuses, Temporal bone and Mastoids. Dental Radiography: Radiography of teeth-intra oral, extraoral, and occlusal view.	15	CO1 ,CO 2
Unit 2	Abdomen: Preparation of patient. General abdominal radiography and positioning for fluid and air levels. Plain film examination. Radiography of female abdomen to look for pregnancy. Radiography in case of acute abdomen. Macroradiography: Principle, advantage, technique, and applications. Stereography - Procedure - presentation, for viewing, stereoscopes, stereometry.	15	CO 2,C O 3

		easting of famion hading. Various tashnious													
Unit 3	Locali Ward radiati be foll	zation /mobi on pro	of for le rac tection or por	eign diog 1, eq table	bodies. raphy - uipment, /ward ra	Variou electra and in diograp	us tech rical s nstructi phy.	niques upply, ons to			15	C 3	3		
Unit 4	Prepar Aseps and fu factors proces radiog Paedia Tomos Forens • All vi tract.	reparation theatre techniques: General precautions, Issepsis in techniques - Checking of mains supply nd functions of equipment, selection of exposure actors, explosion risk, radiation protection, and rapid rocessing techniques.Trauma adiography/Emergency radiography. Neonatal and aediatric Radiography, Tomography and 'omosynthesis Dual- energy X-ray absorptiometry. 'orensic Radiography.15COI ,CO3All views and techniques Abdomen: Gastrointestinal tract , urinary ract.15COI ,CO3													
		•													
CO-PO and I	PSO M PO2	apping PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
CO1 2	2	1	2	2	2	2	1	2	3	2	3	2	3		
CO2 2	2	3	2	2	3	2	2	3	2	3	2	2	2		
Strong contribution	$\frac{2}{n-3}$ ,	Avera	ge contri	5 bution	$\frac{2}{2, 1}$	ow contri	5 bution-1,	Z	2	2	3	3	2		
Suggested Re	adings	:	0												
Text- Books Recapitulatio	Text- Books       4. Clark's Radiography- Clark/Textbook of radiology for residents and technicians- s k Bhargava.         5. Radiographic positioning- Garkal       6. Radiology- Special investigation -champman.														
C			- •												
Component			Mor	ke	Pattorn										
Terminal Eva	minatio	n	12	U2	3 Cont	ainea	lescrint	ive and	stion of	f 4 mar	ks				
	IIIIIatio	/11	12		4. Cont Contains	ains 4 1 2 shor	MCQs t answe	r questi	ons. Ea	ich que	estion car	rries 2	marks		
Attendance		4													
Projects/Assig	gnments	S	4												
Class Particip other	ation of	r any	4			4									

Bedside behaviour	02	
Total marks	30	



Name of the	B.R.I.T			Year/ Semester: IV							
Program	Nowor	Course	<b>BDT 403</b>	Tunoi Somostor	Theory						
Name	Modalities	Code:	DK1 405	Type: Semester	Theory						
	Imaging	couci									
	Techniques										
	including										
	patient care	-			40						
Credits		3		1 otal Sessions Hours:   40							
Evaluation	Internal	30		End Term Exam:	70						
Spread	Continuous Assessment:										
Type of	Assessment.	_									
Course	C Compulsory	Core		C Creative	O Life Skill						
Course	This course is designed to provide the students the basic knowledge in										
Objectives	Padiography notiont care and code of othics. At the and of the course										
	he student should be able to										
	the student should be able to										
Course Outco	omes (CO): After the s	successful c	ourse comp	oletion, learners will develo	p the following						
attributes:		v	1								
Course											
Outcome											
(CO)											
COI	Understood Introduc	ction to hos	pital staffin	g and Medical records and	documentation.						
CO2											
	Must know about L	egal issues	s and Profe	essional ethics.							
CO3	How to handle and r	nust know	Denartmen	tal Safety and Infection cor	utrol						
005	The formation and the	nust know .	Departmen	an Safety and Infection con	luoi						
CO4			_								
	Understood Body r	nechanics	and transf	erring of the patient.							
Pedagogy	Explanations by the Practical, Presentation	Instructor, ons.	Group/Pair	Work, Discussion, Assign	ment,						
Internal	Terminal Exam, Atte	endance, Pi	oject/Assig	nment, Class participation	, Class presentation,						
Evaluation	Bedside behavior or	Interaction	in class.								
Mode											

Session Details	Торіс	Hours	Mapped CO
Unit 1	Interventional Radiography: Basic angiography and DSA: a. History, technique, patient care b. Percutaneous catherisation, catheterization sites, Asepsis c. Guidewire, catheters, pressure injectors, accessories d. Use of digital substraction- single plane and bi-plane All forms of diagnostic procedures including angiography, angioplasty, bilary examination, renal evaluation and drainage procedure. Central Nervous System: a. Myelography b. Cerebral studies c. Ventriculography Arthrography: Shoulder, Hip, Knee, Elbow 4. Angiography: a. Carotid Angiography (4 Vessel angiography) b. Thoracic and Arch Aortography c. Selective studies: Renal, SMA, Coeliac axis d. Vertebral angiography e. Femoral arteriography f. Angiocardiography Venography: a. Peripheral venography b. Cerebral venography c. Inferior and superior venocavography d. Relevant visceral phlebography 6. Cardiac catheterization procedures: PTCA, BMV, CAG, Pacemaker, Electrophyiology,	22	CO1 ,CO 2
Unit 2	Microbiology 1. Introduction and morphology - Introduction of microbiology, Classification of microorganisms, size, shape and structure of bacteria. Use of microscope in the study of bacteria. 2. Growth and nutrition -nutrition, culture media, types of medium with example and uses of culture media in diagnostic bacteriology, antimicrobial sensitivity test Sterilization and disinfection - principles and use of equipments of sterilization namely hot air oven, autoclave and serum inspissator, pasteurization, anti-septic and disinfectants. Introduction to immunology, bacteriology, parasitology, mycology.	22	C02, CO3

Unit 3			1	1		•, 1		1				22	C	03,CO
		Hosp1 record	tal pro s relati	cedure	: Hos <u>j</u> natient	pital si ts an	d mer	and c	of the	ation;			4	
		medic	o-legal	aspe	cts; a	cciden	ts in	the c	lepartn	nents,				
		appoir	tments	s, and o	organiz	ation;	minim	izing v	vaiting	time;				
		out-pa	out-patient and follow-up clinics; stock-taking and stock											
		keepin	ig. Car	e of th	e patie	nt: FII	RST co	ntact v	with pa	tients				
		in the department; management of chair and stretcher												
		patients and aids for this, management of the unconscious												
		patient; elementary hygiene; personal cleanliness; hygiene												
		nursin	nursing care: temperature pulse and respiration: essential											
		care of	f the pa	atient v	who ha	is a tra	cheosto	omy; e	ssentia	l care				
		of the	patient	t who	has a c	colosto	my; be	dpans	and ur	inals;				
		simple	e applic	ation o	of a ste	rile dr	essing.							
Unit 4		First	aid: Ai	ms and	lobiec	tives o	f first a	id: wo	unds a	nd blee	ding.	24	C	01 CO
		dress Shoc of su admit hemo splint Infec proce aseps infec of ase sterile surgi- elemo trolle imag staffi depar to pat of aco	and. An ing an k; inse nistrati orrhage ts, ban tions: H tions; a ess; loc is and tions- I epsis: S e suppl cal drea entary ys in t ing stud ng and tients a cidents	d band nsibilit apparation on of ; pressindaging Bacteria auto-in al tissu antisep HIV, H Steriliza by depa ssings operation dents of l orga al statis nd other	dages; ty; asp tus, dr oxyg sure p g; dre a, thei fectior le reactor in com ing the lio ima nly) 6. nizatio tics; pi er men depart	nves of press hyxia; ug rea gen; e ooints; sssing, r natur o or cr tion, gen niversa is B, C metho t; care imon v eatre p aging of Depar ons; re rofession nbers of ment.	ure and convu actions; electric compr foreig ure and oss-infe eneral b al preca C, and I ds of st of iden use, inc brocedu departm tmenta cords onal att	d splin lsions; propl shocl ression appe ection; ody re utions <b>VIRSA</b> eriliza tificati luding irre; se nent (f l proce relatin, itudes aff, mo	the interventional and the intervention of the intervention of	pports citatior c meas ns; so . Frac poison ; sprea flamm ; ulcera tal-acq 5. Prind se of co nstrum nted sv of trays dy by Depart patients techno egal as	, etc. , use sures; calds; tures; s. 4. ad of atory ation; uired ciples entral nents, wabs, s and radio tment and logist pects	24	3	01,00
CO-PO	) and I	PSO M	apping											
CO	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PSO1</b>	PSO2	PSO3	<b>PSO4</b>	<b>PSO5</b>	<b>PSO6</b>
CO2	3	2	2	2	3	2	2	2	1	3	2	3	2	3
CO3	2	3	2	3	3	3	2	2	2	2	1	1	2	2
CO4	3 ntribution	2	Aver	2 19e contril	2 hution_?		2 ow contrib	3 aution-1	3	2	3	3	3	1
Suggest	ted Re	adinos		se comit	on-2 ,	1	Sw control							
nuggio	icu M	aungo	•											

Text- Books	l. Clark's Radiog hargava Radiographic po Radiology- Spec	graphy- Clar ositioning- ( cial investig	ck/Textbook of radiology for residents and technicians- s k Garkal gation - champman.	
Recapitulation	& Examinatio	n Pattern		
<b>Internal Contin</b>	uous Assessm	ent:		
Component		Marks	Pattern	
Terminal Exam		12	<ol> <li>Contains a descriptive question of 4 marks</li> <li>Contains 4 MCQs</li> <li>Contains 2 short answer questions. Each question carries marks</li> </ol>	2
Attendance		04		
Project/Assignm	nents	04		
Class participati other	on or any	04		
Class Presentati	on	04		
Bed Side Behav Interaction in Cl	ior or lass	02		
<b>Total Marks</b>		30		



Name of the	B.R.I.T			Year/ Semester:	IV
Program					
Course	Newer	Course	BRP 403	Type: Semester	Practical
Name	Modalities	Code:			
	Imaging				
	Techniques				
	including				
	patient care				
Credits	(	3		<b>Total Sessions Hours:</b>	60
Evaluation	Internal	25		End Term Exam:	70
Spread	Continuous				
-	Assessment:				
Type of	0.0.1			0.0	0
Course		<ul> <li>Core</li> </ul>			O Life Skill
Course	This course is desig	ned to pro	vide the st	udents the basic knowle	daein
Objectives				defits the basic knowle	uge m
	Radiography patien	t care and	code of et	hics. At the end of the co	burse,
	the student should b	be able to			
<b>Course Outco</b>	omes (CO): After the	successful c	ourse com	oletion, learners will develo	op the following
attributes:		5	1		1 5 6
Course					
Outcome					
(CO)					
CO1	Understood Introduc	ction to hos	pital staffin	g and Medical records and	l documentation.
			•		
CO2					
	Must know about L	egal issues	s and Profe	essional ethics.	
CO3	How to handle and r	nust know	Departmen	tal Safety and Infection co	ntrol
CO4			1		
	Understood Body 1	nechanics	and transf	erring of the patient.	

Pedagogy	Explanations by the Instructor, Group/Pair Work, Discussion, Assign Practical, Presentations.	ment,	
Internal Evaluation Mode	Terminal Exam, Attendance, Project/Assignment, Class participation Bedside behavior or Interaction in class.	, Class pr	esentation,
Session Details	Торіс	Hours	Mapped CO
Unit 1	Medical records and documentation. Legal issues in radiology department, PNDT Act. .Professional ethics and Code of conduct of radiographer.	15	CO2 ,CO 3
Unit 2	.Handling of patients: Seriously ill and traumatized patients, visually impaired, hearing and speech impaired patients, mentally impaired patients, infectious patients. .Departmental Safety	15	CO3 ,CO 4

Unit 3		.Infecti masks, .Vital	on con head s signs.	trol: sk caps, sh	in ca noe co	re, donn overs.	ing of a	gowns,	gloves	s, face		15	C 3	0
			C											
Unit 4		Body of slic table, t	mechar le boa hree mo	iics and rds, whe en lift ai	tran eelcha nd fou	nsferring air to cou ur men li	of pat uch, cou ft.	ient, d ich to v	lraw sh wheelch	neet lift nair, cou	t, use uch to	15	C 4	0
		.Local .Facilit .Manag	anaesth ies rega gement	esia and arding g of adve	d genera enera rse re	eral anae 1 Anaest actions t	sthesia hesia in o contra	the X- st med	ray dep ia	artment	;			
COP	) and ]	DSO M	onning											
	PO1		apping PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	Г
C01	2	3	2	1	2	3	2	2	2	3	1	2	3	
CO2	3	2	2	3	3	2	1	3	3	2	2	1	2	
CO3	2	2	3	2	2	3	3	2	2	2	3	3	2	F
Strong co	ntributio	<i>n-3</i> ,	Aver	ige contrib	oution-2	$\frac{2}{2}, I$	Low contrib	oution-1,	5	2	5	2	5	_
Sugges	sted Re	eadings	:											
														_
Text- I	3ooks	1. Cla Bharga 2. Radio 3. Radio	rk's Rad va ographic ology- S	iography position pecial ir	y- Cla ning- ( nvestig	rk/Textbo Garkal gation - c	ook of rad hampma	diology n.	for resid	dents and	d techn	icians- s	k	
Recapi	3ooks itulatio	1. Cla Bharga 2. Radio 3. Radio <b>5n &amp; E</b> z	rk's Rad va ographic ology- S <b>xamina</b>	iography position pecial ir tion Pa	y- Cla ning- ( nvestig ttern	rk/Textbo Garkal gation - c	ook of rac	diology n.	for resid	dents and	d techn	icians- s	k	
Recapi	3ooks itulatio I Conti	1. Cla Bharga 2. Radio 3. Radio on & Ex	rk's Rad va ographic ology- S <b>camina</b> Assessi	iography position pecial ir tion Pa nent:	y- Cla ning- ( nvestig <b>ttern</b>	rk/Textbo Garkal gation - c	ook of rac	diology n.	for resid	dents and	d techn	icians- s	k	
Recapi Internal	300ks itulatio l Conti nent	1. Cla Bhargav 2. Radio 3. Radio on & Ex	rk's Rac va ographic ology- S camina Assessi	iography position pecial ir tion Pa nent: Mar	y- Cla ning- ( nvestiį ttern ks	rk/Textbo Garkal gation - c <b>Pattern</b>	ook of rad	diology n.	for resid	dents and	d techn	icians- s	k 	
Recapi Internal Compon Fermina	<b>itulatio</b> I <b>Conti</b> I Exan	1. Cla Bharga 2. Radio 3. Radio on & Ex inuous	rk's Rad va ographic ology- S <b>xamina</b> Assessi	iography position pecial ir tion Pa nent: Mar 12	y- Cla ning- ( nvestig ttern ks	rk/Textbo Garkal gation - c <b>Pattern</b> 4. Con 5. Con 6. Con marl	bok of rad hampma tains a c tains 4 I tains 2 ks	diology n. lescript MCQs short	for resid	dents and estion o questio	d techn f 4 ma ons. E	icians- s rks ach que	k stion c	aı
Recapi Internal Compon Fermina	itulation itulation i Continent 1 Exam	1. Cla Bharga 2. Radio 3. Radio on & Ex inuous	rk's Rad va ographic ology- S camina Assessi	iography e position pecial ir tion Pa nent: 12 12	y- Cla ning- ( nvestig ttern ks	rk/Textbo Garkal gation - c <b>Pattern</b> 4. Con 5. Con 6. Con marl	bok of rad hampma tains a c tains 4 I tains 2 ks	diology n. lescript MCQs short	for resid	dents and estion o questio	d techn f 4 ma ons. E	icians- s rks ach que	k stion c	a1
Recapi Internal Compor Fermina Attendar	itulation itulation i Continent i Exam i Cee Assigni	1. Cla Bharga 2. Radio 3. Radio on & Ex inuous	rk's Rad va ographic ology- S <b>xamina</b> Assessi	iography position pecial ir tion Pa nent: 12 12 04 04	y- Cla ning- ( nvestig ttern ks	rk/Textbo Garkal gation - c Pattern 4. Con 5. Con 6. Con marl	bok of rad hampma tains a c tains 4 1 tains 2 ks	diology n. descript MCQs short	for resid	dents and estion o questio	d techn f 4 ma ons. E	icians- s rks ach que	k stion c	aı
Recapi Internal Compon Fermina Attendar Project// Class pa	itulation itulation I Continent I Exam I Exam nce	1. Cla Bharga 2. Radio 3. Radio on & Ex inuous	rk's Rad va ographic ology- S camina Assessi	iography position pecial ir tion Pa nent: Mar 12 04 04 04	y- Cla ning- ( nvestig ttern ks	rk/Textbo Garkal gation - c Pattern 4. Con 5. Con 6. Con marl	bok of rad hampma tains a c tains 4 I tains 2 ks	n. lescript MCQs short	for resid	dents and estion o questio	f 4 ma ons. E	icians- s rks ach que	k stion c	a1
Recapional Internal Compon Fermina Attendar Project// Class pa other	itulation itulation I Continent I Exam I Exam I Exam	1. Cla Bharga 2. Radio 3. Radio on & Ex inuous	rk's Rad ographic ology- S camina Assessi	iography e position pecial ir tion Pa nent: 12 04 04 04	y- Cla ning- ( nvestig ttern ks	rk/Textbo Garkal gation - c Pattern 4. Con 5. Con 6. Con marl	hampma tains a c tains 4 I tains 2 ks	diology n. lescript MCQs short	for resid	dents and estion o questio	f 4 ma ons. E	icians- s rks ach que	k stion c	an
Recapi nternal Compon Fermina Attendar Project// Class pa other Class Pr	itulation itulation itulation icent i Exam ice Assigni rticipat esentat	1. Cla Bharga 2. Radio 3. Radio on & Ex inuous	rk's Rad ographic ology- S camina Assessi	iography e position pecial ir tion Pa nent: 12 04 04 04 04	y- Cla ning- ( nvestig ttern ks	rk/Textbo Garkal gation - c Pattern 4. Con 5. Con 6. Con marl	bok of rad hampma tains a c tains 4 I tains 2 ks	diology n. descrip MCQs short	for resid	dents and estion o questio	f 4 ma	icians- s rks ach que	k stion c	an

Interaction in Class		
Total Marks	30	



## Department of Radiology and Imaging Techniques

#### Era University, Lucknow Course Outline Effective From 2023-24

Name of the	B.R.I.T			Year/ Semester:	IV
Program					
Course	Physics of newer	Course	BRT 401	Type: Semester	Theory
Name	imaging	Code:			
Course different	modalities	2		T-4-1 C	40
Credits		3		Total Sessions Hours:	40
Evaluation	Internal	30		End Term Exam:	70
Spread					
Type of	Assessment.	,			
Course	C Compulsory	Core		C Creative	🔿 Life Skill
Course		_			
Objectives	This course is desi	gned to p	rovide the	students the basic know	vledge in
U	Radiography using	newer m	odalities of	of radiology. At the en	nd of the
	course, the studen	t should	be able	to know about ultraso	nography
	Computed Tomogr	raphy, the	e Generat	ion of CT Scanners,	Magnetic
	resonance imaging.	fusion in	naging PE	T. Contrast media use.	handling.
	and teleradiology			-,,	8,
	and telefactorogy.				
Course Outco	omes (CO): After the s	successful c	ourse comi	oletion, learners will develo	p the following
attributes:	( <b>-</b> - ) <u>j</u>		r		r
Course					
Outcome					
(CO)					
CO1	Able to know Com	puted Ton	nography i	ts principles, various ger	nerations,
	and advancements				
CO2	Able to know Mag	netic Reso	onance Ima	aging- its principle, adva	ncements, and
<u>CO</u> 2	applications.				
005	Explain and ba abla	to know U	Itraconom	anhy Color Donnlar ita	principle
	advancements	d applice	tions D:	apily, Color Doppler- its	principie,
	subtraction angio	a applica	uolis. Di	principle advanceme	nts and
	applications	siapity et	Juipinent-	principie, auvanceme	ints, and
CO4	Able to know Fusi	on Imagin	g includin	g PET-CT, PET, and PE	T-MRI, Digital
	Mammography, D	EXA equi	pment- pri	nciple, advancements, ar	nd applications.

CO 5	Able to know tele radiology HIS, RIS, and PACS, Image process radiography systems; And processing techniques in console usi panel fluoroscopy systems.	ssing in o ng CR, I	digital DR, and flat
Pedagogy	Practical, Presentations	ment,	
Internal Evaluation Mode	Terminal Exam, Attendance, Project/Assignment, Class participation, Bedside behavior or Interaction in class.	, Class pr	esentation,
Session Details	Торіс	Hours	Mapped CO
Unit 1	<u>Basic</u> principle of CT scan, history of CT Scan, EMI, advantages and disadvantages, Equipment description.	18	CO2 ,CO 3
Unit 2	Scanning principle, Image acquisition, Image reconstruction, Image manipulation, Image display and documentation, Scanning parameters. Advantages and disadvantages.	18	CO1 ,CO 4

Unit 3		Histor Contra magne Recov	ry of M ast agen etic rela very, Gn	RI, Ma nts used axation radient	ignetisn d in MR , Image Echo	n, Basic I. Phys contra	e Princip sical and st and n	ole, har l physic oise, Sj	dware e ological pin Ech	etc, Typ basis o o, Inve	bes of of rsion	18	C 5	04,CO
Unit 4		Applic Applic Defini disadv Clinica MRI	eations eation, tion, A antage al uses	and A Fur pplica s of P , adva	Appara action, tions, C ET-CT ntages	tus for and Clinica . Defir & disa	r nucle inst l uses, a nition, 2 advanta	ar me crumen advanta Applic ages of	dicine, atation. ages & ations, f PET-			18	C 4	03,CO
Unit 5		Benefi Charac Comm Indicat prepar	ts vs eteristic conly u tion an ation to	risk cs an ised R nd cor echniq	or H Id hal Radionu ntraind ue in P	PET-C f-life iclides ication ET Sc	T and of R . Routi .s of 1 an.	PET adionu ne pro PET.	F-MRI. uclides otocols Patient			18	C 5	04,CO
CO-PC	) and I	PSO Ma	apping											
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	3	2	3	2	3	2	3	2	2	3	2	3	2
CO2 CO3	2	3	2	3	2	3	2	3	2	2	3	2	3	2
CO4	2	2	1	1	3	3	3	2	2	3	2	3	3	3
Strong con	ntribution	<i>1-3</i> ,	Avera	ige contri	bution-2,		.ow contrib	ution-1,						
Text- E	ieu Ke	1. Clark 2.s k Bh 3. Radio 4. CT M	's Radic hargava blogy- S Jade Ea	ography Radiogr pecial i sy	- Clark/T raphic po nvestiga	Fextboo ositionir tion - c	k of radi ng- Gark hampma	ology fo al n.	or reside	nts and	technic	ians.		
Keter Boo	ence ks	. Clark's 2.s k Bh	s Radiog argava	graphy- Radiogi	Clark/Te	extbook ositionir	of radio ng- Gark	logy for al	residen	ts and te	echnicia	ans.		
		3. Radio	ology- S	pecial i	nvestiga	tion - c	hampma	n.						
			07	•	0		1							

4. CT Made Easy

Internal Continuous Assessm	ent:	
Component	Marks	Pattern
Terminal Exam	12	<ol> <li>Contains a descriptive question of 4 marks</li> <li>Contains 4 MCQs</li> <li>Contains 2 short answer questions. Each question carries 2 marks</li> </ol>
Attendance	04	
Project/Assignments	04	
Class participation or any other	04	
Class Presentation	04	
Bed Side Behavior or Interaction in Class	02	
Total Marks	30	



### Department of Radiology and Imaging Techniques Era University, Lucknow Course Outline

# Effective From 2023-24

Name of the	B.R.I.T			Year/ Semester:	IV
Program Course	Physics of newer	Course	BRP 401	Type: Semester	Practical
Name	imaging	Code:		Type. Semester	Tactical
	modalities	00400			
Credits	0	3		<b>Total Sessions Hours:</b>	60
Evaluation	Internal	30		End Term Exam:	70
Spread	Continuous Assessment:				
Type of					-
Course	C Compulsory	Core		O Creative	O Life Skill
Course Objectives	This course is desi Radiography with u course, the studen Computed Tomogra imaging, fusion ir teleradiology.	gned to pr sing newe t should aphy, Gen- naging Pl	rovide the er modaliti be able eration of ET, Conti	students the basic know es of radiology. At the e to know about ultraso CT Scanner, Magnetic r cast media using, hand	vledge in end of the nography resonance lling and
attributes:	omes (CO): After the s	successfui c	ourse comp	netion, learners will develo	pjouowing
Course Outcome (CO)					
CO1	Able to know Com and advancements	puted Ton	nography i	ts principles, various ge	nerations,
CO2	Able to know Mag applications.	netic Reso	onance Ima	aging- its principle, adva	ncements, and
CO3	Explain and be able advancements, and	to know U 1 applica	Iltrasonogr tions. Di	aphy, Color Doppler- its gital Radiography and	principle, l Digital

	subtraction angiography equipment- principle, advanceme applications.	ents, and	d
CO4	Able to know Fusion Imaging including PET-CT, PET, and PE Mammography, DEXA equipment- principle, advancements, ar	T-MRI. I nd applic	Digital ations.
CO 5	Able to know tele radiology HIS, RIS, and PACS, Image process radiography systems; And processing techniques in console using panel fluoroscopy systems.	ssing in o ng CR, I	digital DR, and flat
Pedagogy	Explanations by the Instructor, Group/Pair Work, Discussion, Assign Practical, Presentations.	ment,	
Internal Evaluation Mode	Terminal Exam, Attendance, Project/Assignment, Class participation Bedside behavior or Interaction in class.	, Class pr	esentation,
Session Details	Торіс	Hours	Mapped CO
Session Details Unit 1	<b>Topic</b> <u>Basic</u> principle of CT scan, history of CT Scan, EMI, advantages and disadvantages, Equipment description.	<b>Hours</b> 10	Mapped           CO           1, 2

Unit 3		Histo Contr magn Reco	ry of M rast agen etic rela very, G	RI, Ma nts used axation radient	ignetisr d in MF , Image Echo	n, Basio XI. Phys e contra	c Princip sical and st and no	ole, har physic oise, Sj	dware e ological pin Ech	etc, Typ basis o o, Inve	bes of of rsion	10	C	O 2,3
Unit 4		Applio Applio Defini disadv Clinic MRI	cations cation, ition, A vantage al uses	and A Fur pplica s of Pl s, adva	Appara action, tions, ( ET-CT ntages	ntus fo and Clinica C. Defin & dis	r nucle l inst l uses, a nition, a advanta	ar me rumen idvanta Applic iges of	dicine, atation. ages & ations, f PET-			15	С	O 2,3,4
Unit 5		Benef Chara Comn Indica prepar	its vs cteristion nonly u tion au ration to	risk cs an ised R nd coi echniq	or 1 Id ha Radionu ntraind ue in F	PET-C lf-life uclides lication PET Sc	T and of R . Routi is of I can.	PET adionu ne pro PET.	-MRI. uclides otocols Patient			15	C	O 4, 5
	) and I	DEU M	onning											
CO-FC	PO1	PO2	apping   PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
C01	2	3	2	3	2	3	3	2	2	3	2	3	2	3
CO2	3	2	3	2	3	3	2	3	3	2	3	2	3	2
CO3	2	3	2	3	2	2	3	2	2	2	1	2	2	3
CO4	3	3	2	3	3	3	2	3	3	3	3	2	3	2
Strong co.	ntribution	n-3,	Avera	ige contri	bution-2		Low contrib	ution-1,	5	2	5	5	2	2
Sugges	ted Re	adings	:											
Text- F	Books	1.Clark 2.s k bł 3. Radi 4. CT r	's Radio hargava l ology- S nade Ea	graphy- Radiogr pecial i sy	Clark/ ' aphic po nvestiga	Text boo ositionin ation - c	ok of rad ng- Garka champma	ology f l n.	or reside	ents and	technic	ians.		
Refer Boo	ence ks	.Clark's 2.s k bł	Radiog	raphy- ( Radiogr	Clark/ T aphic po	ext bool	k of radio 1g- Garka	ology fo l	r residei	nts and t	echnici	ans.		

	3. Radiology- Spec 4. CT made Easy	cial investig	ation - champman.	
Dara Tavt				
	.Clark's Radiograp	hy- Clark/	Fext book of radiology for residents and technicians.	
	2.s k bhargava Rad	liographic p	positioning- Garkal	
	3. Radiology- Spec 4. CT made Easy	tial investig	gation - champman.	
Internal Cont	tinuous Assessm	ent:		
Component		Marks	Pattern	
Terminal Exa	n	12	<ol> <li>10. Contains a descriptive question of 4 marks</li> <li>11. Contains 4 MCQs</li> <li>12. Contains 2 short answer questions. Each question carries marks</li> </ol>	~ 4
Attendance		04		
Project/Assign	ments	04		
Class participa other	ation or any	04		
Class Presenta	tion	04		
Bed Side Beha Interaction in	avior or Class	02		
<b>Total Marks</b>		30		1



Name of the	BRIT			Year/ Semester:	IV
Program					
Course	Quality control	Course	<b>BRT 404</b>	Type: Semester	Theory
Name	in radiology and	Code:			
	patient safety				
Credits	0	3		<b>Total Sessions Hours:</b>	40
Evaluation	Internal	30		End Term Exam:	70
Spread	Continuous				
	Assessment:				
Type of Course	C Compulsory	Core		C Creative	C Life Skill
Course	This course is desig	ned to pro	vide the s	tudents the basic knowled	dge in
Objectives				he stadents the basic knowled	
e »Jeen ves	Radiography. At the	e end of the	e course,	the student should be able	e to:
	1 Dediction protect	ion			
	1. Radiation protect	1011			
	2 Biological effects	s of radiati	on		
	2. Diological circed	, of fudiation	011		
	3. Planning of radia	tion instal	lation-pro	tection primary &	
	and secondary radia	tion	I.	r j	
	····· · · · · · · · · · · · · · · · ·				
	4-Personnel monito	ring syster	ns		
		0.			
<b>Course Outco</b>	omes (CO): After the s	successful c	ourse com	pletion, learners will develo	op the following
attributes:					
Course					
Outcome					
(CO)					
CO1	Enumerate the guid	elines of a	ll respecti	ve organizations. Enume	rate the
	risks and effects of	the radiation	on.		
CO2	Label and demons	trate how	to use and	care for all types of lead	aprons
CO3				* 1	*
	Demonstrate the ha	ndling and	l how to u	se TLDs and badges as p	er guidelines
Pedagogy	Explanations by the	Instructor,	Group/Pai	r Work, Discussion, Assign	ment,

	Practical, Presentations.		
Internal	Terminal Exam, Attendance, Project/Assignment, Class participation	, Class pr	esentation,
Evaluation	Bedside behavior or Interaction in class.		
Mode			
Session	Торіс	Hours	Mapped
Details			CO
Unit 1		05	CO
	Objectives of quality Control: Improve the quality		1
	of imaging thereby increasing the diagnostic value;		
	to reduce the radiation exposure; Reduction of film		
	wastage and repeat examination; maintain the various		
	diagnostic and imaging units at their optimal		
	performance. Quality assurance activities: Equipment		
	selection phase; Equipment installation and		
	acceptance phase; Operational phase; Preventive		
	maintenance. Quality assurance program at the		
	radiological faculty level: Responsibility; Purchase;		
	Specifications: Acceptance: Routine testing:		
	Evaluation of results of routine testing: Quality		
	assurance practical exercise in the X-ray generator		
	and tube: Image receptors from processing:		
	Radiographic equipment: Eluoroscopic equipment:		
	Mammographic equipment, Fuoroscopic equipment,		
	tomographic equipment, Conventional		
	tomography; Computed tomography; Film		
	processing, manual and automatic; Consideration for		
	storage of film and chemicals; Faults tracing;		
	Accuracy of imaging- image distortion for digital		
	imaging devices. LASER printer calibration.		
Ilmit 2		05	CO
Unit 2	Quanty assurance program tests: General principles	05	2
	and preventive maintenance for routine, daily,		2
	weekly, monthly, quarterly, and annual - machine		
	calibration. Basic concepts of quality assurance -		
	LASER printer - Light beam alignment; X-ray out-		
	put and beam quality check; KVp check; Focal spot		
	size and angle measurement; Timer check; mAs test;		
	Grid alignment test; High and low contrast		
	resolutions; Mechanical and electrical checks;		
	Cassette leak check; Proper screen-film contact test;		
	Safe light test; Radiation proof test; Field alignment		
	test for fluoroscopic device; Resolution test;		

Phantom measurements - CT, US and MRI.	

Unit 3	Quality assurance of film and image recording devices: Sensitometry; Characteristic curve; Film latitude; Film contrast; Film speed Resolution; Distortion; Artifacts of films and image recording. Monitor calibration. SMPTE pattern 6. Maintenance and care of equipment: Safe operation of equipment; Routine cleaning of equipment and instruments; Cassette, and screen maintenance; Maintenance of automatic processor and manual processing units; Routine maintenance of equipment; Record keeping and log book maintenance; Reject analysis and objectives of reject analysis program. Care and maintenance of diagnostic equipment: General principles and preventive maintenance for routine - daily, Weekly, monthly, quarterly, annually: care in use, special care of mobile equipment.	10	CO 2,3
Unit 4	Radiation safety in diagnostic Radiology 1. Radiation Quantities and Units: Radiation- Radioactivity- Sources of radiation - natural radioactive sources - cosmic rays terrestrial radiation - man-made radiation sources. Units of radiation - Quality factor - Flux- Fluence-Kerma- Exposure- Absorbed dose- Equivalent Dose- Weighting Factors-Effective Dose - Occupational Exposure Limits - Dose limits to public.	05	CO 1
Unit 5	Biological Effects of radiation: Ionization, excitation and free radical formation, hydrolysis of water, action of radiation on cell-chromosomal aberration and its application for the biological dosimetry- Effects of whole body and acute irradiation, dose fractionation, effects of ionizing radiation on each of major organ system including fetus - Somatic effects and hereditary effects- stochastic and deterministic effects-Acute exposure and chronic exposure-LOSO - factors affecting radio sensitivity. Biological effects of non- ionizing radiation like ultrasound, lasers, IR,	10	CO 1, 2

CO1	2	3 2	3	2	3	2 7	3	2	3	2	2	2	3
CO	PO1	PO2 PO3	PO4	PO5	PO6	P07	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO-PC	) and l	PSO Mappi	ıg										
		materials.						0					
		factors, oc	cupancy	factor	s, and	differe	ent shi	elding					
		Planning co	onsiderat	tions fo	r radio	ology, ii	ncludii	ng Use					
		Good wor	rk pract	tice in	Dias	gnostic	Radi	ology.					
		calculated of	lose to r	adiation	n work	er & G	au, v eneral	public					
		of Kaulatio	Calcul	ation	of V	Vorklo	ad v						
		Kadiation H	Hazard e	valuation	on and	control	Philo	osophy					
Unit 6			T 1	. 1	1		. DI 'I	1			05	C	O 3
		film batche	es) occup	oational	expos	ure.							
		survey - A	LARA-	person	nnel do	simeter	rs (TL	D and					
		shielding,	shieldin	ig - c	alculat	tion ar	nd rad	liation					
		Principles of	of radiati	on prot	ection	, time -	distan	ce and					
		protection:	Radiatio	on prot	ection	of self	and p	atient-					
		systems,	AGD	mamm	nograpi	hy. $4$ .	Rac	liation					
		Dose area	product	in fluc	roscor	ov and	angios	zraphy					
		Application	ent Me	etnoas,	Dos Fechnia		D1	rierent					
		(DLP), Do	ose Pro	file, E	ffectiv	e Dos	e, Ph	antom					
		Scan Avera	age Dose	e (MSA	D), D	ose Lei	ngth P	roduct					
		Dosimetry,	CT Do	se Ind	ex (C7	TDI, etc	c.), M	ultiple					
		types of	radiati	on m	easure	ment.	Dose	and					
		appropriate	eness of	differe	ent det	ectors	for dif	fferent					
		disadvanta	runeuor	vario	ous o	detector	rs &	the					
		meter -zor	function	tor-con	tamina	ation n	ionitoi	their					
		dosimeterR	adiation	survey	meter	- wide	range	survey					
		Thermolun	ninescen	t	Dosim	neter.	-]	Pocket					
		- film	dosime	ter -	che	mical	dosi	meter-					
		condenser	chamber	- Seco	ndary	standar	d dosi	meters					
		ionization	chambe	er - t	himble	e ion	cham	ber -					
		spectromet	er. Me	asuring	g sys	tems	- fre	e air					
		liquid ser	nicondu	ctor d	etector	rs -	Gamr	na-rav					
		emulsion.	Ionizati	ion C	hambe	rs - illation	propo	rtional					
		and Phosp	phoresce	nce -I	Effects	on p	ohotog	raphic					
		Measureme	ents: Ior	nizatior	n of g	ases- I	Fluores	scence					
		UV, and m	nagnetic	fields.	Radia	ation de	etectio	n and					

CO2	2	2	3	2	2	2	1	2	3	2	3	2	3	2	]
CO3	3	3	2	3	3	2	2	2	2	2	2	3	2	2	
Strong co	ontribution	n-3,	Avera	ige contri	bution-2	, I	Low contril	bution-1,							
Intern	al Con	tinuou	is Asses	sment:											
Comp	onent			Ma	arks	Patter	'n								
Termir	nal Exa	m		12		13. Co 14. Co 15. Co ma	ontains a ontains 4 ontains arks	a descri 4 MCQ 2 short	ptive q s answe	uestion er ques	of 4 m tions. 1	arks Each qu	uestion	carries	2
Attend	ance			04											
Project	t/Assig	nments	5	04											
Class p other	particip	ation o	or any	04											
Class I	Presenta	ation		04											
Bed Si Interac	de Beh tion in	avior c Class	or	02											
Total 1	Marks			30											



Name of the	BRIT			Year/ Semester:	IV
Program					
Course	Quality control	Course	<b>BRP 404</b>	Type: Semester	Practical
Name	in radiology and	Code:			
	radiation safety				
Credits	0	3		<b>Total Sessions Hours:</b>	60
Evaluation	Internal	30		End Term Exam:	70
Spread	Continuous				
	Assessment:				
Type of Course	C Compulsory	Core		C Creative	O Life Skill
Course	This course is desig	ned to pro	vide the st	udents the basic knowled	dge in
Objectives	Radiography. At the	e end of the	e course, f	he student should be able	e to:
			e eouise, i		
	1. Radiation protect	ion			
	1				
	2. Biological effects	s of radiati	on		
	2 Dianning of radio	tion instal	lation pro	action primary by	
	5. Flaining of faula		lation-pro	ection primary &	
	and secondary radia	uion			
	4-Personnel monito	ring system	ns		
		iiiig syster	.115		
<b>Course Outco</b>	omes (CO): After the s	successful c	ourse com	oletion, learners will develo	p the following
attributes:	-	-	-		
Course					
Outcome					
(CO)					
CO1	Enumerate the guid	elines of a	ll respecti	ve organizations. Enume	rate the
	risks and effects of	the radiation	on.		
CO2	Label and demons	trate how	to use and	care for all types of lead	aprons

CO3	Demonstrate the handling and how to use TLDs and badges as p	er guidel	ines
Pedagogy	Explanations by the Instructor, Group/Pair Work, Discussion, Assign Practical, Presentations	ment,	
Internal Evaluation Mode	Terminal Exam, Attendance, Project/Assignment, Class participation Bedside behavior or Interaction in class.	, Class pr	esentation,
Session Details	Торіс	Hours	Mapped CO
Unit 1	Knowledge of all hazards, education of general Public by posters and seminars.	15	CO1 ,CO 2
Unit 2	Safety of women and children, pregnant women, safety of patient attendants, radiation workers and hospital staff, checking of lead aprons, leakage radiation from tube head, radiation survey in and around X - ray installation.	15	CO2 ,CO 3

Unit 3		Use of Scintill dosime Keepin steps a investi	TLD fi lation d eters an ng of do fter hig gations	ilm badg letectors d use of ose reco th expos	ges, <b>G</b> s, Liqu f prote- rds of sure re	<b>M</b> count id scinti ctive de radiation port and	ers, llator, F vices eta n worke	Pocket c. ers,				15	C 2	01,C
Unit 4		Biolog cell.	ical eff	fects of 1	radiati	on- The	cell effe	ect of i	onizing	radiati	on on	15	C 3	02,C
Unit 5		Somati effect.	ic effec	ts and h	eredita	ary effec	et. Stoch	nastic a	nd deter	rminist	ic	15	C 3	02,C0
CO-PO	) and H	PSO M	apping	<u> </u>										
<b>CO-P</b> ( co	D and H	PSO M PO2	apping PO3	g PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO
<b>CO-PO</b> CO CO1	<b>D</b> and <b>I</b> <b>PO1</b> 2	PSO M PO2 3	apping PO3 2	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b> 2	<b>PO8</b>	<b>PSO1</b>	<b>PSO2</b> 3	<b>PSO3</b> 2 2	<b>PSO4</b>	PSO5	<b>PSO</b>
CO-P( CO CO1 CO2 CO3	<b>D and I</b> <b>PO1</b> 2 3 2	PSO M PO2 3 2 3	apping PO3 2 2 3	<b>PO4</b> 2 3 2	<b>PO5</b> 2 3 3	<b>PO6</b> 3 2 2	<b>PO7</b> 2 3 2	<b>PO8</b> 3 2 2	<b>PSO1</b> 2 3 3	<b>PSO2</b> 3 2 2	<b>PSO3</b> 2 3 3	<b>PSO4</b> 2 2 1	<b>PSO5</b> 1 2 2	<b>PSO</b> 2 3 2
CO-PC CO CO1 CO2 CO3 Strong co	D and F PO1 2 3 2 ontribution	PSO M PO2 3 2 3 <i>n</i> -3,	apping PO3 2 2 3 Aver	PO4 2 3 2 age contrib	PO5 2 3 5 00000000000000000000000000000000	PO6 3 2 2 , I	PO7 2 3 2 ow contrib	PO8 3 2 2 <i>bution-1</i> ,	<b>PSO1</b> 2 3 3	<b>PSO2</b> 3 2 2	<b>PSO3</b> 2 3 3	<b>PSO4</b> 2 2 1	<b>PSO5</b> 1 2 2	PSO 2 3 2
CO-PC CO CO1 CO2 CO3 Strong co Sugges	D and F PO1 2 3 2 ontribution sted Re	PSO M PO2 3 2 3 n-3, eadings	apping PO3 2 2 3 Aver	PO4 2 3 2 age contrib	<b>PO5</b> 2 3 3 <i>bution-2</i>	PO6 3 2 2 , <i>I</i>	PO7 2 3 2 ow contrib	PO8 3 2 2 <i>pution-1</i> ,	<b>PSO1</b> 2 3 3	<b>PSO2</b> 3 2 2	<b>PSO3</b> 2 3 3	<b>PSO4</b> 2 2 1	<b>PSO5</b> 1 2 2	<b>PSO</b> 2 3 2
CO-PO CO CO1 CO2 CO3 Strong co Sugges Text-I	D and F PO1 2 3 2 ontribution sted Re Books	PSO M PO2 3 2 3 n-3, eadings 7	apping PO3 2 2 3 Aven : . CLA	PO4 2 3 2 age contrib	PO5 2 3 5 bution-2	PO6 3 2 2 , I	PO7 2 3 2 ow contrib	PO8 3 2 2 <i>pution-1</i> ,	<b>PSO1</b> 2 3 3	<b>PSO2</b> 3 2 2	PSO3 2 3 3	<b>PSO4</b> 2 2 1 1	<b>PSO5</b> 1 2 2	<b>PSO</b>
CO-PO CO CO1 CO2 CO3 Strong co Sugges Text-1 Refer Boo	D and F PO1 2 3 2 ontribution sted Re Books	PSO M PO2 3 2 3 an-3, cadings 7 1	apping PO3 2 2 3 Aven : . CLA	PO4 2 3 age contril	PO5 2 3 5 bution-2	PO6 3 2 2 , I	PO7 2 3 2 ow contrib	PO8 3 2 2 2 2 0 ution-1,	PSO1 2 3 3	PSO2 3 2 2	PSO3 2 3 3	PSO4 2 2 1	PSO5 1 2 2	<b>PSO</b> (2) 3 2
CO-PO CO CO1 CO2 CO3 Strong co Sugges Text- I Refer Boo	D and I PO1 2 3 2 mtribution sted Re Books Books	PSO M PO2 3 2 3 n-3, eadings 7 1 1	apping PO3 2 2 3 Aven : . CLA	PO4 2 3 age contril ARK ARK	PO5 2 3 3 bution-2	<b>PO6</b> 3 2 2 , <i>I</i>	PO7 2 3 2 ow contrib	PO8 3 2 2 bution-1,	<b>PSO1</b> 2 3 3	<b>PSO2</b> 3 2 2	PSO3 2 3 3	PSO4 2 2 1	<b>PSO5</b> 1 2 2	PSO( 2 3 2
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Bed Side Behavior or	02	
Interaction in Class		
Total Marks	30	