ERA UNIVERSITY FACULTY OF ALLIED HEALTH SCIENCES DEPARTMENT OF RADIOLOGICAL IMAGING TECHNIQUES

Name of HoD:	Dr. Taruna Singh MD, Radiotherapy tarunasingh55@gmail.com
Faculty	01 Professor 01 Associate professor 04 Assistant Professor 03 Tutor

	03	Tutor			
S. No	Name	Designation	Qualifica tion	Experience	Awards & certificate/Add on courses
1.	Dr. Taruna Singh	Associate Professor & In- Charge	MD Radiothe rapy	19 years (16 years teaching training and work experience in radiodiagnosis)	1.basic course in biomedical research 2.Basic course in medical education and technology 3. Foundation certificate course in palliative care 4.Certificate course in medical education by Era's Lucknow medical college and University 5 Life time member of Association of radiation oncologists of India 6 winner of best paper award in up chapter conference by AROI on 23rd October 2005

2	Prof. (Dr.) Mohd	Professor	PhD	18 Years	
_	Usman Khan	110105501	RIT	10 1 6415	
3	Mr. Dilshad	Assistant	M.Sc.	4 years 10 months	
	Ahmad	Professor	MIT		
4	Mr. Shailendra	Assistant	M.Sc.	3 years 01 month	
	Kumar Diwakar	Professor	RIT		
5	Mr. Ajay Deep	Assistant	M.Sc.	2 years	
	Singh	Professor	RIT		
6	Mr. Piyush	Assistant	M.Sc.	2 years	
	Pandey	Professor	RIT		
7	Mr. Bhanu	Tutor	Dip in	4 years 6 months	
	Prakash Avasthi		RIT		
8	Mr. Hamd Khan	Tutor	BRIT	10 months	
9	Ms. Tatheer	Tutor	BRIT	10 months	
	Fatima Zaidi				
	Faculti	ies associated from D	epartment o	of Radiodiagnosis ELM	ICH
1	Prof. Dhan	Professor	MD,		
	Prakash Gupta		Radiolog		
			y		
2	Dr. Dheerendra	Associate	MD,		
	Kumar Saxena	Professor	Radiolog		
			\mathbf{y}		

Department of Radiological & Imaging Techniques

The radiology department plays an important role in the modern healthcare system, being an important component in the diagnosis and treatment of many medical conditions. Specializing in the use of medical imaging techniques, this department facilitates the visualization of internal body structures, thereby helping medical professionals make accurate diagnoses and formulate effective treatment strategies. Physicians with specialized training in radiology interpret images created by various imaging modalities and work closely with other healthcare providers to provide overall patient care.

Imaging modalities encountered in radiology departments include:

- 1. <u>X-ray</u>: X-ray is a widely used diagnostic tool to take pictures of bones and hard tissues. This convenient and non-invasive method helps detect fractures, infections and certain respiratory conditions.
- 2. <u>Computed Tomography (CT):</u> By combining X-rays and computerized technology, CT scan creates complex images of the body. It is valuable for visualizing internal organs and blood vessels and diagnosing various disorders.
- 3. Magnetic Resonance Imaging (MRI): Using strong magnets and radio waves, MRI creates complete images of soft tissues such as the brain, spinal cord, muscles, and joints. This technique

is more effective in diagnosing conditions such as brain tumors, joint injuries, and neurological disorders.

- 4. <u>Ultrasound:</u> Ultrasound uses high-frequency sound waves to image organs, blood vessels, and the developing fetus. Known to be safe, ultrasound is often used to monitor pregnancy, evaluate the heart, and diagnose certain conditions.
- 5. <u>Comprehensive Radiology:</u> This includes minimally invasive procedures guided by special techniques in the field of imaging. Allied radiologists perform procedures such as angioplasty, embolization, and biopsy with image guidance that improves accuracy.

The radiology department has state-of-the-art imaging equipment including digital X-ray unit, CT scanner, MRI machines, ultrasound machines, mammography machine, dental x-ray unit and fluoroscopy unit. These machines are operated by technologists and radiographers who ensure patient safety by obtaining high quality images.

In addition, radiology departments use Picture Archiving and Communication Systems (PACS) to store, manage, and share digital images and reports electronically. This technology allows healthcare professionals to access images remotely and collaborate seamlessly.

In fact, the radiology department plays an important role in modern healthcare, providing accurate diagnosis and guiding medical procedures through various advanced imaging technologies.

The faculty of Allied Health Science at Era University offers two year of diploma courses in CT scan technician, MRI technician, Radiological Intervention technician, X ray technician and 4 years Bachelor of Science in Medical radiologic and Imaging Technology. These courses are affiliated to Uttar Pradesh state medical faculty. Medical Imaging Technology is an allied health profession that focuses on the use of radiological imaging modalities used to diagnose, treat and prevent illness. It is one of the most successful career promising branch to those who pursue it MIT specialist are active constituents of the healthcare teams and hospitals. Students learn how to conduct investigation, perform radiological procedure, interpreted the report and record their result to operate and maintain complex radiological equipment. As the number of medical imaging investigations being conducted continues to grow due to expansion in health sector and the introduction of new advancement of medical imaging, profession is on the rise.

LEARNING OBJECTIVES

The Aim of the programs is to provide highest accredited educational and clinical experiences that will render qualified, patient focused, compassionate, critical thinkers Medical Radiology and Imaging Technologist for the community. After completion of this course, one should be able to do image acquisition, image processing and handle the all radiological and imaging equipment independently or as the healthcare team member. They should also able to ensure radiation protection, quality assurance, identify and manage

emergency situations, provide empathetic professional patient care.

PROGRAM OUTCOMES

- Provide the profession and community with trained qualified technologist.
- Provide education a comprehensive program that promotes problem solving, critical thinking and communication skills in the clinical environment.
- Students will demonstrate quality patient care skills including professionalism and ethical behaviors as specified in the code of ethics.
- Graduate students with specific skills necessary to be competent entry level.

ELIGIBILITY FOR ADMISSION

- 10 + 2 or equivalent examination recognized by any board with minimum 55% marks in Physics, Chemistry and Biology (PCB).
- For lateral entry 2 years diploma in CT technician/MRI Technician/X-ray Technician/DRIT affiliated with uttar Pradesh state medical faculty or equivalent.

COURSE DURATION

- From batch 2023 :4 years (3 yrs.+ 1 of internship)
- Till batch 2022:3.5 years (3yrs + six semesters) =+6 months of internship

CAREER PROSPECTS

- Should be able to undertake Mammography, CT scan and MRI procedures independently.
- Assist in specialized radiological procedures.
- Able to do the image processing.
- Should be able to handle all radiological and imaging equipment independently.
- Should ensure radiation protection and quality assurance
- Undertake care and maintenance of all radiological and imaging equipment
- Able to evaluate images for technical quality
- Able to identify and manage emergency situations.
- Able to receive and document verbal, written and electronic orders in the patient's medical record.
- Should have computer skills.
- Should be able to provide empathetic professional patient care.
- Able to demonstrate professional growth, sense of professionalism and desire to learn
- Able to demonstrate the core values of caring, integrity and discovery.

BMRIT CURRICULUM AT A GLANCE from batch 2023 (4 yrs.)

1st semester

- General Anatomy -I
- General Physiology-I
- Basic in Computer & Information Science
- Introduction to Quality and Patient Safety
- Applied Physics
- Image Acquisition, Processing & Archieving
- General Anatomy -I (P)
- General Physiology-I (P)
- Basic in Computer & Information Science (P)
- Applied Physics (P)

IInd semester

- General anatomy II
- General Physiology II
- Basic physics including radiological physics
- Conventional radiography and equipment
- Medical ethics and legal aspects
- Environmental science
- General anatomy II (P)
- General Physiology II (P)
- Basic physics including radiological physics(P)
- Conventional radiography and equipment(P)

IIIrd Semester

- Clinical radiography and positioning I
- Modern radiological and imaging equipment including physics
- Contrast and special radiography procedures
- Clinical radiography and positioning I(P)
- Modern radiological and imaging equipment including physics(P)
- Contrast and special radiography procedures(P)

IVth Semester

- Physics of newer imaging modalities
- Clinical radiography positioning II
- Newer modalities imaging techniques including patient care
- Quality control in radiology and radiation safety
- Physics of newer imaging modalities(P)
- Clinical radiography positioning II(P)
- Newer modalities imaging techniques including patient(P)
- Quality control in radiology and radiation safety(P)

Vth Semester

- Cross sectional anatomy and physiology
- Physics of advanced imaging technology
- Radiographic techniques of advanced imaging technology
- Research methodology and biostatics I
- Regulatory requirements in diagnostic radiology and imaging act and rules
- Cross sectional anatomy and physiology(P)
- Physics of advanced imaging technology(P)
- Radiographic techniques of advanced imaging technology(P)

VI th Semester

- Quality assurance and radiation safety
- Hospital practice and care of patients
- Research methodology and biostatics II
- Quality assurance and radiation safety(P)
- Hospital practice and care of patients.(P)
- Project work

VII semester & VIII semester (One Year Internship)

BRIT CURRICULUM AT A GLANCE till batch 2022,(3.5 Yrs)

1st semester

- Human anatomy I
- Human physiology I
- Fundamentals of medical imaging and radio therapy I
- Basic radiation physics I
- English.
- Fundamentals of computer
- Human anatomy I (P)
- Human physiology I(P)
- Fundamentals of medical imaging and radio therapy I(P)
- Basic radiation physics I(P)
- Fundamentals of computer(P)

IInd Semester

- Human anatomy II
- Human physiology II
- Fundamentals of medical imaging and radiotherapy II

- Basic radiation physics II
- English communication skills-I
- Human anatomy II(P)
- Human physiology II(P)
- Fundamentals of medical imaging and radiotherapy II(P)
- Basic radiation physics II(P)

IIIrd Semester

- Advanced Radiographic technique I
- English communication skills II
- Radiation physics and radiation protection I
- Equipment of radiotherapy I
- Special geographic technique and procedure I
- Medical biochemistry I
- Pathology I
- Advanced Radiographic technique I(P)
- Radiation physics and radiation protection I(P)
- Special geographic technique and procedure I(P)
- Medical biochemistry I(P)
- Pathology I(P)

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IVth Semester

- Advanced Radiographic technique II
- Radiation physics and radiation protection II
- Equipment of radiotherapy II
- Special radiographic technique and procedure II
- Medical biochemistry II
- Pathology II
- Advanced Radiographic technique II(P)
- Radiation physics and radiation protection II(P)
- Special radiographic technique and procedure II(P)
- Medical biochemistry II(P)
- Pathology II(P)

Vth Semester

- Radiotherapy planning and quality control I
- Advanced radiographic imaging technology I
- Physics of advanced imaging technology I
- Quality control in diagnostic radiology
- Radiotherapy planning and quality control I(P)
- Advanced radiographic imaging technology I(P)
- Quality control in diagnostic radiology(P)

VIth Semester

- Physics of advanced imaging technology II
- Radio safety in diagnostic radiology
- Advanced photographic imaging technology II
- Radiotherapy planning and quality control II
- Advanced photographic imaging technology II(P)
- Radiotherapy planning and quality control II(P)

Syllabus And eligibility criteria of Diploma In C.T. scan Technician Course

- 1. Eligibility Criteria for Admission & Duration Of The Course –Candidate Must Have Passed 12th With Physics, Chemistry Biology Or
- 2. Physics, Chemistry, Math With 35% Marks In Intermediate Exam (From UP Board Or Any Other Recognized Board)
- 3. Candidate Must Have Completed Age Of 17 Years Of Age As On 31st December Of Admission Year.

COURSE OBJECTIVE –

- Can perform CT scans of all body parts precisely
- He/she is able to develop film
- Can administer contrast & he/she able to handle adverse reaction to it
- He/she able to Use the radiation protection devices
- Well aware of radiation hazards & protection measures.
- Can read basics of various C.T. scan

In Diploma in CT scan Technician the subjects taught are as follows

- Anatomy
- Physiology
- Pathology
- Pharmacology
- Microbiology
- Radiation physics
- Radiation Hazards
- Radiographic positioning
- Nursing procedures
- CT physics
- CT clinical application
- CT guided procedures
- Biomedical Physics of CT

Course started here since - 2010

Course Duration - It is 2 Years, Full Time Diploma Course

Seats - 10

Affiliated from U.P. STATE MEDICAL FACULTY

Syllabus And eligibility criteria of Diploma in MRI Technician Course

- 1. Eligibility Criteria for Admission & Duration of The Course –Candidate Must Have Passed 12th With Physics, Chemistry Biology Or
- 2. Physics, Chemistry, Math With 35% Marks in Intermediate Exam (From UP Board or Any Other Recognized Board)
- 3.Candidate Must Have Completed Age Of 17 Years of Age as on 31st December of Admission Year.

COURSE OBJECTIVE –

- Can perform MRI scans of all body parts precisely
- He/she is able to develop & post process the film.
- Can administer contrast & he/she able to handle adverse reaction of it
- He/she able to Use protective measure used in MRI.
- Well aware of various MRI scan machine components hazards & protection measures
- Can read basics of various MRI scan

In Diploma in MRI scan Technician the subjects taught are as follows

- Anatomy
- Physiology
- Pathology
- Pharmacology
- Microbiology
- Basic physics
- MRI physics
- Radiation Hazards
- Radiographic positioning
- Nursing procedures
- Radiation Hazards
- MRI clinical application
- MRI guided procedures
- Biomedical Physics of MRI

Course started here since- 2010

Course Duration- It is 2 Years, Full Time Diploma Course

Seats -30

Affiliated from U.P. STATE MEDICAL FACULTY

Syllabus And eligibility criteria of Diploma in Radiological Intervention Technician Course

- 1. Eligibility Criteria for Admission & Duration of The Course –Candidate Must Have Passed 12th With Physics, Chemistry Biology Or
- 2. Physics, Chemistry, Mathematics With 35% Marks in Intermediate Exam (From UP Board or Any Other Recognized Board)

Candidate Must Have Completed Age Of 17 Years of Age as on 31st December of Admission Year.

- COURSE OBJECTIVE -
- Can Perform patient care through safe, efficient, appropriately interventional techniques & procedures
- Observation of site
- Can administer contrast media & he/she able to handle adverse reaction to it
- He/she able to Use the radiation protection devices
- Well aware of radiation hazards & protection measures.

In Diploma in Radiological Intervention Technician the subjects taught are as follows

- Anatomy
- Physiology
- Interventional procedures
- Radiological physics
- Radiation Hazards
- Radiographic positioning
- Nursing procedures
- Conditions requiring intervention
- CT, MRI, DSA, USG guided procedures

Course started here since 2021

Course Duration-It Is 2 Years, Full Time Diploma Course

Seats -30

Affiliated from U.P. STATE MEDICAL FACULTY

Syllabus And eligibility criteria of Diploma In X-ray Technician Course

- 1. Eligibility Criteria for Admission & Duration of The Course –Candidate must Have Passed 12th With Physics, Chemistry Biology Or
- 2. Physics, Chemistry, Math With 35% Marks in Intermediate Exam (From UP Board or Any Other Recognized Board)
- 3. Candidate Must Have Completed Age Of 17 Years of Age as on 31st December of Admission Year.

COURSE OBJECTIVE -

- Can perform X-ray of all parts precisely
- He/she is able to develop film
- Can administer contrast & he/she able to handle adverse reaction to it
- He/she able to Use the radiation protection devices
- Well aware of radiation hazards & protection measures.
- Can read basics of various X-rays.

In Diploma in X-ray Technician the subjects taught are as follows

- Anatomy
- Physiology
- Pathology
- Pharmacology
- Microbiology
- Radiation physics
- Radiation Hazards
- Radiographic positioning
- Nursing procedures
- Radiological Imaging Techniques and Patient Care
- Special Radiographic procedures
- Biomedical Physics of X-ray machines

Course started here since- 2008

Course Duration- It Is 2 Years, Full Time Diploma Course

Seats -30

Affiliated from U.P. STATE MEDICAL FACULTY

Conference/workshop/ Lecture Organized

1. Guest Lecture on topic
"Modern Imaging Advances
for Technicians" by Dr.
Bhanu Priya Singh, Assistant
Professor, Department of
Radiodiagnosis, Ram
Manohar Lohia Institute of
Medical Sciences, Lucknow
on 15/05/2023 at Mini
auditorium university
building ground floor.







2. Guest lecture on topic "Role of Technicians in Intervention radiology: Hope Beyond Expectation" by Dr. Saurabh Kumar Assistant Professor Department of Radiodiagnosis KGMU, Lucknow. on 19th May 2023 at Mini auditorium university building ground floor.







3. Guest lecture on topic "Role of Simulator in Radiotherapy Planning: The Radiological Imaging Aspects." by Dr. Teerathraj Verma Additional Professor Department of Radiotherapy KGMU, Lucknow. on 25th July 2023 at Mini auditorium university building ground floor.







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Name of Faculty	Publications (Title)
Prof. (Dr.) Usman Khan	1. Relationship between dose and response in thyroid cancer caused by Radiation Volume, 10 No.1S (2023). View of Relationship between dose and response in thyroid cancer caused by Radiation
	(sifisheriessciences.com)
	2. Effect of Radiation on DNA Volume, 12 doi: 10.31838.
	3. A study to evaluate information thoughts with perform of Radiographers about COVID-19 disease in integral hospital Lucknow Volume, 10/75, ISSN: 2278-8808.
	4. Illustrative investigation to evaluate the Know-How and opinion point of patients toward radiation exposure and its protection Volume, 10/75, ISSN: 2278-8808.
	5. A descriptive study to access the level of radiation safety awareness from ionizing radiation exposures among radiological students studying in Haryana and Delhi NCR Volume, 11 ISSN: 2455-6211.
	6. To access the knowledge and awareness of radiation dose and risks associated with medical imaging among the general public in India Volume, 10, ISSN: 2349-1590.
	7. Assessment of knowledge among radiography students about handling of emergency conditions in the radiology department Uttar Pradesh, India "European Journal of Molecular & Clinical Medicine" with ISSN: 2515-8260
	8. Diagnosis of sports injuries bit imaging modalities. (book)
	https://www.goodreads.com/book/show/18356 9989-diagnosis-of-sports-injuries-with-imaging- modalities
Dr. Taruna Singh	1. Ultrasonographic Assessment of Subclinical Atherosclerosis in Smokers Aged <40 Years Singh, Taruna MD (Radiotherapy)1; Karoli, Ritu MD (General Medicine)2,; Khanduri,

Sachin MD (Radiodiagnosis)1; Gupta, Nikhil MD (General Medicine)2; Singh, Prem Shanker MD (General Medicine)2 Author Information
Journal of Clinical and Preventive Cardiology 8(3):p 117-120, Jul—Sep 2019. | DOI: 10.4103/JCPC.JCPC_51_18

2. Beetroot Supplementation on Non-Alcoholic Fatty Liver Disease Patients Shikha Srivastava1, Zeba Siddiqi2, Taruna Singh3, Lakshmi Bala4* DOI:

https://dx.doi.org/10.12944/CRNFSJ.7.1.10

3. A Study of Multivariate Modalities of Therapy in Gall Bladder Malignancies with Different Clinical, Radiological and Histo-Pathological Profiles at a Low Resource Indian Cancer Centre Taruna Singh, Yogesh Verma, Meena Tiwari, Rahat Hadi, Mukti Nath Singh VOL 7 NO 1 (2022)

DOI: 10.31557/APJCC.2022.7.1.79-84

VOL 7 NO 1 (2022)

4. Optimum Radiation Fractionation Schedule in Advanced Cancer Cervix; A Study from Low Resource North Indian Cancer Center Taruna Singh, Yogesh Verma, Rahat Hadi, Fareha Khatoon, Mashkoor Ahmed

DOI 10.31557/APJCC.2022.7.1.47-54

Mr. Dilshad Ahmad

- **1.** A CASE STUDY TO CHECK THE X-RAY CERVICAL SPINE FINDINGS WITH COMMON SYMPTOMS", International Journal of Current Science (IJCSPUB), ISSN: 2250-1770, Volume.12, Issue 3, pp.933-961, September 2022.
 - 1. "POTENTIAL OF LOWER TESLA MRI FOR KNEE INJURIES- A CASE STUDY ", International Journal of Science & Engineering Development Research (www.ijsdr.org), ISSN: 2455-2631, Vol.7, Issue 8, page no.296 327, August-2022.
 - **2.** A study to evaluate information thoughts with perform of Radiographers about COVID-19 disease in integral hospital Lucknow Volume, 10/75, ISSN: 2278-

	8808.
	3. EFFECT OF RADIATION ON DNA
	Eur. Chem. Bull. 2023, 12(Special Issue
	5),162 – 173
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	https://www.eurchembull.com/uploads/p
	aper/e93c11081ee50261d8de915d45f883
	95.pdf
	1. Study To Determine The Level Of Knowledge,
Mr. Ajaydeep Singh Yadav	The Practices Followed And The Attitudes Of The
	General Population Towards Uv Radiation, Uttar
	Pradesh, India, International Journal Of Scientific
	Development And Research, Published In Vol 7
	Issue 7, July-2022.
	2. To Assess The Level Of Radiation Safety
	Awareness Among Non-Radiology Students, Uttar
	Pradesh, India, Indian Journal Of Applied
	Research, Vol-12, Issue-7, July 2022.
	3. Potential Of Lower Tesla MRI For Knee
	Injuries- A Case Study, International Journal Of
	Scientific Development And Research, Volume 7
	Issue 8, August-2022.
	issue o, riagast 2022.
	4. A Case Study To Check X-Ray Cervical Spine
	Findings With Common Symptoms, Volume 12,
	Issue 3, Page No. 933-961, September 2022,
	1. Assessment of Significance of Anatomical
Mr. Shailendra Kumar Diwaker	Variations of Sphenoid Sinus on
	Multidetector Computed Tomography.
	2. Evaluation of Radiologic Technology Education
	Programs -A Review Article (INT-JECSE) https://www.int-jecse.net/abstract.php?id=5080
	indexing SCOPUS.
	maching 5001 05.
	3. An analysis of the literature on the use of deep
	learning to generate medical reports for chest X-
	rays automatically (INT-JECSE)
	https://www.intjecse.net/abstract.php?id=5139.
	1. An analysis of the literature on the use of deep
Mr. Piyush Pandey	learning to generate medical reports for chest X-
	rays automatically Volume 14, Issue 07 2022,
	ISSN: 1308-5581.
	2. Evaluation of Radiologic Technology Education
	Programs -A Review Article Volume 14, Issue 07
	2022, ISSN: 1308-5581.
	3. Integrative Techniques in the Health Services

Volume, 8 Issue 7, ISSN: 2456-3315.	

Equipment's available in the Department:

S.NO	Name of equipment	Quantity	Photograph
1	MRI Machine	02 (3 Tesla and 0.4 tesla	
2	Dual Energy CT scan machine 384 slices	01	

3	Ultrasound Machine	08	
	X-ray machine	05	

5 Mobile X-ray Machine

01



Investigations

X-ray

- All routine x-rays
- Mammography
- Barium Studies
- IVP
- HSG/FTR
- MCU/RGU
- Loopogram
- Sinogram
- PTBD
- Fistulogram

CT scan

- All CT scans non contrast and contrast enhanced e.g. CT head, CT neck, HRCT, CT thorax, Abdomen etc.
- All type of Angiography
- Triple phase imaging
- CT guided procedures.

MRI.

- All MRI procedure contrast and non-contrast e.g. MRCP, Angiography, DTI etc.
- MRI guided procedures

Ultrasound

	 All routine and special ultrasound procedure. Ultrasound guided procedures. 	
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