

Babu Banarasi Das University, Lucknow
School of Allied Health Sciences
School Code: 13
University Branch Code: 16
Evaluation Scheme (w.e.f. – 2025-26)

Bachelor in Medical Radiology and Imaging Technology

SETS

	COURSE CODE	COURSE NAME	COURSE TYPE	Periods			Total Credits	Evaluation Scheme		
				L	T	P		CIA	ESE	Subject Total
SET 1	BMRIT 101T	Physics and Radiology Technology Basics	DSC	3	1	0	4	40	60	100
	BMRIT 102T	Vital Signs and Management of Medical Emergencies	DSC	2	0	0	2	40	60	100
	BMRIT 103T	Healthcare Delivery System	MD	2	1	0	3	40	60	100
	BMRIT 104T	Digital Literacy	AEC	2	0	0	2	60	40	100
	BMRIT 105T	Communicative English	SEC	2	1	0	3	60	40	100
	BMRIT 106T	Environment and Ecological Sustainability	VAC	2	1	0	3	40	60	100
	BMRIT 101P	Physics and Radiology Technology Basics Lab	DSC	0	0	6	3	60	40	100
	BMRIT 102P	Vital Signs and Management of Medical Emergencies Lab	DSC	0	0	4	2	60	40	100
		Total		13	4	10	22	400	400	800

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SET 2	COURSE CODE	COURSE NAME	COURSE TYPE	Periods			Total Credits	Evaluation Scheme		
				L	T	P		CIA	ESE	Subject Total
	BMRIT 201T	Basic Radiographic Techniques and Safety	DSC	3	1	0	4	40	60	100
	BMRIT 202T	Infection Control and Biomedical Waste Management	DSC	2	0	0	2	40	60	100
	BMRIT 203T	Hospital Services	MD	2	1	0	3	40	60	100
	BMRIT 204T	Business Communication	AEC	2	1	0	3	60	40	100
	BMRIT 205T	Job Ready Skills I	SEC	2	0	0	2	60	40	100
	BMRIT 206T	AI Tools	VAC	2	1	0	3	40	60	100
	BMRIT 201P	Basic Radiographic Techniques and Safety Lab	DSC	0	0	6	3	60	40	100
	BMRIT 202P	Infection Control and Biomedical Waste Management Lab	DSC	0	0	4	2	60	40	100
		Total		13	4	10	22	400	400	800

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SET 3	COURSE CODE	COURSE NAME	COURSE TYPE	Periods			Total Credits	Evaluation Scheme		
				L	T	P		CIA	ESE	Subject Total
	BMRIT 301T	Advanced Radiographic Techniques and Documentation	DSC	3	1	0	4	40	60	100
	BMRIT 302T	Quality Assurance in Radiology	DSC	2	1	0	3	40	60	100
	BMRIT 303T	Medical Law and Ethics	MD	2	1	0	3	40	60	100
	BMRIT 304T	Sales and Marketing	AEC	2	1	0	3	60	40	100
	BMRIT 305T	Job Ready Skills II	SEC	2	0	0	2	60	40	100
	BMRIT 301P	Advanced Radiographic Techniques and Documentation Lab	DSC	0	0	8	4	60	40	100
	BMRIT 302P	Quality Assurance in Radiology Lab	DSC	0	0	6	3	60	40	100
		Total		11	4	14	22	360	340	700

	COURSE CODE	COURSE NAME	COURSE TYPE	Periods			Total Credits	Evaluation Scheme			
				L	T	P		CIA	ESE	Subject Total	
SET 4	BMRIT 401T	Advanced Radiographic Techniques II	DSC	3	1	0	4	40	60	100	
	BMRIT 402T	Equipment Management and Specialised Imaging Techniques	DSC	3	1	0	4	40	60	100	
	BMRIT 403T	Radiation Therapy	DSC	2	2	0	4	40	60	100	
	BMRIT 404T	Pharmacology and Interventional Radiology	DSC	2	0	0	2	40	60	100	
	BMRIT 405T	Leadership Skills for Business Success	AEC	2	0	0	2	60	40	100	
	BMRIT 402P	Equipment Management and Specialised Imaging Techniques Lab	DSC	0	0	8	4	60	40	100	
	BMRIT 404P	Pharmacology and Interventional Radiology Lab	DSC	0	0	4	2	60	40	100	
		Total			12	4	12	22	340	360	700

SET 5	COURSE CODE	COURSE NAME	COURSE TYPE	Periods			Total Credits	Evaluation Scheme		
				L	T	P		CIA	ESE	Subject Total
	BMRIT 501P	Patient Care and Communication in Radiology	DSC	0	0	24	12	60	40	100
BMRIT 502P	Managing Medical Emergencies	DSC	0	0	12	6	60	40	100	
BMRIT 503P	Summer Internship	SI	0	0	4	2	60	40	100	
	Total			0	0	40	20	180	120	300

SET 6	COURSE CODE	COURSE NAME	COURSE TYPE	Periods			Total Credits	Evaluation Scheme		
				L	T	P		CIA	ESE	Subject Total
	BMRIT 601P	Infection Control Practices	DSC	0	0	24	12	60	40	100
	BMRIT 602P	Medical Ethics and Professionalism	DSC	0	0	12	6	60	40	100
BMRIT 603P	Internship	SEC	0	0	4	2	60	40	100	
				0	0	40	20	180	120	300

SET 7	COURSE CODE	COURSE NAME	COURSE TYPE	Periods			Total Credits	Evaluation Scheme		
				L	T	P		CIA	ESE	Subject Total
	BMRIT 701P	Introduction to Imaging Modalities	DSC	0	0	24	12	60	40	100
BMRIT 702P	Conventional Radiography Techniques	DSC	0	0	16	8	60	40	100	
	Total			0	0	40	20	120	80	200

SET 8	COURSE CODE	COURSE NAME	COURSE TYPE	Periods			Total Credits	Evaluation Scheme		
				L	T	P		CIA	ESE	Subject Total
	BMRIT 801P	Radiation Safety and Protection	DSC	0	0	16	8	60	40	100
	BMRIT 802P	Computed Tomography (CT) Principles and Practice	DSC/RP	0	0	8	4	60	40	100
	BMRIT 803P	Magnetic Resonance Imaging (MRI) Principles and Practice	DSC/RP	0	0	8	4	60	40	100
	BMRIT 804P	Ultrasound and Doppler Imaging	DSC/RP	0	0	8	4	60	40	100
		Total		0	0	40	20	240	160	400

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LEVEL 6 (Bachelor)

1st Classroom Semester- Set 1
2nd Classroom Semester- Set 2
3rd Classroom Semester- Set 3
4th Classroom Semester- Set 4

1st Internship Semester- Set 5
2nd Internship Semester- Set 6
3rd Internship Semester- Set 7
4th Internship Semester- Set 8

LEVEL 5 (Diploma)

1st Classroom Semester- Set 1
2nd Classroom Semester- Set 2

1st Internship Semester- Set 5
2nd Internship Semester- Set 6

LEVEL 5.5 (B.Sc.)

1st Classroom Semester- Set 1
2nd Classroom Semester- Set 2
3rd Classroom Semester- Set 3

1st Internship Semester- Set 5
2nd Internship Semester- Set 6
3rd Internship Semester- Set 7

LEVEL 4.5 (Certificate)

1st Classroom Semester- Set 1

1st Internship Semester- Set 5



Bachelor in Medical Radiology and Imaging Technology

Students choosing the level 4.5 exit will study set 1 in semester I and set 5 in semester II

	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
SEMESTER-I (The student will study set 1)	BMRIT 101T	Physics and Radiology Technology Basics	DSC	3	1	0	4	40	60	100
	BMRIT 102T	Vital Signs and Management of Medical Emergencies	DSC	2	0	0	2	40	60	100
	BMRIT 103T	Healthcare Delivery System	MD	2	1	0	3	40	60	100
	BMRIT 104T	Digital Literacy	AEC	2	0	0	2	60	40	100
	BMRIT 105T	Communicative English	SEC	2	1	0	3	60	40	100
	BMRIT 106T	Environment and Ecological Sustainability	VAC	2	1	0	3	40	60	100
	BMRIT 101P	Physics and Radiology Technology Basics Lab	DSC	0	0	6	3	60	40	100
	BMRIT 102P	Vital Signs and Management of Medical Emergencies Lab	DSC	0	0	4	2	60	40	100
		Total		13	4	10	22	400	400	800

1. An exit request for UG certificate can be raised maximum before the start of Semester II. In case a student raises a request for exit after the start of Semester II, they can only opt for the next available exit stage i.e. 2 year UG Diploma.
2. If a student does not wish to either opt for the next available exit stage or continue with the course, no certification will be provided to the student.
3. Students have to pass all the previous exams in order to be eligible for the internship semester.
4. In case a student fails in any of the exams in any semester, s/he will get another chance to reappear in the next end semester exam.
5. If a student wants to exit for a UG Certificate, after Semester I, then s/he has to complete the required credits in the internship semesters as given below.

SEMESTER -II (Student will study set 5)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BMRIT 501P	Patient Care and Communication in Radiology	DSC	0	0	24	12	60	40	100
	BMRIT 502P	Managing Medical Emergencies	DSC	0	0	12	6	60	40	100
	BMRIT 503P	Summer Internship	SI	0	0	4	2	60	40	100
				0	0	40	20	180	120	300

Students exiting the programme after securing 40 credits will be awarded a UG Certificate (Medical Radiology and Imaging Techniques), provided they secure 4 credits in work-based vocational courses offered during the summer term or an internship / Apprenticeship in addition to 6 credits from skill-based courses earned during the first and second semester.

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Students choosing the level 5 exit will study set 1 in semester I, set 2 in semester II, set 5 in semester III, and set 6 in semester IV

If a student wants to continue after Semester I, then this SET will be followed for Semester II.

	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
SEMESTER-II (Student will study set 2)	BMRIT 201T	Basic Radiographic Techniques and Safety	DSC	3	1	0	4	40	60	100
	BMRIT 202T	Infection Control and Biomedical Waste Management	DSC	2	0	0	2	40	60	100
	BMRIT 203T	Hospital Services	MD	2	1	0	3	40	60	100
	BMRIT 204T	Business Communication	AEC	2	1	0	3	60	40	100
	BMRIT 205T	Job Ready Skills I	SEC	2	0	0	2	60	40	100
	BMRIT 206T	AI Tools	VAC	2	1	0	3	40	60	100
	BMRIT 201P	Basic Radiographic Techniques and Safety Lab	DSC	0	0	6	3	60	40	100
	BMRIT 202P	Infection Control and Biomedical Waste Management Lab	DSC	0	0	4	2	60	40	100
				13	4	10	22	400	400	800

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1. An exit request for a UG diploma can be raised maximum before the start of Semester III. In case a student raises a request for exit after the start of Semester III, they can only opt for the next available exit stage i.e. 3 year UG Degree.
2. If a student does not wish to either opt for the next available exit stage or continue with the course, no certification will be provided to the student.
3. Students have to pass all the previous exams in order to be eligible for the internship semester.
4. In case a student fails in any of the exams in any semester, s/he will get another chance to reappear in the next end semester exam.
5. If a student wants to exit for a UG Diploma after Semester II, then s/he has to complete the required credits in the internship semesters as given below.

SEMESTER-III (Student will study set 5)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BMRIT 501P	Patient Care and Communication in Radiology	DSC	0	0	24	12	60	40	100
	BMRIT 502P	Managing Medical Emergencies	DSC	0	0	12	6	60	40	100
	BMRIT 503P	Summer Internship	SI	0	0	4	2	60	40	100
				0	0	40	20	180	120	300

SEMESTER-IV (Student will study set 6)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BMRIT 601P	Infection Control Practices	DSC	0	0	24	12	60	40	100
	BMRIT 602P	Medical Ethics and Professionalism	DSC	0	0	12	6	60	40	100
	BMRIT 603P	Internship	SEC	0	0	4	2	60	40	100
				0	0	40	20	180	120	300

Students exiting the programme after securing 80 credits will be awarded a UG Diploma (Medical Radiology and Imaging Techniques), provided they secure an additional 4 credits in skill-based vocational courses offered during the first year or second year summer term. If a student wants to continue after Semester II, then this SET will be followed for Semester III.

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Students choosing the level 5.5 exit will study set 1 in semester 1, set 2 in semester II, set 3 in semester III, set 5 in semester IV, set 6 in semester V, and set 7 in semester VI
If a student wants to continue after Semester II, then this SET will be followed for Semester III.

	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
SEMESTER -III (Student will study set 3)	BMRIT 301T	Advanced Radiographic Techniques and Documentation	DSC	3	1	0	4	40	60	100
	BMRIT 302T	Quality Assurance in Radiology	DSC	2	1	0	3	40	60	100
	BMRIT 303T	Medical Law and Ethics	MD	2	1	0	3	40	60	100
	BMRIT 304T	Sales and Marketing	AEC	2	1	0	3	60	40	100
	BMRIT 305T	Job Ready Skills II	SEC	2	0	0	2	60	40	100
	BMRIT 301P	Advanced Radiographic Techniques and Documentation Lab	DSC	0	0	8	4	60	40	100
	BMRIT 302P	Quality Assurance in Radiology Lab	DSC	0	0	6	3	60	40	100
				11	4	14	22	360	340	700

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1. An exit request for 3 year UG degree can be raised maximum before the start of Semester IV. In case a student raises a request for exit after the start of Semester IV, they can only opt for the next available exit stage i.e. 4 year UG degree with honors.
2. If a student does not wish to either opt for the next available exit stage or continue with the course, no certification will be provided to the student.
3. Students have to pass all the previous exams in order to be eligible for the internship semester.
4. In case a student fails in any of the exams in any semester, s/he will get another chance to reappear in the next end semester exam.
5. If a student wants to exit for a 3 year UG Degree, after Semester III, then s/he has to complete the required credits in the internship semesters as given below.

SEMESTER-IV (Student will study set 5)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BMRIT 501P	Patient Care and Communication in Radiology	DSC	0	0	24	12	60	40	100
	BMRIT 502P	Managing Medical Emergencies	DSC	0	0	12	6	60	40	100
	BMRIT 503P	Summer Internship	SI	0	0	4	2	60	40	100
				0	0	40	20	180	120	300

SEMESTER-V (Student will study set 6)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BMRIT 601P	Infection Control Practices	DSC	0	0	24	12	60	40	100
	BMRIT 602P	Medical Ethics and Professionalism	DSC	0	0	12	6	60	40	100
	BMRIT 603P	Internship	SEC	0	0	4	2	60	40	100
				0	0	40	20	180	120	300

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SEMESTER -VI (Student will study set 7)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BMRIT 701P	Introduction to Imaging Modalities	DSC	0	0	24	12	60	40	100
	BMRIT 702P	Conventional Radiography Techniques	DSC	0	0	16	8	60	40	100
				0	0	40	20	120	80	200

Students who want to undertake a 3-year UG programme will be awarded a Bachelor of Science (Medical Radiology and Imaging Techniques) degree upon securing 120 credits

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Students choosing the level 6 exit will study set 1 in semester I, set 2 in semester II, set 3 in semester III, set 4 in semester IV, set 5 in semester V, set 6 in semester VI, set 7 in semester VII, and set 8 in semester VIII

If a student wants to continue after Semester III, then this SET will be followed for the remaining semesters.

	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
SEMESTER-IV (Student will study set 4)	BMRIT 401T	Advanced Radiographic Techniques II	DSC	0	1	0	4	40	60	100
	BMRIT 402T	Equipment Management and Specialised Imaging Techniques	DSC	3	1	0	4	40	60	100
	BMRIT 403T	Radiation Therapy	DSC	2	2	0	4	40	60	100
	BMRIT 404T	Pharmacology and Interventional Radiology	DSC	2	0	0	2	40	60	100
	BMRIT 405T	Leadership Skills for Business Success	AEC	2	0	0	2	60	40	100
	BMRIT 402P	Equipment Management and Specialised Imaging Techniques Lab	DSC	0	0	8	4	60	40	100
	BMRIT 404P	Pharmacology and Interventional Radiology Lab	DSC	0	0	4	2	60	40	100
				12	4	12	22	340	360	700

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1. Students have to pass all the previous exams in order to be eligible for the internship semester.
2. In case a student fails in any of the exams in any semester, s/he will get another chance to reappear in the next end semester exam.

SEMESTER -V (Student will study set 5)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BMRIT 501P	Patient Care and Communication in Radiology	DSC	0	0	24	12	60	40	100
	BMRIT 502P	Managing Medical Emergencies	DSC	0	0	12	6	60	40	100
	BMRIT 503P	Summer Internship	SI	0	0	4	2	60	40	100
				0	0	40	20	180	120	300

SEMESTER -VII (Student will study set 6)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BMRIT 601P	Infection Control Practices	DSC	0	0	24	12	60	40	100
	BMRIT 602P	Medical Ethics and Professionalism	DSC	0	0	12	6	60	40	100
	BMRIT 603P	Internship	SEC	0	0	4	2	60	40	100
				0	0	40	20	180	120	300

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SEMESTER-VII (Student will study set 7)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BMRIT 701P	Introduction to Imaging Modalities	DSC	0	0	24	12	60	40	100
	BMRIT 702P	Conventional Radiography Techniques	DSC	0	0	16	8	60	40	100
				0	0	40	20	120	80	200

SEMESTER-VIII (The student will study set 8)	COURSE CODE	COURSE NAME	COURSE TYPE	CREDITS				Evaluation Scheme--		
				L	T	P	Total	CIA	ESE	Subject Total
	BMRIT 801P	Radiation Safety and Protection	DSC	0	0	16	8	60	40	100
	BMRIT 802P	Computed Tomography (CT) Principles and Practice	DSC/RP	0	0	8	4	60	40	100
	BMRIT 803P	Magnetic Resonance Imaging (MRI) Principles and Practice	DSC/RP	0	0	8	4	60	40	100
	BMRIT 804P	Ultrasound and Doppler Imaging	DSC/RP	0	0	8	4	60	40	100
				0	0	40	20	240	160	400

Students will be awarded a Bachelor in Medical Radiology and Imaging Technology degree provided they secure 160 credits

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Course Type Abbreviations:

DSC: Discipline Specific Core/Major Courses

MD: Multi-Disciplinary Courses

AEC: Ability Enhancement Courses

SEC: Skill Enhancement Courses

VAC: Common Values Added Courses

SI: Summer Internship

RP: Research Project

CIA: Continuous Internal Assessment

ESE: End Semester Examination

L: Lecture

T: Tutorial

P: Practical

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Babu Banarasi Das University, Lucknow
School of Allied Health Sciences
School Code: 13
University Branch Code: 16
Evaluation Scheme (w.e.f. – 2025-26)

PROGRAM OUTCOMES

- PO1: Demonstrate a comprehensive understanding of human anatomy, physiology, pathology, and medical terminology for effective clinical communication and radiological interpretation.
- PO2: Apply stringent infection control and safety measures during radiological procedures to ensure a sterile and secure healthcare environment.
- PO3: Exhibit proficiency in diagnostic imaging modalities such as X-ray, CT, MRI, ultrasound, and digital radiography, including their indications, limitations, and advancements.
- PO4: Perform patient positioning, preparation, and aftercare in various radiological procedures like IVP, HSG, barium studies, and contrast-enhanced imaging with a focus on patient safety.
- PO5: Interpret imaging results, correlate them with clinical findings, and assist in accurate diagnosis and clinical decision-making.
- PO6: Demonstrate adherence to radiation protection principles, equipment handling protocols, quality assurance, and legal-ethical standards in radiology practice.
- PO7: Operate and maintain radiology equipment effectively, ensuring high-quality imaging and adherence to quality control standards.
- PO8: Integrate knowledge of health systems, biomedical ethics, environmental science, and IT tools for efficient healthcare service delivery.
- PO9: Communicate effectively with patients, healthcare professionals, and multidisciplinary teams, demonstrating cultural sensitivity and empathy.
- PO10: Apply problem-solving, critical thinking, and evidence-based approaches to clinical scenarios in radiological and imaging contexts.
- PO11: Exhibit professionalism, time management, and adaptability in various clinical and diagnostic imaging settings.
- PO12: Develop leadership qualities, emotional intelligence, and a growth mindset for continuous professional development and contributions to the healthcare field.


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PROGRAM SPECIFIC OUTCOMES

PSO 1: Apply comprehensive knowledge of radiological sciences and imaging technologies to perform diagnostic procedures with accuracy, safety, and ethical integrity, contributing effectively to patient care and clinical decision-making in diverse healthcare settings.

PSO 2: Demonstrate professional competence through effective communication, teamwork, and leadership skills while upholding legal, ethical, and quality standards in medical imaging and continually adapting to advancements in healthcare technologies.



Program	BMRIT					
Year	I	Semester		I		
Course Name	Physics and Radiology Technology Basics					
Code	BMRIT 101T					
Course Type	DSC	L	T	P	Credit	
Pre-Requisite		3	1	0	4	
Course Objectives	Understand the anatomical planes and positions used to describe the human body, and learn the foundational structure and usage of medical terminology including prefixes, suffixes, abbreviations, and directional terms. Explore the basics of human anatomy and physiology. Explain the roles and workflow of a radiology department. Explain the fundamental physics concepts—including electricity, magnetism, radioactivity, and X-ray production—relevant to radiology technology.					
Course Outcomes						
CO1	Describe human body structures using anatomical planes, positions, and appropriate medical terminology					
CO2	Explain the structure and functions of cells, tissues, organs, and organ systems, and explain their interrelationships and roles in maintaining homeostasis and overall health					
CO3	Understand the fundamentals of medical imaging, including X-ray physics and various radiology modalities, along with their clinical applications, the role and responsibilities of a radiology technician, and their contribution to patient care and accurate diagnostics.					
CO4	Possess knowledge about the fundamental physics principles underlying diagnostic imaging techniques used in radiology.					

Module	Course Contents	Contact Hrs.	Mapped CO
1	Anatomical Planes, Anatomical Positions and Medical Terminology; Sagittal plane, Frontal plane, Transverse plane, Supine position, Prone position, Parts of medical terminology, Rules for constructing and interpreting medical terms, Terminology	15 Hours	CO1







	related to body parts, Regional terms of the human body, Directional terms, Abbreviations & symbols, Prefixes, Suffixes		
2	Anatomy and Physiology: Cell, Tissue, Organ, Organ system, Digestive system, Respiratory system, Integumentary system, Circulatory system, Lymphatic System, Muscular system, Skeletal System, Urinary System, Reproductive System - Male and female, Endocrine system, Nervous System, Body fluids	15 Hours	CO2
3	Introduction to Radiology Technology: History and principles of medical imaging; X-ray physics and radiation safety concepts.; Different radiology modalities (X-ray, fluoroscopy, CT, MRI, etc.) and their applications.; Departmental organization and workflow in radiology, Roles and responsibilities of radiology technician	15 Hours	CO3
4	Basic Physics: Electric charge, Static & current electricity, Alternating current & direct current; Magnetism; Properties of magnet and types of magnets; Coulomb's law and Transformers, Concept of radioactivity, Properties of x-rays, Electromagnetic radiation, Types of radiation, Production of X-rays, Radiation classification and its interaction with matter	15 Hours	CO4

Suggested Readings

1. Davi-Allen Chabner, Medical Terminology: A Short Course, Saunders, 2017
2. Barbara Janson Cohen, Shirley A Jone, Medical Terminology an Illustrated Guide, Ninth edition
3. G Deepa, PR Ashalatha, Textbook of Applied Anatomy and Physiology for Nurses, Jaypee Brothers Medical Publishers
4. B.D. Chaurasia, Applied Anatomy and Physiology for BSc Nursing Students, CBS Publishers & Distributors Pvt. Ltd.
5. A.P. Saxena, Radiation Physics and Physics of Diagnostic Radiology, June 2016, First Edition, Laxmi Publications Private Limited
6. Kuppusamy Thayalan, Basic Radiological Physics, 2024, 2nd Edition, Jaypee Brothers Medical Publishers (P) Ltd
7. Pooja Shah and Shamvab Dhaka, A Textbook of Radiographic Technique, 2019, 1st edition, Samiksha Publication

Online Resources

1. <https://www.ncbi.nlm.nih.gov/books/NBK607454/>
2. <https://radiopaedia.org>
3. <https://www.ncbi.nlm.nih.gov/books/NBK546155/>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2

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CO1	3	—	1	1	2	—	—	—	—	1	—	—	3	1
CO2	3	—	1	1	2	—	—	—	—	1	—	—	3	1
CO3	2	2	3	2	2	2	2	1	2	3	2	2	3	3
CO4	2	—	3	—	1	2	2	—	—	2	—	—	3	2

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Program	BMRIT				
Year	I	Semester		I	
Course Name	Vital Signs and Management of Medical Emergencies				
Code	BMRIT 102T				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		2	0	0	2
Course Objectives	Explain the concept, types, and normal ranges of vital signs, and demonstrate accurate measurement and interpretation using appropriate clinical methods and equipment. Describe and apply the step-by-step process of administering Cardiopulmonary Resuscitation (CPR) in adults and children, and manage choking incidents effectively through risk identification and appropriate first aid techniques. Provide appropriate first aid for common medical emergencies such as fractures, burns, hemorrhage, stroke, and wounds, ensuring timely and effective pre-hospital care.				
Course Outcomes					
CO1	Understand, measure and interpret the various types of vital signs and their normal ranges along with their clinical significance				
CO2	Perform CPR (Cardiopulmonary resuscitation) in adults and children.				
CO3	Assist in managing medical emergencies, including choking, fractures, burns, hemorrhage, stroke, and wounds.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Vital Signs and its Measurement: Introduction to vital signs, Types of vital signs, Normal ranges of vital signs, Methods and instruments used to monitor vital signs	10 Hours	CO1
2	CPR – Adult and Child: CPR (Cardiopulmonary resuscitation), Indications of CPR, Steps in CPR, The algorithm of Adult CPR, CPR (Cardiopulmonary resuscitation) in Child	10 Hours	CO2

3	Common Medical Emergencies and its Management Choking/Foreign body airway obstruction, Risk factors of choking, Mechanism of occurrence of choking, Signs of choking, Complications of choking, Choking management, First aid for fractures, Burns management, Haemorrhage management, Stroke management, Wound management	10 Hours	CO3
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Suggested Readings

1. Devendra Richhariya, Textbook of Emergency and Trauma Care, Jaypee Brothers Medical Publishers
2. S.P. Gupta & D.K. Gupta, Medical Emergencies in General Practice

Online Resources

1. <https://medlineplus.gov>
2. <https://cpr.heart.org>
3. <https://www.redcross.org>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	2	2	—	—	—	—	2	—	—	3	1
CO2	2	3	2	2	2	2	2	—	2	3	2	1	3	2
CO3	2	3	2	3	3	2	2	1	2	3	2	2	3	3

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Program	BMRIT				
Year	I	Semester		I	
Course Name	Healthcare Delivery System				
Code	BMRIT 103T				
Course Type	MD	L	T	P	Credit
Pre-Requisite		2	1	0	3
Course Objectives	Understand the structure of the Indian healthcare delivery system, including its primary, secondary, and tertiary levels, as well as public and private sectors, while gaining knowledge about alternative healthcare systems under AYUSH and the role of hospitals in healthcare delivery.				
	Understand National Health Programs, voluntary agencies, and foundational health concepts, including disease types and hospital roles in healthcare delivery.				
	Comprehend the basic concepts of demography and epidemiology, including population statistics, trends, and principles of disease occurrence and distribution in the Indian context.				
Course Outcomes					
CO1	Describe the structure of the Indian healthcare system including levels of care (primary, secondary, tertiary), and differentiate the roles of public, private, and alternative systems like AYUSH.				
CO2	Explain the objectives of national health programs and voluntary health agencies, and define health and disease along with their determinants and influencing factors.				
CO3	Explain key demographic features of India and basic epidemiological concepts related to public health.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Indian Healthcare Delivery System and Alternative Medicine Introduction to Indian Health Care Delivery System, Levels of healthcare – Primary, secondary and tertiary levels, Healthcare Sectors - Public sector, Private sector, AYUSH (Ayurveda, Yoga, Unani, Siddha, and Homeopathy)	15 Hours	CO1

2	National Health Programs and Basic Concepts of Health and Disease: National Health programs, Voluntary health agencies, Basic concept of health, Basic concept of diseases, Health determinants, Types of diseases, Factors influencing health and disease, Hospital as an organization	15 Hours	CO2
3	Demography and Epidemiology: Demography of India: Population trends and statistics, Epidemiology: Basic principles, definitions	15 Hours	CO3

Suggested Readings

1. B.M. Sakharkar, Principles of Hospital Administration and Planning, Jaypee Brothers Medical Publishers
2. Caroline Curren, Meg Stacey, Concepts of Health, Illness and Disease: A Comparative

Online Resources

1. <https://lmis.nihfw.ac.in/local/course/view.php?id=734>
2. <https://ayush.gov.in/#/>
3. <https://www.india.gov.in/ministry-health-and-family-welfare-6>
4. <https://www.who.int/health-topics>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1	—	1	—	—	3	2	2	1	2	2	3
CO2	2	1	—	—	1	—	—	3	2	2	1	2	2	3
CO3	2	1	—	—	2	—	—	2	1	3	1	1	2	2

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Program	BMRIT				
Year	I	Semester		I	
Course Name	Digital Literacy				
Code	BMRT 104T				
Course Type	AEC	L	T	P	Credit
Pre-Requisite		2	0	0	2
Course Objective	Describe the fundamental components of a computer, basic operations, and perform number system conversions. Explain the principles of computer networks, operating systems, and basic internet concepts. Demonstrate effective use of MS Office tools for word processing, creating spreadsheets, and preparing presentations.				
Course Outcomes					
CO1	Describe basic computer components, operations, and number system conversions.				
CO2	Explain computer networks, operating systems, and internet fundamentals.				
CO3	Utilize MS Office tools effectively for word processing, spreadsheets, and presentations.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Introduction to Computer, Operations and Number System Characteristics of computer, Application of computer, Classification of computer, Types of computers, Generation and organization, Computer languages, Input and output devices, Hardware and software, Computer memory, Number system, Different types of number systems used in computer, Number system conversion	5 Hours	CO1
2	Computer Network, Operating System and Internet: Introduction to computer networks, Networking components, Classification and types of networks, Topologies, Communication channels, Client server architecture, LAN concepts Introduction to operating system, Functions of operating system, Types of operating system, Classification of	8 Hours	CO2

	operating system, Components of operating system, Basics of internet		
3	MS Office: MS Word, MS Excel, MS PowerPoint	17 Hours	CO3

Suggested Readings

1. The Essentials of Computer Organization and Architecture, Linda Null and Julia Lobur, 2006
2. Understanding Digital Literacies: A Practical Introduction, Rodney H. Jones and Christoph A. Hafner, 2016

Online Resources

1. <https://lms.nihfw.ac.in/local/course/view.php?id=734>
2. https://www.researchgate.net/publication/313309097_Operating_Systems#:~:text=An%20operating%20system%20is%20a,physical%20computer%20to%20execute%20applications.
3. <https://lincs.ed.gov/sites/default/files/TSTMDigitalLiteracyBrief-508.pdf>
4. <https://davpgcvns.ac.in/wp-content/uploads/2020/11/Introduction-of-MS-Office-MS-Word-PDF-eng.pdf>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	—	1	—	—	—	1	3	—	2	1	1	1	2
CO2	1	—	1	—	—	—	1	3	—	2	1	1	1	2
CO3	—	—	—	—	—	—	1	3	1	2	2	2	1	3

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Program	BMRIT				
Year	I	Semester		I	
Course Name	Communicative English				
Code	BMRIT 105T				
Course Type	SEC	L	T	P	Credit
Pre-Requisite		2	1	0	3
Course Objective	Understand and differentiate between various types of communication skills, including verbal and non-verbal forms. Demonstrate effective communication using appropriate body language, posture, and context-based interactions. Apply personal hygiene and grooming etiquette to maintain a professional and presentable appearance.				
Course Outcomes					
CO1	Understand and differentiate between various types of communication skills, including verbal and non-verbal forms.				
CO2	Demonstrate effective communication using appropriate body language, posture, and context-based interactions.				
CO3	Apply personal hygiene and grooming etiquette to maintain a professional appearance.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Communication Skills and Types of Communication Communication skills, Types of communication skills, Oral communication, Written communication, Facial expressions, Tone of voice, Pitch of voice, Body language	15 Hours	CO1
2	Body Language and Posture: Components of body language, Components of posture	15 Hours	CO2
3	Personal Hygiene and Grooming Importance of personal hygiene, Components of personal hygiene, Grooming etiquette, Do's and Don'ts of Grooming	15 Hours	CO3

Suggested Readings

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1. Ahuja, B.N. and S.S. Chopra, Communication, Surjeet Publications, 2006
2. Barun K Mitra, Personality Development and Soft Skills, Oxford University Press, 2016

Online Resources

1. <https://www.skillsyouneed.com>
2. <https://www.mindtools.com>
3. <https://alison.com>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	—	—	—	—	—	—	—	3	2	2	2	—	3
CO2	1	—	—	—	—	—	—	—	3	2	3	2	—	3
CO3	—	—	—	—	—	—	—	—	1	—	3	2	—	2

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Program	BMRIT				
Year	I	Semester		I	
Course Name	Environment and Ecological Sustainability				
Code	BMRIT 106T				
Course Type	VAC	L	T	P	Credit
Pre-Requisite		2	1	0	3
Course Objectives	To develop basic knowledge of environment, ecology and ecosystem. To impart basic and key knowledge of atmospheric and global climate change. To develop a knowledge of natural resources, conservation and sustainable use. To recognize knowledge of effects disturbance, adaptation and development in the ecosystem. To help students to acquire knowledge of pollution and environment protection.				
Course Outcomes					
CO1	Understand atmosphere and climatic change, major biome and ecosystem energy.				
CO2	Be able to conserve natural resources and to learn equity at different levels and benefits of sustainable use of natural resources.				
CO3	Develop improved understanding of environmental pollution, principles and application of environmental management tools including legislation and regulation.				

Module	Course Contents	Contact Hrs.	Mapped CO
I	Environment & Ecology Environment and its segments: Definition, Scope and importance; Atmosphere: Composition characterization, temperature behaviour and atmospheric stability, climate change; Hydrosphere; Water distribution Lithosphere: Structure and composition. Biosphere Ecology and Ecosystem: Introduction, Concept of an Ecosystem.	15 Hours	CO1

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	Structure and function of Ecosystem, Energy flow in an Ecosystem, Food chain and food web, Types of Ecosystem; Ecological Pyramids: Definition, Types of Ecological Pyramid Material cycle: Definition and importance, Nitrogen and carbon cycle.		
2	Natural Resources: Natural resources: Definition, types of natural resource Water Resources: Drinking water quality, Water crisis and uses, Water borne and water induced diseases, Fluoride problem in drinking water, Rain water harvesting; Forest Resources: Impact of deforestation on environment Food resources: Crisis, Food adulteration and Hygiene National Policy for Food Security and Managements. Mineral Resources: Use and exploitation of minerals, Impact of mining on environment; Energy resources: Conventional and nonconventional energy sources, Solar energy, Hydropower energy, Hydrogen energy, Biomass-energy Sustainable Development: Definition, sustainable use and conservation of natural resource, Equitable use of Resources, Common Property Resources; Biodiversity and its conservation Environment Management System(EMS): Definition, stages of EMS, cost and benefits of EMS	15 Hours	CO2
3	Environmental Pollution and Protection: Environmental Pollution: Definition, Pollutants, sources, causes, effects and control measures of air, water, and soil pollution; Noise: Sources of Noise pollution, Measurement of noise, Noise exposure levels and standards. Impact of noise on human health. Noise control and abatement measures. Current environmental Issues: Population growth, Logistic growth curve equation. Climate change, Global Warming, Acid rain, Ozone layer, Waste Water Treatments. Solid Waste Management, Natural disaster and its management. Environment Protection: Legal aspects of Environment Protection, Environment Protection Act, Air(Prevention and Control of Pollution)Act, Water(Prevention and control of Pollution) Act, Role of NGOs in Environment Protection. Environmental Protection and Sustainability Environmental Education and Awareness.	15 Hours	CO3

Suggested Readings

1. Daniel B. Botkin and Edward A. Keller, Environmental Science: Earth as a Living Planet
2. R. Rajagopalan, Environmental Studies
3. William P. Cunningham and Mary Ann Cunningham, Principles of Environmental Science:

Inquiry and Applications

Online Resources

1. <https://pubmed.ncbi.nlm.nih.gov/31506839/>
2. <https://ecology.edu>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	—	—	—	2	—	2	2	2	—	2	2	1	—	—
CO2	—	—	—	2	—	2	2	—	—	2	2	—	—	—
CO3	—	—	—	3	—	3	3	—	—	2	2	2	—	—



Program	BMRIT				
Year	I	Semester		I	
Course Name	Physics and Radiology Technology Basics Lab				
Code	BMRIT 101P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	6	3
Course Objective	Develop the ability to identify and describe the major organs and structures of the human body's key systems (respiratory, digestive, skin, circulatory, excretory, nervous, skeletal). Demonstrate practical skills in constructing and analyzing simple electrical and magnetic circuits. Explore and explain the fundamental concepts of static electricity, magnetism, and electromagnetic induction through hands-on experiments. Apply scientific methods to investigate the properties and behaviors of magnets and electromagnets.				
Course Outcomes					
CO1	Accurately identify and label the major anatomical structures of the respiratory, digestive, skin, circulatory, excretory, nervous, and skeletal systems.				
CO2	Construct and demonstrate open and closed electrical circuits, and explain their functioning.				
CO3	Investigate and interpret the effects of static electricity, magnetic attraction/repulsion, and the creation of magnetic fields.				
CO4	Build electromagnets and temporary magnets, and demonstrate electromagnetic induction using Faraday's experiment.				

S. No.	List of Experiments	
1	Identification of different parts of the respiratory system	CO1
2	Identification of different parts of the digestive system	CO1
3	Identification of different layers of the skin.	CO1
4	Identification of different parts of the circulatory system	CO1
5	Identification of different parts of the excretory system	CO1
6	Identification of different parts of the nervous system	CO1

7	Identification of different bones and joints in the human body	CO1
8	Construct open and closed electrical circuits.	CO2
9	Observe the effects of static electricity.	CO3
10	Investigate the attraction and repulsion between magnetic poles.	CO3
11	Create magnetic field lines using iron filings and a magnet.	CO3
12	Construct an electromagnet by coiling wire around a magnetic core.	CO3
13	Identify the north and south poles of a magnet using a compass.	CO3
14	Construct a temporary magnet by stroking a piece of metal with a magnet.	CO3
15	Conduct Faraday's experiment to demonstrate electromagnetic induction.	CO3

Suggested Readings

1. Davi-Allen Chabner, Medical Terminology: A Short Course, Saunders, 2017
2. Barbara Janson Cohen, Shirley A Jone, Medical Terminology an Illustrated Guide, Ninth edition
3. G Deepa, PR Ashalatha, Textbook of Applied Anatomy and Physiology for Nurses, Jaypee Brothers Medical Publishers
4. B.D. Chaurasia, Applied Anatomy and Physiology for BSc Nursing Students, CBS Publishers & Distributors Pvt. Ltd.
5. A.P. Saxena, Radiation Physics and Physics of Diagnostic Radiology, June 2016, First Edition, Laxmi Publications Private Limited
6. Kuppusamy Thayalan, Basic Radiological Physics, 2024, 2nd Edition, Jaypee Brothers Medical Publishers (P) Ltd
7. Pooja Shah and Shamvab Dhaka, A Textbook of Radiographic Technique, 2019, 1st edition, Samiksha Publication

Online Resources

1. <https://www.ncbi.nlm.nih.gov/books/NBK607454/>
2. <https://radiopaedia.org>
3. <https://www.ncbi.nlm.nih.gov/books/NBK546155/>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	—	1	—	1	—	—	—	—	2	—	—	3	1
CO2	1	—	2	—	—	—	2	—	—	3	2	2	2	2
CO3	1	—	2	—	—	—	1	—	—	3	2	2	2	2
CO4	1	—	2	—	—	—	1	—	—	3	2	2	2	2

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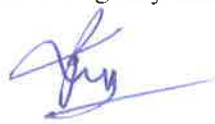
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Program	BMRIT					
Year	I	Semester		I		
Course Name	Vital Signs and Management of Medical Emergencies Lab					
Code	BMRIT 102P					
Course Type	DSC	L	T	P	Credit	
Pre-Requisite		0	0	4	2	
Course Objective	Measure and accurately record vital signs including temperature, respiratory rate, pulse, blood pressure, and oxygen saturation. Demonstrate the correct procedures for performing CPR and defibrillation on adults and children. Apply appropriate first aid techniques to manage emergency situations such as choking effectively.					
Course Outcomes						
CO1	Measure and record vital signs including temperature, respiratory rate, pulse, blood pressure, and oxygen saturation.					
CO2	Demonstrate the correct procedure for CPR and defibrillation in adults and children.					
CO3	Manage emergency scenarios such as choking using appropriate first aid techniques.					

S. No.	List of Experiments	
1	Determination of temperature and respiratory rate	CO1
2	Determination of pulse, blood pressure and oxygen saturation	CO1
3	Perform CPR in adults and children	CO2
4	Perform defibrillation	CO2
5	Perform choking management	CO3

Suggested Readings

1. Devendra Richhariya, Textbook of Emergency and Trauma Care, Jaypee Brothers Medical Publishers






2. S.P. Gupta & D.K. Gupta, Medical Emergencies in General Practice

Online Resources

1. <https://medlineplus.gov>
2. <https://cpr.heart.org>
3. <https://www.redcross.org>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	2	2	—	—	—	—	2	—	—	3	1
CO2	2	3	2	2	2	2	2	—	2	3	2	1	3	2
CO3	2	3	2	3	3	2	2	1	2	3	2	2	3	3

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Program	BMRIT				
Year	I	Semester		II	
Course Name	Basic Radiographic Techniques and Safety				
Code	BMRIT 201T				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		3	1	0	4
Course Objectives	Explain the principles of X-ray film processing, digital image enhancement, and factors affecting radiographic image quality, including artifact recognition. Demonstrate correct radiographic positioning for various anatomical regions and apply patient care, safety, and documentation protocols in the radiology department. Describe the types, indications, procedures, and aftercare of contrast media studies and implement emergency protocols during radiological procedures. Apply radiation safety measures, recognize hazards, and perform preventive maintenance of X-ray equipment to ensure safe radiology practice.				
Course Outcomes					
CO1	Understand the process of film processing for optimal image quality and safety in diagnostic radiology.				
CO2	Apply skills to position patients accurately and safely for various X-ray examinations, optimizing image quality while minimizing radiation exposure.				
CO3	Understand various contrast media types and their applications in radiography.				
CO4	Apply knowledge of radiation hazards, protective measures, and safety protocols to ensure safe and responsible practice in radiology.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	X rays and Image Processing Techniques: X- ray film, X- ray film processing, Intensifying screens, Darkroom, Darkroom processes, Digital image processing, Image enhancement techniques, Factors affecting image clarity,	15 Hours	CO1

	The radiologist's focus: Regions of interest, Common artifacts in radiographs		
2	Radiographic Positioning and Patient Care Position terminology & skull and facial bone radiographic positioning, Shoulder and upper radiographic positioning, Chest and abdomen radiographic positioning, Hip, pelvis and lower limb Radiographic positioning, Vertebral column radiographic positioning, Patient assessment and Communication, Medical record documentation, Patient safety and environment management	15 Hours	CO2
3	Contrast Media and Emergency Protocols: Contrast medium and its different types (Iodinated and Non iodinated), Barium swallow technique; Indication and contraindication of barium swallow technique, follow through and enema; Patient preparation and procedure for barium swallow, follow through and enema; Radiographic technique of barium swallow follow through and enema; Aftercare of barium swallow, follow through and enema	15 Hours	CO3
4	Radiation Safety, Hazards, and Prevention: Radiation dose, Radiation effects, Methods to control scatter radiation, Radiation protection, Care and maintenance of X ray equipment	15 Hours	CO4

Suggested Readings

1. A.P. Saxena, Dark Room Techniques Hardcover, 2016, First Edition; Laxmi Publications Private Limited
2. A Krishnamurthy, Medical Radiographic Techniques and Dark Room Practices, 2007, 1st Edition, Jaypee Brothers Medical Publishers (P) Ltd
3. Abhitabh Gupta, LC Gupta, Radiophysics and Dark Room Procedures (Including Ultrasound), 2002, 3rd Edition, Jaypee Brothers Medical Publishers (P) Ltd
4. A. Stewart Whitley, Gail Jefferson, Ken Holmes, & 3 More, Clark's Positioning in Radiography 13E, CRC
5. Kenneth L. Bontrager, John P. Lampignano, Textbook of Radiographic Positioning and Related Anatomy 8Ed, 2013, Elsevier
6. Pushparajav, Radiological protection and safety: A practitioner's Guide, 2019, Notion Press
7. Prashant Kumar Jha, Basics of Radiation Hazards and Prevention in Diagnostic Radiology, 2022
8. Kushal Gehlot, A Concise Guide On Special Radiographic Investigations & Techniques, 2022, 2nd edition, JBD publications

Online Resources

1. <https://www.ncbi.nlm.nih.gov/books/NBK557499/>
2. <https://ehs.usc.edu/research/rad/x-ray-safety/>
3. <https://www.epa.gov/sites/default/files/2015-05/documents/fgr14-2014.pdf>

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4. <https://www.radiologyinfo.org/en/info/safety-contrast>
5. <https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/barium-swallow>
6. <https://radiopaedia.org/articles/barium-swallow?lang=us>
7. <https://www.ncbi.nlm.nih.gov/books/NBK565865/>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	—	3	—	2	1	2	—	—	2	—	—	3	1
CO2	2	3	3	3	2	2	2	—	1	3	2	2	3	3
CO3	2	2	2	2	2	1	1	—	—	2	—	—	3	1
CO4	2	3	2	2	2	3	2	1	—	3	2	2	3	3

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Program	BMRIT				
Year	I	Semester	II		
Course Name	Infection Control and Biomedical Waste Management				
Code	BMRIT 202T				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		2	0	0	2
Course Objective	Apply infection control and proper PPE use. Implement sterilization and biomedical waste protocols. Understand vaccination importance for healthcare workers.				
Course Outcomes					
CO1	Understand different types of infections and apply infection control measures, including proper hand hygiene practices, utilizing PPE.				
CO2	Demonstrate knowledge of sterilization methods and BMW by implementing correct protocols				
CO3	Understand the importance of vaccination for healthcare workers.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Infection & its Types and Infection Control and Prevention Definition of infection and infectious diseases, Types of infection – Acute, Chronic, Primary, Localized, Systemic, Clinical, Subclinical and Hospital Acquired Infections, Measures of Infection Control, Importance of Hand Hygiene, Hand washing Techniques, Hand Rub Techniques, 5 moments of hand Hygiene, PPE, Importance of PPE, Types of PPE and its uses, Sequence for donning and removing – PPE, Sterilization: introduction	10 Hours	CO1
2	Sterilization and BMW Management Sterilization vs Disinfection, Different methods of sterilization, Know about hot air oven, Autoclave, Factors affecting autoclave, Process of Autoclaving, Advantages and disadvantages of autoclave, Categorization of biomedical wastes, Steps for BMW management – Segregation and colour codes for BMW, collection, storage and transportation of waste, Different methods for treatment of biomedical waste	10 Hours	CO2

3	Vaccination for Healthcare Professionals: Importance of vaccines for healthcare workers, Risk categorization, Currently recommended vaccines for healthcare workers, Post exposure prophylaxis	10 Hours	CO3
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Suggested Readings

1. S. Apruba Sastry, R. Deepashree, Essentials of Hospital Infection Control, Jaypee Brothers Medical Publishers
2. Singh Anantpreet, Kaur Sukhjit, Biomedical Waste Disposal, Jaypee Brothers Medical Publishers

Online Resources

1. <https://www.cdc.gov>
2. <https://main.icmr.nic.in>
3. <https://www.ncbi.nlm.nih.gov/books>
4. <https://www.who.int/infection-prevention>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3	2	2	2	3	2	—	1	2	2	2	3	3
CO2	2	3	2	2	2	3	2	1	—	2	2	2	3	3
CO3	1	2	—	—	1	2	—	—	—	—	1	1	2	2

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Program	BMRIT				
Year	I	Semester		II	
Course Name	Hospital Services				
Code	BMRIT 203T				
Course Type	MD	L	T	P	Credit
Pre-Requisite		2	1	0	3
Course Objective	Describe hospital services, including patient care and specialized units. Explain the roles of key support services in hospital operations. Understand the functions of auxiliary services supporting hospital management.				
Course Outcomes					
CO1	Define and explain hospital services, including OPD/IPD patient care and the functions, planning, and requirements of specialized units like ICU, operation theaters, and daycare.				
CO2	Understand the functions of support services such as CSSD, dietary, laundry, blood bank, medical gas systems, and pharmacy services.				
CO3	Explain the functions and roles of auxiliary services, including registration, admitting departments, recordkeeping, ambulance & transport, and housekeeping in supporting hospital operations.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Core Hospital Services: Introduction to hospital services, Classification of hospital services. Emergency services, OPD services, Inpatient services, ICU, Operation theater, Daycare services	15 Hours	CO1
2	Support Services: Introduction to support services, CSSD, Dietary, Laundry, Blood bank services, Medical gas system, Pharmacy services, Quality mandates for a hospital pharmacy	15 Hours	CO2
3	Auxiliary Services: Registration, Admitting department, Recordkeeping, Ambulance & transport, Maintenance department, Housekeeping Department	15 Hours	CO3









Suggested Readings

1. B.M. Sakharkar, Principles of Hospital Administration and Planning, Jaypee Brothers Medical Publishers
2. Caroline Curren, Meg Stacey, Concepts of Health, Illness and Disease: A Comparative
3. Tabish Syed Amin, Hospital and Health Services Administration: Principles and Practices, OUP India

Online Resources

1. <https://nhsrindia.org>
2. <https://main.mohfw.gov.in>
3. <https://www.nabh.co>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	3	2	2	2	2	1	2	2	2	3	3
CO2	2	2	1	2	1	1	2	2	—	2	2	1	2	2
CO3	2	2	1	2	1	1	1	2	—	2	2	1	2	2

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Program	BMRIT				
Year	I	Semester		II	
Course Name	Business Communication				
Code	BMRIT 204T				
Course Type	AEC	L	T	P	Credit
Pre-Requisite		2	1	0	3
Course Objective	Understand and apply various communication methods in healthcare settings. Demonstrate effective communication with colleagues, clients, and customers. Handle sensitive healthcare communications confidently and professionally.				
Course Outcomes					
CO1	Understand the purpose and mechanisms of communication, including verbal, non-verbal, written, intrapersonal, and group communication, and apply them effectively in healthcare settings.				
CO2	Apply effective communication techniques in workplace interactions with colleagues, clients, and customers				
CO3	Communicate effectively in healthcare settings, addressing sensitive issues with confidence and professionalism.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Communication, its Types and Methods Communication, Communication in society, How do we communicate, Non-verbal communication, Verbal communication, Forms of written communication, Intrapersonal communication, Group communication	15 Hours	CO1
2	Effective Communication at Workplace: Introduction to effective communication, Importance of effective communication, Verbal communication at workplace, Written communication at workplace	15 Hours	CO2
3	Communication in Healthcare: Types of communication in healthcare – Inter hospital and intra hospital communication, Causes and effects of poor communication in healthcare, Coping with anxiety while	15 Hours	CO2

	communicating bad news, Effective communication checklist in healthcare, Learn how to communicate with patients and caregivers, Tips to communicate effectively		
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Suggested Readings

1. Ahuja, B.N. and S.S. Chopra, Communication, Surjeet Publications, 2006
2. Barun K Mitra, Personality Development and Soft Skills, Oxford University Press, 2016

Online Resources

1. <https://www.skillsyouneed.com>
2. <https://www.mindtools.com>
3. <https://alison.com>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	—	—	—	—	—	—	—	3	2	2	2	—	3
CO2	2	—	—	—	—	—	—	—	3	2	3	2	—	3
CO3	2	—	—	—	—	—	—	—	3	2	3	2	—	3

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Program	BMRIT				
Year	I	Semester		II	
Course Name	Job Ready Skills I				
Code	BMRIT 205T				
Course Type	SEC	L	T	P	Credit
Pre-Requisite		2	0	0	2
Course Objective	Apply time management techniques to prioritize and organize tasks efficiently. Collaborate effectively in teams by building positive relationships and enhancing quality. Use critical thinking to solve problems creatively and make informed decisions.				
Course Outcomes					
CO1	Apply time management techniques to organize and prioritize tasks efficiently.				
CO2	Work effectively in teams by understanding the dynamics, building constructive relationships, and recognizing key factors contributing to quality improvement.				
CO3	Use critical thinking to solve problems systematically and creatively, and make informed decisions in work and personal settings.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Time Management: Introduction to time management, Importance of time management, Time management matrix, How to manage time	10 Hours	CO1
2	Teamwork and Quality Consciousness Introduction to teamwork, Importance of teamwork, Basic elements of teamwork, Building positive relationships, Quality, Strategies to improve quality	10 Hours	CO2
3	Problem-solving and Decision Making Skills Critical thinking, Developing critical thinking mindset, Decisions, Effective decision-making process	10 Hours	CO3

Suggested Readings

1. S P Dhanavel, English and Soft Skills, Orient BlackSwan
2. Gupta Seema, Soft Skills - Interpersonal and Intrapersonal Skills Development, V&S Publishers

Online Resources

1. <https://www.mindtools.com>
2. <https://www.skillsyouneed.com>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	—	—	—	—	—	—	—	—	—	2	3	3	—	2
CO2	—	—	—	—	—	—	—	—	3	2	3	3	—	3
CO3	1	—	—	—	2	—	—	—	—	3	2	2	2	2

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Program	BMRIT					
Year	I	Semester		II		
Course Name	AI Tools					
Code	BMRIT 206T					
Course Type	VAC	L	T	P	Credit	
Pre-Requisite		2	1	0	3	
Course Objective	Understand fundamental concepts of artificial intelligence and the types of AI tools available. Explore common AI tools and platforms, learning their key features and real-world applications. Apply AI tools responsibly while recognizing ethical considerations in their usage.					
Course Outcomes						
CO1	Explain the basics of AI and identify different categories of AI tools.					
CO2	Demonstrate familiarity with popular AI platforms and describe their functionalities.					
CO3	Evaluate ethical challenges in AI and practice responsible use of AI technologies.					

Module	Course Contents	Contact Hrs.	Mapped CO
1	Introduction to Artificial Intelligence and AI Tools Overview of Artificial Intelligence (AI) concepts, Types of AI tools and their applications, Basics of machine learning and data processing	15 Hours	CO1
2	Common AI Tools and Platforms Introduction to popular AI tools (e.g., chatbots, image recognition, speech recognition), Features and functionalities of AI platforms, Use cases across industries	15 Hours	CO2
3	Practical Applications and Ethical Considerations How to use AI tools effectively in everyday tasks, Benefits and challenges of AI adoption, Ethical issues and responsible AI use	15 Hours	CO3

Suggested Readings

1. Russell, Stuart, and Peter Norvig. 2021. Artificial Intelligence: A Modern Approach. 4th ed. Upper Saddle River, NJ: Pearson.
2. Nilsson, Nils J. 2014. Principles of Artificial Intelligence. San Francisco, CA: Morgan Kaufmann.
3. Marr, Bernard. 2020. Artificial Intelligence in Practice. How 50 Successful Companies Used AI and Machine Learning to Solve Problems. New York: Wiley.
4. Floridi, Luciano. 2019. The Ethics of Artificial Intelligence. Oxford. Oxford University Press.

Online Resources

1. <https://ai.google.dev/>
2. <https://github.com/microsoft/AI-For-Beginners>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	—	2	—	—	—	—	2	—	2	2	2	2	2
CO2	2	—	2	—	—	—	1	2	—	2	2	2	2	2
CO3	—	—	—	—	—	—	—	3	—	2	2	3	—	3

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Program	BMRIT					
Year	I	Semester		II		
Course Name	Basic Radiographic Techniques and Safety Lab					
Code	BMRIT 201P					
Course Type	DSC	L	T	P	Credit	
Pre-Requisite		0	0	6	3	
Course Objective	Prepare and position patients accurately for various radiographic and interventional procedures. Apply appropriate radiographic projections and image enhancement techniques to optimize image quality, while identifying and correcting common errors and artifacts. Safely administer contrast media and follow protocols for diagnostic imaging procedures. Practice and enforce radiation safety protocols to protect patients and staff during radiographic examinations."					
Course Outcomes						
CO1	Demonstrate correct patient preparation and positioning for standard and interventional radiographic procedures.					
CO2	Apply appropriate radiographic projections and image enhancement methods to improve diagnostic quality, and identify errors or artifacts with effective correction strategies.					
CO3	Administer contrast media safely and according to established protocols.					
CO4	Consistently follow radiation safety guidelines to ensure a safe imaging environment for patients and staff.					

S. No.	List of Experiments	
1	Prepare and position the patient based on the region of interest.	CO1
2	Understand and apply appropriate projections for different body regions.	CO2
3	Perform image enhancement techniques to improve radiographic quality.	CO2
4	Identify common errors and artifacts in radiographs and suggest ways to prevent them.	CO2

5	Administer contrast media for diagnostic imaging as per protocol.	CO3
6	Position the patient for different interventional radiographic procedures.	CO3
7	Follow and practice different radiation safety protocols to ensure patient and staff safety	CO4

Suggested Readings

1. A.P. Saxena, Dark Room Techniques Hardcover, 2015, First Edition; Laxmi Publications Private Limited
2. A Krishnamurthy, Medical Radiographic Techniques and Dark Room Practices, 2007, 1st Edition, Jaypee Brothers Medical Publishers (P) Ltd
3. Abhitabh Gupta, LC Gupta, Radiophysics and Darkroom Procedures (Including Ultrasound), 2002, 3rd Edition, Jaypee Brothers Medical Publishers (P) Ltd
4. A. Stewart Whitley, Gail Jefferson, Ken Holmes, & 3 More, Clark's Positioning in Radiography 13E, CRC
5. Kenneth L. Bontrager, John P. Lampignano, Textbook of Radiographic Positioning and Related Anatomy 8Ed, 2013, Elsevier
6. Pushparajav, Radiological protection and safety: A practitioner's Guide, 2019, Notion Press
7. Prashant Kumar Jha, Basics of Radiation Hazards and Prevention in Diagnostic Radiology, 2022
8. Kushal Gehlot, A Concise Guide On Special Radiographic Investigations & Techniques, 2022, 2nd edition, JBD publications

Online Resources

1. <https://www.ncbi.nlm.nih.gov/books/NBK557499/>
2. <https://ehs.usc.edu/research/rad/x-ray-safety/>
3. <https://www.epa.gov/sites/default/files/2015-05/documents/fgr14-2014.pdf>
4. <https://www.radiologyinfo.org/en/info/safety-contrast>
5. <https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/barium-swallow>
6. <https://radiopaedia.org/articles/barium-swallow?lang=us>
7. <https://www.ncbi.nlm.nih.gov/books/NBK565865/>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	3	3	2	2	3	—	1	2	2	2	3	2
CO2	2	—	3	2	3	2	3	—	—	3	2	2	3	2
CO3	2	2	2	2	2	3	2	—	—	2	2	2	3	2
CO4	2	3	2	2	2	3	2	—	—	3	2	2	3	3

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Program	BMRIT				
Year	I	Semester		II	
Course Name	Infection Control and Biomedical Waste Management Lab				
Code	BMRIT 202P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	4	2
Course Objective	Demonstrate effective hand hygiene through proper handwashing and hand rub techniques to prevent infections. Perform correct donning and doffing of PPE to ensure safety and infection control. Apply biomedical waste segregation using appropriate color-coded bins in compliance with regulations.				
Course Outcomes					
CO1	Demonstrate proper hand hygiene techniques through effective handwashing and handrub methods to prevent healthcare-associated infections.				
CO2	Perform correct donning and doffing procedures for Personal Protective Equipment (PPE) ensuring infection control and personal safety in clinical settings.				
CO3	Apply biomedical waste segregation protocols by identifying waste categories and using appropriate color-coded bins in compliance with safety and regulatory standards.				

S. No.	List of Experiments	
1	Perform method of handwashing	CO1
2	Perform method of handrub	CO1
3	Perform donning and doffing of PPE	CO2
4	Segregation of biomedical waste	CO3

Suggested Readings

1. S. Apruba Sastry, R. Deepashree, Essentials of Hospital Infection Control, Jaypee Brothers Medical Publishers, 2019

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2. Singh Anantpreet, Kaar Sukhjit, Biomedical Waste Disposal, Jaypee Brothers Medical Publishers, 2012

Online Resources

1. <https://www.cdc.gov>
2. <https://main.icmr.nic.in>
3. <https://www.ncbi.nlm.nih.gov/books>
4. <https://www.who.int/infection-prevention>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3	2	2	—	3	2	—	1	2	2	2	3	2
CO2	2	3	2	2	—	3	2	—	—	2	2	2	3	2
CO3	2	3	1	2	—	3	2	1	—	2	2	2	3	3

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Program	BMRIT					
Year	II	Semester		III		
Course Name	Advanced Radiographic Techniques and Documentation					
Code	BMRIT 301T					
Course Type	DSC	L	T	P	Credit	
Pre-Requisite		3	1	0	4	
Course Objective	Apply advanced radiographic techniques such as fluoroscopy, C-ARM, and DEXA scanning while ensuring adherence to clinical protocols and patient safety standards. Understand the principles, components, and clinical applications of CT and MRI to assist in accurate imaging and ensure safe patient positioning and care. Learn the fundamental principles and clinical applications of ultrasound imaging, including correct positioning and basic interpretation techniques. Demonstrate the ability to manage radiological documentation accurately, maintain patient records, and use appropriate medical terminology in compliance with quality management systems.					
Course Outcomes						
CO1	Explain the principles and clinical applications of advanced radiographic techniques such as fluoroscopy, C-ARM, and DEXA scanning, including their procedural protocols and patient safety considerations.					
CO2	Describe the basic principles of X-ray physics and CT and MRI technology, the functions of CT and MRI scanner components, and the image reconstruction process.					
CO3	Understand the fundamental principles of ultrasound imaging and describe its clinical applications, including basic positioning techniques and image interpretation.					
CO4	Apply knowledge of documentation and record-keeping in radiology by creating, maintaining, and managing records effectively.					

Module	Course Contents	Contact Hr.	Mapped CO
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1	Specialized Radiographic Techniques: Advanced radiographic techniques such as fluoroscopy, C-ARM, and DEXA scanning, Clinical applications, Procedural protocols, and Patient safety during imaging	15 Hours	CO1
2	Basics of Computed Tomography (CT) and Magnetic Resonance Imaging (MRI): X-ray physics principles and CT technology basics, CT scanner components and their functions, Image reconstruction process in CT scans,, Various CT scanning techniques Patient positioning and safety protocols for CT examinations, Fundamental principles of magnetism and MRI technology, MRI scanner components, CT and MRI comparison and clinical relevance	15 Hours	CO2
3	Basics of Ultrasound (USG): Fundamentals and principles of ultrasound imaging, Clinical uses of USG, Basics of positioning and interpretation	15 Hours	CO3
4	Documentation and Records: Introduction to documentation, record, maintenance, Patient information management, Medical terminology in documentation, Role of documents and records in QMS	15 Hours	CO4

Suggested Readings

1. Kushal Gehlot, A Concise Guide On Special Radiographic Investigations & Techniques, 2022, 2nd edition, JBD publications
2. Pooja Shah and Shamvab Dhaka, A Textbook of Radiographic Technique, 2019, 1st edition, Samiksha Publication

Online Resources

1. <https://radiopaedia.org/articles/intensifying-screen?lang=us>
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8724686/>
3. https://www.physio-pedia.com/Dual_Energy_X-ray_Absorptiometry_%28DEXA_Scan%29
4. <https://radiopaedia.org/articles/ct-in-practice?lang=us>
5. <https://www.aium.org/resources>
6. <https://www.cms.gov/files/document/mln4840534-medical-record-maintenance-and-access-requirements.pdf>
7. <https://www.hhs.gov/hipaa/for-professionals/privacy/guidance/access/index.html>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3	3	3	2	3	3		1	2	2		3	2

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CO2	3	2	3	2	2	2	3		-	3	2	2	3	2
CO3	2	2	3	2	2	2	2		-	2	2	2	3	2
CO4	1	-	-	-	-	-	2	2	-	2	2	2	2	2

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Program	BMRIT				
Year	II	Semester	III		
Course Name	Quality Assurance in Radiology				
Code	BMRIT 302T				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		2	1	0	3
Course Objective	Explain the principles of quality assurance (QA) and quality control (QC), and describe various tests and procedures for quality management in radiology. Apply laboratory safety guidelines, maintain accurate documentation, and implement quality management and equipment handling protocols. Understand the legal and ethical responsibilities and codes of conduct required of a radiology technician. Demonstrate radiation protection techniques and ensure compliance with AERB guidelines, including shielding practices, occupational safety, and regulatory requirements.				
Course Outcomes					
CO1	Understand the differences between QA and QC and apply various tests for ensuring quality in radiology services				
CO2	Gain knowledge of radiation surveys, safety regulations, and the role and responsibilities of a Radiation Safety Officer				
CO3	Apply ethical and legal principles in radiology, ensuring the protection of patients and healthcare personnel through proper shielding and safety measures				
CO4	Apply radiation protection measures and AERB guidelines to ensure patient and personnel safety in radiology settings.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Quality Assurance and Quality Control: QA and QC; Difference between QA and QC; Various tests for quality management	15 Hours	CO1
2	Surveys and Regulations:	15 Hours	CO2

	Source of radiation; Surveys and regulation; Various types of surveys; Radiation safety officer and its duties and responsibilities		
3	Legal and Ethical Responsibilities: Ethical codes and responsibilities of radiology technician	15 Hours	CO3
4	Practical Radiation Protection and AERB: Patient shielding and its importance; Shielding and its aspects, Types of barriers, Patient and personnel shielding technique, Principles of radiation protection as per the AERB; Responsibilities of radiation technologist; Offences and penalties; Requirements for occupational radiation protection; X-ray room specifications; Licensing/consent/approval; Manufacturer/ supplier licensing	15 Hours	CO4

Suggested Readings

1. Bhargava S.K, Quality assurance and control in Diagnostic Radiology and Imaging, 2015, CBS Publishers
2. Dr. Zafar Neyaz, An Introduction to Quality Assurance in Radiology, 2023, 1st edition, JBD publication

Online Resources:

1. https://www-pub.iaea.org/MTCD/Publications/PDF/PUB2021_web.pdf
2. https://www.aerb.gov.in/images/PDF/layout_guidelines.pdf

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	3	2	2	3	3	1	—	2	2	2	3	2
CO2	2	3	2	2	1	3	2	2	—	2	2	2	3	2
CO3	2	3	2	2	2	3	2	3	—	2	2	3	3	3
CO4	2	3	2	2	2	3	2	3	—	2	2	3	3	3

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Program	BMRIT				
Year	II	Semester		III	
Course Name	Medical Law and Ethics				
Code	BMRIT 303T				
Course Type	MD	L	T	P	Credit
Pre-Requisite		2	1	0	3
Course Objective	Explain the principles and importance of medical ethics and demonstrate professionalism through adherence to a healthcare code of conduct. Describe types of consent, their significance, and the management of medico-legal cases with legal compliance. Differentiate between malpractice and negligence and understand their ethical and legal implications in medical practice.				
Course Outcomes					
CO1	Explain the principles, need, and importance of medical ethics, and demonstrate professionalism through adherence to a proper code of conduct in healthcare practice.				
CO2	Explain types of consent and their importance, and understand medico-legal cases including proper consent and legal compliance in medical practice.				
CO3	Explain the difference between malpractice and negligence, and understand their ethical and legal implications.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Medical Ethics and Professional Conduct Medical ethics, Need and importance of medical ethics, Principles of medical ethics, Professionalism, Code of conduct and its importance, Attributes of code of conduct	15 Hours	CO1
2	Consent and Medico-Legal Understanding Consent, Types of consent, Importance of consent, Medico Legal Cases, Consent and management of MLC	15 Hours	CO2
3	Medical Malpractice and Negligence: Medical malpractice and negligence, Malpractice vs negligence, Ethical vs legal	15 Hours	CO3

Suggested Readings

1. B. Sandeepa Bhat, Reflections on Medical Law and Ethics in India, Eastern Law House
2. Subrata Sharma, Medical Ethics Challenges and prospects in India

Online Resources

1. <https://imlindia.com>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	2	1	3	2	3	2	2	3	3	3	3
CO2	2	2	2	2	1	3	2	3	-	2	3	3	3	3
CO3	2	2	2	2	1	3	2	3	-	2	3	3	3	3

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Program	BMRIT				
Year	II	Semester		III	
Course Name	Sales and Marketing				
Code	BMRIT 304T				
Course Type	AEC	L	T	P	Credit
Pre-Requisite		2	1	0	3
Course Objective	Understand the key elements, types, and processes involved in marketing health services. Analyze market segmentation, targeting, and positioning strategies relevant to healthcare Practice sales techniques and address challenges within healthcare marketing scenarios.				
Course Outcomes					
CO1	Explain the elements, types, and process of marketing in health services, including market segmentation benefits and bases.				
CO2	Develop effective market targeting and positioning strategies for health services.				
CO3	Describe the sales process and apply techniques for closing sales while addressing challenges in healthcare marketing.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Fundamentals of Health Services Marketing: Marketing in health services, Elements of marketing, Types of marketing mix, Process of marketing of health services, Market segmentation principles, benefits and bases for segmentation in healthcare	15 Hours	CO1
2	Market Targeting and Positioning in Healthcare: Market targeting and targeting strategies, Marketing positioning and positioning strategies,	15 Hours	CO2
3	Sales Techniques: Introduction to sales, sales processes, closing techniques, and challenges in sales.	15 Hours	CO3









Suggested Readings

1. Marketing Management, Philip Kotler and Kevin Lane Keller
2. Sales Management: Building Customer Relationships and Partnerships, Joseph F. Hair, Rolph E. Anderson, and Rajiv Mehta

Online Resources

1. <https://www.cancer.gov/publications/dictionaries/cancer-terms/def/copy>

Course Articulation Matrix														
PO-PSC	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	—	1	—	2	—	—	2	2	2	2	3	2	3
CO2	2	—	1	—	2	—	—	2	2	3	2	3	2	3
CO3	2	—	1	—	2	—	—	2	2	3	2	3	2	3

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Program	BMRIT				
Year	II	Semester		III	
Course Name	Job Ready Skills II				
Code	BMRIT 305T				
Course Type	SEC	L	T	P	Credit
Pre-Requisite	Job Ready Skills II	2	0	0	2
Course Objective	Develop a positive mindset and apply emotional intelligence to manage interpersonal relationships effectively. Utilize stress management techniques and enhance negotiation skills for professional growth. Foster a result-oriented mindset to accomplish personal and organizational objectives.				
Course Outcomes					
CO1	Cultivate a positive mindset and demonstrate emotional intelligence to manage relationships effectively.				
CO2	Apply stress management techniques and develop negotiation skills for professional success.				
CO3	Adopt a result-oriented approach to achieve personal and organizational goals.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Positive Mindset and Emotional Intelligence: Introduction to positive mindset, Importance of positive mindset, Developing a positive mindset, Emotional quotient, Components of emotional intelligence	10 Hours	CO1
2	Stress Management and Negotiation Skills: Stress, Ways to manage stress, Negotiation and its outcomes, Ways to develop effective negotiation skills	10 Hours	CO2
3	Result Orientation: Introduction to result orientation, Ways to develop result oriented mindset	10 Hours	CO3

Suggested Readings

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1. Emotional Intelligence 2.0, Travis Bradberry and Jean Greaves
2. Mindset: The New Psychology of Success, Carol S. Dweck
3. S P Dhanavel, English and Soft Skills, Orient BlackSwan
4. Gupta Seema, Soft Skills - Interpersonal and Intrapersonal Skills Development, V&S Publishers

Online Resources

1. <https://www.mindtools.com>
2. <https://www.skillsyouneed.com>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	-	-	-	-	1	-	-	2	3	2	3	3	-	3
CO2	-	-	-	-	1	-	-	2	2	3	3	3	-	3
CO3	-	-	-	-	2	-	-	2	2	2	3	3	-	3

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Program	BMRIT					
Year	II	Semester		III		
Course Name	Advanced Radiographic Techniques and Documentation Lab					
Code	BMRIT 301P					
Course Type	DSC	L	T	P	Credit	
Pre-Requisite		0	0	8	4	
Course Objectives	Enable students to prepare and position patients accurately for various CT and MRI examinations. Develop the ability to operate CT and MRI machines and capture diagnostic-quality images. Equip students with the knowledge and skills for routine equipment care, preventive maintenance, and identifying common operational issues.					
Course Outcomes						
CO1	Demonstrate correct patient preparation and positioning techniques for CT and MRI scans.					
CO2	Acquire high-quality diagnostic images using appropriate scan parameters and protocols.					
CO3	Perform routine maintenance and basic troubleshooting of CT/MRI equipment to ensure optimal performance.					

S. No.	List of Experiments	
1	Patient preparation and position for CT and MRI	CO1
2	Image capturing	CO2
3	Maintenance and troubleshooting of the equipment	CO3

Suggested Readings

1. Pooja Shah and Shamvab Dhaka, A Textbook of Radiographic Technique, 2019, 1st edition, Samiksha publication
2. Kushal Gehlot, A Concise Guide On Special Radiographic Investigations & Techniques, 2022, 2nd edition, JBD publications

Online Resources

1. <https://radiopaedia.org/articles/intensifying-screen?lang=en>
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8724686/>
3. https://www.physio-pedia.com/Dual_Energy_X-ray_Absorptiometry_%28DEXA_Scan%29
4. <https://radiopaedia.org/articles/ct-in-practice?lang=en>
5. <https://www.aium.org/resources>
6. <https://www.cms.gov/files/document/mln4840534-medical-record-maintenance-and-access-requirements.pdf>
7. <https://www.hhs.gov/hipaa/for-professionals/privacy/guidance/access/index.html>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	3	3	2	2	3	1	2	2	2	2	3	2
CO2	2	2	3	2	3	3	3	1	-	3	2	2	3	2
CO3	1	1	2	1	-	3	3	1	-	2	2	2	3	2

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Program	BMRIT				
Year	II	Semester		III	
Course Name	Quality Assurance in Radiology Lab				
Code	BMRIT 302P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	6	3
Course Objectives	Understand and perform standard patient shielding procedures to minimize exposure to ionizing radiation. Develop ethical reasoning skills through simulation of real-world radiologic scenarios involving patient care. Identify and classify QA and QC tasks relevant to imaging services and assess their impact on diagnostic accuracy.				
Course Outcomes					
CO1	Demonstrate correct patient shielding techniques and explain their importance in radiation safety				
CO2	Analyze and respond ethically to common dilemmas encountered in radiologic practice.				
CO3	Differentiate between Quality Assurance and Quality Control practices in diagnostic radiology.				

S. No.	List of Experiments	
1	Demonstration of Patient Shielding Techniques	CO1
2	Ethical Decision-Making in Radiologic Scenarios	CO2
3	Comparison between QA vs. QC	CO3

Suggested Readings

1. Bhargava S.K, Quality assurance and control in Diagnostic Radiology and Imaging, 2015, CBS Publishers
2. Dr. Zafar Neyaz, An Introduction to Quality Assurance in Radiology, 2023, 1st edition, JBD publication

Online Resources:









1. https://www-pub.iaea.org/MTCD/Publications/PDF/PUB2021_web.pdf
2. https://www.acrb.gov.in/images/PDF/layout_guidelines.pdf

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3	3	2	2	3	3	2	-	2	2	2	3	2
CO2	2	2	2	1	2	3	2	3	3	3	3	3	3	3
CO3	2	2	3	2	2	3	3	2	-	3	2	2	3	3

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Program	BMRIT				
Year	II	Semester		IV	
Course Name	Advanced Radiographic Techniques II				
Code	BMRIT 401T				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		3	1	0	4
Course Objective	Describe the principles and clinical uses of advanced CT techniques, including angiography, virtual colonoscopy, and high-resolution imaging. Explain the fundamentals and diagnostic applications of advanced MRI procedures such as spectroscopy, ADC mapping, and functional imaging. Compare the strengths, limitations, and appropriate clinical use of CT and MRI for different organ systems and scenarios. Discuss protocols for patient preparation and positioning in advanced CT and MRI, emphasizing safety and comfort.				
Course Outcomes					
CO1	Summarize how advanced CT techniques are performed and their clinical applications.				
CO2	Explain the purpose and process of advanced MRI procedures and their roles in diagnosis.				
CO3	Compare when to use CT versus MRI based on patient needs and diagnostic goals.				
CO4	Describe patient preparation and positioning steps for advanced CT and MRI procedures, including safety measures.				

Module	Course Contents	Contact Hr.	Mapped CO
1	Advanced CT Techniques: Perforation studies (e.g., detection of gastrointestinal perforations), CT angiography: principles, indications, and workflow, Virtual colonoscopy: technique and clinical applications, High-resolution CT and its clinical uses	15 Hours	CO1

2	Advanced MRI Procedures: MR spectroscopy: principles and diagnostic value, ADC (Apparent Diffusion Coefficient) mapping and its role in tissue characterization, MR myelography: technique and indications, Functional MRI and advanced neuroimaging application	15 Hours	CO2
3	Comparative Analysis of CT and MRI in Clinical Diagnostics: Strengths and limitations of CT vs. MRI for various organ systems, Selection criteria for CT or MRI based on clinical scenario (e.g. trauma, soft tissue, neurological, vascular), Case-based discussion of diagnostic yield and accuracy	15 Hours	CO3
4	Patient Preparation and Positioning for Advanced Imaging: Protocols for patient preparation (fasting, contrast administration, screening for contraindications), Positioning techniques for optimal imaging in advanced CT and MRI procedures, Managing patient safety and comfort during advanced imaging	15 Hours	CO4

Suggested Readings

1. Dacif, Mohammed Naser, Khudair Abis Kazem, Ahmed Rabie Jaber Mustafa, and Ali Karim Mohsen. 2024. Advanced Imaging Techniques: MRI and CT Scanning. 1st ed. New Delhi: Bright Sky Publications.
2. Procedures & Documentation for Advanced Imaging. 2000. New York: McGraw-Hill.
3. Advanced CT and MR Imaging Techniques: An Academic Whim or a Clinical Necessity? 2006. Radiology Research and Practice, PMC8133949.
4. Advanced Magnetic Resonance Imaging (MRI) Techniques. 2022. Nanomaterials, PMC8997011.

Online Resources

1. <https://www.ncbi.nlm.nih.gov/books/NBK557794/>
2. <https://www.ncbi.nlm.nih.gov/books/NBK482487/>
3. [https://www.jmirs.org/article/S1939-8654\(22\)00379-4/fulltext](https://www.jmirs.org/article/S1939-8654(22)00379-4/fulltext)

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	3	1	3	2	2	1	—	3	2	2	3	2
CO2	3	1	3	1	3	2	2	1	—	3	2	2	3	2
CO3	3	—	3	1	3	2	2	—	—	3	2	2	3	2
CO4	2	3	3	3	2	3	3	2	1	2	2	2	3	2

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Program	BMRIT					
Year	II	Semester		IV		
Course Name	Equipment Management and Specialised Imaging Techniques					
Code	BMRIT 402T					
Course Type	DSC	L	T	P	Credit	
Pre-Requisite		3	1	0	4	
Course Objective	Describe the importance, types, and regulatory requirements of radiology equipment management and safety.					
	Explain and perform routine preventive maintenance procedures for major radiology equipment.					
	Identify and apply basic troubleshooting techniques for common equipment issues, ensuring safe practices and documentation.					
	Explain and conduct quality control tests to optimize image quality and minimize artifacts.					
Course Outcomes						
CO1	Explain the role of equipment management in patient care, identify major radiology equipment, and outline safety and regulatory requirements.					
CO2	Perform basic preventive maintenance, recognize wear signs, and follow cleaning protocols for radiology equipment.					
CO3	Identify common equipment malfunctions, apply safe troubleshooting steps, and document issues clearly.					
CO4	Conduct quality control tests, recognize image artifacts, and adjust imaging parameters for optimal results.					

Module	Course Contents	Contact Hrs.	Mapped CO
1	Introduction to Radiology Equipment Management: Importance of equipment management in patient care and safety; Regulatory requirements for radiology equipment maintenance and operation; Familiarization with different types of radiology equipment (X-ray, fluoroscopy, CT, MRI, etc.); Basic principles of radiation safety and quality control in radiology	15 Hours	CO1

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2	Preventive Maintenance Procedures: Performing routine preventative maintenance checks on X-ray machines, fluoroscopes, CT scanners, and MRI systems; Identifying common signs of wear and tear in radiology equipment; Utilizing equipment manuals and service protocols; Importance of proper cleaning and disinfection of radiology equipment	15 Hours	CO2
3	Troubleshooting and Problem-Solving: Identifying common malfunctions and error messages in radiology equipment; Applying systematic troubleshooting techniques to identify and resolve equipment issues; Safe practices for basic troubleshooting procedures; Importance of clear communication and documentation of equipment problems.	15 Hours	CO3
4	Quality Control and Image Optimization: Quality control tests on radiology equipment to ensure image quality and accuracy; Principles of image artifacts and their mitigation strategies; Optimizing imaging parameters for different examinations and patient conditions.	15 Hours	CO4

Suggested Readings

1. X-Ray Equipment Maintenance and Repairs Workbook for Radiographers and Radiological Technologists, by WHO Dept of Essential Health Technology
2. Pooja Shah and Shamvab Dhaka, A Textbook of Radiographic Technique, 2019, 1st edition, Samiksha publication

Online Resources

1. <https://iris.who.int/handle/10665/42952>
2. <https://www.cancercare.mb.ca/export/sites/default/Research/galleries/files/radiation-protection-services-files/300-80-001-V01-Xray-Safety-Manual.pdf>
3. https://www-pub.iaea.org/MTCD/Publications/PDF/PUB2021_web.pdf

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3	3	2	2	3	3	2	—	2	2	2	3	2
CO2	1	2	2	2	—	3	3	2	—	2	2	2	3	2
CO3	1	2	2	1	—	3	3	1	—	3	2	2	3	2
CO4	2	2	3	2	3	3	3	2	—	3	2	2	3	2

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Program	BMRIT					
Year	II	Semester		IV		
Course Name	Radiation Therapy					
Code	BMRIT 403T					
Course Type	DSC	L	T	P	Credit	
Pre-Requisite		2	2	0	4	
Course Objective	Explain the history, principles, and types of radiation therapy, and their role in cancer management. Describe the biological effects of radiation, dose-response relationships, and safety principles for patients and healthcare workers. Demonstrate understanding of treatment planning, simulation, and patient positioning techniques in radiation therapy. Apply patient care skills, including assessment, side effect management, and infection control, throughout the radiation therapy process.					
Course Outcomes						
CO1	Describe the fundamental principles of radiation therapy and its evolution in cancer treatment.					
CO2	Explain the biological effects of radiation and how dose-response relationships influence radiation therapy treatment plans.					
CO3	Identify the key steps involved in radiation treatment planning, including patient positioning and the use of planning software.					
CO4	Describe the key elements of patient care and safety during radiation therapy, including the management of side effects and providing psychological support.					

Module	Course Contents	Contact Hrs.	Mapped CO
I	Introduction to Radiation Therapy: History and evolution of radiation therapy, Basic principles of radiation and radiation physics, Role of radiation therapy in cancer treatment, Types of radiation therapy (external beam, internal therapy, brachytherapy)	15 Hours	CO1

2	Radiobiology and Radiation Physics: Biological effects of radiation on tissues and cells, Radiation dose-response relationships, Types of radiation used in therapy (X-rays, Gamma rays, etc.), Radiation safety principles for patients and healthcare workers	15 Hours	CO2
3	Radiation Treatment Planning and Techniques: Overview of treatment planning process, CT simulation and imaging techniques in treatment planning, Treatment planning software and tools, Techniques for patient positioning and immobilization	15 Hours	CO3
4	Patient Care and Safety in Radiation Therapy: Patient assessment before, during, and after treatment, Management of side effects of radiation therapy, Pain management and psychological support, Infection control and radiation protection for patients	15 Hours	CO4

Suggested Readings

1. C. S. Lakhani, Textbook of Radiotherapy: Radiation Physics, Therapy and Oncology
2. R. K. Vyas, Radiotherapy and Oncology
3. Shyam Mehta and M. R. Pillai, Principles and Practice of Radiation Therapy

Online Resources

1. <https://www.iaea.org/newscenter/news/what-is-radiation-therapy>
2. <https://pubmed.ncbi.nlm.nih.gov/15124539/>
3. <https://www.iaea.org/publications/7086/radiation-oncology-physics>
4. <https://www.cancer.org/cancer/managing-cancer/treatment-types/radiation/effects-on-different-parts-of-body.html>
5. <https://www.aafp.org/pubs/afp/issues/2010/0815/p381.html>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3	2	2	3	2	2	—	3	2	2	3	2
CO2	3	2	3	2	3	3	2	2	—	3	2	2	3	2
CO3	2	2	3	3	2	3	3	2	—	2	2	2	3	2
CO4	2	3	2	3	2	3	2	2	3	2	3	2	3	3

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Program	BMRIT				
Year	II	Semester	IV		
Course Name	Pharmacology and Interventional Radiology				
Code	BMRIT 404T				
Course Type	DEC	L	T	P	Credit
Pre-Requisite		2	0	0	2
Course Objectives	Explain foundational pharmacological principles, terminology, drug classifications, sources of drugs and principles of pharmacokinetics. Explain the mechanisms of drug action, drug-receptor interactions, principles of pharmacodynamics, drug interactions and adverse drug reactions, emphasizing pharmacovigilance. Summarize the pharmacology, indications, and safety profiles of commonly used drug classes in clinical practice. Explain the fundamentals, indications, and techniques of common interventional radiology procedures.				
Course Outcomes					
CO1	Accurately define and use pharmacological terminology, classify drugs, describe their sources and nomenclature, explain the processes of drug absorption, distribution, metabolism, and excretion in pharmacokinetics.				
CO2	Explain drug action mechanisms, including drug-receptor interactions, pharmacodynamic responses and assess drug-drug, drug-food, and drug-condition interaction				
CO3	Demonstrate knowledge of the pharmacology and clinical applications of antiseptics, antibiotics, antacids, antiemetics, antidiarrheals, antivirals, antifungals, antipyretics, NSAIDs, antidiabetics, antihypertensives, and antihistamines.				
CO4	Identify and explain the purpose, process, and patient care aspects of key interventional radiology procedures.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Introduction to Pharmacology and Pharmacokinetics: Principles of pharmacology; Common terminology used in pharmacology; Drug nomenclature; Classification of drugs; Sources of drugs, Definition of pharmacokinetics; Absorption;	7 Hours	CO1

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	Factors affecting absorption; Bioavailability; Distribution; Metabolism; Excretion		
2	Pharmacodynamics, Interactions, and Safety: Definition of pharmacodynamics; Principles and mechanisms of drug action; Drug-receptor interactions, Drug-drug interaction; Drug-food interaction; Drug-condition interaction; ADRs and its types; Pharmacovigilance	8 Hours	CO2
3	Pharmacology of commonly used drugs: Antiseptic and disinfectants; Antibiotics; Antacid, Antiemetics and Antidiarrheal Drugs; Antiviral and Antifungal; Antipyretics and NSAIDs; Antidiabetic Drugs; Antihypertensive & Antihistamines Drugs	7 Hours	CO3
4	Interventional Radiology: Introduction to interventional radiology and imaging modalities, Angiography, Angioplasty and stent placement, Embolization procedures, Thrombolysis and thrombectomy, Image-guided biopsies (fine-needle, core), Drainage procedures (abscess, biliary, pleural, urinary), Tumor ablation (radiofrequency, microwave, cryoablation)	8 Hours	CO4

Suggested Readings

1. KD Tripathi, Essentials of Medical Pharmacology, 2023, 8th edition, Jaypee Brothers Medical Publishers
2. Dr. S.K. Srivastava, A Complete Textbook of Medical Pharmacology (Volumes I and II) – pharmacology, 2017, 2nd edition, APC Books

Online Resources

1. <https://openstax.org/books/pharmacology/pages/2-introduction>
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6529235/>
3. <https://openstax.org/books/pharmacology/pages/26-4-glucocorticoids-and-mineralocorticoids>
4. <https://www.uclahealth.org/medical-services/radiology/interventional-radiology/treatments-procedures/embolization>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	1	2	2	2	2	–	2	2	–	3	2
CO2	3	2	2	1	3	2	2	2	–	3	2	–	3	2

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CO3	3	2	3	2	3	2	2	2	—	2	2	—	3	2
CO4	2	2	3	3	3	3	3	2	—	3	2	2	3	2

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Program	BMRIT				
Year	II	Semester		IV	
Course Name	Leadership Skills for Business Success				
Code	BMRIT 405T				
Course Type	AEC	L	T	P	Credit
Pre-Requisite		2	0	0	2
Course Objective	To develop a strong sense of ownership and responsibility, encouraging learners to be accountable and proactive in both personal and professional settings while promoting adaptability through a growth mindset. To equip learners with interpersonal and leadership skills, including conflict resolution, openness to feedback, initiative-taking, strategic thinking, and mentoring in diverse environments. To foster an entrepreneurial mindset, nurturing a bias for action and enhancing creative problem-solving abilities needed for innovation and success in dynamic contexts.				
Course Outcomes					
CO1	Demonstrate ownership and a growth mindset by taking initiative, embracing challenges, adapting to change, and being accountable for tasks.				
CO2	Apply effective interpersonal and leadership skills by managing conflicts constructively, showing openness to feedback, mentoring others, and thinking strategically.				
CO3	Exhibit entrepreneurial thinking by taking proactive action and solving problems innovatively in personal and professional contexts.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Personal Ownership and Growth Mindset: Ownership, Taking ownership, Ways to develop ownership, Fixed mindset vs Growth mindset, Ways to develop a growth mindset, Adaptability	10 Hours	CO1
2	Conflict and Leadership Skills: Conflict, Types of conflicts, Ways to manage conflicts, Openness to feedback, Taking initiative, Strategic thinking skills, Mentoring skills	10 Hours	CO2

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3	Entrepreneurial Mindset and Problem Solving Entrepreneurial mindset: bias for action, Importance of problem-solving in leadership and innovation, Integrating ownership and growth mindset into entrepreneurial thinking	10 Hours	CO3
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Suggested Readings

1. The Five Dysfunctions of a Team: A Leadership Fable, Patrick Lencioni
2. Getting Things Done: The Art of Stress-Free Productivity, David Allen

Online Resources

1. <https://www.mindtools.com>
2. <https://www.skillsyouneed.com>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	—	—	—	—	—	—	—	2	2	3	3	3	—	3
CO2	—	—	—	—	—	—	—	2	3	3	3	3	—	3
CO3	—	—	—	—	—	—	—	2	2	3	2	3	—	3

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Program	BMRIT					
Year	II	Semester		IV		
Course Name	Equipment Management and Specialised Imaging Techniques Lab					
Code	BMRIT 402P					
Course Type	DSC	L	T	P	Credit	
Pre-Requisite		0	0	8	4	
Course Objectives	Demonstrate proper techniques for the care, cleaning, and routine maintenance of radiology equipment. Identify and apply basic troubleshooting steps for common equipment issues.					
Course Outcomes						
CO1	Demonstrate proper cleaning and disinfection techniques for radiology equipment to ensure patient safety and infection control.					
CO2	Perform routine maintenance checks on radiological equipment to ensure optimal functioning and compliance with safety standards.					
CO3	Identify common technical faults in imaging equipment and apply basic troubleshooting techniques for timely resolution.					

S. No.	List of Experiments	
1	Basic equipment care and cleaning	CO1
2	Maintenance checks and troubleshooting	CO2

Suggested Readings

1. X-Ray Equipment Maintenance and Repairs Workbook for Radiographers and Radiological Technologists, by WHO Dept of Essential Health Technology
2. Pooja Shah and Shamvab Dhaka, A Textbook of Radiographic Technique, 2019, 1st edition, Samiksha publication
3. KD Tripathi, Essentials of Medical Pharmacology, 2023, 8th edition, Jaypee Brothers Medical Publishers
4. Dr. S.K. Srivastava, A Complete Textbook of Medical Pharmacology (Volumes I and II) – pharmacology, 2017, 2nd edition, A.P.C. Books

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5. Kushal Gehlot, A Concise Guide On Special Radiographic Investigations & Techniques, 2022, 2nd edition, JBD publications
6. Kendall Preston Jr, Medical Imaging Techniques: A Comparison, 2012, Springer-Verlag New York Inc.

Online Resources

1. <https://iris.who.int/handle/10665/42952>
2. <https://www.cancercare.mb.ca/export/sites/default/Research/galleries/files/radiation-protection-services-files/300-80-001-V01-Xray-Safety-Manual.pdf>
3. https://www-pub.iaea.org/MTCD/Publications/PDF/PUB2021_web.pdf

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	—	3	2	2	—	3	3	—	—	2	2	—	3	2
CO2	—	2	3	—	—	3	3	—	—	2	2	—	3	2
CO3	—	—	3	—	—	2	3	—	—	3	2	—	3	2

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Program	BMRIT					
Year	II	Semester		IV		
Course Name	Pharmacology and Interventional Radiology Lab					
Code	BMRIT 404P					
Course Type	DSC	L	T	P	Credit	
Pre-Requisite		0	0	4	2	
Course Objective	Enable students to recognize and classify commonly used drugs based on therapeutic categories, dosage forms, and nomenclature. Develop analytical skills to interpret case scenarios and identify potential drug interactions and adverse drug reactions (ADRs). Familiarize students with key interventional radiology procedures, tools, and safety protocols through visual aids and procedural simulations.					
Course Outcomes						
CO1	Accurately identify and categorize drugs (e.g., antibiotics, NSAIDs, antihypertensives) using labels, generic and brand names.					
CO2	Demonstrate the ability to analyze cases, detect interactions (drug-drug, drug-food), and propose appropriate safety measures or reporting actions.					
CO3	Describe the basic steps and objectives of procedures like angiography, biopsies, or stent placement and explain their diagnostic or therapeutic relevance.					

S. No.	List of Experiments	
1	Drug Classification and Identification	CO1
2	Simulated Case Study on Drug Interactions and ADRs	CO2
3	Demonstration of Interventional Radiology Techniques (via videos or models)	CO3

Suggested Readings

1. KD Tripathi, Essentials of Medical Pharmacology, 2023, 8th edition, Jaypee Brothers Medical Publishers.
2. Dr. S.K. Srivastava, A Complete Textbook of Medical Pharmacology (Volumes I and II) – pharmacology, 2017, 2nd edition, APC Books

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Online Resources

1. <https://openstax.org/books/pharmacology/pages/2-introduction>
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6529235/>
3. <https://openstax.org/books/pharmacology/pages/26-4-glucocorticoids-and-mineralocorticoids>
4. <https://www.uclahealth.org/medical-services/radiology/interventional-radiology/treatments-procedures/embolization>

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	—	—	—	—	—	—	—	—	—	—	—	2	—
CO2	3	2	—	—	3	2	—	—	—	3	—	—	3	2
CO3	2	2	3	3	3	2	2	—	—	3	2	—	3	2

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Program	BMRIT				
Year	III	Semester	V		
Course Name	Patient Care and Communication in Radiology				
Code	BMRIT 501P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	24	12
Course Objective	Explain the principles of patient-centered care in radiology. Demonstrate effective communication with patients and healthcare professionals. Describe protocols for patient preparation and identification. Recognize the importance of empathy, privacy, and consent in radiological practice.				
Course Outcomes					
CO1	Describe the essentials of patient-centered care and its impact on imaging outcomes.				
CO2	Demonstrate effective verbal and non-verbal communication in the radiology setting.				
CO3	Apply patient preparation and identification protocols in clinical scenarios				
CO4	Recognize and respect patient privacy, dignity, and informed consent requirements.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Introduction to Patient Care: Principles of patient-centered care, roles of radiology staff, patient rights	90 Hours	CO1
2	Communication Skills: Verbal and non-verbal communication, handling anxious/difficult patients, communication with families and teams	90 Hours	CO2
3	Patient Preparation and Identification Patient verification, consent, psychological preparation, preparation for imaging procedures	90 Hours	CO3

4	Patient Safety and Comfort: Positioning, infection control, comfort measures, special considerations for vulnerable groups	90 Hours	CO4
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Suggested Readings

1. Suri, J.S., & Saxena, S. (2022). Textbook for the Student's of Medical Radiology & Imaging Technology. New Delhi: CBS Publishers.
2. Frank, E.D., Long, B.W., & Smith, B.J. (2015). Merrill's Atlas of Radiographic Positioning & Procedures (13th ed.). St. Louis: Elsevier.

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	3	2	2	—	—	3	2	2	2	3	3
CO2	—	—	—	—	—	—	—	—	3	2	3	2	2	3
CO3	2	3	2	3	2	3	2	—	2	2	2	—	3	2
CO4	2	2	—	—	2	3	—	2	3	2	2	2	3	3

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Program	BMRIT				
Year	III	Semester	V		
Course Name	Managing Medical Emergencies				
Code	BMRIT 502P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	12	6
Course Objective	Understand the importance of timely response in medical emergencies. Learn basic resuscitation and life support techniques. Identify signs of critical medical conditions. Explain first aid for common injuries.				
Course Outcomes					
CO1	Explain the basic principles of emergency medical response.				
CO2	Demonstrate understanding of CPR and life-saving protocols.				
CO3	Identify signs of common emergency conditions.				
CO4	Describe appropriate first aid interventions.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Introduction to Emergency Medical Services: Definition and types of medical emergencies, assessment and prioritization, basic life support principle	45 Hours	CO1
2	CPR, Defibrillation, and Basic Life Support: Recognition and management of cardiac arrest, respiratory distress, airway obstruction.	45 Hours	CO2
3	Emergency Response to Bleeding and Shock: Types of trauma, hemorrhage control, types and stages of shock, initial stabilization.	45 Hours	CO3
4	Management of Burns, Fractures: Types of fractures and burns, principles of fracture immobilization and first aid, burn classification and treatment, pain management, infection prevention, and wound care.	45 Hours	CO4

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Suggested Readings

1. American Heart Association, BLS Provider Manual
2. First Aid Manual, Indian Red Cross Society
3. Satish Chandra, Essentials of Emergency Medicine, Jaypee Brothers

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3	—	2	2	2	—	—	—	2	2	—	2	2
CO2	2	3	—	2	—	3	—	—	—	2	2	—	2	2
CO3	2	2	—	2	2	2	—	—	—	2	2	—	2	2
CO4	2	3	—	2	2	2	—	—	—	2	2	—	2	2

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Program	BMRIT				
Year	III	Semester		V	
Course Name	Summer Internship				
Code	BMRIT 503P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	4	2
Course Objectives	Apply theoretical knowledge in a real-world work environment to develop practical skills and professional competence. Enhance communication, teamwork, and problem-solving abilities through active participation in organizational tasks and projects. Understand workplace culture, ethics, and professional responsibilities to prepare for future career opportunities.				
Course Outcomes					
CO1	Demonstrate the ability to perform job-related tasks effectively by applying academic concepts to practical scenarios.				
CO2	Exhibit improved interpersonal and professional skills, including communication, collaboration, and adaptability in a work setting.				
CO3	Reflect on the internship experience to identify personal strengths, areas for improvement, and career goals.				







Program	BMRIT				
Year	III	Semester		VI	
Course Name	Infection Control Practices				
Code	BMRIT 601P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	24	12
Course Objectives	Understand the types of infectious agents, their modes of transmission, and the significance of standard precautions in healthcare. Apply sterilization and disinfection methods appropriately to ensure infection-free clinical environments. Demonstrate correct usage of PPE, including donning, doffing, and disposal, as part of infection prevention practices. Identify hospital-acquired infections (HAIs) and implement biomedical waste management techniques following regulatory standards.				
Course Outcomes					
CO1	Describe infectious agents and implement standard precautions such as hand hygiene and respiratory etiquette				
CO2	Apply suitable sterilization and disinfection methods based on the type of equipment and setting.				
CO3	Demonstrate the correct selection, usage, and disposal of PPE in clinical situations.				
CO4	Identify common HAIs and manage biomedical waste using color-coded segregation and safe disposal practices.				

Module	Course Contents	Contact Hrs.	Mapped CO
I	Introduction to Infection and Standard Precautions: Overview of infectious agents (bacteria, viruses, fungi, parasites), modes of transmission (contact, droplet, airborne), and the significance of infection control in healthcare settings., Principles of standard precautions, handwashing techniques, hand sanitizers, respiratory hygiene, and cough etiquette.	90 Hours	CO1









2	Sterilization and Disinfection: Methods of sterilization (autoclaving, dry heat, chemical sterilants), disinfection techniques, and selection of appropriate disinfectants.	90 Hours	CO2
3	Use of Personal Protective Equipment (PPE): Types of PPE (gloves, gowns, masks, eye protection), proper donning and doffing procedures, and disposal protocols.	90 Hours	CO3
4	Hospital-Acquired Infections and Waste Management: Common HAIs, prevention strategies, biomedical waste segregation, handling, and disposal in compliance with regulatory guidelines.	90 Hours	CO4

Suggested Readings

1. Kamaluddin A. et al., Infection Control in Healthcare Settings, 3rd Edition, Jaypee Publications
2. Shrivastava P.S., Textbook of Infection Control and Hospital Hygiene, 2nd Edition, Elsevier India
3. Parikh C.R., Infection Control in Clinical Laboratories, 1st Edition, CBS Publishers
4. WHO Guidelines on Hand Hygiene in Healthcare, 2009

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	3	—	—	—	3	—	—	2	2	2	—	2	2
CO2	2	3	—	—	—	3	2	—	—	2	2	—	2	2
CO3	—	3	—	—	—	3	—	—	2	2	2	—	2	2
CO4	2	3	—	—	—	3	2	—	—	2	2	—	2	2

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Program	BMRIT				
Year	III	Semester		VI	
Course Name	Medical Ethics and Professionalism				
Code	BMRIT 602P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	12	06
Course Objectives	Explain ethical principles and their application in medical imaging. Describe professional responsibilities and conduct in radiology. Recognize the importance of patient confidentiality and informed consent. Identify and address ethical dilemmas and conflicts in clinical practice.				
Course Outcomes					
CO1	Summarize ethical principles relevant to radiology practice.				
CO2	Demonstrate professionalism and accountability in clinical and academic settings.				
CO3	Apply confidentiality and consent protocols in imaging procedures.				
CO4	Analyze and resolve common ethical dilemmas in radiology.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Introduction to Medical Ethics: Principles (autonomy, beneficence, non-maleficence, justice), historical context	45 Hours	CO1
2	Professionalism in Radiology: Professional behavior, accountability, scope of practice	45 Hours	CO2
3	Confidentiality and Consent: Patient privacy, informed consent, legal aspects	45 Hours	CO3
4	Social Responsibility and Lifelong Learning: Equity in healthcare, continuing education, self-assessment	45 Hours	CO4

Suggested Readings

1. Suri, J.S., & Saxena, S. (2022). Textbook for the Student's of Medical Radiology & Imaging Technology. New Delhi: CBS Publishers.
2. Goyal, K.L. (2022). Manual of Practical Medicine. New Delhi: CBS Publishers.

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	—	—	2	3	—	2	2	2	2	2	2	3
CO2	—	2	—	—	—	3	—	—	3	2	3	3	—	3
CO3	2	2	—	—	2	3	—	2	2	2	2	—	2	3
CO4	—	—	—	—	2	3	—	—	2	3	2	2	2	3

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Program	BMRIT				
Year	III	Semester	VI		
Course Name	Internship				
Code	BMRIT 603P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	4	2
Course Objectives	Apply theoretical knowledge in a real-world work environment to develop practical skills and professional competence. Enhance communication, teamwork, and problem-solving abilities through active participation in organizational tasks and projects. Understand workplace culture, ethics, and professional responsibilities to prepare for future career opportunities.				
Course Outcomes					
CO1	Demonstrate the ability to perform job-related tasks effectively by applying academic concepts to practical scenarios.				
CO2	Exhibit improved interpersonal and professional skills, including communication, collaboration, and adaptability in a work setting.				
CO3	Reflect on the internship experience to identify personal strengths, areas for improvement, and career goals.				







Program	BMRIT				
Year	IV	Semester		VII	
Course Name	Introduction to Imaging Modalities				
Code	BMRIT 701P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	24	12
Course Objectives	Describe the basic principles and clinical applications of major imaging modalities. Identify indications, advantages, and limitations of each imaging modality. Explain patient safety and preparation for different imaging techniques. Compare and contrast imaging modalities for common clinical scenarios.				
Course Outcomes					
CO1	Summarize the principles and uses of key imaging modalities.				
CO2	Identify appropriate imaging techniques for various clinical conditions.				
CO3	Describe patient preparation and safety protocols for each modality.				
CO4	Compare the strengths and limitations of different imaging methods.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Overview of Medical Imaging: History, evolution, and scope of imaging modalities	90 Hours	CO1
2	Conventional Radiography: X-ray physics, image formation, indications, limitations	90 Hours	CO2
3	CT and MRI: Principles, patient preparation, indications, contraindications	90 Hours	CO3
4	Ultrasonography: Basic physics, instrumentation, clinical uses, safety	90 Hours	CO4

Suggested Readings

1. Chesney, D.N., & Chesney, M.O. (1987). Radiographic Imaging (4th ed.). London: Churchill Livingstone.
2. Westbrook, C., & Roth, C. (2018). MRI in Practice (5th ed.). Oxford: Wiley-Blackwell.
3. Bushong, S.C. (2016). Radiologic Science for Technologists: Physics, Biology, and Protection (11th ed.). St. Louis: Elsevier.
4. Suri, J.S., & Saxena, S. (2022). Textbook for the Student's of Medical Radiology & Imaging Technology. New Delhi: CBS Publishers.

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	—	3	—	2	2	2	—	—	2	—	—	3	2
CO2	3	—	3	2	3	2	2	—	—	3	—	—	3	2
CO3	2	3	2	3	2	3	2	—	2	2	2	—	3	2
CO4	2	—	3	—	3	2	—	—	—	3	—	—	3	2

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Program	BMRIT				
Year	IV	Semester	VII		
Course Name	Conventional Radiography Techniques				
Code	BMRIT 702P				
Course Type	DSC	L	T	P	Credit
Pre-Requisite		0	0	16	08
Course Objectives	Explain the principles and physics of conventional radiography. Describe the operation and maintenance of radiographic equipment. Demonstrate correct patient positioning and projection techniques. Identify and apply radiation protection measures during radiographic procedures.				
Course Outcomes					
CO1	Summarize the principles and components of conventional radiography.				
CO2	Operate radiographic equipment and perform routine maintenance checks				
CO3	Demonstrate proper patient positioning for standard radiographic projections.				
CO4	Apply radiation safety and protection protocols in practice.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Principles of Conventional Radiography: X-ray production, X-ray tube, image formation, exposure factors	60 Hours	CO1
2	Radiographic Equipment: Types of equipment, maintenance, quality control, mobile units	60 Hours	CO2
3	Patient Positioning and Projections: Positioning for chest, extremities, spine, skull, abdomen	60 Hours	CO3
4	Radiation Safety in Radiography: ALARA principle, shielding, monitoring, safe practices	60 Hours	CO4

Suggested Readings

1. Frank, E.D., Long, B.W., & Smith, B.J. (2015). Merrill's Atlas of Radiographic Positioning & Procedures (13th ed.). St. Louis: Elsevier.
2. Bushong, S.C. (2016). Radiologic Science for Technologists: Physics, Biology, and Protection (11th ed.). St. Louis: Elsevier.

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	—	3	—	2	2	2	—	—	2	—	—	3	2
CO2	2	—	3	—	—	2	3	—	—	2	2	—	3	2
CO3	2	2	3	3	2	2	—	—	—	2	2	—	3	2
CO4	—	3	2	2	2	3	2	—	—	2	2	—	3	3

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Program	BMRIT					
Year	IV	Semester		VIII		
Course Name	Radiation Safety and Protection					
Code	BMRIT 801P					
Course Type	DSC	L	T	P	Credit	
Pre-Requisite		0	0	16	08	
Course Objectives	Explain the biological effects of ionizing radiation. Describe national and international radiation safety standards. Identify and implement radiation protection measures for patients and staff. Monitor and document radiation exposure in clinical settings.					
Course Outcomes						
CO1	Describe the biological and health effects of radiation exposure.					
CO2	Apply safety standards and protocols in radiology departments.					
CO3	Implement protective measures for patients, staff, and the public.					
CO4	Monitor, record, and interpret radiation exposure data.					

Module	Course Contents	Contact Hrs.	Mapped CO
1	Basics of Radiation and Its Effects: Types of radiation, interaction with tissue, deterministic and stochastic effects	60 Hours	CO1
2	Radiation Protection Standards: ICRP, AERB, NCRP guidelines, legal requirements	60 Hours	CO2
3	Patient and Staff Protection: Shielding, distance, time, personal protective equipment, monitoring devices	60 Hours	CO3
4	Radiation Monitoring and Record Keeping: Dosimetry, exposure limits, documentation, audits	60 Hours	CO4

Suggested Readings

1. Bushong, S.C. (2016). Radiologic Science for Technologists: Physics, Biology, and Protection (11th ed.). St. Louis: Elsevier.
2. Martin, A., & Harbison, S.A. (2018). An Introduction to Radiation Protection (7th ed.). CRC Press.

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	—	3	3	—	—	—	2	—	—	3	2
CO2	2	3	2	2	2	3	2	—	—	3	2	—	3	3
CO3	2	3	2	2	2	3	2	—	—	2	2	—	3	3
CO4	—	2	—	—	—	3	2	—	—	2	—	—	2	2

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Program	BMRIT				
Year	IV	Semester	VIII		
Course Name	Computed Tomography (CT) Principles and Practice				
Code	BMRIT 802P				
Course Type	DSC/RP	L	T	P	Credit
Pre-Requisite		0	0	8	4
Course Objectives	Explain the basic principles and physics of CT imaging. Describe the components and operation of CT scanners. Demonstrate patient preparation and positioning for CT procedures. Identify common CT protocols and clinical applications.				
Course Outcomes					
CO1	Summarize the physical principles and instrumentation of CT.				
CO2	Operate CT equipment and select appropriate scanning protocols.				
CO3	Prepare and position patients for various CT examinations.				
CO4	Recognize indications and contraindications for CT imaging.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Principles of CT Imaging: Physics, generations of CT, image formation, Hounsfield unit	30 Hours	CO1
2	CT Equipment and Instrumentation: Gantry, detectors, computer systems, contrast injectors	30 Hours	CO2
3	Patient Preparation and Positioning: Screening, consent, contrast administration, positioning techniques	30 Hours	CO3
4	CT Protocols and Applications: Head, chest, abdomen, angiography, trauma, pediatric CT	30 Hours	CO4

Suggested Readings

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1. Seeram, E. (2015). Computed Tomography: Physical Principles, Clinical Applications, and Quality Control (4th ed.). St. Louis: Elsevier.
2. Bushong, S.C. (2016). Radiologic Science for Technologists: Physics, Biology, and Protection (11th ed.). St. Louis: Elsevier.

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	—	3	—	2	2	2	—	—	2	—	—	3	2
CO2	—	2	3	—	—	3	3	—	—	2	2	—	3	2
CO3	2	2	2	3	—	2	—	—	—	2	—	—	3	2
CO4	3	—	3	2	3	2	—	—	—	3	—	—	3	2

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Program	BMRIT				
Year	IV	Semester	VIII		
Course Name	Magnetic Resonance Imaging (MRI) Principles and Practice				
Code	BMRIT 803P				
Course Type	DSC/RP	L	T	P	Credit
Pre-Requisite		0	0	8	04
Course Objectives	Explain the basic physics and principles of MRI. Describe MRI equipment and safety considerations. Demonstrate patient preparation and positioning for MRI procedures. Identify common MRI protocols and clinical applications.				
Course Outcomes					
CO1	Summarize the physical principles and instrumentation of MRI.				
CO2	Operate MRI equipment and select appropriate imaging protocols.				
CO3	Prepare and position patients for various MRI examinations.				
CO4	Recognize indications, contraindications, and applications of MRI.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Principles of MRI: Basic physics, magnetism, resonance, relaxation, image formation	30 Hours	CO1
2	MRI Equipment and Instrumentation: Magnets, coils, gradients, computer systems, safety devices	30 Hours	CO2
3	Patient Preparation and Positioning: Screening for contraindications, consent, positioning, comfort	30 Hours	CO3
4	MRI Protocols and Applications: Brain, spine, musculoskeletal, abdominal, vascular MRI	30 Hours	CO4

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Suggested Readings

1. Westbrook, C., & Roth, C. (2018). MRI in Practice (5th ed.). Oxford: Wiley-Blackwell.
2. Bushong, S.C. (2016). Radiologic Science for Technologists: Physics, Biology, and Protection (11th ed.). St. Louis: Elsevier.

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	—	3	—	2	2	2	—	—	2	—	—	3	2
CO2	—	2	3	—	—	2	3	—	—	2	2	—	3	3
CO3	2	2	2	3	—	2	—	—	—	2	—	—	3	2
CO4	3	—	2	2	3	2	—	—	—	3	—	—	3	2

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Program	BMRIT				
Year	IV	Semester	VIII		
Course Name	Ultrasound and Doppler Imaging				
Code	BMRIT 804P				
Course Type	DSC/RP	L	T	P	Credit
Pre-Requisite		0	0	8	04
Course Objectives	Explain the physical principles and instrumentation of ultrasound and Doppler imaging. Describe the different modes of ultrasound and their clinical applications. Demonstrate patient preparation and scanning techniques for common ultrasound procedures. Interpret normal and abnormal findings in grayscale and Doppler ultrasound.				
Course Outcomes					
CO1	Summarize the principles of ultrasound and Doppler imaging, including the Doppler effect and instrumentation.				
CO2	Identify and describe the clinical uses of B-mode, color, power, and spectral Doppler ultrasound.				
CO3	Demonstrate patient positioning and preparation for routine ultrasound and Doppler studies.				
CO4	Recognize normal and pathological flow patterns and basic artifacts in Doppler studies.				

Module	Course Contents	Contact Hrs.	Mapped CO
1	Principles of Ultrasound: Sound waves, transducers, image formation, safety	30 Hours	CO1
2	Doppler Imaging Basics: Doppler effect, types (color, power, spectral), flow measurement	30 Hours	CO2
3	Instrumentation & Techniques: Machine settings, optimization, patient prep, scanning protocols	30 Hours	CO3

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4	Clinical Applications: Vascular, abdominal, obstetric, cardiac, and musculoskeletal Doppler	30 Hours	CO4
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Suggested Readings

1. Rumack, C.M., Wilson, S.R., & Charboneau, J.W. (2017). Diagnostic Ultrasound (5th ed.). Elsevier.
2. Deane, C. (2011). "Doppler Ultrasound: Principles and Practice."
3. Radiology Cafe. "Doppler - Radiology Cafe."
4. Bushong, S.C. (2016). Radiologic Science for Technologists (11th ed.). Elsevier.

Course Articulation Matrix														
PO-PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	—	3	—	2	2	2	—	—	2	—	—	3	2
CO2	2	—	3	—	2	—	—	—	—	2	—	—	3	2
CO3	2	2	2	3	—	2	—	—	—	2	—	—	3	2
CO4	3	—	3	—	3	—	—	—	—	3	—	—	3	2

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