

ALLIED HEALTH SCIENCES

Programme Name-BMRIT

VISION

- To impart quality education through outcomes-based teaching & Hands-On clinical practice.
- To encourage innovation & interdisciplinary collaboration in solving real world challenges.
- To produce skilled, ethical Allied Health Professionals, who contribute holistic Health care &
- To produce skilled, ethical, ALLIED HEALTH Professionals, who contribute holistic Health Care & enhancement of community health at local & global level.

MISSION

- To educate & professionals who contribute to the promotion of health prevention of disease & delivery of high quality patient care.
- Developing next generation of Allied Health leaders through membership, education & innovation.
- To encourage creative solution and best practice in patient care.

PROGRAMME EDUCATIONAL OBJECTIVES:

PEO1: To prepare graduates who can competently perform and manage diagnostic imaging procedures with a high degree of technical proficiency, ethical values, and professional integrity.

PEO2: To nurture radiology professionals who engage in lifelong learning, research, and innovation, contributing to advancements in medical imaging technology and healthcare delivery

PROGRAM SPECIFIC OUTCOME (PSOs)

PSO1: Apply theoretical and practical knowledge of imaging modalities such as X-ray, CT, MRI, Ultrasound, and Nuclear Medicine in clinical diagnosis and patient management.

PSO2: Implement radiation protection measures and quality assurance protocols in diagnostic imaging departments to ensure patient, staff, and environmental safety.

PROGRAMME OUTCOMES:

At the end of the program, students should be able to:

PO1: Demonstrate a comprehensive understanding of concepts in radiology, imaging technology, and radiation physics, and apply this knowledge in diverse clinical settings.

PO2: Exhibit critical thinking and problem-solving skills to evaluate radiographic images, identify errors, and ensure diagnostic accuracy.

PO3: Acquire competency in the operation and maintenance of conventional and advanced imaging modalities, ensuring patient safety and optimal image quality.

PO4: Work effectively as a member or leader in multidisciplinary healthcare teams and actively participate in clinical and research activities.

PO5: Apply appropriate quantitative and analytical techniques for radiation dose optimization, quality control, and image assessment.

PO6: Develop an aptitude for research, evidence-based practice, and continuous learning to keep pace with technological advancements in radiological sciences.

PO7: Demonstrate ethical responsibility, empathy, and sensitivity towards patients while adhering to professional standards and radiation protection principles.

PO8: Communicate effectively with patients, healthcare professionals, and the community to promote awareness of diagnostic imaging procedures, radiation safety, and healthcare standards.

Credit Definition

Type	Duration (in hours)	Credit
Lecture (L)	1	1
Tutorial (T)	0	0
Practical (P)	2	1

Total Credit Distribution for the Entire Programme

Semester	Credit						Total/Sem
	CC	DSE	GE	AECC	SEC	USC	
First	18			2			20
Second	18		4	2	1		25
Third	12	6	4	2	1	2	27
Fourth	12	6	4	2	1	2	27
Fifth	18	6			1	2	27
Sixth	18	6				2	26
Total Credit/ Course	96	24	12	8	4	8	
Total Credit							152

Category Definition:

Definition of Category/Type	Abbreviation
Core Courses;	CC
General Elective	GE
Ability Enhancement Compulsory Course	AECC
Skill Enhancement Courses;	SEC
Discipline Specific Elective	DSE
University specified course	USC
Skill Enhancement Courses	SEC

FIRST YEAR

SEMESTER-I & II:

Category	Course Name	Credit	Teaching Scheme		
			L	T	P
Semester – I					
CC – 1	Basic & Applied Human Anatomy	4	4	0	0
	Basic & Applied Human Anatomy Lab	2	0	0	4
CC – 2	Basic & Applied Human Physiology	4	4	0	0
	Basic & Applied Human Physiology lab	2	0	0	4
CC-3	Basic Instrument & Equipment	4	4	0	0
	Basic Instrument & Equipment lab	2	2	0	0
AECC – 1	Communicative English – I	2	2	0	0
Total Credit = 20			Teaching Hour = 24		
Semester – II					
CC – 4	Basic Biochemistry & Microbiology	4	4	0	0
	Basic Biochemistry & Microbiology Lab	2	0	0	4
CC – 5	Basic Physics with an introduction to Plasma	4	4	0	0
	Basic Physics with an introduction to Plasma Lab	2	0	0	4
CC- 6	Radiation Physic -I	4	4	0	0
	Radiation Physic –I	2	0	0	4
GE – 1	General Elective-I	4	4	0	0
AECC – 2	Communicative English – II	2	2	0	0
SEC – 1	Mentored Seminar – I	1	1	0	0
Total Credit = 25			Teaching Hour = 31		

SECOND YEAR

SEMESTER-III & IV

Category	Course Name	Credit	Teaching Scheme		
			L	T	P
Semester – III					
CC – 7	Basic Radiology & Dark Room Analysis	4	4	0	0
	Basic Radiology & Dark Room Analysis - Lab	2	0	0	4
CC – 8	Radiation Physics II	4	4	0	0
	Radiation Physics II Lab	2	0	0	4
DSE – 1	Radiography Position	4	4	0	0
	Radiography Position Lab	2	0	0	4
GE – 2	General Elective-II	4	4	0	0
AECC – 3	Fundamentals of Computer Science	2	2	0	0
SEC – 2	Mentored Seminar – II	1	1	0	0
USC – 1	Environmental Science-I	2	2	0	0
Total Credit = 27			Teaching Hour = 33		
Semester – IV					
CC – 9	Special Radiographic Techniques	4	4	0	0
	Special Radiographic Techniques Lab	2	0	0	4
CC – 10	General Radiography & Patient Care in Hospital	4	4	0	0
	General Radiography & Patient Care in Hospital Lab	2	0	0	4
DSE – 2	Contrast Media with Interventional Techniques	4	4	0	0
	Contrast Media with Interventional Techniques– Lab	2	0	0	4
GE – 3	General Elective-III	4	4	0	0
AECC – 4	Medical Law & Ethics	2	2	0	0
SEC – 3	Mentored Seminar – III	1	1	0	0
USC – 2	Environmental Science-II	2	2	0	0
Total Credit = 27			Teaching Hour = 33		

THIRD YEAR

SEMESTER V & VI

Category	Course Name	Credit	Teaching Scheme		
			L	T	P
Semester – V					
CC – 11	Advanced Radiography Equipment & Techniques	4	4	0	0
	Advanced Radiography Equipment & Techniques Lab	2	0	0	4
CC – 12	Radiation Hazards & Preventative Strategies	4	4	0	0
	Radiation Hazards & Preventative Strategies Lab	2	0	0	4
CC – 13	CT Scan	4	4	0	0
	CT Scan Lab	2	0	0	4
DSE – 3	Nuclear Medicine	4	4	0	0
	Nuclear Medicine Lab	2	0	0	4
SEC – 4	Mentored Seminar – IV	1	1	0	0
USC – 3	Health Statistics	2	2	0	0
Total Credit = 27			Teaching Hour = 33		
Semester – VI					
CC – 14	USG & Doppler Study	4	4	0	0
	USG & Doppler Study Lab	2	0	0	4
CC – 15	MRI	4	4	0	0
	MRI Lab	2	0	0	4
CC – 16	Basic and Cross Sectional Anatomy in CT & MRI Imaging	4	4	0	0
	Basic and Cross Sectional Anatomy in CT & MRI Imaging Lab	2	0	0	4
DSE-4	Project	6	0	0	12
USC-4	Research Methodology	2	2	0	0
Total Credit = 26			Teaching Hour 38		

COURSE CO-PO-PSO MAPPING

SEMESTER-I

COURSE 1 (BMRIT)

PAPER: Basic and Applied Human Anatomy

PROGRAM OUTCOMES (PO)

Program Outcomes (POs)-

At the end of the program, students should be able to:**PO1:** Demonstrate a comprehensive understanding of concepts in radiology, imaging technology, and radiation physics, and apply this knowledge in diverse clinical settings.**PO2:** Exhibit critical thinking and problem-solving skills to evaluate radiographic images, identify errors, and ensure diagnostic accuracy.

PO3: Acquire competency in the operation and maintenance of conventional and advanced imaging modalities, ensuring patient safety and optimal image quality.

PO4: Work effectively as a member or leader in multidisciplinary healthcare teams and actively participate in clinical and research activities.

PO5: Apply appropriate quantitative and analytical techniques for radiation dose optimization, quality control, and image assessment.

PO6: Develop an aptitude for research, evidence-based practice, and continuous learning to keep pace with technological advancements in radiological sciences.

PO7: Demonstrate ethical responsibility, empathy, and sensitivity towards patients while adhering to professional standards and radiation protection principles.

PO8: Communicate effectively with patients, healthcare professionals, and the community to promote awareness of diagnostic imaging procedures, radiation safety, and healthcare standards.

Program Specific Outcomes (PSOs)

PSO1: Apply theoretical and practical knowledge of imaging modalities such as X-ray, CT, MRI, Ultrasound, and Nuclear Medicine in clinical diagnosis and patient management.

PSO2: Implement radiation protection measures and quality assurance protocols in diagnostic imaging departments to ensure patient, staff, and environmental safety.

Course outcome

CO1.Students will be able to outline position, specified function of skeletal system and respiratory system.

CO2 Students will be able to Demonstrate the parts and functions of Cardiovascular system of human body .

CO3.Students will be able to think critically to differentiate the anatomical position and function of Excretory system of human body.

CO4.Students will be able to Monitoring the functions of gastro-intestinal system with position.

CO5.Students will be able to Design the pathways and correlation of Nervous system with other systems including cardiovascular system, excretory system.

CO PO and PSO mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	3	2	2	1	2	2	2	2	3	3
CO2	3	2	3	2	2	2	2	3	3	2
CO3	3	3	2	2	2	2	2	1	2	3
CO4	3	3	3	2	2	2	2	2	3	3
CO5	3	3	3	3	3	3	2	3	3	3
TOTAL	15	13	13	10	11	11	10	11	14	14

PAPER: BASIC INSTRUMENT AND EQUIPMENT

Course Outcomes:

- CO1: Students will be able to identify the parts and functions of basic clinical equipment.
 CO2: Students will be able to demonstrate the use of basic diagnostic tools.
 CO3: Students will be able to compare various patient care accessories used in clinical practice.
 CO4: Students will be able to differentiate between types of surgical instruments.
 CO5: Students will be able to evaluate the handling strategies of surgical and emergency instruments in clinical settings.

Program Outcomes (POs)

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Program Specific Outcomes (PSO)

- PSO 1: Apply theoretical and practical knowledge of imaging modalities such as X-ray, CT, MRI, Ultrasound, and Nuclear Medicine in clinical diagnosis and patient management.
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Program Educational Objectives (PEO)

PEO 1: To prepare graduates who can competently perform and manage diagnostic imaging procedures with a high degree of technical proficiency, ethical values, and professional integrity.

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CO-PO and PSO mapping

CO/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 1	PSO 2
CO1	3	2	2	1	2	1	3	2	1	2
CO2	3	2	2	1	2	2	2	2	3	2
CO3	3	2	1	1	1	2	2	2	3	2
CO4	2	3	3	2	3	2	3	3	3	3
CO5	3	2	2	1	1	1	2	2	3	2
TOTAL	14	11	10	6	9	8	12	11	13	11

PAPER: BASIC & APPLIED HUMAN PHYSIOLOGY

Course Outcomes:

CO1: Students will be able to classify the various blood components and their transfusion according to the clinical physiology.

CO2: Students will be able to demonstrate the physiology of cardio-vascular system, pulmonary system, and renal system, and its abnormalities.

CO3: Students will be able to detect hormonal imbalance.

CO4: Students will be able to monitor cardio-pulmonary parameters and management. CO5: Students will be able to check the reflexes of neuro-muscular system.

Program Outcomes (POs)

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Program Specific Outcomes (PSOs)

PSO1: Apply theoretical and practical knowledge of imaging modalities such as X-ray, CT, MRI, Ultrasound, and Nuclear Medicine in clinical diagnosis and patient management.

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SEMESTER-II

PAPER: Basic Physics with an introduction to Plasma

COURSE OUTCOMES:

CO1: Student will be able to discuss about study of a Atomic Structure.

CO2: Student will be able to illustrate about Heat, Temperature, Thermal conductivity, Stefan law, application in Diagnostic Radiology.

CO3: Student will be able to differentiate Radiation Spectrum.

CO4: Student will be able to analyze, evaluate circuitry.

CO5: Student will be able to understand, apply the concepts of magnetism.

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PSO1: Apply theoretical and practical knowledge of imaging modalities such as X-ray, CT, MRI, Ultrasound, and Nuclear Medicine in clinical diagnosis and patient management.

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CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	3	2	2	1	2	2	1	1	3	2
CO2	3	3	3	1	3	2	2	1	3	2
CO3	3	3	3	1	3	2	2	1	3	3
CO4	3	3	3	2	3	2	1	1	3	3
CO5	3	2	2	1	2	2	1	1	3	2
Total	15	13	13	6	13	10	7	5	15	12

PAPER- RADIATION PHYSICS

Program Outcomes (POs)-

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Program Specific Outcomes (PSOs)

PSO1: Apply theoretical and practical knowledge of imaging modalities such as X-ray, CT, MRI, Ultrasound, and Nuclear Medicine in clinical diagnosis and patient management.

PSO2: Implement radiation protection measures and quality assurance protocols in diagnostic imaging departments to ensure patient, staff, and environmental safety.

Course Outcomes (COs)

CO1: Students will be able to describe the basic principles of atomic and nuclear structure, radioactivity, and various types of radiation relevant to medical imaging.

CO2: Students will be able to explain the process of X-ray production and analyse how radiation interacts with matter to influence image formation and quality.

CO3: Students will be able to apply radiation physics concepts to calculate exposure parameters, attenuation, and radiation dose in diagnostic radiology.

CO4: Students will be able to evaluate the biological effects of ionizing radiation and interpret mechanisms of radiation damage at cellular and tissue levels.

CO5: Students will be able to demonstrate appropriate radiation protection measures and follow safety standards and regulatory guidelines in clinical and laboratory environments.

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	3	2	2	0	2	1	2	0	3	2
CO2	3	3	3	0	3	1	2	0	3	3
CO3	3	3	2	0	3	2	2	0	3	3
CO4	2	2	2	0	3	3	3	2	2	3
CO5	2	2	3	2	3	2	3	3	2	3
TOTAL	19	12	12	2	14	9	12	5	13	14

PAPER: BASIC BIOCHEMISTRY AND MICROBIOLOGY

CO1: Discuss the classification, function and metabolism of carbohydrate.

CO2: Discuss the classification, function, and metabolism of protein.

CO3: Describe the types, function and metabolism of lipids, including their physiological roles.

CO4: Explain the historical background and basic concepts of microbiology including classification and morphology of bacteria.

CO5: Explain the structural and functional features of prokaryotic cells including gram positive and gram-negative bacteria.

PO-

PO1 Disciplinary knowledge: Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programme of study.

PO2 Communication Skills: Able to share ideas clearly in writing and speech, listen actively, and communicate well with all healthcare professionals and patients.

PO3 Problem Solving & Reasoning: Able to analyze situations, think critically, and use knowledge to solve real-life healthcare problems effectively.

PO4 Cooperation/Team work: Able to work respectfully and efficiently with hospital team and other staff as part of a coordinated healthcare team.

PO5 Self-directed learning: Able to work independently in various healthcare settings and manage situations requiring quick and responsible action

PO6 Moral and ethical awareness/reasoning: Able to follow ethical principles, maintain honesty in all work, and respect confidentiality and professional conduct.

PO7 Lifelong learning: Able to continue learning new skills and knowledge to keep up with changes in healthcare and professional growth.

PO8: Clinical Competence and Technical Skills:

Able to apply practical and technical skills in operating, maintaining, and troubleshooting critical care equipment, perform patient monitoring procedures accurately, and ensure safe and effective delivery of critical care services in emergency and ICU settings.

PROGRAM EDUCATIONAL OUTCOMES (PEOs)

PEO 1: Professional Competence and Ethical Practice

Students will demonstrate strong foundational and applied knowledge in critical care technology, enabling them to provide high-quality patient monitoring and life-support services while adhering to ethical, moral, and professional standards within healthcare institutions.

(Derived from PO1, PO3, PO6, and PO8)

PEO 2: Lifelong Learning and Leadership in Healthcare

Students will continuously update their knowledge and technical skills to adapt to emerging technologies and healthcare advancements, effectively communicating and collaborating with multidisciplinary teams to assume leadership roles in critical care environments.

(Derived from PO2, PO4, PO5, and PO7)

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO 1: Clinical Application and Technical Proficiency

Students will be able to competently operate, calibrate, and manage critical care instruments such as ventilators, defibrillators, and monitoring systems, ensuring accurate data collection and effective patient care in ICUs and emergency units.

(Linked to PO1, PO3, and PO8)

PSO 2: Patient-Centered Critical Care and Professional Collaboration

Graduates will be able to assess patient conditions, support clinicians in emergency decision-making, and effectively communicate and coordinate with healthcare teams to deliver safe, ethical, and efficient critical care services.

SEMESTER-III

PAPER: - RADIOLOGY AND DARKROOM ANALYSIS

COURSE OUTCOMES

CO1 Student will able to Describe the density and contrast of x-ray

CO2-Student will able to utilize lead apron ,lead thyroid shield badge during fluoroscopy

CO3- Student will able to Detect lesion in different body parts of Xray image

CO4- Student able to Detect different between Developer and fixer

CO5-Student able to know construct the Dark room.

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	3	2	2	0	3	2	0	1	3	2
CO2	2	2	3	0	2	1	3	2	2	3
CO3	2	3	2	0	3	2	0	1	3	2
CO4	3	1	2	0	2	1	0	1	2	2
CO5	3	1	3	0	2	1	0	1	3	2
TOTAL	13	9	12	0	12	7	3	6	13	11

PAPER: RADIATION PHYSICS II

COURSE OUTCOMES

CO 1: Students will be able to Illustrate the structure and working principal of Beam Restricting device and grid.

CO 2: Students will be able to classify the type of interaction.

CO 3: Students will be able to Differentiate between within general radiation.

CO4: Students will be able to Monitor x-ray equipment's and other radiology related equipment's

CO 5: Students will be able to Design the radiation detection.

PROGRAM OUTCOMES (POS):

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CO1	3	2	3	1	2	1	2	1	3	3
CO2	3	2	2	1	3	1	1	1	3	3
CO3	3	3	2	1	3	2	2	1	3	3
CO4	2	2	3	2	3	1	2	1	3	3
CO5	3	3	3	2	3	2	2	1	3	3
TOTAL	15	12	13	7	14	7	9	5	15	15

PAPER- RADIOGRAPHY POSITION

Program Outcomes (POs)

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Course Outcome:

CO:1 Students will be able to explain the basic patient positioning techniques during radiographic procedures.

CO:2 Students will be able to demonstrate special positioning skill for patients with different pathological and physical conditions.

CO:3 Students will be able to differentiate appropriate equipment handling techniques in radiology departments.

CO:4 Students will be able to monitor various patient positioning methods to ensure optimal radiographic imaging.

CO:5 Students will be able to generate the relative positions of the X-ray tube and patient to determine suitable exposure factors during radiography.

Program Specific Outcomes (PSOs)

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CO2	2	3	3	2	2	1	3	2	3	2
CO3	2	2	3	1	3	1	2	1	3	3
CO4	3	3	3	2	3	2	3	2	3	3
CO5	3	3	3	1	3	2	2	2	3	3
TOTAL	13	13	14	7	13	7	12	9	15	13

SEMESTER- V

PAPER: RADIOGRAPHY EQUIPMENT & TECHNIQUES:

CO1: Students will be able to Illustrate different type of Cassette Structure & intensifying Screen.

CO2: Students will be able to judge the X-ray tube overload protection circuit.

CO3: Students will be able to monitor the different X-ray tube.

CO4: Students will be able to demonstrate the component of Radiological equipment.

CO5: Students will be able to invent the purpose and function of exposure timers.

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PO6. Develop an aptitude for research, evidence-based practice, and continuous learning to keep pace with technological advancements in radiological sciences.

PO7. Demonstrate ethical responsibility, empathy, and sensitivity towards patients while adhering to professional standards and radiation protection principles.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	3	2	2	1	2	1	1	1	3	3
CO2	3	3	3	1	3	2	1	1	3	3
CO3	3	3	3	1	3	2	2	1	3	3
CO4	3	2	3	2	2	1	2	1	3	3
CO5	3	3	3	2	3	2	1	1	3	3
TOTAL	15	13	14	7	13	8	7	5	15	15

PAPER: Radiation Hazard and Preventive Strategies

CO1: Define the Radiation source

CO2: Implement Radiation in cancer patient

CO3: Differentiate work between AERB and BARC

CO4: Detect Radiological imaging

CO5: Create the latent image formation on the Film

CO–PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1:	3	1	1	0	2	1	2
CO2:	2	3	3	1	3	2	3
CO3:	3	2	2	1	2	2	3
CO4:	2	3	3	0	3	2	1
CO5:	3	2	2	0	2	1	1

PAPER: Adv CLINICAL NUTRITION

Course Outcomes (CO):

CO1: Recall and list the sources, functions, deficiency symptoms, and toxicities of major vitamins and minerals essential to human health and the techniques used in nutritional assessment and describe the structure and goals of national nutrition programs in India.

CO2: Demonstrate the principles of therapeutic nutrition in the planning of diet charts for common liver, cardiovascular, renal, and gastrointestinal disorders.

CO3: Differentiate between dietary requirements for various pathological states and analyze the impact of diet modifications in chronic diseases.

CO4: Monitor the Micronutrients deficiencies by observing Clinical signs and the effectiveness of community nutrition programs and evaluate nutritional interventions based on clinical and biochemical indicators

CO5: Designing diagnosis plan for confirmation of deficiencies and biochemical markers for the nutritional deficiencies based on clinical manifestations

Program Outcomes (PO)

At the end of the program, students should be able to:

PO1. Demonstrate a comprehensive understanding of concepts in radiology, imaging technology, and radiation physics, and apply this knowledge in diverse clinical settings.

PO2. Exhibit critical thinking and problem-solving skills to evaluate radiographic images, identify errors, and ensure diagnostic accuracy. PO3. Acquire competency in the operation and maintenance of conventional and advanced imaging modalities, ensuring patient safety and optimal image quality.

PO4. Work effectively as a member or leader in multidisciplinary healthcare teams and actively participate in clinical and research activities.

PO5. Apply appropriate quantitative and analytical techniques for radiation dose optimization, quality control, and image assessment.

PO6. Develop an aptitude for research, evidence-based practice, and continuous learning to keep pace with technological advancements in radiological sciences.

PO7. Demonstrate ethical responsibility, empathy, and sensitivity towards patients while adhering to professional standards and radiation protection principles.

PO8: Communicate effectively with patients, healthcare professionals, and the community to promote awareness of diagnostic imaging procedures, radiation safety, and healthcare standards.

Program Specific Outcomes (PSO)

PSO1: Apply theoretical and practical knowledge of imaging modalities such as X-ray, CT, MRI, Ultrasound, and Nuclear Medicine in clinical diagnosis and patient management.

PSO2: Implement radiation protection measures and quality assurance protocols in diagnostic imaging departments to ensure patient, staff, and environmental safety.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PSO 1	PSO 2
CO1	0	1	0	2	0	0	0	1	0	0
CO2	0	1	0	3	0	1	1	2	1	1
CO3	0	1	0	3	0	1	1	2	1	1
CO4	1	1	1	3	1	1	1	1	2	1
CO5.	1	0	0	2	1	2	1	1	2	1
TOTAL	2	4	1	13	2	5	4	7	6	4

SEMESTER -VI

PAPER: RADIOGRAPHY TECHNIQUES OF BONES & JOINTS

CO1: Student will be able to identify the basic patient positioning during radiographic investigation.

CO2: Student will be able to illustrate special positioning skills for different physical, pathological conditions.

CO3: Student will be able to organize of equipment s while working in radiology departments.

CO4: Student will be able to monitor proper position during radiography.

CO5: Students will be able to design to relative radiographic position for achieve diagnostic-quality radiographic images.

PROGRAM OUTCOMES (POS)

At the end of the program, students should be able to:

PO1. Demonstrate a comprehensive understanding of concepts in radiology, imaging technology, and radiation physics, and apply this knowledge in diverse clinical settings.

PO2. Exhibit critical thinking and problem-solving skills to evaluate radiographic images, identify errors, and ensure diagnostic accuracy.

PO3. Acquire competency in the operation and maintenance of conventional and advanced imaging modalities, ensuring patient safety and optimal image quality.

PO4. Work effectively as a member or leader in multidisciplinary healthcare teams and actively participate in clinical and research activities.

PO5. Apply appropriate quantitative and analytical techniques for radiation dose optimization, quality control, and image assessment.

PO6. Develop an aptitude for research, evidence-based practice, and continuous learning to keep pace with technological advancements in radiological sciences.

PO7. Demonstrate ethical responsibility, empathy, and sensitivity towards patients while adhering to professional standards and radiation protection principles.

CO-PO MAPPING:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	3	2	2	2	1
CO2	3	3	3	2	2	1	3
CO3	2	2	3	2	3	2	2
CO4	3	3	3	2	3	1	2
CO5	3	3	3	2	3	2	3
Total	14	13	15	10	13	8	11

PAPER: ADVANCED IMAGING & CONTRAST MEDIA

Program Outcomes (POs)

Students should be able to:

PO1. Demonstrate a comprehensive understanding of concepts in radiology, imaging technology, and radiation physics, and apply this knowledge in diverse clinical settings.

PO2. Exhibit critical thinking and problem-solving skills to evaluate radiographic images, identify errors, and ensure diagnostic accuracy.

PO3. Acquire competency in the operation and maintenance of conventional and advanced imaging modalities, ensuring patient safety and optimal image quality.

PO4. Work effectively as a member or leader in multidisciplinary healthcare teams and actively participate in clinical and research activities.

PO5. Apply appropriate quantitative and analytical techniques for radiation dose optimization, quality control, and image assessment.

PO6. Develop an aptitude for research, evidence-based practice, and continuous learning to keep pace with technological advancements in radiological sciences.

PO7. Demonstrate ethical responsibility, empathy, and sensitivity towards patients while adhering to professional standards and radiation protection principles.

PO8: Communicate effectively with patients, healthcare professionals, and the community to promote awareness of diagnostic imaging procedures, radiation safety, and healthcare standards.

Program Specific Outcomes (PSOs)

PSO1: Apply theoretical and practical knowledge of imaging modalities such as X-ray, CT, MRI, Ultrasound, and Nuclear Medicine in clinical diagnosis and patient management.

PSO2: Implement radiation protection measures and quality assurance protocols in diagnostic imaging departments to ensure patient, staff, and environmental safety.

Course Outcomes:

CC-13: Advanced Imaging & Contrast Media

CO:1 Students will be able to explain the principles of different imaging instruments like MRI, PET, and Color Doppler.

CO:2 Students will be able to illustrate the application of fusion imaging in diagnostic radiology.

CO:3 Students will be able to differentiate the types and uses of teleradiology in clinical practice.

CO:4 Students will be able to detect the suitability of various contrast media for different imaging modalities.

CO:5 Students will be able to design a contrast media selection protocol for IVU, MCU, and RGU procedures.

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	3	2	3	1	2	2	2	2	3	3
CO2	3	3	3	2	3	2	2	2	3	3
CO3	3	3	2	2	3	2	2	3	3	2
CO4	3	2	3	1	3	2	2	2	3	3
CO5	3	3	3	1	3	3	2	2	3	3
TOTAL	15	13	14	7	14	11	10	11	15	14

PAPER- SPECIAL RADIOGRAPHIC TECHNIQUES

Program Outcomes (POs)

Students should be able to:

PO1. Demonstrate a comprehensive understanding of concepts in radiology, imaging technology, and radiation physics, and apply this knowledge in diverse clinical settings.

PO2. Exhibit critical thinking and problem-solving skills to evaluate radiographic images, identify errors, and ensure diagnostic accuracy.

PO3. Acquire competency in the operation and maintenance of conventional and advanced imaging modalities, ensuring patient safety and optimal image quality.

PO4. Work effectively as a member or leader in multidisciplinary healthcare teams and actively participate in clinical and research activities.

PO5. Apply appropriate quantitative and analytical techniques for radiation dose optimization, quality control, and image assessment.

PO6. Develop an aptitude for research, evidence-based practice, and continuous learning to keep pace with technological advancements in radiological sciences.

PO7. Demonstrate ethical responsibility, empathy, and sensitivity towards patients while adhering to professional standards and radiation protection principles.

PO8: Communicate effectively with patients, healthcare professionals, and the community to promote awareness of diagnostic imaging procedures, radiation safety, and healthcare standards.

Program Specific Outcomes (PSOs)

PSO1: Apply theoretical and practical knowledge of imaging modalities such as X-ray, CT, MRI, Ultrasound, and Nuclear Medicine in clinical diagnosis and patient management.

PSO2: Implement radiation protection measures and quality assurance protocols in diagnostic imaging departments to ensure patient, staff, and environmental safety.

COURSE OUTCOME

CO:1 Students will be able to describe the principles and procedure of trauma radiography.

CO:2 Students will be able to demonstrate the operation of CR machines and orthopedic imaging techniques.

CO:3 Students will be able to analyze radiation protection techniques and exposure factors for pediatric patients.

CO:4 Students will be able to monitor the safe methods for moving and lifting pediatric and trauma patients.

CO:5 Students will be able to create a radiographic protocol for geriatric patient care.

CO-PO-PSO MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2
CO1	3	3	3	2	2	2	2	2	3	2
CO2	3	3	3	2	3	2	2	2	3	3
CO3	3	3	3	2	3	2	3	2	3	3
CO4	2	3	2	3	2	2	3	3	2	3
CO5	2	3	2	3	2	2	3	3	3	3
TOTAL	13	15	13	12	12	10	13	12	14	14



Bloom's Taxonomy Verbs:

Remember (BT1)	Understand (BT2)	Apply (BT3)	Analyze (BT4)	Evaluate (BT5)	Create (BT6)
Cite	Add	Acquire	Analyze	Appraise	Abstract
Define	Approximate	Adapt	Audit	Assess	Animate
Describe	Articulate	Allocate	Blueprint	Compare	Arrange
Draw	Associate	Alphabetize	Breadboard	Conclude	Assemble
Enumerate	Characterize	Apply	Break down	Contrast	Budget
Identify	Clarify	Ascertain	Characterize	Counsel	Categorize
Index	Classify	Assign	Classify	Criticize	Code
Indicate	Compare	Attain	Compare	Critique	Combine
Label	Compute	Avoid	Confirm	Defend	Compile
List	Contrast	Back up	Contrast	Determine	Compose
Match	Convert	Calculate	Correlate	Discriminate	Construct
Meet	Defend	Capture	Detect	Estimate	Cope
Name	Describe	Change	Diagnose	Evaluate	Correspond
Outline	Detail	Classify	Diagram	Explain	Create
Point	Differentiate	Complete	Differentiate	Grade	Cultivate
Quote	Discuss	Compute	Discriminate	Hire	Debug
Read	Distinguish	Construct	Dissect	Interpret	Depict
Recall	Elaborate	Customize	Distinguish	Judge	Design
Recite	Estimate	Demonstrate	Document	Justify	Develop
Recognize	Example	Depreciate	Ensure	Measure	Devise
Record	Explain	Derive	Examine	Predict	Dictate
Repeat	Express	Determine	Explain	Prescribe	Enhance
Reproduce	Extend	Diminish	Explore	Rank	Explain
Review	Extrapolate	Discover	Figure out	Rate	Facilitate
Select	Factor	Draw	File	Recommend	Format
State	Generalize	Employ	Group	Release	Formulate
Study	Give	Examine	Identify	Select	Generalize
Tabulate	Infer	Exercise	Illustrate	Summarize	Generate
Trace	Interact	Explore	Infer	Support	Handle
Write	Interpolate	Expose	Interrupt	Test	Import
	Interpret	Express	Inventory	Validate	Improve
	Observe	Factor	Investigate	Verify	Incorporate
	Paraphrase	Figure	Layout		Integrate
	Picture graphically	Graph	Manage		Interface
	Predict	Handle	Maximize		Join
	Review	Illustrate	Minimize		Lecture
	Rewrite	Interconvert	Optimize		Model
	Subtract	Investigate	Order		Modify
	Summarize	Manipulate	Outline		Network
	Translate	Modify	Point out		Organize
	Visualize	Operate	Prioritize		Outline
		Personalize	Proofread		Overhaul
		Plot	Query		Plan
		Practice	Relate		Portray
		Predict	Select		Prepare
		Prepare	Separate		Prescribe
		Price	Subdivide		Produce
		Process	Train		Program



		Produce	Transform		Rearrange
		Project			Reconstruct
		Provide			Relate
		Relate			Reorganize
		Round off			Revise
		Sequence			Rewrite
		Show			Specify
		Simulate			Summarize
		Sketch			
		Solve			
		Subscribe			
		Tabulate			
		Transcribe			
		Translate			
		Use			