

# ***Program Curriculum***

## ***School of Allied Health Sciences***

### ***Bachelor of Radiological Imaging Techniques (Radiology/CT/MRI)***

#### ***Program CODE SAH0107***

**Batch 2018-2021**

## **1. Standard Structure of the Program at University Level**

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### **1.1 Vision, Mission and Core Values of the University**

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#### **Vision of the University**

**To serve the society by being a global University of higher learning in pursuit of academic excellence, innovation and nurturing entrepreneurship.**

#### **Mission of the University**

- 1. Transformative educational experience**
- 2. Enrichment by educational initiatives that encourage global outlook**
- 3. Develop research, support disruptive innovations and accelerate entrepreneurship**
- 4. Seeking beyond boundaries**

#### **Core Values**

- Integrity**
- Leadership**
- Diversity**
- Community**

## 1.2 Vision and Mission of the School

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### **Vision of the School**

To steer the School of Allied Health Sciences towards excellence in academics, innovation and entrepreneurship by constant endeavors

### **Mission of the School**

1. To create the state of the art facility for quality teaching learning, research & innovation
2. To incorporate the contemporary standards in teaching & learning
3. To inculcate in the students values of integrity and compassion towards the care of patients and society.

### **Core Values**

- Critical Thinking and Observation
- Analytical Skills
- Creativity
- Skilled professional
- Multidimensional
- Compassion
- Management

### **1.3 Programme Educational Objectives (PEO)**

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#### **1.3.1 Writing Programme Educational Objectives (PEO)**

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##### **PEO1: Disciplinary knowledge and its appropriate application:**

This subject will facilitate students to gain relevant disciplinary understanding of the nature, practice and application of Medical Imaging Technology through lectures, Hands on training on imaging machines, computer practical, workshops and presentations. The material will be assessed in the test and the examination

##### **PEO2 : Professional skills and their appropriate application**

Provide Time management, personal organization and teamwork skills, and communication skills will be developed through the presentation projects.

##### **PEO3 : Engagement with the needs of society**

The subject will enhance the capacity of the students to respond to the needs and grapple with ethical concerns that accompany the practice of Medical Imaging (e.g. the balance between diagnostic accuracy and radiation dose to the patient, the staff and population as a whole).

##### **PEO4 : Clinical Care**

Using a patient/family-centered approach and best evidence, each student will organize and implement the prescribed preventive, investigative and management plans; and will offer appropriate follow-up services.

##### **PEO5 : Lifelong learning**

The student should be committed to continuous improvement in skills and knowledge while harnessing modern tools and technology. Program objectives will aim at making the students being able to:  
Perform objective self-assessments of their knowledge and skills; learn and refine existing skills; and acquire new skills

##### **PEO6: Social Accountability and Responsibility**

The students will recognize that allied and healthcare professionals need to be advocates within the health care system, to judiciously manage resources and to acknowledge their social accountability. They have a mandate to serve the community, region and the nation and will hence direct all research and service activities towards addressing their priority health concerns.

### 1.3.2 Map PEOs with Mission Statements:

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| <b>PEO Statements</b> | <b>School<br/>Mission 1</b> | <b>School<br/>Mission 2</b> | <b>School<br/>Mission 3</b> |
|-----------------------|-----------------------------|-----------------------------|-----------------------------|
| <b>PEO1:</b>          | <b>3</b>                    | <b>3</b>                    | <b>2</b>                    |
| <b>PEO2:</b>          | <b>3</b>                    | <b>2</b>                    | <b>3</b>                    |
| <b>PEO3:</b>          | <b>2</b>                    | <b>3</b>                    | <b>2</b>                    |
| <b>PEO4:</b>          | <b>3</b>                    | <b>3</b>                    | <b>3</b>                    |
| <b>PEO5:</b>          | <b>3</b>                    | <b>2</b>                    | <b>3</b>                    |
| <b>PEO6:</b>          | <b>3</b>                    | <b>3</b>                    | <b>2</b>                    |

Enter correlation levels 1, 2, or 3 as defined below:

- 1. Slight (Low)    2. Moderate (Medium)    3. Substantial (High)**

### **1.3.3 Program Outcomes (PO's)**

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PO1 : Apply the knowledge of clinical, diagnostic and Medical physics, Imaging technology, clinical sciences, as well as an understanding of health care delivery diagnostic imaging system.

PO2 : Find, analyze, evaluate and apply the information systematically and shall make a appropriate diagnosis to provide quality of image along with patient care.

PO3 : Demonstrate effective planning abilities including the prevention, detection, radiation protection, diagnosis, and management of patient without compromising image quality.

PO4 : Apply ethical principles like radiation protection and commit to professional ethics and responsibilities and norms of the Imaging techniques practice.

PO5 : Conduct and present research and clinical studies which will contribute to the advancement of Imaging techniques, quality, diagnosis and health sciences.

PO6 : Explain theory of technology, instrumentation and physics in Medical Imaging using discipline specific terminology.

### 1.3.4 Mapping of Program Outcome Vs Program Educational Objectives

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|     | PEO1 | PEO2 | PEO3 | PEO4 | PEO5 | PEO6 |
|-----|------|------|------|------|------|------|
| PO1 | 3    | 2    | 1    | 3    | 3    | 3    |
| PO2 | 3    | 3    | 3    | 3    | 2    | 2    |
| PO3 | 2    | 1    | 2    | 3    | 2    | 2    |
| PO4 | 2    | 2    | 3    | 2    | 3    | 3    |
| PO5 | 2    | 3    | 3    | 2    | 3    | 2    |
| PO6 | 3    | 3    | 2    | 1    | 3    | 2    |

*1. Slight (Low)*

*2. Moderate (Medium)*

*3. Substantial (High)*

### 1.3.5 Program Outcome Vs Courses Mapping Table<sup>1</sup>:

| Program Outcome Courses | Course Name   | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-------------------------|---|-----|-----|-----|-----|-----|-----|
| <b>Sem-1</b>            |   |     |     |     |     |     |     |
| BIT104.1                | Human Anatomy as Applied to Radiology & Imaging –I      | 3   | 3   | 3   | 2   | 3   | 2   |
| BIT105.2                | Human Physiology –I                                     | 3   | 3   | 2   | 3   | 3   | 3   |
| BIT106.3                | Basics & Radiation Physics -I                           | 3   | 3   | 3   | 3   | 3   | 2   |
| BIT107.4                | English –I  | 3   | 2   | 2   | 3   | 2   | 3   |
| BIT160.5                | Human Anatomy as Applied to Radiology & Imaging –I (P)  | 3   | 3   | 3   | 2   | 3   | 2   |
| BIT161.6                | Human Physiology –I (P)                                 | 3   | 3   | 2   | 3   | 3   | 3   |
| BIT156.7                | Basic & Radiation Physics –I (P)                        | 3   | 3   | 3   | 3   | 3   | 2   |
| BIT162.8                | English-I   | 3   | 2   | 2   | 3   | 2   | 2   |
| <b>Sem-2</b>            |   |     |     |     |     |     |     |
| BIT 109.1               | Human Anatomy as Applied to Radiology & Imaging –II     | 3   | 3   | 3   | 2   | 3   | 2   |
| BIT 110.2               | Human Physiology –II                                    | 3   | 3   | 2   | 3   | 3   | 3   |
| BIT 111.3               | Basic & Radiation Physics -II                           | 3   | 3   | 3   | 3   | 3   | 2   |
| BIT 112.4               | English –II   | 3   | 2   | 2   | 3   | 2   | 3   |
| BIT 159.5               | Human Anatomy as Applied to Radiology & Imaging –II (P) | 3   | 3   | 3   | 2   | 3   | 2   |
| BIT 150.6               | Human Physiology –II (P)                                | 3   | 3   | 2   | 3   | 3   | 3   |
| BIT 151.7               | Basic & Radiation Physics –II (P)                       | 3   | 3   | 3   | 3   | 3   | 2   |
| BIT 152.8               | English –II (P)   | 3   | 2   | 2   | 3   | 2   | 2   |
| <b>Sem-3</b>            |   |     |     |     |     |     |     |
| BIT-205.1               | Dark Room Procedure I                                   | 3   | 3   | 3   | 3   | 2   | 3   |
| BIT-206.2               | Patient Care in Hospital and Radiology -I               | 3   | 2   | 3   | 3   | 3   | 2   |
| BIT-207.3               | Apparatus for Radiography & Imaging - I                 | 3   | 3   | 3   | 3   | 3   | 2   |
| BIT-208.4               | Radiography of upper & lower extremities -I             | 2   | 3   | 3   | 2   | 3   | 2   |
| BIT-255.5               | Dark Room Procedure I (Lab)                             | 3   | 3   | 3   | 3   | 2   | 3   |
| BIT 001.6               | Clinical Postings- I (Lab)                              | 3   | 3   | 3   | 3   | 3   | 3   |
| <b>Sem-4</b>            |   |     |     |     |     |     |     |
| BIT-209.1               | Dark Room Procedure II                                  | 3   | 3   | 3   | 3   | 2   | 3   |
| BIT-210.2               | Patient Care in Hospital and Radiology -II              | 3   | 2   | 3   | 3   | 3   | 2   |
| BIT-211.3               | Apparatus for Radiography & Imaging - II                | 3   | 3   | 3   | 3   | 3   | 2   |
| BIT-212.4               | Radiography of upper & lower extremities -II            | 2   | 3   | 3   | 2   | 3   | 2   |
| BIT-256.5               | Dark Room Procedure II                                  | 3   | 3   | 3   | 3   | 2   | 3   |
| BIT 004.6               | Clinical Postings- II                                   | 3   | 3   | 3   | 3   | 3   | 3   |
| <b>Sem-5</b>            |   |     |     |     |     |     |     |

<sup>1</sup> Cel value will contain the correlation value of respective course with PO.



|              |   |   |   |   |   |   |   |
|--------------|---|---|---|---|---|---|---|
| BIT-306      | Radiographic Technique of Bone & Joints-I                     | 3 | 3 | 3 | 3 | 3 | 2 |
| BIT-307      | Special Radiographic Techniques-I                             | 3 | 3 | 3 | 3 | 3 | 2 |
| BIT-308      | Recent Advances in Imaging & Contrast Media-I                 | 3 | 2 | 3 | 3 | 3 | 3 |
| BIT-309      | Radiation Hazards, Protection & Planning of the Department-I  | 3 | 3 | 3 | 2 | 3 | 2 |
| BIT-310      | Radiographic Technique of Bone & Joints-I                     | 3 | 3 | 2 | 3 | 3 | 3 |
| BIT-005      | Clinical Postings- I  | 3 | 3 | 3 | 3 | 3 | 3 |
| <b>Sem-6</b> |   |   |   |   |   |   |   |
| BIT-311      | Radiographic Technique of Bone & Joints-II                    | 3 | 3 | 3 | 3 | 3 | 2 |
| BIT-312      | Special Radiographic Techniques-II                            | 3 | 3 | 3 | 3 | 3 | 2 |
| BIT-313      | Recent Advances in Imaging & Contrast Media-II                | 3 | 2 | 3 | 3 | 3 | 3 |
| BIT-314      | Radiation Hazards, Protection & Planning of the Department-II | 3 | 3 | 3 | 2 | 3 | 2 |
| BIT-315      | Radiographic Technique of Bone & Joints-II                    | 3 | 3 | 2 | 3 | 3 | 3 |
| BIT-006      | Clinical Postings- II   | 3 | 3 | 3 | 3 | 3 | 3 |

*1. Slight (Low)*

*2. Moderate (Medium)*

*3. Substantial (High)*

**Credit Scheme**  
**Allied Health Sciences**  
**Bachelor of Radiological Imaging Techniques (Radiology/CT/MRI)**  
**Batch: 2018-2021**  
**Session- 2018-19**  
**TERM: I**

| S. No.                   | Paper ID | Subject Code | Subjects   | Teaching Load |   |   | Credits | Core/Elective Pre-Requisite/Co Requisite | Type of Course <sup>2</sup> :<br>1. CC<br>2. AECC<br>3. SEC<br>4. DSE |
|--------------------------|----------|--------------|--|---------------|---|---|---------|--|---|
|                          |          |              |  | L             | T | P |         |  |   |
| THEORY SUBJECTS          |          |              |  |               |   |   |         |  |   |
| 1.                       | 35011    | BIT 104      | Human Anatomy as Applied to Radiology & Imaging –I | 3             | 1 |   | 4       | Core                                     | CC  |
| 2.                       | 35012    | BIT 105      | Human Physiology –I                                | 3             | 1 |   | 4       | Core                                     | CC  |
| 3.                       | 35013    | BIT 106      | Basic & Radiation Physics -I                       | 3             | 1 |   | 4       | Core                                     | CC  |
| 4.                       | 35133    | BIT 113      | English –I   | 2             | 1 |   | 3       |  | AECC  |
| Practical/Viva-Voce/Jury |          |              |  |               |   |   |         |  |   |
| 5.                       | 35134    | BIT 160      | Human Anatomy as Applied to Radiology & Imaging -I | -             | - | 4 | 2       | Core                                     | CC, SEC, AECC   |
| 6.                       | 35135    | BIT 161      | Human Physiology -I                                | -             | - | 4 | 2       | Core                                     | CC, SEC, AECC   |
| 7.                       | 35018    | BIT 156      | Basic & Radiation Physics –I (only viva)           | -             | - | 4 | 2       | Core                                     | CC, SEC, AECC   |
| 8.                       | 35136    | BIT 162      | English –I (Lab)                                   | -             | - | 4 | 2       |  | SEC,AECC  |
| TOTAL CREDITS            |          |              |  |               |   |   | 23      |  |   |

<sup>2</sup> CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

**Credit Scheme**  
**Bachelor of Radiological Imaging Techniques (Radiology/CT/MRI)**  
**Batch: 2018-2021**  
**Session- 2018-19**  
**TERM: II**

| S. No.                   | Paper ID | Subject Code | Subjects  | Teaching Load |   |   | Credits | Core/Elective Pre-Requisite/ Co Requisite | Type of Course <sup>3</sup> :<br>5. CC<br>6. AECC<br>7. SEC<br>8. DSE |
|--------------------------|----------|--------------|---|---------------|---|---|---------|---|---|
|                          |          |              |   | L             | T | P |         |   |   |
| THEORY SUBJECTS          |          |              |   |               |   |   |         |   |   |
| 9.                       | 35057    | BIT 109      | Human Anatomy as Applied to Radiology & Imaging –II | 3             | 1 |   | 4       | Core                                      | CC  |
| 10.                      | 35058    | BIT 110      | Human Physiology –II                                | 3             | 1 |   | 4       | Core                                      | CC  |
| 11.                      | 35059    | BIT 111      | Basic & Radiation Physics -II                       | 3             | 1 |   | 4       | Core                                      | CC  |
| 12.                      |          | BIT 112      | English –II   | 2             | 1 |   | 3       |   | AECC  |
| 13.                      |          | OPE          | Open Elective course                                | 2             | - | - | 2       | Elective                                  | AECC, SEC   |
| Practical/Viva-Voce/Jury |          |              |   |               |   |   |         |   |   |
| 14.                      | 35060    | BIT 159      | Human Anatomy as Applied to Radiology & Imaging –II | -             | - | 4 | 2       | Core                                      | CC, AECC  |
| 15.                      | 35061    | BIT 150      | Human Physiology -II                                | -             | - | 4 | 2       | Core                                      | CC, AECC  |
| 16.                      | 35062    | BIT 151      | Basic & Radiation Physics -II                       | -             | - | 4 | 2       | Core                                      | CC, AECC  |
| 17.                      |          | BIT 152      | English –II (Lab)                                   | -             | - | 4 | 2       |   | AECC, AECC  |

<sup>3</sup> CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

|                      |           |  |  |
|----------------------|-----------|--|--|
| <b>TOTAL CREDITS</b> | <b>25</b> |  |  |
|----------------------|-----------|--|--|

**Credit Scheme**  
**Allied Health Sciences**  
**Bachelor of Radiological Imaging Techniques (Radiology/CT/MRI)**  
**Batch: 2018-2021**  
**Session- 2019-20**  
**TERM: III**

| S. No.                   | Paper ID | Subject Code | Subjects                                    | Teaching Load |   |   | Credits | Core/Elective Pre-Requisite/ Co Requisite | Type of Course <sup>4</sup> :<br>9. CC<br>10. AECC<br>11. SEC<br>12. DSE |
|--------------------------|----------|--------------|---|---------------|---|---|---------|---|--|
|                          |          |              |   | L             | T | P |         |   |  |
| THEORY SUBJECTS          |          |              |   |               |   |   |         |   |  |
| 18.                      | 35112    | BIT-205      | Dark Room Procedure I                       | 4             | 1 |   | 5       | Core                                      | CC   |
| 19.                      | 35113    | BIT-206      | Patient Care in Hospital and Radiology -I   | 2             | 1 | - | 3       | Core                                      | CC   |
| 20.                      | 35114    | BIT-207      | Apparatus for Radiography & Imaging - I     | 4             | 2 | - | 6       | Core                                      | CC   |
| 21.                      | 35115    | BIT-208      | Radiography of upper & lower extremities -I | 4             | 2 | - | 6       | Core                                      | CC   |
| Practical/Viva-Voce/Jury |          |              |   |               |   |   |         |   |  |
| 22.                      |          | BIT-255      | Dark Room Procedure I                       | -             | - | 2 | 1       | Core                                      | CC, AECC   |
| 23.                      |          | BIT-001      | Clinical Postings- I                        | -             | - | 4 | 2       | Core                                      | CEC, AECC  |
| TOTAL CREDITS            |          |              |   |               |   |   | 23      |   |  |

<sup>4</sup> CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

**Credit Scheme**  
**Allied Health Sciences**  
**Bachelor of Radiological Imaging Techniques (Radiology/CT/MRI)**  
**Batch: 2018-2021**  
**Session- 2019-20**  
**TERM: IV**

| S. No.                   | Paper ID | Subject Code | Subjects                                     | Teaching Load |   |   | Credits | Core/Elective Pre-Requisite/ Co Requisite | Type of Course <sup>5</sup> :<br>13. CC<br>14. AECC<br>15. SEC<br>16. DSE |
|--------------------------|----------|--------------|--|---------------|---|---|---------|---|---|
|                          |          |              |  | L             | T | P |         |   |   |
| THEORY SUBJECTS          |          |              |  |               |   |   |         |   |   |
| 24.                      | 35189    | BIT-209      | Dark Room Procedure II                       | 4             | 1 |   | 5       | Core                                      | CC  |
| 25.                      | 35190    | BIT-210      | Patient Care in Hospital and Radiology -II   | 2             | 1 | - | 3       | Core                                      | CC  |
| 26.                      | 35191    | BIT-211      | Apparatus for Radiography & Imaging - II     | 4             | 2 | - | 6       | Core                                      | CC  |
| 27.                      | 35192    | BIT-212      | Radiography of upper & lower extremities -II | 4             | 2 | - | 6       |   | CC  |
| 28.                      |          | OPE          | Open Elective course                         | 2             | - | - | 2       | Elective                                  | AECC, SEC   |
| Practical/Viva-Voce/Jury |          |              |  |               |   |   |         |   |   |
| 29.                      |          | BIT-256      | Dark Room Procedure II                       | -             | - | 2 | 1       | Core                                      | CC, AECC  |

<sup>5</sup> CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

|                      |  |         |                       |   |   |   |           |      |           |
|----------------------|--|---------|-----------------------|---|---|---|-----------|------|-----------|
| 30.                  |  | BIT 004 | Clinical Postings- II | - | - | 4 | 2         | Core | SEC, AECC |
| <b>TOTAL CREDITS</b> |  |         |                       |   |   |   | <b>25</b> |      |           |

**Credit Scheme**  
**Allied Health Sciences**  
**Bachelor of Radiological Imaging Techniques (Radiology/CT/MRI)**  
**Batch: 2018-2021**  
**Session- 2020-21**  
**TERM: V**

| S. No.                   | Paper ID | Subject Code | Subjects  | Teaching Load |   |   | Credits | Core/Elective Pre-Requisite/ Co Requisite | Type of Course <sup>6</sup> :<br>17. CC<br>18. AECC<br>19. SEC<br>20. DSE |
|--------------------------|----------|--------------|---|---------------|---|---|---------|---|---|
|                          |          |              |   | L             | T | P |         |   |   |
| THEORY SUBJECTS          |          |              |   |               |   |   |         |   |   |
| 31.                      | 35227    | BIT-306      | Radiographic Technique of Bone & Joints -I                    | 2             | 1 | - | 3       | Core                                      | CC  |
| 32.                      | 35228    | BIT-307      | Special Radiographic Techniques -I                            | 3             | 3 | - | 6       | Core                                      | CC  |
| 33.                      | 35229    | BIT-308      | Recent Advances in Imaging & Contrast Media- I                | 5             | 1 | - | 6       | Core                                      | CC  |
| 34.                      | 35230    | BIT-309      | Radiation Hazards, Protection & Planning of the Department- I | 3             | 1 | - | 4       | Core                                      | CC  |
| Practical/Viva-Voce/Jury |          |              |   |               |   |   |         |   |   |
| 35.                      |          | BIT-310      | Radiographic Technique of Bone & Joints -I                    | -             | - | 6 | 3       | Core                                      | CC, AECC  |

<sup>6</sup> CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

|                      |  |         |                      |   |   |   |           |      |          |
|----------------------|--|---------|----------------------|---|---|---|-----------|------|----------|
| 36.                  |  | BIT-005 | Clinical Postings- I | - | - | 6 | 3         | Core | CC, AECC |
| <b>TOTAL CREDITS</b> |  |         |                      |   |   |   | <b>25</b> |      |          |

**Credit Scheme**  
**Allied Health Sciences**  
**Bachelor of Radiological Imaging Techniques (Radiology/CT/MRI)**  
**Batch: 2018-2021**  
**Session- 2020-21**  
**TERM: VI**

| S. No.                   | Paper ID | Subject Code | Subjects   | Teaching Load |   |   | Credits | Core/Elective Pre-Requisite/ Co Requisite | Type of Course <sup>7</sup> :<br>21. CC<br>22. AECC<br>23. SEC<br>24. DSE |
|--------------------------|----------|--------------|--|---------------|---|---|---------|---|---|
|                          |          |              |  | L             | T | P |         |   |   |
| THEORY SUBJECTS          |          |              |  |               |   |   |         |   |   |
| 37.                      | 35350    | BIT-311      | Radiographic Technique of Bone & Joints –II                    | 2             | 1 | - | 3       | Core                                      | CC  |
| 38.                      | 35351    | BIT-312      | Special Radiographic Techniques –II                            | 3             | 3 | - | 6       | Core                                      | CC  |
| 39.                      | 35352    | BIT-313      | Recent Advances in Imaging & Contrast Media- II                | 5             | 1 | - | 6       | Core                                      | CC  |
| 40.                      | 35353    | BIT-314      | Radiation Hazards, Protection & Planning of the Department- II | 3             | 1 | - | 4       | Core                                      | CC  |
| 41.                      |          | OPE          | Open Elective course   | 2             | - | - | 2       | Elective                                  | AECC, SEC   |
| Practical/Viva-Voce/Jury |          |              |  |               |   |   |         |   |   |
| 42.                      |          | BIT-315      | Radiographic Technique of Bone & Joints –II                    | -             | - | 6 | 3       | Core                                      | CC, AECC  |

<sup>7</sup> CC: Core Course, AECC: Ability Enhancement Compulsory Courses, SEC: Skill Enhancement Courses, DSE: Discipline Specific Courses

|                      |  |         |                       |   |   |   |           |      |           |
|----------------------|--|---------|-----------------------|---|---|---|-----------|------|-----------|
|                      |  |         |                       |   |   |   |           |      |           |
| 43.                  |  | BIT-006 | Clinical Postings- II | - | - | 6 | 3         | Core | SEC, AECC |
| <b>TOTAL CREDITS</b> |  |         |                       |   |   |   | <b>27</b> |      |           |

**SHARDA UNIVERSITY, GREATER NOIDA**  
**SCHOOL OF ALLIED HEALTH SCIENCES**  
**EVALUATION SCHEME (BATCH- 2018-2021)**

**Program: -B.Sc. (Radiological Imaging Techniques (Radiology/CT/MRI)**

**SEMESTER:-First Semester**

**Session: -2018-19**

| S.No              | Paper ID | Course Code | Course/Subject Name                                      | CA | MTE | ETE | TOTAL MARKS |
|-------------------|----------|-------------|--|----|-----|-----|-------------|
| 1                 | 35011    | BIT 104     | Human Anatomy as Applied to Radiology & Imaging -I       | 30 | 20  | 50  | 100         |
| 2                 | 35012    | BIT 105     | Human Physiology -I                                      | 30 | 20  | 50  | 100         |
| 3                 | 35013    | BIT 106     | Basics & Radiation Physics -I                            | 30 | 20  | 50  | 100         |
| 4                 | 35133    | BIT 113     | English -I   | 50 | -   | -   |             |
| <b>PRACTICALS</b> |          |             |  |    |     |     |             |
| 1                 | 35057    | BIT 160     | Human Anatomy as Applied to Radiology & Imaging -I (LAB) | 60 | -   | 40  | 100         |
| 2                 | 35058    | BIT 161     | Human Physiology -I (LAB)                                | 60 | -   | 40  | 100         |
| 3                 | 35059    | BIT 156     | Basic & Radiation Physics -I (LAB)                       | 60 | -   | 40  | 100         |
| 4                 |          | BIT 162     | English-I (LAB)  | 50 | -   | -   |             |
|                   |          |             | <b>TOTAL</b>   |    |     |     | <b>600</b>  |



Paper ID and Subject Code (For new Subject) will be allotted by the Controller of Examination Sharda University.

**SHARDA UNIVERSITY, GREATER NOIDA**  
**SCHOOL OF ALLIED HEALTH SCIENCES**  
**EVALUATION SCHEME (BATCH- 2018-2021)**

**Program: -B.Sc. (Radiological Imaging Techniques (Radiology/CT/MRI))**

**SEMESTER:-Second Semester**

**Session: -2018-19**

| S.No              | Paper ID | Subject Code | Subject Name  | CA | MTE | ETE | TOTAL MARKS |
|-------------------|----------|--------------|---|----|-----|-----|-------------|
| 1                 | 35057    | BIT 109      | Human Anatomy as Applied to Radiology & Imaging -II | 30 | 20  | 50  | 100         |
| 2                 | 35058    | BIT 110      | Human Physiology -II                                | 30 | 20  | 50  | 100         |
| 3                 | 35059    | BIT 111      | Basic & Radiation Physics -II                       | 30 | 20  | 50  | 100         |
| 4                 |          | BIT 112      | English -II   | 50 | -   | -   | -           |
| <b>PRACTICALS</b> |          |              |   |    |     |     |             |
| 1                 | 35060    | BIT 159      | Human Anatomy as Applied to Radiology & Imaging -II | 60 | -   | 40  | 100         |
| 2                 | 35061    | BIT 150      | Human Physiology -II                                | 60 | -   | 40  | 100         |
| 3                 | 35062    | BIT 151      | Basic & Radiation Physics -II                       | 60 | -   | 40  | 100         |
| 4                 |          | BIT 152      | English –II (Lab)                                   | -  | -   | -   | -           |
|                   |          |              |   |    |     |     |             |
|                   |          |              | <b>TOTAL</b>  |    |     |     | <b>600</b>  |

**SHARDA UNIVERSITY,**  
**SCHOOL OF ALLIED HEALTH SCIENCES**  
**EVALUATION SCHEME (BATCH- 2018-2021)**  
**Program: -B.Sc. (Radiological Imaging Techniques (Radiology/CT/MRI))**

**SEMESTER: THIRD**

**Session- 2019-20**

| S.No               | Paper ID | Course Code | Course/Subject Name                         | EVALUATION SCHEME (Distribution of Marks) |     |     |             |
|--------------------|----------|-------------|---|---|-----|-----|-------------|
|                    |          |             |   | CA  | MTE | ETE | TOTAL MARKS |
| THEORY SUBJECTS    |          |             |   |   |     |     |             |
| 1                  | 35112    | BIT-205     | Dark Room Procedure I                       | 30  | 20  | 50  | 100         |
| 2                  | 35113    | BIT-206     | Patient Care in Hospital and Radiology -I   | 30  | 20  | 50  | 100         |
| 3                  | 35114    | BIT-207     | Apparatus for Radiography & Imaging - I     | 30  | 20  | 50  | 100         |
| 4                  | 35115    | BIT-208     | Radiography of upper & lower extremities -I | 30  | 20  | 50  | 100         |
| PRACTICAL SUBJECTS |          |             |   |   |     |     |             |
| 1                  |          | BIT-255     | Dark Room Procedure I                       | 60  | -   | 40  | 100         |
| TOTAL              |          |             |   |   |     |     | 500         |

Paper ID and Subject Code (For new Subject) will be allotted by the Controller of Examination Sharda University.

**SHARDA UNIVERSITY,  
SCHOOL OF ALLIED HEALTH SCIENCES  
EVALUATION SCHEME (BATCH- 2018-2021)**

**Program: -B.Sc. (Radiological Imaging Techniques (Radiology/CT/MRI))**

**SEMESTER: FOURTH**

**Session- 2019-20**

| S.No               | Paper ID | Subject Code | Subject Name                                  | EVALUATION SCHEME (Distribution of Marks) |     |     |             |
|--------------------|----------|--------------|---|---|-----|-----|-------------|
|                    |          |              |   | CA  | MTE | ETE | TOTAL MARKS |
| THEORY SUBJECTS    |          |              |   |   |     |     |             |
| 1                  | 35189    | BIT-209      | Dark Room Procedure II                        | 30  | 20  | 50  | 100         |
| 2                  | 35190    | BIT-210      | Patient Care in Hospital and Radiology -II    | 30  | 20  | 50  | 100         |
| 3                  | 35191    | BIT-211      | Apparatus for Radiography & Imaging - II      | 30  | 20  | 50  | 100         |
| 4                  | 35192    | BIT-212      | Radiography of upper & lower extremities - II | 30  | 20  | 50  | 100         |
|                    |          |              |   |   |     |     |             |
| PRACTICAL SUBJECTS |          |              |   |   |     |     |             |
| 1                  |          | BIT-256      | Dark Room Procedure II                        | 60  | -   | 40  | 100         |
|                    |          |              |   |   |     |     |             |
|                    |          |              |   |   |     |     |             |
| TOTAL              |          |              |   |   |     |     | 500         |

**SHARDA UNIVERSITY, GREATER NOIDA  
 SCHOOL OF ALLIED HEALTH SCIENCES  
 EVALUATION SCHEME (BATCH- 2018-2021)**

**Program: -B.Sc. (Radiological Imaging Techniques (Radiology/CT/MRI)**

**SEMESTER:FIFTH SEMSTER**

**Session: -2020-21**

| S.No               | Paper ID | Subject Code | Subject Name  | EVALUATION SCHEME (Distribution of Marks) |     |     |             |
|--------------------|----------|--------------|---|---|-----|-----|-------------|
|                    |          |              |   | CA  | MTE | ETE | TOTAL MARKS |
| THEORY SUBJECTS    |          |              |   |   |     |     |             |
| 1                  | 35227    | BIT-306      | Radiographic Technique of Bone & Joints -I                    | 30  | 20  | 50  | 100         |
| 2                  | 35228    | BIT-307      | Special Radiographic Techniques -I                            | 30  | 20  | 50  | 100         |
| 3                  | 35229    | BIT-308      | Recent Advances in Imaging & Contrast Media - I               | 30  | 20  | 50  | 100         |
| 4                  | 35230    | BIT-309      | Radiation Hazards, Protection & Planning of the Department- I | 30  | 20  | 50  | 100         |
| PRACTICAL SUBJECTS |          |              |   |   |     |     |             |
| 1                  |          | BIT-310      | Radiographic Technique of Bone & Joints -I                    | 60  | -   | 40  | 100         |
|                    |          |              | Total   |   |     |     | 500         |

Paper ID and Subject Code (For new Subject) will be allotted by the Controller of Examination Sharda University.

**SHARDA UNIVERSITY, GREATER NOIDA  
 SCHOOL OF ALLIED HEALTH SCIENCES  
 EVALUATION SCHEME (BATCH- 2018-2021)**

**Program: -B.Sc. (Radiological Imaging Techniques (Radiology/CT/MRI)**

**SEMESTER:SIXTH SEMSTER**

**SESSION – 2020-21**

|                    |          |              |   | EVALUATION SCHEME (Distribution of Marks) |     |     |             |
|--------------------|----------|--------------|---|---|-----|-----|-------------|
| S.No               | Paper ID | Subject Code | Subject Name  | CA  | MTE | ETE | TOTAL MARKS |
| THEORY SUBJECTS    |          |              |   |   |     |     |             |
| 1                  | 35350    | BIT-311      | Radiographic Technique of Bone & Joints -I                    | 30  | 20  | 50  | 100         |
| 2                  | 35351    | BIT-312      | Special Radiographic Techniques -I                            | 30  | 20  | 50  | 100         |
| 3                  | 35352    | BIT-313      | Recent Advances in Imaging & Contrast Media - I               | 30  | 20  | 50  | 100         |
| 4                  | 35353    | BIT-314      | Radiation Hazards, Protection & Planning of the Department- I | 30  | 20  | 50  | 100         |
| PRACTICAL SUBJECTS |          |              |   |   |     |     |             |
| 1                  |          | BIT-315      | Radiographic Technique of Bone & Joints -I                    | 60  | -   | 40  | 100         |
|                    |          |              | Total   |   |     |     | 500         |

Paper ID and Subject Code (For new Subject) will be allotted by the Controller of Examination Sharda University.

- **Value added courses are mandatory for each student of odd semester (List of VAC is enclosed as Annexure 1) and it is non-graded.**
- **Open elective course is mandatory for each student of even semester (List of approved open elective courses offered by the University are enclosed as Annexure 2 and it will be in audit mode and mandatory to pass it.**
- **In each academic session, project work will be provided to the students.**
- **Bachelor of Radiological and Imaging 7<sup>th</sup> semester/ 8<sup>th</sup> Semester (6months of mandatory Clinical training & Internship). Assessment based on Viva at the end of each semester and Project submission after the end of the Internship.**

## ***C. Course Templates***



## **SYLLABUS OF BRIT**

|                      |                       |   |            |
|----------------------|-----------------------|---|------------|
| <b>School: SAHS</b>  |                       | <b>Batch : 2018-21</b>  |            |
| <b>Program: BMIT</b> |                       | <b>Current Academic Year: 2018-2019</b>   |            |
| <b>Branch: All</b>   |                       | <b>SEMESTER: FIRST</b>  |            |
| 1                    | Course Code           | BIT-104   |            |
| 2                    | Course Title          | <b>Human Anatomy as Applied to Radiology &amp; Imaging - I</b>  |            |
| 3                    | Credits               | 4   |            |
| 4                    | Contact Hours (L-T-P) | 3-1   |            |
|                      | Course Status         | <b>Compulsory</b>   |            |
| 5                    | Course Objective      | 1: Defining, listing and understanding basic anatomy of Human Body in reference to bone, joints, and blood .<br>2. Understanding, characterizing & explaining the anatomical details of the systems of human body with special emphasis on skeleton system , CVS , Respiratory & digestive system .<br>3. Performing, demonstrating & implementing the concept of anatomy principles in the practice of imaging and radiation technology.   |            |
| 6                    | Course Outcomes       | <b>CO1:</b> Demonstrate the general and anatomical aspects to make the fundamental concepts of anatomy.<br><b>CO2:</b> Describe the composition , functions and applied related to bones and skeleton system in human body .<br><b>CO3:</b> Demonstrate an understanding of Cardio Vascular System, its structure , functioning and related applied aspects .<br><b>CO4:</b> Discuss the basic principles of structure, functions and applied of respiratory system .<br><b>CO5:</b> Discuss the structure , functions and applied of Gastro Intestinal Tract in human body |            |
| 8                    | Outline syllabus      |   | CO Mapping |
|                      | <b>UNIT 1</b>         | <b>Anatomical introduction</b>  |            |
|                      | A                     | Introduction - human body as a whole, Definitions and terms of anatomy  | CO1, CO2   |
|                      | B                     | Positions and planes  | CO1, CO2   |
|                      | C                     | Types of muscle and difference between them   | CO1, CO2   |
|                      |                       |   |            |
|                      | <b>UNIT 2</b>         | <b>Bones and joints</b>   | CO1, CO2   |
|                      | A                     | Classification of bones according to shape, development, regional, structural (macroscopically – compact bone and spongy bone)<br>Parts of young and adult long bone  | CO2        |
|                      | B                     | <b>CARTILAGE</b><br>1. Different types of cartilage (hyaline, fibro and elastic cartilage)  | CO2        |

|  |                        |   |      |     |            |
|--|------------------------|---|------|-----|------------|
|  |                        | <b>(C)JOINTS</b><br><b>1.Classification of joints</b><br>Fibrous joints with example, cartilaginous joints with example<br>Synovial joint – types with example, diagram of typical synovial joint and its characteristic features |      |     |            |
|  | C                      | Lymphatic system<br>Glands – difference between endocrine and exocrine glands   |      |     | CO2        |
|  | <b>UNIT 3</b>          | <b>Circulatory system</b>   |      |     | <b>CO3</b> |
|  | A                      | Heart - structure and function<br>Blood supply of heart   |      |     | CO3, CO1   |
|  | B                      | Systemic and pulmonary circulation  |      |     | CO1, CO3   |
|  | C                      | Difference between artery and vein  |      |     | CO3        |
|  | <b>UNIT 4</b>          | <b>Respiratory system</b>   |      |     | CO1, CO4   |
|  | A                      | Parts of respiratory system – (nose, nasal cavity, pharynx, larynx, trachea, lung, alveoli)   |      |     | CO4        |
|  | B                      | Bronchopulmonary segments   |      |     | CO4        |
|  | C                      | Lung and pleura<br>Names of paranasal air sinuses   |      |     | CO4        |
|  | <b>UNIT 5</b>          | <b>GIT</b>  |      |     | CO1, CO5   |
|  | A                      | Parts of GIT- gross anatomy and functions (oesophagus, stomach, small intestine and large intestine and liver)  |      |     | CO5        |
|  | B                      | Difference between small and large intestine<br>Functions of liver and gall bladder   |      |     | CO5        |
|  | C                      | Oral cavity Names of main salivary glands   |      |     | CO5        |
|  | Mode of examination    | Theory/Practical/Viva   |      |     |            |
|  | Weightage Distribution | CA  | MTE  | ETA |            |
|  |                        | 30%   | 20 % | 50% |            |
|  | Text book/s*           | 1.Textbook Of Anatomy & Physiology For Nurses   |      |     |            |
|  | Other References       | General anatomy B D Chaurasia   |      |     |            |

| <b>POs<br/>Cos</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> |
|--------------------|------------|------------|------------|------------|------------|
| <b>CO105.1</b>     | 2          | 1          | 2          | 2          | 3          |
| <b>CO105.2</b>     | 2          | 2          | 1          | 2          | 2          |
| <b>CO105.3</b>     | 3          | 2          | 3          | 2          | 3          |
| <b>CO105.4</b>     | 2          | 3          | 2          | 2          | 2          |
| <b>CO105.5</b>     | 1          | 3          | 3          | 2          | 3          |

*1. Slight (Low)*

*2. Moderate (Medium)*

*3. Substantial (High)*

|                      |                       |  |                    |
|----------------------|-----------------------|--|--------------------|
| <b>School: SAHS</b>  |                       | <b>Batch : 2018-21</b>   |                    |
| <b>Program: BMIT</b> |                       | <b>Current Academic Year: 2018-2019</b>  |                    |
| <b>Branch: All</b>   |                       | <b>SEMESTER: FIRST</b>   |                    |
| 1                    | Course Code           | BIT-105  |                    |
| 2                    | Course Title          | <b>Human Physiology –I</b>   |                    |
| 3                    | Credits               | 6  |                    |
| .                    | Contact Hours (L-T-P) | 3-1-2  |                    |
|                      | Course Status         | <b>Compulsory</b>  |                    |
| 5                    | Course Objective      | 1: Defining, listing and understanding basic Physiology of Human Body in reference to Nerve & Muscle, and blood .<br>2. Understanding, characterizing & explaining the physiological functions of the systems of human body with special emphasis on Heart , CVS , Respiratory & digestive system .<br>3. Performing, demonstrating & implementing the concept of Physiological principles in the practice of imaging and radiation technology.  |                    |
| 6                    | Course Outcomes       | <b>CO1:</b> Demonstrate the general and nerve muscle physiology aspects to make the fundamental concepts of physiology.<br><b>CO2:</b> Describe the composition , functions and applied related to blood in human body .<br><b>CO3:</b> Demonstrate an understanding of Cardio Vascular System, its structure , functioning and related applied aspects .<br><b>CO4:</b> Discuss the basic principles of structure, functions and applied of respiratory system .<br><b>CO5</b> Discuss the structure , functions and applied of Gastro Intestinal Tract in human body . |                    |
| 8                    | Outline syllabus      |  | CO Mapping         |
|                      | <b>UNIT 1</b>         | <b>GENERAL &amp; NERVE MUSCLE PHYSIOLOGY</b>   | <b>CO1</b>         |
|                      | A                     | Components of cell, functions of cell organelles, transport across cell membrane, intercellular communication and body fluids , homeostasis & membrane potential.  | CO1                |
|                      | B                     | Structure , functions & classification of nerve tissues, physiological properties of nerve and nerve impulse & neuroglia.  | CO1, CO2           |
|                      | C                     | neuromuscular junction, Difference between skeletal muscle, smooth muscle & cardiac muscle.  | CO1, CO3, CO4, CO5 |
|                      | <b>UNIT 2</b>         | <b>BLOOD</b>   | <b>CO2</b>         |
|                      | A                     | Composition & functions of blood, plasma proteins, blood volume & haemoglobin.   | CO2                |
|                      | B                     | Erythrocytes, jaundice, leucocytes & platelets   | CO2,               |
|                      | C                     | blood coagulation, blood groups, blood transfusion, Rh factor, Hematocrit value, ESR, Lymph , RE system & immunity   | CO2& CO3           |
|                      | <b>UNIT 3</b>         | <b>CARDIO VASCULAR SYSTEM</b>  | <b>CO3</b>         |
|                      | A                     | Cardiac Muscle, physiological anatomy of the heart & blood vessels, cardiac cycle.   | CO1&CO3            |

|  |                        |  |      |                |
|--|------------------------|--|------|----------------|
|  | B                      | Conducting system of heart, Heart sounds & ECG.  |      | CO3            |
|  | C                      | Heart Rate, Cardiac Output, Blood Pressure & Pulse.  |      | CO3            |
|  | <b>UNIT 4</b>          | <b>RESPIRATORY SYSTEM</b>  |      | CO4            |
|  | A                      | Physiological anatomy & functions of respiratory system , airways, dead space, graph of lung volume & capacities . |      | CO1& CO4       |
|  | B                      | Transport of Gases.  |      | CO2, CO3 & CO4 |
|  | C                      | Regulation of respiration & Hypoxia  |      | CO1& CO4       |
|  | <b>UNIT 5</b>          | <b>DIGESTIVE SYSTEM</b>  |      | CO5            |
|  | A                      | Physiological anatomy and functions of GIT, Saliva , Mouth & Oesophagus.   |      | CO1& CO5       |
|  | B                      | Stomach, Pancreas, Liver & Gall Bladder. digestive juices and their functions.                                     |      | CO1& CO5       |
|  | C                      | Small Intestine , Large Intestine , Digestion and Absorption in GIT.   |      | CO1, CO3& .CO5 |
|  | Mode of examination    | Theory/Practical/Viva  |      |                |
|  | Weightage Distribution | CA   | MTE  | ETA            |
|  |                        | 30%  | 20 % | 50%            |
|  | Text book/s*           | Text & Practical Physiology for MLT by DR A.K.Jain   |      |                |
|  | Other References       | • Guyton & Hall Textbook of Medical Physiology .<br>• Ganong's Review of Medical Physiology                        |      |                |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO105.1</b> | 3   | 1   | 1   | 1   | 1   |
| <b>CO105.2</b> | 3   | 2   | 1   | 1   | 1   |
| <b>CO105.3</b> | 3   | 3   | 3   | 1   | 2   |
| <b>CO105.4</b> | 3   | 3   | 3   | 1   | 2   |
| <b>CO105.5</b> | 3   | 3   | 3   | 1   | 3   |

*1. Slight (Low)*

*2. Moderate (Medium)*

*3. Substantial (High)*

|                      |                       |  |                 |
|----------------------|-----------------------|--|-----------------|
| <b>School: SAHS</b>  |                       | <b>Batch : 2018-21</b>   |                 |
| <b>Program: BMIT</b> |                       | <b>Current Academic Year: 2018-2019</b>  |                 |
| <b>Branch: All</b>   |                       | <b>SEMESTER: FIRST</b>   |                 |
| 1                    | Course Code           | BIT-106  |                 |
| 2                    | Course Title          | <b>Basics and Radiation Physics-I</b>  |                 |
| 3                    | Credits               | 6  |                 |
| 4                    | Contact Hours (L-T-P) | 3-1-2  |                 |
|                      | Course Status         | <b>Compulsory</b>  |                 |
| 5                    | Course Objective      | 1 : Defining, listing and understanding basic physics.<br>2. Understanding, characterizing, explaining, identifying and applying on machines.<br>3. performing, demonstrating, implementing and applying the concept of general physics in better understanding the relevance to imaging technology  |                 |
| 6                    | Course Outcomes       | <b>CO1:</b> Describe the physics principles underlying the operation of medical imaging equipment;<br><b>CO2:</b> Demonstrate an understanding of and apply mathematical methods of image construction and processing;<br><b>CO3:</b> Demonstrate an understanding of aspects of clinical applications of imaging methods;<br><b>CO4:</b> Discuss basic principle of imaging machines and how to used with it<br><b>CO5</b> Discuss issues in the operation of medical imaging equipments. |                 |
| 8                    | Outline syllabus      |  | CO Mapping      |
|                      | <b>UNIT 1</b>         | <b>Basic physics</b>   | <b>CO1, CO2</b> |
|                      | A                     | Revision of mathematics related to radiography measurements and unit of C.G.S and M.K.S. system .Radiation units .   | CO1, CO2        |
|                      | B                     | Electrical charges, potential differences, current and resistance.   | CO1, CO2        |
|                      | C                     | Ohms low for electrical circuits, Direct current   | CO1, CO2        |
|                      |                       |  |                 |
|                      | <b>UNIT 2</b>         | <b>EMI (Electromagnetic inductions)</b>  |                 |
|                      | A                     | Conductor, insulator and semi- conductor   | CO1, CO3,       |
|                      | B                     | Electrical power ammeters and voltmeters   | CO1, CO2,       |
|                      | C                     | Electromagnetism, Electromagnetic induction self and mutual Induction.   | CO, CO2         |
|                      | <b>UNIT 3</b>         | <b>Generators and transformers</b>   |                 |
|                      | A                     | Production of A.C. Generators High Frequency generators (Construction, working and Uses).  | CO2             |
|                      | B                     | The diode as rectifier and as an X-Ray tube components (target material, filament, tube housing.).   | CO2             |
|                      | C                     | Types of rectification and methods used in diagnosis of X-Rays,  | CO1,CO2         |
|                      | <b>UNIT 4</b>         | <b>X RAY Transformer</b>   |                 |
|                      | A                     | Transformers, Transformers losses (hysteresis loss, eddy correct, copper loss)   | CO3             |
|                      | B                     | construction regulations of transformers   | CO3             |
|                      | C                     | Types of transformers and its used in X-Ray apparatus .  | CO3             |
|                      | <b>UNIT 5</b>         | <b>Production of X ray</b>   |                 |

|  |                        |   |      |     |         |
|--|------------------------|---|------|-----|---------|
|  | A                      | Thermionic emission and its application in x ray production, (brehmstrahlung, characteristic, binding energy, auger electron,), Vacuum, diode- variation of tubes current and anode ,cathode voltage.   |      |     | CO4     |
|  | B                      | Interaction of X-Ray with matter (Compton, photoelectric, coherent, photodisintegration ,pair production)   |      |     | CO4     |
|  | C                      | Application in diagnostic radiology, Advantages and Disadvantages of Each modality  |      |     | CO5.CO6 |
|  | Mode of examination    | Theory/Practical/Viva   |      |     |         |
|  | Weightage Distribution | CA  | MTE  | ETA |         |
|  |                        | 30%   | 20 % | 50% |         |
|  | Text book/s*           | <b>-Physics of diagnostic radiology (christensen),<br/>         -The essential physics of medical imaging (by bushberg 3<sup>rd</sup> edition)<br/>         - Text book of radiology for residents and technicians 5<sup>th</sup> Edition by Prof S.K Bahrgava.</b> |      |     |         |
|  | Other References       | AERB website ,Radiopedia  |      |     |         |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO106.1</b> | 3   | 3   | 2   | 3   | 2   |
| <b>CO106.2</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO106.3</b> | 3   | 2   | 3   | 3   | 3   |
| <b>CO106.4</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO106.5</b> | 2   | 3   | 2   | 2   | 2   |

|                      |                       |  |
|----------------------|-----------------------|--|
| <b>School: SAHS</b>  |                       | <b>Batch : 2018-21</b>   |
| <b>Program: BMIT</b> |                       | <b>Current Academic Year: 2018-2019</b>                                |
| <b>Branch: All</b>   |                       | <b>SEMESTER:FIRST</b>  |
| 1                    | Course Code           | BIT-107  |
| 2                    | Course Title          | <b>English-I</b>   |
| 3                    | Credits               | 6  |
| 4                    | Contact Hours (L-T-P) | 2-1-2  |
|                      | Course Status         | <b>Compulsory</b>  |
| 5                    | Course                | 1. To equip students to minimize the linguistic barriers emerging in a |

|   |                        |  |   |                 |
|---|------------------------|--|---|-----------------|
|   | Objective              | different environment.<br>2. Help students to understand different accents and standardise their existing English<br>3. Guide the students to hone the basic communication skills, listening, speaking and reading.  |   |                 |
| 6 | Course Outcomes        | CO1: Develop writing skills<br>CO2: Learn to use correct sentence structure and punctuation<br>CO3: Develop Impressive Speaking Skills.<br>CO4: Recognise stress patterns in pronunciation of the English sentences<br>CO5: To be able to speak confidently in the English language<br>CO6: Listen and interpret main ideas to differentiate between opinions and facts<br>CO7: Cultivate and develop reading habits |   |                 |
| 8 | Outline syllabus       |  |   | CO Mapping      |
|   | <b>Unit 1</b>          | <b>Basic elements of grammar</b>   |   | <b>CO1, CO2</b> |
|   | A                      | Parts of speech  |   | CO1, CO2        |
|   | B                      | Articles: A, An , The  |   | CO1, CO2        |
|   | C                      | Tenses   |   | CO1, CO2        |
|   | <b>Unit 2</b>          | <b>Vocabulary enhancement</b>  |   |                 |
|   | A                      | Antonyms & Synonyms  |   | CO1, CO2, CO3   |
|   | B                      | Homophones   |   | CO1, CO2, CO3   |
|   | C                      | Homonyms   |   | CO1, CO2, CO3   |
|   | <b>Unit 3</b>          | <b>Reading comprehension</b>   |   |                 |
|   | A                      | Reading comprehension passage 1  |   | CO7             |
|   | B                      | The Thief by Ruskin Bond   |   | CO7             |
|   | C                      | Discussions Based on the text  |   | CO7             |
|   | Mode of examination    | Theory/Practical   |   |                 |
|   | Weightage Distribution | CA   | MTE                                     | 50 Marks        |
|   |                        | 30 Marks (2 Best CTs out of 3)   | 20 Marks ( 2 Best Assignments out of 3) | 100% CA         |
|   | Text book/s*           | Workbook for Beginners   |   |                 |
|   | Other References       | <ul style="list-style-type: none"> <li>Kumar, Sanjay and PushpLata. <i>Communication Skills</i>, Oxford University Press: New Delhi.</li> <li>Comfort, Jeremy(et.al). <i>Speaking Effectively</i>. Cambridge University Press</li> </ul>   |   |                 |
|   |                        | •  |   |                 |
|   |                        | •  |   |                 |

|            |            |            |            |            |            |
|------------|------------|------------|------------|------------|------------|
| <b>POs</b> | <b>PO1</b> | <b>PO2</b> | <b>PO3</b> | <b>PO4</b> | <b>PO5</b> |
| <b>COs</b> |            |            |            |            |            |



|                |   |   |   |   |   |
|----------------|---|---|---|---|---|
| <b>CO107.1</b> | 1 | 1 | 1 | 2 | 1 |
| <b>CO107.2</b> | 1 | 2 | 1 | 1 | 2 |
| <b>CO107.3</b> | 1 | 2 | 1 | 1 | 1 |
| <b>CO107.4</b> | 1 | 1 | 1 | 1 | 1 |
| <b>CO107.5</b> | 1 | 2 | 1 | 1 | 1 |

|                      |                       |  |                 |
|----------------------|-----------------------|--|-----------------|
| <b>School: SAHS</b>  |                       | <b>Batch : 2018-21</b>   |                 |
| <b>Program: BMIT</b> |                       | <b>Current Academic Year: 2018-2019</b>  |                 |
| <b>Branch: All</b>   |                       | <b>SEMESTER: 2<sup>ND</sup></b>  |                 |
| 1                    | Course Code           | BIT-109  |                 |
| 2                    | Course Title          | <b>Human Anatomy as Applied to Radiology &amp; Imaging - II</b>  |                 |
| 3                    | Credits               | 6  |                 |
| 4                    | Contact Hours (L-T-P) | 3-1-2  |                 |
|                      | Course Status         | <b>Compulsory</b>  |                 |
| 5                    | Course Objective      | 1: Defining, listing and understanding basic anatomy of Human Body in reference to bone, joints, and blood .<br>2. Understanding, characterizing & explaining the anatomical details of the systems of human body with special emphasis on skelton system , CVS , Respiratory & digestive system .<br>3. Performing, demonstrating & implementing the concept of anatomy principles in the practice of imaging and radiation technology. |                 |
| 6                    | Course Outcomes       | <b>CO1:</b> Demonstrate the types and function of joints and fracture<br><b>CO2:</b> Demonstrate the anatomy of reproductive system<br><b>CO3:</b> Demonstrate the radiological anatomy and surface anatomy<br><b>CO4:</b> Demonstrate the excretory system anatomy<br><b>CO5 :</b> Demonstrate the nervous system anatomy   |                 |
| 8                    | Outline syllabus      |  | CO Mapping      |
|                      | <b>UNIT 1</b>         | <b><u>FRACTURE</u></b>   | <b>CO1</b>      |
|                      | A                     | Joints and fracture  | CO1             |
|                      | B                     | Dislocation (Types, Appearance, and practical assessment),   | CO1, CO3        |
|                      | C                     | Types of fracture and special view for fracture  | CO1             |
|                      | <b>UNIT 2</b>         | <b>Reproductive system</b>   | <b>CO2</b>      |
|                      | A                     | General introduction to anatomy of Reproductive system   | CO1, CO2        |
|                      | B                     | Anatomical function of reproductive system   | CO2             |
|                      | C                     | Reproductive organs radiographic landmarks   | CO2             |
|                      | <b>UNIT 3</b>         | <b>RADIOLOGICAL ANATOMY/ SURFACE ANATOMY.</b>  | <b>CO1, CO3</b> |

|  |                     |  |         |
|--|---------------------|--|---------|
|  |                     |  |         |
|  | A                   | Surface landmarks of all organs viscera                                | CO3     |
|  | B                   | Surface landmarks of all bones,  | CO3     |
|  | C                   | Joints in relating to organs on the body for radiographic positioning- | CO3     |
|  | <b>UNIT 4</b>       | <b>Radiological anatomy and locations</b>                              | CO1,CO3 |
|  | A                   | Anatomical terminology with regard to location of bones and organs.    | CO3     |
|  | B                   | Anatomical sutures and skull   | CO3     |
|  | C                   | Anatomical landmarks   | CO3     |
|  | <b>UNIT 5</b>       | <b>Excretory system and nervous system</b>                             | CO4,CO5 |
|  | A                   | General introduction to anatomy of excretory system                    | CO4,CO5 |
|  | B                   | Function and anatomy of excretory system                               | CO4,CO5 |
|  | C                   | General introduction to anatomy of nervous system                      | CO4,CO5 |
|  | Mode of examination | Theory/Practical/Viva  |         |
|  | Weightage           | CA   | MTE     |
|  | Distribution        | 30%  | 20 %    |
|  |                     |  | 50%     |
|  | Text book/s*        | 1.Textbook Of Anatomy & Physiology For Nurses                          |         |
|  | Other References    | General anatomy B D Chaursia   |         |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO105.1</b> | 1   | 2   | 1   | 2   | 3   |
| <b>CO105.2</b> | 3   | 2   | 3   | 2   | 3   |
| <b>CO105.3</b> | 2   | 3   | 2   | 2   | 31  |
| <b>CO105.4</b> | 1   | 2   | 3   | 1   | 2   |
| <b>CO105.5</b> | 3   | 2   | 3   | 2   | 1   |

*1. Slight (Low)*

*2. Moderate (Medium)*

*3. Substantial (High)*

|                      |                       |   |                |
|----------------------|-----------------------|---|----------------|
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| <b>Program: BMIT</b> |                       | <b>Current Academic Year: 2018-2019</b>   |                |
| <b>Branch: All</b>   |                       | <b>SEMESTER: SECOND</b>   |                |
| 1                    | Course Code           | BIT-110   |                |
| 2                    | Course Title          | <b>Human Physiology –II</b>   |                |
| 3                    | Credits               | 6   |                |
| 4                    | Contact Hours (L-T-P) | 3-1-2   |                |
|                      | Course Status         | <b>Compulsory</b>   |                |
| 5                    | Course Objective      | 1: Defining, listing and understanding basic Physiology of Human Body in reference to Excretory system, Endocrine & Reproductive system . .<br>2. Understanding, characterizing & explaining the physiological functions of the systems of human body with special emphasis on nervous system and special senses.<br>3. performing, demonstrating & implementing the concept of Physiological principles in the practice of imaging and radiation technology.   |                |
| 6                    | Course Outcomes       | <b>CO1:</b> Demonstrate the Excretory system physiology in aspects to make the fundamental concepts of physiology.<br><b>CO2:</b> Describe the Endocrinology ,various hormone functions, regulation and applied related to it in human body .<br><b>CO3:</b> Demonstrate an understanding of male and female reproductive system , its structure , functioning and related applied aspects .<br><b>CO4:</b> Discuss the basic principles of structure, functions and applied of Central Nervous System .<br><b>CO5 :</b> Discuss the structure , functions and applied of special senses. |                |
| 8                    | Outline syllabus      |   | CO Mapping     |
|                      | <b>UNIT 1</b>         | <b>THE EXCRETORY SYSTEM</b>   | <b>CO1</b>     |
|                      | A                     | Physiological anatomy of kidney, structure and functions of excretory system, structure of nephron & JG Apparatus   | CO1            |
|                      | B                     | Mechanism of formation of Urine. & mechanism of concentration and dilution of urine--- The Counter Current System .   | CO1, CO4       |
|                      | C                     | Physiology of micturition and Regulation of Body Temperature in Humans.   | CO1, CO4       |
|                      |                       |   |                |
|                      | <b>UNIT 2</b>         | <b>ENDOCRINE SYSTEM</b>   | <b>CO2</b>     |
|                      | A                     | General principles of endocrinology, The pituitary Gland.   | CO2& CO4       |
|                      | B                     | The Thyroid Gland , The parathyroids , Calcitonin and Vitamin D.  | CO2& CO4       |
|                      | C                     | The Adrenal Cortex & Pancreas.  | CO2& CO4       |
|                      | <b>UNIT 3</b>         | <b>REPRODUCTIVE SYSTEM</b>  | <b>CO3</b>     |
|                      | A                     | Changes during Puberty, Classification of Male sex hormones and their functions, Spermatogenesis & semen.   | CO2, CO3&CO4   |
|                      | B                     | Changes during Puberty, Classification and Functions of female sex hormones, menstruation, ovulation and contraception.   | CO2, CO3 & CO4 |

|  |                        |   |     |     |                |
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|  | C                      | Physiological changes during pregnancy, functions of placenta and physiology of lactation.  |     |     | CO2, CO3 & CO4 |
|  | <b>UNIT 4</b>          | <b><i>THE NERVOUS SYSTEM</i></b>  |     |     | CO4            |
|  | A                      | Organisation of Nervous system, The Synapse , Physiology of receptor organs for special and general sensation, physiology of reflex action, classification and properties of reflexes . |     |     | CO4            |
|  | B                      | Intro to Sensory and motor system. Functions of hypothalamus, thalamus, basal ganglia, cerebrum & cerebellum .  |     |     | CO4            |
|  | C                      | Autonomic nervous system, Cerebrospinal Fluid and Blood Brain Barrier.  |     |     | CO4            |
|  | <b>UNIT 5</b>          | <b><i>SPECIAL SENSES</i></b>  |     |     | CO5            |
|  | A                      | Taste and Smell.  |     |     | CO4& CO5       |
|  | B                      | Vision—structure and function of eye, errors of refraction & their correction. colour blindness.  |     |     | CO4& CO5       |
|  | C                      | Hearing—structure and function of ear, general outline of mechanism of hearing and perception of sound.   |     |     | CO4 & CO5      |
|  | Mode of examination    |   |     |     |                |
|  | Weightage Distribution | CA  | MTE | ETE |                |
|  |                        | 30%   | 20% | 50% |                |
|  | Text book/s*           | Text & Practical Physiology for MLT by DR A.K.Jain  |     |     |                |
|  | Other References       | <ul style="list-style-type: none"><li>Guyton &amp; Hall Textbook of Medical Physiology .</li><li>Ganong’s Review of Medical Physiology</li></ul>  |     |     |                |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO105.1</b> | 3   | 3   | 3   | 2   | 2   |
| <b>CO105.2</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO105.3</b> | 2   | 3   | 3   | 2   | 3   |
| <b>CO105.4</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO105.5</b> | 1   | 1   | 1   | 1   | 1   |

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|----------------------|-----------------------|---|-----------------|
| <b>Program: BMIT</b> |                       | <b>Current Academic Year: 2018-2019</b>   |                 |
| <b>Branch: All</b>   |                       | <b>SEMESTER: SECOND</b>   |                 |
| 1                    | Course Code           | BIT-111   |                 |
| 2                    | Course Title          | <b>Basics and Radiation Physics-II</b>  |                 |
| 3                    | Credits               | 6   |                 |
| 4                    | Contact Hours (L-T-P) | 3-1-2   |                 |
|                      | Course Status         | <b>Compulsory</b>   |                 |
| 5                    | Course Objective      | 1 : Defining, listing and understanding basic physics.<br>2. Understanding, characterizing, explaining, identifying and applying on machines.<br>3. performing, demonstrating, implementing and applying the concept of general physics in better understanding the relevance to imaging technology   |                 |
| 6                    | Course Outcomes       | <b>CO1:</b> Study about x ray tube components and its working,types<br><b>CO2:</b> Learn about protection of x ray tube and its methods<br><b>CO3:</b> Demonstrate an understanding of aspects Grids and filters, its types and uses<br><b>CO4:</b> Discuss basic principle of Ultrasound, production, applications uses in imaging technology<br><b>CO5</b> Discuss basics principles, components of medical imaging equipments. |                 |
| 8                    | Outline syllabus      |   | CO Mapping      |
|                      | <b>UNIT 1</b>         | <b>X-Ray tube</b>   | <b>CO1, CO2</b> |
|                      | A                     | Construction, types (coolidge, crooks,),  | CO1, CO2        |
|                      | B                     | working and new advancements in x ray tubes(rotation anode, stationary anode, Micro focus, heavy duty, grid controlled x ray  | CO1, CO2        |
|                      | C                     | Mammography X RAY tube, super rotalix x ray tube, angiography x ray tube, carbon nano x ray tube).  | CO1, CO2        |
|                      | <b>UNIT 2</b>         | <b>Protection of x ray tube</b>   |                 |
|                      | A                     | Diagnostic type method of heat dissipation,(conduction, convection, radiation ,fan AC ,OIL cooling) Failure measurement in Radiation exposure.  | CO1, CO3,       |
|                      | B                     | Scattered Radiation (primary, secondary, Tertiary) leakage, and its protection  | CO1, CO2,       |
|                      | C                     | Method to reduce scattered radiation (lead apron, lead goggles etc). Inverse square law   | CO, CO2         |
|                      | <b>UNIT 3</b>         | <b>Grid and filters</b>   |                 |
|                      | A                     | Grid and its types, moving , stationary, parallel, focused, cross grid, grid ratio, grid frequency, characterization of grid. Problems with grid like grid cut off  | CO2             |
|                      | B                     | Filters.(inherent, added, total ,wedge filters uses, composition, advantages, disadvantages),Beam limiting devices,(cones ,collimators, cylinders, diaphragm etc )  | CO2             |
|                      | C                     | Radioactivity,(types like particle or radiation) alpha, beta, gamma radiation, half life, decay constant, decay law ,isotopes   | CO1,CO2         |

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|--|------------------------|---|-----|-----|---------|
|  | <b>UNIT 4</b>          | <b><i>Ultrasound/CT</i></b>   |     |     |         |
|  | A                      | Basic Principles of ultrasound, and its types and uses, Production, piezoelectric affect ,Transducers , types of transducers  |     |     | CO3     |
|  | B                      | <b>Colour Doppler</b> -principle and its applications in imaging technology   |     |     | CO3     |
|  | C                      | Basic principle, generations of CT,CT Numbers (HU unit) HU Scale  |     |     | CO3     |
|  | <b>UNIT 5</b>          | <b><i>Fluoroscopy/Mammography/MRI</i></b>   |     |     |         |
|  | A                      | Fluoroscopy Definition, Basic principle types (Direct, indirect)  |     |     | CO4     |
|  | B                      | Mammography Principle, machine components and its working   |     |     | CO4     |
|  | C                      | Nuclear magnetic resonance, magnetic resonance imaging. Basic principle, basic machine Components   |     |     | CO4.CO5 |
|  | Mode of examination    | Theory/Viva   |     |     |         |
|  | Weightage Distribution | CA  | MTE | ETA |         |
|  |                        | 30%   | 20% | 50% |         |
|  | Text book/s*           | <b>-Physics of diagnostic radiology (christensen),</b><br><b>-The essential physics of medical imaging (by bushberg 3<sup>rd</sup> edition)</b><br><b>- Text book of radiology for residents and technicians 5<sup>th</sup> Edition by Prof S.K Bahrgava.</b> |     |     |         |
|  | Other References       | AERB website ,Radiopedia  |     |     |         |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO111.1</b> | 3   | 3   | 3   | 3   | 2   |
| <b>CO111.2</b> | 3   | 3   | 2   | 3   | 3   |
| <b>CO111.3</b> | 3   | 3   | 2   | 3   | 3   |
| <b>CO111.4</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO111.5</b> | 3   | 3   | 2   | 3   | 3   |

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| <b>Program: BMIT</b> |                        | <b>Batch : 2018-21</b>   |   |                 |
| <b>Branch: All</b>   |                        | <b>Current Academic Year: 2018-2019</b>  |   |                 |
| 1                    | Course Code            | BIT-112  |   |                 |
| 2                    | Course Title           | <b>English II</b>  |   |                 |
| 3                    | Credits                | 5  |   |                 |
| 4                    | Contact Hours (L-T-P)  | 2-1-2  |   |                 |
|                      | Course Status          | <b>Compulsory</b>  |   |                 |
| 5                    | Course Objective       | 1. To equip students to minimize the linguistic barriers emerging in a different environment.<br>2. Help students to understand different accents and standardise their existing English<br>3. Guide the students to hone the basic communication skills, listening, speaking and reading.   |   |                 |
| 6                    | Course Outcomes        | CO1: Develop writing skills<br>CO2: Learn to use correct sentence structure and punctuation<br>CO3: Develop Impressive Speaking Skills.<br>CO4: Recognise stress patterns in pronunciation of the English sentences<br>CO5: To be able to speak confidently in the English language<br>CO6: Listen and interpret main ideas to differentiate between opinions and facts<br>CO7: Cultivate and develop reading habits |   |                 |
| 8                    | Outline syllabus       | CO Mapping   |   |                 |
|                      | <b>Unit 1</b>          | <b>Basic elements of grammar</b>   |   | <b>CO1, CO2</b> |
|                      | A                      | Subject verb agreement   |   | CO1, CO2        |
|                      | B                      | Active and passive voice   |   | CO1, CO2        |
|                      | C                      | Question Tags  |   | CO1, CO2        |
|                      |                        |  |   |                 |
|                      | <b>Unit 2</b>          | <b>Vocabulary enhancement</b>  |   |                 |
|                      | A                      | One word substitutes   |   | CO1, CO2, CO3   |
|                      | B                      | Phrasal verbs  |   | CO1, CO2, CO3   |
|                      | C                      | Formation of words: suffixes and prefixes  |   | CO1, CO2, CO3   |
|                      | <b>Unit 3</b>          | <b>Reading comprehension</b>   |   |                 |
|                      | A                      | The Last Leaf by O Henry : Reading text and discussions  |   | CO7             |
|                      | B                      | Where the mind is without fear by Rabindranath Tagore : Critical appreciation and discussions  |   | CO7             |
|                      | C                      | Comprehension and vocabulary based exercise  |   | CO7             |
|                      | Mode of examination    | Theory/Practical   |   |                 |
|                      | Weightage Distribution | CA   | 50 Marks                                |                 |
|                      |                        | 30 Marks (2 Best CTs out of 3)   | 20 Marks ( 2 Best Assignments out of 3) | 100% CA         |

|  |                  |   |  |
|--|------------------|---|--|
|  | Text book/s*     | Workbook for Beginners  |  |
|  | Other References | <ul style="list-style-type: none"> <li>Kumar, Sanjay and PushpLata. <i>Communication Skills</i>, Oxford University Press: New Delhi.</li> <li>Comfort, Jeremy (et.al). <i>Speaking Effectively</i>. Cambridge University Press</li> </ul> |  |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO112.1</b> | 1   | 1   | 1   | 2   | 1   |
| <b>CO112.2</b> | 1   | 2   | 1   | 1   | 2   |
| <b>CO112.3</b> | 1   | 2   | 1   | 1   | 1   |
| <b>CO112.4</b> | 1   | 1   | 1   | 1   | 1   |
| <b>CO112.5</b> | 1   | 2   | 1   | 1   | 1   |

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| <b>Program: BMIT</b> |                       | <b>Current Academic Year: 2019-2020</b>  |
| <b>Branch: All</b>   |                       | <b>SEMESTER: THIRD</b>   |
| 1                    | Course Code           | BIT-205  |
| 2                    | Course Title          | <b>Dark Room Procedure- I</b>  |
| 3                    | Credits               | 6  |
| 4                    | Contact Hours (L-T-P) | 4-1-2  |
|                      | Course Status         | <b>Compulsory</b>  |
| 5                    | Course Objective      | <ol style="list-style-type: none"> <li>Defining, listing and recognizing the x ray films and identify image artefacts and improve it..</li> <li>Understanding, characterizing, explaining, identifying problems with x ray films and remove it from x ray film and improve image quality.</li> <li>Performing, demonstrating, implementing and applying the concept of darkroom related in better understanding the relevance Radiographic image.</li> </ol> |
| 6                    | Course Outcomes       | <b>CO1:</b> To learn about the photographic process: Introduction, visible light, images produced by radiation, light sensitive photographic materials   |



|   |                     |  |     |                 |
|---|---------------------|--|-----|-----------------|
|   |                     | <b>CO2:</b> To learn about the Film processing: Development. The nature of development-manual or automatic. The PH scale<br><b>CO3:</b> To learn about the construction of x-ray film & its cross over effect<br><b>CO4:</b> To learn about the Intensifying screens and cassettes. Luminescence: fluorescence and phosphorescence<br><b>CO5 :</b> To learn about the Image characteristic: Real and mental images, reflected, transmitted and emitted light images Photographic emulsions |     |                 |
| 8 | Outline syllabus    |  |     | CO Mapping      |
|   | <b>UNIT 1</b>       | <b><u>Basic Principle of radiographic film</u></b>   |     | <b>CO1, CO3</b> |
|   | A                   | Fundamental of photographic emulsion, light sensitive materials, construction and emulsion formation.  |     | CO1, CO2        |
|   | B                   | Formation of latent image. Chemical development of the latent image.   |     | CO1, CO2        |
|   | C                   | Storage of X-Ray films and its transportation.   |     | CO3, CO2        |
|   | <b>UNIT 2</b>       | <b>Grain Technology</b>  |     |                 |
|   | A                   | Type of photography emulsion size of grain   |     | CO2, CO4        |
|   | B                   | Advances in film grain technology  |     | CO3, CO4,       |
|   | C                   | Speed of the films   |     | CO3, CO4        |
|   | <b>UNIT 3</b>       | <b>Sensitometry</b>  |     |                 |
|   | A                   | Evaluation of emulsion characteristic – density. Contrast and latitude – basic fog- characteristic curve.  |     | CO3             |
|   | B                   | Mechanism of Lumiscence – fluorescence and phosphorescence. Fluorescent screens .  |     | CO4             |
|   | C                   | Cassettes. Intensification factor. Size of crystals  |     | CO4             |
|   | <b>UNIT 4</b>       | <b>X RAY films</b>   |     |                 |
|   | A                   | (Construction,all types and its uses)(X-rays, material etc.)   |     | CO4             |
|   | B                   | Cassettes- principle, Construction & types.  |     | CO4             |
|   | C                   | CR Cassette (principle, Construction, function, working and uses), medical imaging films, laser imager, day light processing, dry processing.  |     | CO4             |
|   | <b>UNIT 5</b>       | <b>Dark room Processing</b>  |     |                 |
|   | A                   | Dark room Processing agents, Developing Agents   |     | CO2             |
|   | B                   | Function and construction of the developer – standardization by time and temperature   |     | CO2             |
|   | C                   | Process of development- latitude- exhaustion of developer – regeneration by replacement.   |     | CO2,CO3         |
|   | Mode of examination | Theory/Practical/Viva  |     |                 |
|   | Weightage           | CA   | MTE | ETE             |
|   | Distribution        | 30%  | 20% | 50%             |

|                  |  |  |
|------------------|--|--|
| Text book/s*     | <ul style="list-style-type: none"> <li>Dark room procedures (chesney's)</li> <li>Text book of radiology for residents and technicians 5<sup>th</sup> Edition by Prof S.K Bahrgava</li> </ul> |  |
| Other References | <ul style="list-style-type: none"> <li>Articles,internet</li> </ul>  |  |

| Pos/COs        | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO205.1</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO205.2</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO205.3</b> | 2   | 2   | 2   | 2   | 2   |
| <b>CO205.4</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO205.5</b> | 2   | 2   | 2   | 2   | 2   |

|                      |                       |  |
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| <b>School: SAHS</b>  |                       | <b>Batch : 2018-21</b>   |
| <b>Program: BMIT</b> |                       | <b>Current Academic Year: 2019-2020</b>  |
| <b>Branch: All</b>   |                       | <b>SEMESTER: THIRD</b>   |
| 1                    | Course Code           | BIT-206  |
| 2                    | Course Title          | <b>Patient Care In Hospital and Radiology-I</b>  |
| 3                    | Credits               | 3  |
| 4                    | Contact Hours (L-T-P) | 2-1-0  |
|                      | Course Status         | <b>Compulsory</b>  |
| 5                    | Course Objective      | <ol style="list-style-type: none"> <li>Defining, listing and recognizing the patient care related issues and resolve it.</li> <li>performing, demonstrating, implementing</li> <li>Applying the concept of general patient care principle in better understanding the relevance Radiographic procedure.</li> </ol> |
| 6                    | Course Outcomes       | <b>CO1:</b> Understand sensitivities involved in patient's right and responsibilities<br><b>CO2:</b> To understand the radiological diagnostic needs for patients<br><b>CO3:</b> Learn planning and organization of work<br><b>CO4:</b> Able to handle effective Communication with Peers/ colleagues using        |

|   |                     |  |     |                 |
|---|---------------------|--|-----|-----------------|
|   |                     | medical terminology in communication<br><b>CO5 : Learn Radiology Technician's role in maintaining patient's rights</b>   |     |                 |
| 8 | Outline syllabus    | CO Mapping   |     |                 |
|   | <b>UNIT 1</b>       | <b>Hospital staffing and administration</b>  |     | <b>CO1, CO2</b> |
|   | A                   | Hospital staffing and administration- records- professional ethics in attitudes to patients  |     | CO1, CO3        |
|   | B                   | Cooperation with other staff and departments   |     | CO1, CO3        |
|   | C                   | Departmental organization.   |     | CO1             |
|   | <b>UNIT 2</b>       | <b>Patient handling and vital signs</b>  |     |                 |
|   | A                   | Handling of the patients- moving of injured patient  |     | CO1, CO2        |
|   | B                   | Normal pulse, temperature and respiration  |     | CO2, CO3        |
|   | C                   | Introduction of contrast media and its type  |     | CO3, CO4        |
|   | <b>UNIT 3</b>       | <b>Patient protection</b>  |     |                 |
|   | A                   | Protection of the patients for general examination   |     | CO2             |
|   | B                   | Protection of the patients in special case   |     | CO2, CO4        |
|   | C                   | Special examinations   |     | CO3             |
|   | <b>UNIT 4</b>       | <b>Patient preparation in special examination</b>  |     |                 |
|   | A                   | Supervision of patients  |     | CO2             |
|   | B                   | Patient preparation undergoing routine examination   |     | CO3             |
|   | C                   | Patient preparation special examinations   |     | CO3             |
|   | <b>UNIT 5</b>       | <b>Contrast Media</b>  |     |                 |
|   | A                   | Administration of contrast media   |     | CO3             |
|   | B                   | Aseptic and sterile procedures   |     | CO4             |
|   | C                   | Use of opaque media.   |     | CO3, CO4        |
|   | Mode of examination | Theory/Practical/Viva  |     |                 |
|   | Weightage           | CA   | MTE | ETE             |
|   | Distribution        | 30%  | 20% | 50%             |
|   | Text book/s*        | <ul style="list-style-type: none"> <li>Care of the patient in diagnostic radiography by (D.NOREEN AND MURIEL O.CHESNEY) 5<sup>TH</sup> OR 6<sup>TH</sup> EDITION.</li> <li>Text book of radiology for residents and technicians 5<sup>th</sup> Edition by Prof S.K Bahrgava</li> </ul> |     |                 |
|   | Other References    | <ul style="list-style-type: none"> <li>Articles, internet</li> </ul>   |     |                 |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO206.1</b> | 1   | 1   | 2   | 3   | 1   |
| <b>CO206.2</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO206.3</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO206.4</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO206.5</b> | 2   | 2   | 2   | 2   | 2   |

|                      |                          |   |
|----------------------|--------------------------|---|
| <b>School: SAHS</b>  |                          | <b>Batch : 2018-21</b>  |
| <b>Program: BMIT</b> |                          | <b>Current Academic Year: 2019-2020</b>   |
| <b>Branch: All</b>   |                          | <b>SEMESTER: THIRD</b>  |
| 1                    | Course Code              | BIT-207   |
| 2                    | Course Title             | <b>Apparatus of Radiography and Imaging-I</b>   |
| 3                    | Credits                  | 6   |
| 4                    | Contact Hours<br>(L-T-P) | 4-2-0   |
|                      | Course Status            | <b>Compulsory</b>   |
| 5                    | Course Objective         | 1. Defining, listing and recognizing the imaging instruments and makes practices.<br>2. Understanding, characterizing, explaining, identifying parts of imaging equipments and how to use it.<br>3. Performing, demonstrating, implementing and applying the concept and physics of machines in better understanding the relevance Radiographic equipments. |
| 6                    | Course Outcomes          | <b>CO1:</b> To learn about its Principles and about related Equipment<br><b>CO2:</b> To know about CT scan, Historical development, its principle and applications  |

|   |                        |  |     |            |
|---|------------------------|--|-----|------------|
|   |                        | <b>CO3:</b> To know about conventional, spiral (helical), Multislice, Historical development, its principle and applications<br><b>CO4:</b> To know about Computerized Radiography-: Principle, application, advantage & technique<br><b>CO5 :</b> To know about the reconstruction techniques of computed tomography. |     |            |
| 8 | Outline syllabus       |  |     | CO Mapping |
|   | <b>UNIT 1</b>          | <b><u>Introduction</u></b>   |     |            |
|   | A                      | Basic circuits of X-Ray machine, .   |     |            |
|   | B                      | Construction and functioning of each part,   |     |            |
|   | C                      | Component of x ray machine.  |     |            |
|   |                        |  |     |            |
|   | <b>UNIT 2</b>          | <b><u>Tomography</u></b>   |     |            |
|   | A                      | Tomography- Advantages of various movement, linear, circular elliptical, hypocycloidal- Basic of Topographic principles-   |     |            |
|   | B                      | Effects of operational angle, F.F.D., vibration blur, magnification- Estimation of relevant layer thickness and localization of required area by plain films and fluoroscopy-  |     |            |
|   | C                      | Sequential tomography- Horizontal tomography- simultaneous multisession tomography   |     |            |
|   | <b>UNIT 3</b>          | <b><u>Basics of CT</u></b>   |     |            |
|   | A                      | Computed Tomography equipment working, principle   |     |            |
|   | B                      | Slip Ring Technology   |     |            |
|   | C                      | Detectors and its types,   |     |            |
|   | <b>UNIT 4</b>          | <b><u>Generations Of CT</u></b>  |     |            |
|   | A                      | Generations of CT  |     |            |
|   | B                      | Axial CT   |     |            |
|   | C                      | Helical CT, Multi detectors technology (MDCT)  |     |            |
|   | <b>UNIT 5</b>          | <b><u>Reconstruction Techniques</u></b>  |     |            |
|   | A                      | All protocols in CT Imaging  |     |            |
|   | B                      | Image reconstruction principle, mathematical, analog methods,  |     |            |
|   | C                      | 2D and 3D, RECON image reconstructions.  |     |            |
|   | Mode of examination    | Theory   |     |            |
|   | Weightage Distribution | CA   | MTE | ETE        |
|   |                        | 30%  | 20% | 50%        |
|   | Text book/s*           | <b>-Physics of diagnostic radiology (christensen),<br/>         -The essential physics of medical imaging (by bushberg 3<sup>rd</sup> edition)<br/>         - Text book of radiology for residents and technicians 5<sup>th</sup> Edition by Prof S.K Bahrgava.</b>  |     |            |
|   | Other References       | AERB website , Radiopedia  |     |            |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO207.1</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO207.2</b> | 2   | 2   | 2   | 3   | 3   |
| <b>CO207.3</b> | 2   | 2   | 2   | 2   | 3   |
| <b>CO207.4</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO207.5</b> | 2   | 3   | 3   | 2   | 2   |

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| <b>School: SAHS</b>  |                       | <b>Batch : 2018-21</b>   |
| <b>Program: BMIT</b> |                       | <b>Current Academic Year: 2019-2020</b>  |
| <b>Branch: All</b>   |                       | <b>SEMESTER: THIRD</b>   |
| 1                    | Course Code           | BIT-208  |
| 2                    | Course Title          | <b>RADIOGRAPHY OF UPPER AND LOWER EXTREMITIES-I</b>  |
| 3                    | Credits               | 6  |
| 4                    | Contact Hours (L-T-P) | 4-2-0  |
|                      | Course Status         | Compulsory   |
| 5                    | Course Objective      | <ol style="list-style-type: none"> <li>1. Defining, listing and recognizing the anatomical structure of the human body in relevant to radiographic techniques.</li> <li>2. Understanding, characterizing, explaining, identifying and locating the anatomical structure of the human body irrespective to radiographic anatomy..</li> <li>3. Performing, demonstrating, implementing and applying the concept of general radiography in better understanding the relevance Radiographic Anatomy and understand diagnostic image.</li> <li>4. Analyzing, categorizing, comparing and differentiating</li> </ol> |

|   |                 |  |                |
|---|-----------------|--|----------------|
|   |                 | the anatomical structure of the human body by radiographic image and applying on imaging technology as radiographic anatomy  |                |
| 6 | Course Outcomes | <b>CO1:</b> To know regarding anatomical terminology and Positioning terminology<br><b>CO2:</b> To develop understanding about positioning of the upper limb<br><b>CO3:</b> To learn about Chest & Thorax Bones<br><b>CO4:</b> To learn to ensure availability of medical and diagnostic supplies<br><b>CO5:</b> To develop understanding about Selecting and performing basic views (projections) and conventional contrast |                |
| 8 |                 |  | CO Mapping     |
|   | <b>UNIT 1</b>   | <b><u>Introduction of skeleton system</u></b>  | <b>CO1,CO2</b> |
|   | A               | Individual bones of skeleton system of human body  | CO1, CO2       |
|   | B               | Different projections of bones.  | CO1, CO2       |
|   | C               | Different movements of joints  | CO1            |
|   |                 |  |                |
|   | <b>UNIT 2</b>   | <b><u>Radiographic terminology</u></b>   |                |
|   | A               | Special projection, all radiographic projections   | CO2            |
|   | B               | Terminology and special projections.   | CO2,           |
|   | C               | With radiographic anatomy.   | CO1, CO2       |
|   | <b>UNIT 3</b>   | <b><u>Joints and movement</u></b>  |                |
|   | A               | Movement of all joints   | CO1,CO2        |
|   | B               | Including flexion, extension, inversion, eversion  | CO2,CO1        |
|   | C               | Internal, external rotation, etc   | CO1            |
|   | <b>UNIT 4</b>   | <b><u>Upper limb projections</u></b>   |                |
|   | A               | All radiographic projections of upper limbs  | CO2,C03        |
|   | B               | Different views for fingers AP/LAT/Oblique ,thumb AP/Lat. oblique all special projection of thumb, Views for scaphoid bone   | CO2            |
|   | C               | Wrist, and, forearm, elbow s all special views, Clavicle .sterno-clavicular joint etc.   | CO3            |

|  |                        |                                       |            |
|--|------------------------|---------------------------------------|------------|
|  | <b>UNIT 5</b>          | <b><u>Thorax projections</u></b>      |            |
|  | A                      | Projection for shoulder joint,        | CO3,C04    |
|  | B                      | Sternum.ac joint ,SC joint, clavicle, | CO4,C05    |
|  | C                      | Scapula and its views                 | CO4,CO5    |
|  | Mode of examination    | Theory                                |            |
|  | Weightage Distribution | CA<br>30%                             | MTE<br>20% |
|  |                        |                                       | ETE<br>50% |
|  | Text book/s*           |                                       |            |
|  | Other References       |                                       |            |

| POs<br>COs | PO1 | PO2 | PO3 | PO4 | PO5 |
|------------|-----|-----|-----|-----|-----|
| CO208.1    | 1   | 3   | 3   | 3   | 3   |
| CO208.2    | 2   | 3   | 3   | 2   | 2   |
| CO208.3    | 3   | 3   | 3   | 3   | 3   |
| CO208.4    | 3   | 3   | 3   | 3   | 3   |
| CO208.5    | 3   | 2   | 2   | 2   | 3   |

|                      |                       |  |
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| <b>School: SAHS</b>  |                       | <b>Batch : 2018-21</b>   |
| <b>Program: BMIT</b> |                       | <b>Current Academic Year: 2019-2020</b>  |
| <b>Branch: All</b>   |                       | <b>SEMESTER: FOURTH</b>  |
| 1                    | Course Code           | BIT-209  |
| 2                    | Course Title          | <b>Dark Room Procedure – II</b>  |
| 3                    | Credits               | 6  |
| 4                    | Contact Hours (L-T-P) | 4-2-0  |
|                      | Course Status         | Compulsory   |
| 5                    | Course Objective      | <ol style="list-style-type: none"> <li>1. Acquire skills necessary for safe and effective darkroom practice,</li> <li>2. Mix and store chemicals to perform at their optimum.</li> <li>3. Choose materials suitable for the range of work to be undertaken</li> <li>4. Describe the necessity for separate wet and dry areas</li> <li>5. Develop an appreciation of print tonality on final interpretation of images.</li> </ol> |



|   |                 |   |            |
|---|-----------------|---|------------|
| 6 | Course Outcomes | <p><b>CO1:</b> To know about constitution of developing solutions both in manual and automatic processing and properties of developing chemicals. To learn about the Film processing: Development. The nature of development-manual or automatic. The PH scale.</p> <p><b>CO2:</b> To learn about film processing: Fixing and role of a fixing solution. Constitution of the fixing solutions and properties of the constituents. Factors affecting the quality of fixer.</p> <p><b>CO3:</b> To understand about Location To understand about Layout, To understand Illumination, To understand about related, Accessories &amp; apparatus required</p> <p><b>CO4:</b> To learn about the GRIDS types and cassettes</p> <p><b>CO5:</b> To learn about factors and its affects in radiographic film.</p> |            |
| 8 |                 |   | CO Mapping |
|   | <b>UNIT 1</b>   | <b>Developing</b>   |            |
|   | A               | Types of <b>developer</b> used in radiography powder and liquid concentrates- standard high contrast and high energy developers-  | CO1        |
|   | B               | Ultra rapid development methods- increased temperature.   | CO1        |
|   | C               | Used of replenisher, Special ultra rapid developer combined developer/ fixer solutions.   | CO1,CO2    |
|   |                 |   |            |
|   | <b>UNIT 2</b>   | <b>Fixation</b>   | <b>CO2</b> |
|   | A               | - fixing agents- constituents of radiographic fixer and function of the chemicals fixation time exhaustion of fixer-  | CO2        |
|   | B               | Silver recovery combined with generation of fixer (electrolysis)- other silver recovery methods- rapid fixer.   | CO2        |
|   | C               | Film rinse- acid stop bath- washing of films static bath- water flow and rate of change- test for washing- film during methods  | CO2        |
|   |                 |   |            |
|   | <b>UNIT 3</b>   | <b>Film Processing</b>  |            |
|   | A               | Practical processing- preparation of solutions- water supply mixing vessels- Order of mixing chemicals- stock, solutions and storage- storage of dry chemicals and liquid, concentrates.  | CO2,CO3    |
|   | B               | Processing apparatus – temperature control- immersion heaters- thermostat – ice cooling and refrigeration cooling. Type and care of hangers. Technical and processing faults  | CO3        |
|   | C               | Fog, static pressure, screen artifacts  | CO3        |
|   |                 |   |            |
|   | <b>UNIT 4</b>   | <b>Dark Room Lay out</b>  |            |

|     |                        |  |         |     |     |     |     |     |  |
|-----|------------------------|--|---------|-----|-----|-----|-----|-----|--|
|     | A                      | The X-Ray dark room- minimum dimensions- planned circulation and layout – light proofing- ventilation- radiation protection- radiation and chemical proof materials.   | CO3     |     |     |     |     |     |  |
|     | B                      | Bench design, film hoppers, film makers, hanger location- Location of processing unit- Pass box, fixer or wash tank  | CO3,CO4 |     |     |     |     |     |  |
|     | C                      | Wet of dry viewing rooms following manual of automatic processing rapid drying apparatus- effects of circulation and layout planning of efficiency   | CO3     |     |     |     |     |     |  |
|     | <b>UNIT 5</b>          | <b>Factors affecting radiographic film</b>   |         |     |     |     |     |     |  |
|     | A                      | The radiographic image- effects of exposure factors on contrast details and image sharpness. Relationship between kilo voltage and exposure time and tube current (mAs), effects of distance, filtration, collimation, screens, Grids, film speed developers and processing techniques | CO4,CO5 |     |     |     |     |     |  |
|     | B                      | Presentation of the radiograph- identification – orientation- technical information- techniques for film making action markers using radiation source, use of lead letters and numbers, accessories- viewing boxes- magnifier- high intensity localized viewers- projectors.           | CO5     |     |     |     |     |     |  |
|     | C                      | Dental mounts, films, films envelopes- filling system and units- stores viewers, Fluorescent screen photography- photofluorography, Cineradiography and cineradiography, Cassettes types- film magazines – manual and automatic operation.   | CO5     |     |     |     |     |     |  |
|     | Mode of examination    | Theory/Practical/Viva  |         |     |     |     |     |     |  |
|     | Weightage Distribution | <table><tr><td>CA</td><td>MTE</td><td>ETE</td></tr><tr><td>30%</td><td>20%</td><td>50%</td></tr></table>   | CA      | MTE | ETE | 30% | 20% | 50% |  |
| CA  | MTE                    | ETE  |         |     |     |     |     |     |  |
| 30% | 20%                    | 50%  |         |     |     |     |     |     |  |
|     | Text book/s*           | <ul style="list-style-type: none"><li>Physics of diagnostic radiology (by christensen).</li><li>Principles of radiographic imaging by Richard R. Carlton (5<sup>th</sup> or 6<sup>th</sup> Edition)</li><li>DN,MO Chesney</li></ul>  |         |     |     |     |     |     |  |
|     | Other References       | <ul style="list-style-type: none"><li>Articles/Internet</li></ul>  |         |     |     |     |     |     |  |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO209.1</b> | 1   | 2   | 1   | 2   | 1   |
| <b>CO209.2</b> | 2   | 2   | 3   | 1   | 1   |
| <b>CO209.3</b> | 2   | 3   | 2   | 3   | 3   |
| <b>CO209.4</b> | 3   | 3   | 3   | 2   | 2   |
| <b>CO209.5</b> | 3   | 3   | 3   | 3   | 3   |

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| <b>School: SAHS</b>  |                             | <b>Batch : 2018-21</b>  |
| <b>Program: BMIT</b> |                             | <b>Current Academic Year: 2019-2020</b>   |
| <b>Branch: All</b>   |                             | <b>SEMESTER: FOURTH</b>   |
| 1                    | <b>Course Code</b>          | BIT-210   |
| 2                    | <b>Course Title</b>         | <b>Hospital Practice, Care and radiation protection of the Patients -II</b>   |
| 3                    | <b>Credits</b>              | 6   |
| 4                    | <b>ContactHours (L-T-P)</b> | 4-2-0   |
|                      | <b>Course Status</b>        | Compulsory  |
| 5                    | <b>Course Objective</b>     | 1.To develop understanding about Explanation of diagnosis and report to patient , if required<br>2.To develop understanding about Documentation of patient records:<br>3. To develop understanding about Procedure to patients - Explaining |

|   |                        |   |            |            |            |
|---|------------------------|---|------------|------------|------------|
|   |                        | Do's and Don'ts to the patient  |            |            |            |
| 6 | Course Outcomes        | <b>CO1:</b> To develop understanding about Drugs in the x-ray department<br><b>CO2:</b> To learn How to handle: Children, Adult etc<br><b>CO3:</b> Learn how handle patient in special conditions<br><b>CO4:</b> To develop understanding about Preparation of the patient for special radiological procedure<br><b>CO5:</b> To develop understanding about Side effect and reaction of contrast media, classification of reactions of contrast media and treatment of contrast reactions |            |            |            |
| 8 |                        |   |            |            | CO Mapping |
|   | <b>UNIT 1</b>          | <b>Emergency Trolley</b>  |            |            |            |
|   | A                      | Trolley setting for special X-Ray examinations, like barium study, IVP study, HSG study,  |            |            |            |
|   | B                      | Emergency trolley and drugs and   |            |            |            |
|   | C                      | all type needle, syringe, Catheters, cannula.   |            |            |            |
|   | <b>UNIT 2</b>          | <b>Safety</b>   |            |            |            |
|   | A                      | Safety of patient   |            |            |            |
|   | B                      | Patient on traction, wheel chair, stretcher, infusion, blood transfusion, tracheostomy  |            |            |            |
|   | C                      | anesthesia patient, Oxygen therapy.etc  |            |            |            |
|   | <b>UNIT 3</b>          | <b>Patient care:-</b>   |            |            |            |
|   | A                      | Child patient care ,accidental patient ,MLC patient,  |            |            |            |
|   | B                      | Anesthetized patient,patient on trolley traction etc.   |            |            |            |
|   | C                      | Patient preparation of diabetes patient , preparation of infants  |            |            |            |
|   | <b>UNIT 4</b>          | <b>Patient shifting</b>   |            |            |            |
|   | A                      | work with mobile x ray set  |            |            |            |
|   | B                      | patient having oxygen therapy,  |            |            |            |
|   | C                      | patient having intravenous infusion of fluid.   |            |            |            |
|   | <b>UNIT 5</b>          | <b>Reactions</b>  |            |            |            |
|   | A                      | <b>Contrast reactions</b>   |            |            |            |
|   | B                      | <b>CM reaction management</b> its managements   |            |            |            |
|   | C                      | Drugs using management of contrast reaction in radiology department   |            |            |            |
|   | Mode of examination    | Theory  |            |            |            |
|   | Weightage Distribution | CA<br>30%   | MTE<br>20% | ETE<br>50% |            |
|   | Text book/s*           | <b>Care of the patient in diagnostic radiography by (D.NOREEN AND MURIEL O.CHESENEY) 5TH OR 6<sup>TH</sup> EDITION</b>  |            |            |            |
|   | Other References       |   |            |            |            |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO210.1</b> | 1   | 2   | 3   | 2   | 2   |
| <b>CO210.2</b> | 2   | 1   | 2   | 3   | 2   |
| <b>CO210.3</b> | 3   | 2   | 1   | 1   | 3   |
| <b>CO210.4</b> | 3   | 3   | 3   | 2   | 1   |
| <b>CO210.5</b> | 1   | 1   | 3   | 1   | 1   |

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| <b>School: SAHS</b>  |                          | <b>Batch : 2018-21</b>  |
| <b>Program: BMIT</b> |                          | <b>Current Academic Year: 2019-2020</b>   |
| <b>Branch: All</b>   |                          | <b>SEMESTER: FOURTH</b>   |
| 1                    | Course Code              | BIT-211   |
| 2                    | Course Title             | <b>Apparatus of Radiography &amp; Imaging -II</b>   |
| 3                    | Credits                  | 6   |
| 4                    | Contact Hours<br>(L-T-P) | 4-2-0   |
|                      | Course Status            | Compulsory  |
| 5                    | Course Objective         | 1. It is used to diagnose or treat patients by recording images of the internal structure of the body to assess the presence or absence of disease, foreign objects, and structural damage or anomaly |

|   |                 |   |
|---|-----------------|---|
|   |                 | 2. Understand standard positions for diagnostic imaging examinations.<br>3. Learn normal anatomy as seen on plain radiographs, magnetic resonance imaging (MRI), and X-ray computed tomography (CT).<br>4. Expand his/her knowledge of anatomy in all organ systems and its appearance on various imaging modalities (CT, MRI, ultrasound, etc).<br>5. Demonstrate the ability to use information technology and feedback to improve their fund of knowledge and skills.  |
| 6 | Course Outcomes | <b>CO1:</b> To learn and understand to prepare the patient and the fluroscopy machine and room for the procedure<br><b>CO2:</b> To develop understanding regarding Ultrasound Scanning principal Display of images, modes Doppler ultrasound<br><b>CO3:</b> To know about Magnetic Resonance Imaging (MRI)-: Principle, application, its advantage over computed tomography or ultra sonography. Its limitations, uses & cross sectional anatomy.<br><b>CO4:</b> To develop understanding about Mammography, Equipment, Positioning and projections<br><b>CO5:</b> To learn about portable and mobile radiography and its uses,advantages,Disadvantages |
| 8 |                 | CO Mapping  |
|   | <b>UNIT 1</b>   | <b>Fluoroscopy-</b>   |
|   | A               | Equipments, Image intensifier, IITV   |
|   | B               | Dose measurements, dose hazards- limitation of K.V., mA. Focus – skin distance. Fluoroscopic timer  |
|   | C               | Radiation protection to staff during fluoroscopy and associated examinations.   |
|   | <b>UNIT 2</b>   | <b>Ultrasound</b>   |
|   | A               | <b>Construction and function of Imaging equipment like</b> Ultrasound,Transducer,construction,fuction   |
|   | B               | Doppler Ultrasound  |
|   | C               | Applications of Doppler ultrasound  |
|   | <b>UNIT 3</b>   | <b>MRI</b>  |
|   | A               | MRI principle instrumentation,Magnetization,gradients,fuction of gradients  |
|   | B               | Basic pulse sequence, spin echo, gradient echo and all its application as pulse sequences all,  |
|   | C               | all using in MR Imaging protocols.  |
|   | <b>UNIT 4</b>   | <b>Soft Tissue radiogrgraphy</b>  |
|   | A               | Soft tissue techniques-(Mammography) Equipments,working,applications  |
|   | B               | non-screen techniques- simultaneous screen and non-screen technique-  |

|  |                     |   |     |     |     |
|--|---------------------|---|-----|-----|-----|
|  | C                   | Digital Mammography   |     |     | CO4 |
|  | <b>UNIT 5</b>       | <b>Portable X rays</b>  |     |     |     |
|  | A                   | Portable x ray equipments,  |     |     | CO5 |
|  | B                   | mobile x ray equipments, ward radiography equipments,   |     |     | CO5 |
|  | C                   | C ARM equipment.  |     |     | CO5 |
|  | Mode of examination | Theory/Practical/Viva   |     |     |     |
|  | Weightage           | CA  | MTE | ETE |     |
|  | Distribution        | 30%   | 20% | 50% |     |
|  | Text book/s*        | <b>-Physics of diagnostic radiology (christensen),<br/>-The essential physics of medical imaging (by bushberg 3<sup>rd</sup> edition)<br/>- Text book of radiology for residents and technicians<br/>5<sup>th</sup> Edition by Prof S.K Bahrgava.</b> |     |     |     |
|  | Other References    | AERB website , Radiopedia   |     |     |     |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO211.1</b> | 3   | 3   | 3   | 3   | 2   |
| <b>CO211.2</b> | 3   | 2   | 3   | 3   | 3   |
| <b>CO211.3</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO211.4</b> | 2   | 2   | 3   | 3   | 3   |
| <b>CO211.5</b> | 3   | 3   | 2   | 3   | 2   |

|                      |                      |   |
|----------------------|----------------------|---|
| <b>School: SAHS</b>  |                      | <b>Batch : 2018-21</b>  |
| <b>Program: BMIT</b> |                      | <b>Current Academic Year: 2019-2020</b>                               |
| <b>Branch: All</b>   |                      | <b>SEMESTER: FOURTH</b>   |
| 1                    | Course Code          | BIT-212   |
| 2                    | Course Title         | <b>Radiographic Technique of Extremities -II</b>                      |
| 3                    | Credits              | 6   |
| 4                    | Contact Hours(L-T-P) | 4-2-0   |
|                      | Course Status        | Compulsory  |
| 5                    | Course               | 1. This course will introduce to and familiarize the student with the |

|   |                     |  |            |             |
|---|---------------------|--|------------|-------------|
|   | Objective           | basic routine of radiographic positioning, shielding techniques, and related terminology.<br>2. Describe student positioning terms, Demonstrate proper use of positioning skills, Cite the structures demonstrated on routine radiographic procedures,<br>3. Evaluate images for positioning, centering , appropriate anatomy and overall image quality,<br>4. Discuss equipment and supplies necessary to complete radiographic procedures<br>5. Apply general radiation safety and protection practices associated with radiologic examinations. |            |             |
| 6 | Course Outcomes     | <b>CO1:</b> To know regarding anatomical terminology<br><b>CO2:</b> To know regarding Exposure factors : Millie ampere, Kilovolt age<br><b>CO3:</b> Understand clinical observation of radiology department , radiographic procedures and x-ray equipment.<br><b>CO4:</b> Ability to define radiographic positioning terms , manipulate equipment properly,<br><b>CO5:</b> position and align anatomical structure and equipment, evaluate images for proper demonstration of anatomy and pathology.   |            |             |
| 8 |                     |  | CO Mapping |             |
|   | <b>UNIT 1</b>       | <b>Introduction</b>  |            |             |
|   | A                   | Terminology of positioning,  |            | CO1         |
|   | B                   | Projections,   |            | CO1         |
|   | C                   | Movements of lower limb  |            | CO1         |
|   | <b>UNIT 2</b>       | <b>Radiography of foot</b>   |            |             |
|   | A                   | Radiography of toes ,foot, ankle joint, (special view of ankle joint), tibia, fibula   |            | CO1,CO2,CO4 |
|   | B                   | Radiography of Knee joints and its all special view  |            | CO2,CO4     |
|   | C                   | Sky line and its methods   |            | CO2,CO4     |
|   | <b>UNIT 3</b>       | <b>Radiography of thigh bone</b>   |            |             |
|   | A                   | Radiography of femur bone and its view   |            | CO4,CO5     |
|   | B                   | Special view and techniques of femur   |            | CO4,CO5     |
|   | C                   | View for pelvic and techniques   |            | CO4,CO5     |
|   | <b>UNIT 4</b>       | <b>Radiography of thigh Pelvice</b>  |            |             |
|   | A                   | Radiography hip joint single and both ,pelvic  |            | CO3,CO4     |
|   | B                   | special views of pelvice   |            | CO4,CO5     |
|   | C                   | Radiography in Emergency situations.   |            | CO4,CO5     |
|   | <b>UNIT 5</b>       | <b>Mescellaneous</b>   |            |             |
|   | A                   | Leg length basement  |            | CO5,CO3     |
|   | B                   | Bone age   |            | CO4         |
|   | C                   | Child Radiography for (upper and lower limbs)  |            | CO5         |
|   | Mode of examination | Theory   |            |             |
|   | Weightage           | CA   | MTE        | ETA         |



|  |                  |  |     |     |  |
|--|------------------|--|-----|-----|--|
|  | Distribution     | 30%  | 20% | 50% |  |
|  | Text book/s*     | <b>-Radiographic positioning by Ronald L.Eisenberg MD</b><br><b>-K,C Clark</b> |     |     |  |
|  | Other References | <ul style="list-style-type: none"> <li>Radiopedia</li> </ul>                   |     |     |  |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO212.1</b> | 1   | 1   | 1   | 1   | 2   |
| <b>CO212.2</b> | 2   | 3   | 3   | 3   | 3   |
| <b>CO212.3</b> | 3   | 2   | 3   | 3   | 3   |
| <b>CO212.4</b> | 3   | 3   | 2   | 3   | 3   |
| <b>CO212.5</b> | 1   | 1   | 1   | 2   | 1   |

|                      |                      |   |
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| <b>School: SAHS</b>  |                      | <b>Batch : 2018-21</b>                            |
| <b>Program: BMIT</b> |                      | <b>Current Academic Year: 2020-21</b>             |
| <b>Branch: All</b>   |                      | <b>SEMESTER: FIFTH</b>                            |
| 1                    | Course Code          | BIT-306   |
| 2                    | Course Title         | <b>Radiography Technique of Bone and Joints-I</b> |
| 3                    | Credits              | 3   |
| 4                    | Contact Hours(L-T-P) | 2-1-2   |

|   |                  |   |                 |
|---|------------------|---|-----------------|
|   | Course Status    | Compulsory  |                 |
| 5 | Course Objective | <ol style="list-style-type: none"> <li>1. Defining, listing and recognizing the anatomical structure of the human body in relevant to radiographic techniques.</li> <li>2. Understanding, characterizing, explaining, identifying and locating the anatomical structure of the human body irrespective to radiographic anatomy.</li> <li>3. Performing, demonstrating, implementing and applying the concept of general radiography in better understanding the relevance Radiographic Anatomy and understand diagnostic image.</li> <li>4. Understand clinical observation of radiology department , radiographic procedures and x-ray equipment.</li> </ol> |                 |
| 6 | Course Outcomes  | <b>CO1:</b> To know regarding anatomical terminology and Positioning terminology of skull<br><b>CO2:</b> To develop understanding about positioning of the skull<br><b>CO3:</b> To learn about dental radiographic positioning<br><b>CO4:</b> To learn about lung & Thorax Bones<br><b>CO5:</b> To develop understanding about Selecting and performing basic views (projections) and conventional contrast.  |                 |
| 8 |                  |   | CO Mapping      |
|   | <b>UNIT 1</b>    | <b><u>Unit 1: Introduction of Skeleton system</u></b>   | <b>CO1, CO2</b> |
|   | A                | Individual bones of skeleton system of human body and its different projections   | CO1, CO2        |
|   | B                | Revision of all bones, joints, movements.   | CO1, CO2        |
|   | C                | All Radiographic terminology related projections.   | CO1             |
|   |                  |   |                 |
|   | <b>UNIT 2</b>    | <b><u>Unit 2: Skull Radiography</u></b>   |                 |
|   | A                | Skull related radiographic terminology  | CO2             |
|   | B                | Routine projections like AP, Lateral, facial bones, nasal bone  | CO2             |
|   | C                | Special projection, whenever required and indicated as in skull including petrous, oral, mastoids, accessory nasal arches, nasal bone, maxilla, mandible, T.M. Joint, optic foramina,   | CO2             |
|   |                  |   |                 |
|   | <b>UNIT 3</b>    | <b><u>Unit 3: Dental radiography/Projections</u></b>  |                 |
|   | A                | Dental views  | CO3             |
|   | B                | Intra oral and extra oral projection  | CO2, CO3        |
|   | C                | Occlusal view.(manual/Digital) ,OPG & CBCT  | CO3             |
|   |                  |   |                 |
|   | <b>UNIT 4</b>    | <b><u>Unit 4: Radiography Lungs</u></b>   |                 |
|   | A                | Routine projection- evaluation of unilateral density  | CO4             |

Beyond Bound

|       |                        |  |         |     |     |    |    |    |   |       |     |
|-------|------------------------|--|---------|-----|-----|----|----|----|---|-------|-----|
|       | B                      | Exposure on inspiration and expiration   | CO4     |     |     |    |    |    |   |       |     |
|       | C                      | Valsalva and Muller manoeuvres- Pleura<br>Techniques to demonstrate fluid levels, effusions and adhesions – oblique., lordotic and decubitus A.P. and Lateral projections- pneumothorax, expiation and inspiration | CO4     |     |     |    |    |    |   |       |     |
|       | <b>UNIT 5</b>          | <b><u>Unit 5: Radiography of Diaphragm</u></b>   |         |     |     |    |    |    |   |       |     |
|       | A                      | Diaphragmatic excretion  | CO4,CO5 |     |     |    |    |    |   |       |     |
|       | B                      | Double exposure technique  | CO5     |     |     |    |    |    |   |       |     |
|       | C                      | Mediastinum – routine projections  | CO4,CO5 |     |     |    |    |    |   |       |     |
|       | Mode of examination    | Theory/viva/Practical  |         |     |     |    |    |    |   |       |     |
|       | Weightage Distribution | <table><tr><td>CA</td><td>MTE</td><td>ETE</td></tr><tr><td>30</td><td>20</td><td>50</td></tr></table>  | CA      | MTE | ETE | 30 | 20 | 50 | <table><tr><td>Total</td></tr><tr><td>100</td></tr></table> | Total | 100 |
| CA    | MTE                    | ETE  |         |     |     |    |    |    |   |       |     |
| 30    | 20                     | 50   |         |     |     |    |    |    |   |       |     |
| Total |                        |  |         |     |     |    |    |    |   |       |     |
| 100   |                        |  |         |     |     |    |    |    |   |       |     |
|       | Text book/s*           | K. C. Clerk Radiographic positioning<br><b>Radiographic positioning by Ronald L.Eisenberg MD</b><br><b>Special procedures (BY whitehouse)</b>  |         |     |     |    |    |    |   |       |     |
|       | Other References       | <ul style="list-style-type: none"><li>• Radiopedia</li></ul>   |         |     |     |    |    |    |   |       |     |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO306.1</b> | 3   | 3   | 3   | 3   | 2   |
| <b>CO306.2</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO306.3</b> | 3   | 3   | 3   | 2   | 3   |
| <b>CO306.4</b> | 3   | 2   | 3   | 3   | 3   |
| <b>CO306.5</b> | 1   | 2   | 3   | 2   | 1   |

|                         |  |
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| <b>School: SAHS</b>     | <b>Batch : 2018-21</b>                   |
| <b>Program: BMIT</b>    | <b>Current Academic Year: 2020-21</b>    |
| <b>Branch: All</b>      | <b>SEMESTER: FIFTH</b>                   |
| 1 Course Code           | BIT-307                                  |
| 2 Course Title          | <b>Special Radiographic Techniques-I</b> |
| 3 Credits               | 6  |
| 4 Contact Hours (L-T-P) | 3-3-0                                    |
| Course Status           | Compulsory                               |

|   |                  |   |                 |
|---|------------------|---|-----------------|
| 5 | Course Objective | <ol style="list-style-type: none"><li>1. Defining, listing and recognizing the anatomical structure of the human body by radiographic procedures and helps to diagnose problem with patient.</li><li>2. Understanding, characterizing, explaining, identifying and locating the anatomical structure of the human body by radiographic images and explain procedures by read of image.</li><li>3. Performing, demonstrating, implementing and applying the concept of radiographic anatomy in better understanding the relevance</li><li>4. Radiographic procedure and makes accurate diagnosis problem of patient.</li><li>5. Understand clinical observation of radiology department , radiographic procedures and x-ray equipment.</li></ol> |                 |
| 6 | Course Outcomes  | CO1:Learn and understand to prepare the patient and the room for the procedure<br>CO2: To develop understanding anatomy of salivary gland and sialography<br>CO3: To develop understanding anatomy of respiration system and special procedure of respiration system and arterio-graphy and venography<br>CO4: To develop understanding of special procedure of genito-urinary tract<br>CO5: To develop understanding of special procedure of fistulography   |                 |
| 8 |                  |   | CO Mapping      |
|   | <b>UNIT 1</b>    | <b><u>Unit 1: Salivary Glands</u></b>   | <b>CO1, CO2</b> |
|   | A                | Anatomy of Salivary glands  | CO1, CO2        |
|   | B                | Routine projection for calculi  | CO1, CO2        |
|   | C                | Sialography with opaque media ,Macro radiography  | CO1             |
|   |                  |   |                 |
|   | <b>UNIT 2</b>    | <b><u>Angiography</u></b>   | <b>CO1,CO3</b>  |
|   | A                | General and selective abdominal angiography, Peripheral angiography   | CO1, CO3        |
|   | B                | Cerebral angiography  | CO3             |
|   | C                | Venograms with valsalva manoeuvre.  | CO3             |
|   | <b>UNIT 3</b>    | <b><u>Respiratory system</u></b>  |                 |
|   | A                | Overview of Respiratory system Study Upper respiratory tract- Naso- pharynx- larynx- Trachea, Barium swallow with valsalva manoeuvre  | CO3             |
|   | B                | Thyroid and parathyroid glands, Bronchography –methods of introduction of opaque media- positioning and technique during the introduction of media,   | CO1,CO3         |
|   | C                | CT Virtual brochography   | CO3             |
|   | <b>UNIT 4</b>    | <b><u>Genito- Urinary system</u></b>  |                 |
|   | A                | Plain film examination K.U.B,Lateral, double exposure on inspiration and expiration, Pyelography – intravenous pvelography (I.V.P) pvelography – pvelography in children.   | CO4             |

|  |                     |  |         |
|--|---------------------|--|---------|
|  |                     |  |         |
|  | B                   | Use or non- use of compression- Trendelenberg position, High doss technique-   | CO4     |
|  | C                   | Supplementary techniques- Retrograde pyelography- position and identification of ureteric catheters. MCU,RGU                         | CO4     |
|  | <b>UNIT 5</b>       | <b><u>Cystography</u></b>  |         |
|  | A                   | Fistulography (Demonstration of fistulae,) ,Central nervous system- Routine projections for skull and spine-                         | CO5     |
|  | B                   | Ventriculography and encephography- Injection of contrast media- film series to cover all ventricular outlines- Central angiography, | CO5     |
|  | C                   | Myelography – metrhods of contrast injection.  | CO1,CO5 |
|  | Mode of examination | Theory   |         |
|  | Weightage           | CA   | MTE     |
|  | Distribution        | 30%  | 20%     |
|  |                     |  | ETE     |
|  |                     | 50%  |         |
|  | Text book/s*        | <b>Special procedures (BY whitehouse).<br/>Radiographic positioning by Ronald L.Eisenberg MD</b>                                     |         |
|  | Other References    | • Radiopedia   |         |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO307.1</b> | 3   | 3   | 3   | 2   | 3   |
| <b>CO307.2</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO307.3</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO307.4</b> | 2   | 2   | 3   | 3   | 2   |
| <b>CO307.5</b> | 2   | 2   | 2   | 2   | 2   |

|                      |                       |  |
|----------------------|-----------------------|--|
| <b>School: SAHS</b>  |                       | <b>Batch : 2018-21</b>                                 |
| <b>Program: BMIT</b> |                       | <b>Current Academic Year: 2020-21</b>                  |
| <b>Branch: All</b>   |                       | <b>SEMESTER: FIFTH</b>                                 |
| 1                    | Course Code           | BIT-308  |
| 2                    | Course Title          | <b>Recent Advances In Imaging And Contrast Media-I</b> |
| 3                    | Credits               | 6  |
| 4                    | Contact Hours (L-T-P) | 5-1-0  |
|                      | Course Status         | Compulsory   |

|   |                  |   |                        |
|---|------------------|---|------------------------|
| 5 | Course Objective | <ol style="list-style-type: none"><li>1. Defining, hands on practice and recognizing the imaging instruments and makes practices.</li><li>2. Understanding, characterizing, explaining, identifying parts of imaging equipments and how to use it..</li><li>3. Performing, demonstrating, implementing and applying the concept and physics of machines in better understanding the relevance Radiographic equipments.</li></ol>  |                        |
| 6 | Course Outcomes  | <p><b>CO1:</b> To know about radionuclide and their half life</p> <p><b>CO2:</b> To know about PET-CT , Gamma camera imaging and instrumentation</p> <p><b>CO3:</b> To know about recent advances in imaging technology-: Detailed knowledge of ultrasound, colour Doppler, different types of transducers, their principles, applications &amp; role in medicine &amp; cross sectional anatomy. •</p> <p><b>CO4:</b> To know about CT scan, conventional, spiral (helical), Multislice-: Historical development, its principle and applications, various generations&amp; definition of terms and cross sectional anatomy&amp; use of diagnostic methods.</p> <p><b>CO5:</b> To know about Magnetic Resonance Imaging (MRI)-: Principle, application, its advantage over computed tomography or ultra sonography. Its limitations, uses &amp; cross sectional anatomy. • To know about Spectroscopy-: Principle, application and uses.</p> |                        |
| 8 |                  |   | CO Mapping             |
|   | <b>UNIT 1</b>    | <b><u>Radio Nuclide Imaging:</u></b>  | <b><u>CO1, CO2</u></b> |
|   | A                | Basic principles of Nuclear medicine  | CO1, CO2               |
|   | B                | Instrumentations (Scintillation and detectors) of Radio Nuclide Imaging   | CO1, CO2               |
|   | C                | Radionuclide and their half life  | CO1                    |
|   |                  |   |                        |
|   | <b>UNIT 2</b>    | <b><u>Nuclear medicine instrumentation</u></b>  |                        |
|   | A                | Gamma camera, SPECT , PET scanner   | CO1, CO2               |
|   | B                | Production of radionuclide medicines, PET CT,PET MRI  | CO1, CO2               |
|   | C                | Bone radionuclide imaging   | CO1, CO2               |
|   |                  |   |                        |
|   | <b>UNIT 3</b>    | <b><u>Advancement in MRI</u></b>  |                        |
|   | A                | MRI, spectroscopy, Functional MRI   | CO5                    |
|   | B                | MR perfusion, diffusion   | CO5                    |
|   | C                | MR angiography ,dynamic study, CSF Flow metry   | CO5                    |
|   | <b>UNIT 4</b>    | <b><u>Advancement in USG</u></b>  |                        |
|   | A                | Advancements in Ultrasound,   | CO3                    |
|   | B                | Doppler ultrasound  | CO3                    |
|   | C                | Advance application in Doppler US   | CO3                    |
|   |                  |   |                        |
|   | <b>UNIT 5</b>    | <b><u>Advancement in CT</u></b>   |                        |

|  |                        |   |     |     |     |
|--|------------------------|---|-----|-----|-----|
|  | A                      | CT advancement, Advancement on detector technology  |     |     | CO4 |
|  | B                      | X ray tube  |     |     | CO4 |
|  | C                      | CT applications like, dual source CT, Portable CT,  |     |     | CO4 |
|  | Mode of examination    | Theory  |     |     |     |
|  | Weightage Distribution | CA  | MTE | ETE |     |
|  |                        | 30%   | 20% | 50% |     |
|  | Text book/s*           | <b>-Physics of diagnostic radiology (christensen),</b><br><b>-The essential physics of medical imaging (by bushberg 3<sup>rd</sup> edition)</b><br><b>- Text book of radiology for residents and technicians 5<sup>th</sup> Edition by Prof S.K Bahrgava.</b><br><b>Advance Imaging (AIIMS)</b> |     |     |     |
|  | Other References       | AERB website , Radiopedia   |     |     |     |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO308.1</b> | 2   | 2   | 3   | 3   | 3   |
| <b>CO308.2</b> | 2   | 2   | 3   | 3   | 3   |
| <b>CO308.3</b> | 3   | 3   | 2   | 3   | 2   |
| <b>CO308.4</b> | 3   | 3   | 3   | 2   | 3   |
| <b>CO308.5</b> | 3   | 1   | 2   | 1   | 1   |

|                      |                       |   |
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| <b>Program: BMIT</b> |                       | <b>Current Academic Year: 2020-21</b>                                 |
| <b>Branch: All</b>   |                       | <b>SEMESTER: FIFTH</b>  |
| 1                    | Course Code           | BIT-309   |
| 2                    | Course Title          | <b>Radiation Hazards, Protection And Planning of The Department-I</b> |
| 3                    | Credits               | 4   |
| 4                    | Contact Hours (L-T-P) | 3-1-0   |
|                      | Course Status         | Compulsory  |

|   |                  |   |
|---|------------------|---|
| 5 | Course Objective | <div>1. Defining, hands on practice and recognizing the imaging instruments and makes practices.</div> <div>2. Understanding, characterizing, explaining, identifying parts of imaging equipments and how to use it..</div> <div>3. Performing, demonstrating, implementing and applying the concept and physics of machines in better understanding the relevance Radiographic equipments.</div>   |
| 6 | Course Outcomes  | <div><b>CO1:</b> Introduction to Radiation Hazards, To develop understanding for biological effect of radiation and Orientation to Radiation Protection</div> <div><b>CO2:</b> Introduction to various radiation units – Roentgen, rad, rem, etc</div> <div><b>CO3:</b> TO develop understanding for Dosimetry, various radiation measuring instruments</div> <div><b>CO3:</b> To develop understanding for Principles and Methods of Radiation</div> <div><b>CO4:</b> To know about AERB related guidelines, , ICRP recommendations, measurement of X-ray and other radiation, rules of AERB</div> |
| 8 | CO Mapping       |   |
|   | <b>UNIT 1</b>    | <b><u>Introduction of radiation hazards</u></b>   |
|   | A                | Hazards and objectives  |
|   | B                | Direct and indirect effects of radiation  |
|   | C                | Principles of radiation protection and Methods of radiation protection  |
|   |                  |   |
|   | <b>UNIT 2</b>    | <b><u>Types of Radiation hazards on human body</u></b>  |
|   | A                | Somatic Effects And Genetic Effects   |
|   | B                | stochastic effect   |
|   | C                | Deterministic effects   |
|   |                  |   |
|   | <b>UNIT 3</b>    | <b><u>Radiation effect</u></b>  |
|   | A                | Radiation effects & hazards on pregnant women (tartogenic effect)   |
|   | B                | Radiations units  |
|   | C                | Radiation effect on DNA , RNA,,Radiation protection of female during radiographic examination   |
|   |                  |   |
|   | <b>UNIT 4</b>    | <b><u>Devices</u></b>   |
|   | A                | Radiation detection devices   |
|   | B                | Measurement devices   |
|   | C                | Radiation Doses<br>MPD (Maximum permissible   |
|   |                  |   |
|   | <b>UNIT 5</b>    | <b><u>Radiation protection</u></b>  |
|   | A                | Radiation protective equipment  |
|   | B                | Storage , handling and maintenance of radiation protective equipment/devices  |



|  |                     |   |     |     |         |
|--|---------------------|---|-----|-----|---------|
|  | C                   | Role of different regulatory bodies regarding radiation protection in india   |     |     | CO4,CO5 |
|  | Mode of examination | Theory  |     |     |         |
|  | Weightage           | CA  | MTE | ETE |         |
|  | Distribution        | 30%   | 20% | 50% |         |
|  | Text book/s*        | <b>Radiation Protection by Euclid Seeram.<br/>The essential physics of medical imaging (by bushberg 3<sup>rd</sup> edition)</b> |     |     |         |
|  | Other References    | AERB Webcontent   |     |     |         |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO309.1</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO309.2</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO309.3</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO309.4</b> | 2   | 2   | 2   | 3   | 2   |
| <b>CO309.5</b> | 3   | 2   | 3   | 2   | 3   |

|                      |                       |   |
|----------------------|-----------------------|---|
| <b>School: SAHS</b>  |                       | <b>Batch : 2018-21</b>  |
| <b>Program: BMIT</b> |                       | <b>Current Academic Year: 2020-21</b>                                   |
| <b>Branch: All</b>   |                       | <b>SEMESTER: SIXTH</b>  |
| 1                    | Course Code           | BIT 311   |
| 2                    | Course Title          | <b>Recent Advances In Imaging System and Contrast Media –II</b>         |
| 3                    | Credits               | 5   |
| 4                    | Contact Hours (L-T-P) | 4-1-2   |
|                      | Course Status         | <b>Compulsory</b>   |
| 5                    | Course                | 1. Defining, listing and recognizing the x ray films and identify image |

|   |                  |  |
|---|------------------|--|
|   | Objective        | artefacts and improve it..<br>2. Understanding, characterizing, explaining, identifying problems with x ray films and remove it from x ray film and improve image quality.<br>3. Performing, demonstrating, implementing and applying the concept of darkroom related in better understanding the relevance Radiographic image |
| 6 | Course Outcomes  | <b>CO1:</b> To learn about the Nuclear medicine and radionuclides<br><b>CO2:</b> To learn about the production of Radio-nuclide<br><b>CO3:</b> To learn about the cyclotron , SPECT,PET CT<br><b>CO4:</b> To learn about the Gamma camera<br><b>CO5 :</b> To learn about the OPG, Dental radiography                           |
| 8 | Outline syllabus | CO Mapping   |
|   | <b>Unit 1</b>    | <b>Basics of Nuclear medicine</b>  |
|   | A                | Basic principles of Radioactivity  |
|   | B                | Radionuclides and their different roles in Nuclear medicine department   |
|   | C                | Instrumentations (Scintillation and detectors) of Radio Nuclide Imaging Production of Radionuclides  |
|   |                  |  |
|   | <b>UNIT 2</b>    | <b>PRODUCTION OF RADIONUCLIDE</b>  |
|   | A                | Cyclotron  |
|   | B                | Fusion, radionuclide example and their half life originated from fusion  |
|   | C                | Fission, radionuclide example and their half life originated from fission  |
|   | <b>Unit 2</b>    | <b><u>Gamma camera</u></b>   |
|   | A                | Basic principle of gamma camera  |
|   | B                | Construction of gamma camera   |
|   | C                | Radionuclides used in gamma camera and role of gamma camera<br>Tc <sup>99m</sup> generator   |
|   | <b>Unit 3:</b>   | <b><u>SPECT, PET CT</u></b>  |
|   | A                | Basic principle of SPECT CT, PET CT Construction of SPECT and PET CT   |
|   | B                | FDG <sup>18</sup> and Role of FDG <sub>18</sub>  |
|   | C                | Clinical role of SPECT CT and PET CT   |
|   | <b>Unit 4</b>    | <b><u>Diagnostic radiology modalities and techniques</u></b>   |
|   | A                | DEXA , principle and working of DEXA   |
|   | B                | Digital OPG and Digital dental radiography   |

|  |                        |   |     |     |         |
|--|------------------------|---|-----|-----|---------|
|  | C                      | SONO CT, CT angiography, CT perfusion, MRI perfusion.<br>Mammography, Digital Mammography, different view of mammography  |     |     | CO5,CO5 |
|  | Mode of examination    | Theory  |     |     |         |
|  | Weightage Distribution | CA  | MTE | ETE |         |
|  |                        | 30%   | 20% | 50% |         |
|  | Text book/s*           | <b>-Physics of diagnostic radiology (christensen),</b><br><b>-The essential physics of medical imaging (by bushberg 3<sup>rd</sup> edition)</b><br><b>- Text book of radiology for residents and technicians 5<sup>th</sup> Edition by Prof S.K Bahrgava.</b><br><b>Advance Imaging (AIIMS)</b> |     |     |         |
|  | Other References       | AERB website , Radiopedia   |     |     |         |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO311.1</b> | 2   | 2   | 3   | 2   | 2   |
| <b>CO311.2</b> | 2   | 3   | 2   | 3   | 3   |
| <b>CO311.3</b> | 2   | 2   | 2   | 2   | 2   |
| <b>CO311.4</b> | 3   | 3   | 2   | 3   | 2   |
| <b>CO311.5</b> | 3   | 2   | 3   | 2   | 2   |

|                      |                       |   |
|----------------------|-----------------------|---|
| <b>School: SAHS</b>  |                       | <b>Batch : 2018-21</b>  |
| <b>Program: BMIT</b> |                       | <b>Current Academic Year: 2020-21</b>   |
| <b>Branch: All</b>   |                       | <b>SEMESTER: SIXTH</b>  |
| 1                    | Course Code           | BIT-312   |
| 2                    | Course Title          | <b>Radiation Hazards And Its Protections And Planning Of The Department. II</b> |
| 3                    | Credits               | 5   |
| 4                    | Contact Hours (L-T-P) | 4-1-0   |

|   |                        |   |     |                 |
|---|------------------------|---|-----|-----------------|
|   | Course Status          | <b>Compulsory</b>   |     |                 |
| 5 | Course Objective       | 1. Defining, listing and recognizing the patient care related issues and resolve it.<br>2. performing, demonstrating, implementing<br>3. Applying the concept of general patient care principle in better understanding the relevance Radiographic procedure.   |     |                 |
| 6 | Course Outcomes        | <b>CO1:</b> To develop knowledge<br><b>CO2:</b> To understand the radiological diagnostic needs for patients<br><b>CO3:</b> Learn planning and organization of work<br><b>CO4:</b> Able to handle effective Communication with Peers/ colleagues using medical terminology in communication<br><b>CO5 :</b> Learn Radiology Technician's role in maintaining patient's rights |     |                 |
| 8 | Outline syllabus       |   |     | CO Mapping      |
|   | <b>Unit 1:</b>         | <b>Diagnostic X-Ray room</b>  |     | <b>CO1, CO2</b> |
|   | A                      | Construction, Design Locations, Layout, Room Size   |     | CO1, CO3        |
|   | B                      | Shielding, Illumination, Control Panels, Waiting Area, Choice Of Equipment  |     | CO1, CO3        |
|   | C                      | Radiation Dosimetry In All Modalities   |     | CO1             |
|   | <b>Unit 2:</b>         | <b>Radiation Protection In Hospital</b>   |     |                 |
|   | A                      | Radiation protection in Cath lab  |     | CO1, CO2        |
|   | B                      | Radiation protection in operation theatre   |     | CO2, CO3        |
|   | C                      | Radiation protection in Wards, Radiation protection in emergency radiography  |     | CO3, CO4        |
|   | <b>Unit 3:</b>         | <b>Radiation measurement devices</b>  |     |                 |
|   |                        | TLD Badge , principle and working of TLD  |     | CO2             |
|   |                        | OSLD , principle and working of OSLD  |     | CO2,CO4         |
|   |                        | Film Badge , principle and working of Film badge  |     | CO3             |
|   | <b>Unit 4:</b>         | <b>Quality Control and Quality Assurance</b>  |     |                 |
|   | A                      | Quality Control and Quality Assurance of x-ray  |     | CO2             |
|   | B                      | Quality Control and Quality Assurance of CT   |     | CO3             |
|   | C                      | Quality Control and Quality Assurance of fluoroscopy, Quality Control and Quality Assurance MRI   |     | CO3             |
|   | <b>Unit 5</b>          | <b>Area monitoring devices</b>  |     |                 |
|   | A                      | GM Counter, principle and working of GM counter   |     | CO3             |
|   | B                      | Ionization chamber , principle and working of ionization chamber  |     | CO4             |
|   | C                      | Pocket dosimeter, principle and working of ionization chamber   |     | CO3,CO4         |
|   | Mode of examination    | Theory  |     |                 |
|   | Weightage Distribution | CA  | MTE | ETE             |
|   |                        | 30%   | 20% | 50%             |
|   | Text book/s*           | <b>-Radiation Protection by Euclid Seeram.</b><br><b>-The essential physics of medical imaging (by</b>  |     |                 |

|  |                  |  |  |
|--|------------------|--|--|
|  |                  | bushberg 3 <sup>rd</sup> edition).<br>-Quality Assurance in diagnostic radiology and imaging BY prof S.K Bhargava. |  |
|  | Other References | <ul style="list-style-type: none"> <li>Articles,journals</li> </ul>  |  |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO312.1</b> | 1   | 2   | 2   | 3   | 3   |
| <b>CO312.2</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO312.3</b> | 3   | 3   | 2   | 3   | 3   |
| <b>CO312.4</b> | 1   | 2   | 3   | 2   | 2   |
| <b>CO312.5</b> | 1   | 2   | 2   | 2   | 2   |

|                      |                       |  |
|----------------------|-----------------------|--|
| <b>School: SAHS</b>  |                       | <b>Batch : 2018-21</b>                                   |
| <b>Program: BMIT</b> |                       | <b>Current Academic Year: 2020-21</b>                    |
| <b>Branch: All</b>   |                       | <b>SEMESTER: SIXTH</b>                                   |
| 1                    | Course Code           | BIT-313  |
| 2                    | Course Title          | <b>Radiographic Techniques for Special procedures-II</b> |
| 3                    | Credits               | 6  |
| 4                    | Contact Hours (L-T-P) | 4-2-0  |

|   |                  |  |             |
|---|------------------|--|-------------|
|   | Course Status    | <b>Compulsory</b>  |             |
| 5 | Course Objective | 4. Defining, listing and recognizing the imaging instruments and makes practices.<br>5. Understanding, characterizing, explaining, identifying parts of imaging equipments and how to use it.<br>6. Performing, demonstrating, implementing and applying the concept and physics of machines in better understanding the relevance Radiographic equipments.      |             |
| 6 | Course Outcomes  | <b>CO1:</b> To learn about central nervous system and procedures<br><b>CO2:</b> To know about alimentary system and barium procedures<br><b>CO3:</b> To know about biliary system and techniques for biliary system procedures<br><b>CO4:</b> To know about liver and spleen radiography procedures<br><b>CO5 :</b> To know about the lymphatic system procedure |             |
| 8 | Outline syllabus |  | CO Mapping  |
|   | <b>Unit 1:</b>   | <b>Central Nervous System</b>  | <b>CO1,</b> |
|   | A                | Routine projections for skull and spine- ventriculography and encephography  | CO1         |
|   | B                | Injection of contrast media- film series to cover all ventricular outlines   | CO1         |
|   | C                | Central angiography, Myelography – methods of contrast injection.  | CO1         |
|   |                  |  |             |
|   | <b>Unit 2:</b>   | <b>Alimentary System</b>   |             |
|   | A                | Barium swallow , Pharynx and oesophagus contrast technique with valsalva manoeuvre – fistula   | CO2         |
|   | B                | Barium meal procedure for fluoroscopic examination of stomach, jejunum and colon appropriate timing- Diaphragmatic hernia- Post – operative examinations   | CO2         |
|   | C                | Barium meal follow through – plain film, erect, P.A., decubitus for abdominal , Barium enema- preparation of the patient- Administration of opaque medium- routine projections under fluoroscopic control, special techniques in colostomy, Hirschsprung's disease- double contrast enema with insufflation technique Insufflation. CT Colonoscopy               | CO2         |
|   | <b>Unit 3:</b>   | <b>Biliary system</b>  |             |
|   | A                | Routine projections for plain films differentiation of opacities in right hypochondrium (See genitor – urinary system) Respiratory movements.  | CO3         |
|   | B                | Oral cholecystography – preparation of the patient- advice on taking of oral opaque medium- reasons for non-appearance of opaque medium in system  | CO3         |
|   | C                | Intravenous cholecystography (I.V.C) Action of fatty meal- direct and indirect cholangiography- Demonstration of hepatic ducts.<br>PTC – indication , patient preparation and technique  | CO3         |

|  |                     |  |     |     |     |
|--|---------------------|--|-----|-----|-----|
|  | <b>UNIT 4:</b>      | <b>Liver and spleen</b>  |     |     |     |
|  | A                   | <b>Peumoperitoneum-</b> fluoroscopy and radiography of diaphragmatic excursion – selective Aortogram – splenohepatic enography.                                    |     |     | CO4 |
|  | B                   | <b>Arthography</b> – media for visualizing joint space-asepsie, special projections.   |     |     | CO4 |
|  | C                   | <b>Sinography-</b> tracing of fistulae and inflammatory conditions by opaque media and fluoroscopic control.   |     |     | CO4 |
|  | <b>UNIT 5</b>       | <b>Lymphatic system</b>  |     |     |     |
|  | A                   | soft tissue differentiation for regions concerned- calcification of glands-.   |     |     | CO5 |
|  | B                   | technique for lymphography with colour tracer and opaque media   |     |     | CO5 |
|  | C                   | Techniques for intraocular F.B. Technique for swallowed bones and obstructions to barium swallow- Techniques to locate non- opaque F.B- Technique for inhaled F.B. |     |     | CO5 |
|  | Mode of examination | Theory   |     |     |     |
|  | Weightage           | CA   | MTE | ETE |     |
|  | Distribution        | 30%  | 20% | 50% |     |
|  | Text book/s*        | <b>Special procedures (BY whitehouse).<br/>Radiographic positioning by Ronald L.Eisenberg MD</b>   |     |     |     |
|  | Other References    | • Radiopedia   |     |     |     |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO313.1</b> | 1   | 2   | 3   | 3   | 3   |
| <b>CO313.2</b> | 2   | 3   | 3   | 3   | 2   |
| <b>CO313.3</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO313.4</b> | 3   | 3   | 2   | 2   | 2   |
| <b>CO313.5</b> | 1   | 2   | 1   | 1   | 2   |

|                      |                                       |
|----------------------|---------------------------------------|
| <b>School: SAHS</b>  | <b>Batch : 2018-21</b>                |
| <b>Program: BMIT</b> | <b>Current Academic Year: 2020-21</b> |
| <b>Branch: All</b>   | <b>SEMESTER: SIXTH</b>                |
| 1 Course Code        | BIT-314                               |
| 2 Course Title       | <b>Radiographic Techniques-II</b>     |
| 3 Credits            | 6                                     |
| 4 Contact Hours      | 4-2-2                                 |

|   |                  |  |
|---|------------------|--|
|   | (L-T-P)          |  |
|   | Course Status    | Compulsory   |
| 5 | Course Objective | <ol style="list-style-type: none"> <li>1. Defining, listing and recognizing the anatomical structure of the human body in relevant to radiographic techniques.</li> <li>2. Understanding, characterizing, explaining, identifying and locating the anatomical structure of the human body irrespective to radiographic anatomy..</li> <li>3. Performing, demonstrating, implementing and applying the concept of general radiography in better understanding the relevance Radiographic Anatomy and understand diagnostic image.</li> <li>4. Analyzing, categorizing, comparing and differentiating the anatomical structure of the human body by radiographic image and applying on imaging technology as radiographic anatomy</li> </ol> |
| 6 | Course Outcomes  | <b>CO1:</b> To know regarding anatomical terminology and Positioning terminology<br><b>CO2:</b> To develop understanding about positioning of the Thorax and sternum<br><b>CO3:</b> To learn about ct basic protocols<br><b>CO4:</b> To learn to about MRI protocols , angiography<br><b>CO5:</b> To learn about foetal radiography, dental and HSG radiography  |
| 8 |                  | CO Mapping   |
|   | <b>Unit 1:</b>   | <b>Basic Projection</b>  |
|   | A                | Projection of shoulder joint, sternum.   |
|   | B                | S.I. Joint, Hip joint,   |
|   | C                | patella, calcaneum , lordic view chest, Apicogram.   |
|   |                  |  |
|   | <b>Unit 2.</b>   | <b>CT basic Protocol</b>   |
|   | A                | All different CT brain protocol HRCT temporal bone and 3d reconstruction   |
|   | B                | All CT thorax( NCCT, CECT, HRCT) and abdomen protocol  |
|   | C                | CT extremities protocols, VRT, SSD , MPR, MIP  |
|   | <b>UNIT 3:</b>   | <b>MRI Protocols</b>   |
|   | A                | All different MRI brain protocol   |
|   | B                | All different MRI MSK ( musko-skeltal) protocol (knee, shoulder, wrist, ankle, elbow, pelvis, bony pelvis etc.)  |
|   | C                | Multiparametric MRI studies (prostate gland , breast MRI), MRI Dynamic studies   |
|   | <b>UNIT 4:</b>   | <b>CT and MRI Angiography and special investigation</b>  |
|   | A                | CT carotid angiography , head and neck angiography, peripheral angiography, coronary angiography, pulmonary angiography , abdominal aorta angiography, triple phase live   |
|   | B                | MRI Brain angiography, Head and neck angiography, MRI epilepsy protocol , MRI pituitary dynamic study etc.   |



Beyond Bound

|  |                     |  |     |     |     |
|--|---------------------|--|-----|-----|-----|
|  | C                   | CT and MRI enterography, CT renal angiography  |     |     | CO5 |
|  | <b>Unit 5</b>       | <b><u>Procedures for feotal and female infertility</u></b>   |     |     |     |
|  | A                   | Techniques for evaluation of foetal development, maturity, abnormality, position and multiplicity – placentography - use of compensating filters--                             |     |     | CO5 |
|  | B                   | contrast media and soft tissue techniques – cystography and arteriography – pelvimerry - consolidation of radiation hazard – Cephalometry                                      |     |     | CO5 |
|  | C                   | Hystero- saipingography – preparation of patient- Alternative injection procedures – Radiation Hazards in Obstetric and Gynecological radiography. Dental radiography and OPG. |     |     | CO5 |
|  | Mode of examination | Theory   |     |     |     |
|  | Weightage           | CA   | MTE | ETE |     |
|  | Distribution        | 30%  | 20% | 50% |     |
|  | Text book/s*        | <b>-Radiographic positioning by Ronald L.Eisenberg MD</b><br><b>-K.C Clark</b>   |     |     |     |
|  | Other References    | <ul style="list-style-type: none"> <li>Radiopedia</li> </ul>   |     |     |     |

| POs<br>COs     | PO1 | PO2 | PO3 | PO4 | PO5 |
|----------------|-----|-----|-----|-----|-----|
| <b>CO314.1</b> | 3   | 3   | 3   | 3   | 3   |
| <b>CO314.2</b> | 3   | 3   | 3   | 3   | 2   |
| <b>CO314.3</b> | 2   | 2   | 2   | 2   | 2   |
| <b>CO314.4</b> | 1   | 1   | 2   | 1   | 2   |
| <b>CO314.5</b> | 3   | 2   | 1   | 2   | 3   |

**DEPARTMENT OF RADIOLOGY**  
**SCHOOL OF ALLIED HEALTH SCIENCES,**  
**SHARDA UNIVERSITY, GREATER NOIDA**  
**Rules for Internship Training Programme**

1) For the Degree of Bachelor of Imaging Technology, the students after passing the professional examinations as per the syllabi prescribed by the Sharda University, students shall undergo Six Months compulsory rotatory internship training Programme to develop skill and acquire Technical & clinical knowledge with efficiently handle the imaging machines independently.

2) These rules shall be implemented by Department of Radiology, School of Allied Health Sciences, Sharda University, Greater Noida, The evaluation of the interns shall be done very carefully by the In- charge, Internship Training Programme and the Head of the concerned department on the basis of the technical skill, knowledge and ability to handle the imaging machines and cases independently. The Dean of the college shall have to monitor Internship Training Programme in collaboration with Heads of the Department and Program coordinators.

3) The Coordinator, Heads of the Program shall be responsible for the maintenance of standard and records of the interns.

### **General -**

Internship is a phase of training where in a candidate is expected to learn technical skill , with fair independence in technical , where as to work under supervision at high risk areas; so that at the end of Internship he/ she is capable to handle the imaging machines independently.

The Rules & Regulations recommended by the Department of Radiology & , School of Allied Health Sciences,

- 1) The Dean of SAHS & HOD of radiology shall be authorized for implementation of Internship Programme & also for the issue of Internship completion certificate.
- 2) Internship shall commence not later than One week from the day of declaration of results of 3<sup>rd</sup> yr BRIT. Examination.
- 3) It shall be binding on the candidate to follow strictly, the code of conduct prescribed by the Department of Radiology,& School of Allied Health Sciences.
- 4) Compulsory Internship shall include rotational clinical assignments, Administrative skills over a period of 26 weeks.

On successful completion of Internship, to the satisfaction of the Programm coordinator, Head of Radiology Dept. & the Dean of SAHS, the Internship completion certificate shall be issued by the institution; and it will be forwarded to the Sharda University for the award of B.R.I.T. Degree.

## **OBJECTIVES -**

Radiological imaging encompasses different imaging modalities and processes to image the human body for diagnostic and treatment purposes and therefore plays an important role in initiatives to improve public health for all population groups. Furthermore, Radiological imaging is frequently justified in the follow-up of a disease already diagnosed and/or treated.

At the end of Internship Programme, the candidate shall be able to-

- 1) Handle all imaging machines independently.
- 2) Understand the rationale & basic investigative approach to the Medical system & produced images with minimization of radiation dose without compromising diagnostic e quality effectively or make a timely decision for referral to appropriate specialty.
- 3) Demonstrate skill of managing patients attending duration imaging procedures, by developing skills to use appropriate manipulative techniques and methods
- 4) Develop ability to understand radiation hazard concepts and its protections & use of appropriate devices as per required investigations.

## INTERNSHIP SCHEDULE -

Candidate shall be posted to four Rotational Technical assignments of total 26 weeks,

| Modalities                                      | Department/Place                          | Duration |
|---|---|----------|
| <b>CT Scan</b>                                  | Radiology Dept                            | 5 weeks  |
| <b>MRI</b>                                      | Radiology dept                            | 5 weeks  |
| <b>Digital/CR x ray/Special inv/Mammography</b> | Radiology dept                            | 4 weeks  |
| <b>Dental</b>                                   | School of Dental Sciences(Radiology dept) | 4 weeks  |
| <b>OT (Ortho)/Cath Lab</b>                      | Ortho Dept                                | 4 weeks  |
| <b>Casualty</b>                                 | Casualty                                  | 4 weeks  |

## EVALUATION-

During the rotational posting, student shall handle the imaging machines learn technical parameters and superficial clinical diagnosis on different modalities and handle the patients & also undertake skills of maintaining administrative records & Maintenance of equipment. The candidate shall maintain a **log book & record** all the events of the respective posting He /She shall be closely monitored by the Program coordinator and senior Technical staff in charge throughout the posting & the same shall also sign in the Log book on completion of the assignment.

There shall be Formative & summative assessment at the end of each of the 4 postings given in the schedules.

### **LEAVE FOR INTERNS -**

An internee shall be entitled for maximum 6 days leave (not more than 3 days at a time) during six Months period of internship posting.

An internee will not be permitted to avail more than 2 days leave in any department. The leave other than C.L. will not be admissible.

Any leave in excess of above rule or absence from the work on any ground should be treated, as absence and the intern shall have to complete the required attendance as a repeat day.

Internees cannot avail casual leave without prior permission to Dean \Principal\HOD/Program coordinator of the college, in emergency interns should intimate within 24 hours, with supporting reasons to the Dean\ Principal \ HOD. Any student taking Leave without prior permission will be compensated for 2 days.

Working hours for interns are to be not less than 7 hours per day.

He\She can avail weekly off\ Sunday and national \Govt. holidays permissible to hospital with prior permission of Hospital Authority.

### **Issue of Internship completion certificate**

Internee will be issued internship completion certificate by the Dean only after completion of internship training Programme satisfactorily.

Active verbs developed based on Bloom's Taxonomy

| Knowledge | Understand    | Apply       | Analyze       | Evaluate     | Create      |
|-----------|---------------|-------------|---------------|--------------|-------------|
| define    | explain       | solve       | analyze       | reframe      | design      |
| identify  | describe      | apply       | compare       | criticize    | compose     |
| describe  | interpret     | illustrate  | classify      | evaluate     | create      |
| label     | paraphrase    | modify      | contrast      | order        | plan        |
| list      | summarize     | use         | distinguish   | appraise     | combine     |
| name      | classify      | calculate   | infer         | judge        | formulate   |
| state     | compare       | change      | separate      | support      | invent      |
| match     | differentiate | choose      | explain       | compare      | hypothesize |
| recognize | discuss       | demonstrate | select        | decide       | substitute  |
| select    | distinguish   | discover    | categorize    | discriminate | write       |
| examine   | extend        | experiment  | connect       | recommend    | compile     |
| locate    | predict       | relate      | differentiate | summarize    | construct   |
| memorize  | associate     | show        | discriminate  | assess       | develop     |
| quote     | contrast      | sketch      | divide        | choose       | generalize  |
| recall    | convert       | complete    | order         | convince     | integrate   |
| reproduce | demonstrate   | construct   | point out     | defend       | modify      |
| tabulate  | estimate      | dramatize   | prioritize    | estimate     | organize    |
| tell      | express       | interpret   | subdivide     | find errors  | prepare     |
| copy      | Identify      | Manipulate  | survey        | grade        | produce     |
| discover  | indicate      | Paint       | advertise     | measure      | rearrange   |
| duplicate | Infer         | Prepare     | appraise      | predict      | rewrite     |
| enumerate | relate        | produce     | Break down    | rank         | role-play   |