DOW INSTITUTE OF RADIOLOGY

DOW UNIVERSITY OF HEALTH SCIENCES

OJHA CAMPUS

One-Year Diploma Program for On-Job Radiographers

ONE-YEAR DIPLOMA PROGRAM FOR ON-JOB RADIOGRAPHERS

SCOPE OF WORK:

The **One-Year Diploma Program for On-Job Radiographers** aims to enhance the technical, clinical, and interpersonal skills of radiographers, enabling them to contribute effectively to healthcare services.

OBJECTIVES

Upon completion of the program, participants will be able to:

1. Radiologic Skills and Knowledge

- Perform routine and advanced radiographic procedures with accuracy and adherence to protocols.
- Operate imaging equipment such as X-rays, CT, MRI, and ultrasound machines proficiently.
- Apply radiation safety principles to protect patients, colleagues, and themselves.

2. Patient Care

- Communicate effectively with patients to explain procedures and ensure their comfort.
- Manage patients with special needs, including pediatric, geriatric, and trauma cases.
- Respond to emergencies such as adverse contrast reactions or critical incidents with competence.

3. Technical Proficiency

- Perform equipment maintenance, quality control, and troubleshooting to ensure optimal performance.

- Minimize imaging artifacts and enhance image quality through technical adjustments.

4. Professional Development

- Demonstrate readiness for leadership roles within radiology departments.
- Pursue further education and specialization in areas such as interventional radiology, mammography, or nuclear medicine.
- Adapt to emerging trends and technologies, including artificial intelligence and hybrid imaging.

5. Contribution to Healthcare

- Enhance diagnostic accuracy, contributing to better patient outcomes and efficient workflows.
- Support multidisciplinary teams in complex diagnostic and therapeutic procedures.
- Uphold ethical and legal standards in radiography practice.

ELIGIBILITY CRITERIA:

The following eligibility criteria apply to interested candidates:

1. Academic Qualifications

- **Minimum Requirement**:
  - Intermediate / A levels or equivalent with a Pre medical background.
- **Additional Qualifications preferred (if any)** :
  - Diploma from Sindh Faculty Board
  - One year Certificate in basic radiography or any related healthcare training.

2. Professional Requirements

- Applicants must be currently employed as radiographers
- Minimum **3 years** of prior work experience in radiology or imaging services
- A recommendation or no-objection certificate (NOC) from the current employer to participate in the program.

FEE

Admission and Tuition fee : (PKR 70,000)

Examination fee : (PKR 15,000)

Total : (PKR 85,000)

PROGRAM STRUCTURE

The program consists of three core components: Theory, Practical, and Assessments

Syllabus for One-Year Diploma Program for On-Job Radiographers

Module 1: Radiologic Anatomy

- **Introduction to Anatomy for Radiographers**
  - Anatomical planes, directions, and terminology.
  - Imaging correlation with anatomical structures.
- **System-Specific Anatomy**
  1. **Skeletal System**:
     - Skull, spine, ribs, pelvis, and extremities.
  2. **Thoracic Cavity**:
     - Lungs, heart, mediastinum.
  3. **Abdominal and Pelvic Organs**:
     - Liver, spleen, kidneys, gastrointestinal tract, bladder, and reproductive organs.
  4. **Neuroanatomy**:
     - Brain, spinal cord, and cranial nerves (CT/MRI focus).
  5. **Vascular Anatomy**:
     - Arteries and veins visible on angiographic imaging.

Module 2: Radiologic Physics Basics of Radiation

  - Properties of X-rays and electromagnetic spectrum.
  - Production and interaction of radiation with matter.
- **Radiation Equipment**
  - X-ray tube construction and functioning.
  - Basics of fluoroscopy, CT, MRI, and ultrasound equipment.
- **Radiation Protection**
  - Principles of ALARA (As Low As Reasonably Achievable).
  - Shielding, collimation, and personal dosimetry.

- **Image Formation**
    - Factors affecting image quality (contrast, resolution, and noise).
    - Scatter radiation and its management.

Module 3: Radiology for Medical Technologists

- **Overview of Positioning for Routine Radiographs**
    - Chest, abdomen, spine, pelvis, extremities.
- **Special Techniques**
    - Skull, sinus, and dental radiography.
    - Pediatric and geriatric imaging techniques.
- **Contrast Studies**
    - Barium studies (swallow, meal, enema).
    - Intravenous Urography (IVU), Hysterosalpingography (HSG).
- **Portable and Emergency Radiography**
    - Techniques for bedside and trauma imaging.

Module 4: Advanced Imaging Modalities

- **Computed Tomography (CT)**
    - Principles, protocols, and contrast usage.
    - Imaging of the brain, chest, abdomen, and pelvis.
- **Magnetic Resonance Imaging (MRI)**
    - Principles and safety.
    - Imaging of the brain, spine, and joints.

Module 5: Patient Care and Communication

- **Patient Preparation and Positioning**
    - Explaining procedures and ensuring comfort.
    - Handling patients with special needs.

- **Ethical and Legal Considerations**
    - Informed consent and patient confidentiality.
    - Cultural sensitivity and professionalism.
- **Emergency Management**
    - Managing contrast reactions.
    - Basic life support (BLS) and first aid.

Module 6: Equipment Maintenance and Quality Control

- **Routine Maintenance**
    - Calibration of X-ray equipment.
    - Preventive maintenance of CT/MRI machines.
- **Quality Control (QC)**
    - Techniques to ensure consistent image quality.
    - Identifying and resolving artifacts.

Module 7: Emerging Trends in Radiology

- **Teleradiology and AI in Imaging**
    - Basics of remote imaging services.
    - Role of artificial intelligence in protocol and image reconstruction.

Modules 8: Quality Control in Radiology

- Calibration, equipment testing, and maintenance protocols.

Ensuring compliance with quality assurance standards

Teaching Methods:

Theory Classes

1. **Lectures**:
    - Use PowerPoint presentations with diagrams, animations, and videos.
    - Clinical cases to connect theory with practice.
2. **Interactive Sessions**:
    - Q&A discussions.
    - Group brainstorming on challenges like imaging errors.
3. **Case Studies**:
    - Review anonymized patient imaging for interpretation and anatomy correlation.
4. **Workbooks and Assignments**:

Workstation Rotations:

Candidates' rotations in CT & MRI if required

Duration: 48 Weeks (1 Year)

- **Theory Classes**: 5 classes of one hour duration on every Sunday
- **Assessments and Revision**: Monthly
- **Log Book** : Submission after every 03 months for verification

Assessment Methods:

Internal Evaluations: At the end of each module.

- Quizzes / BCQs on anatomy, physics, and techniques for example identifying anatomical landmarks in X-rays, CT, and MRI images and Correlating imaging findings with anatomical structures.
- Practical assessments on equipment handling and patient positioning. Operating X-ray, CT, and MRI equipment. Applying radiation safety measures. Troubleshooting equipment and optimizing image quality.

Final Examination at the end of the year:

- Theory / BCQ's: Marks: 100 (written exam covering all the modules)
- Viva: Marks: 100 (Demonstration of imaging techniques and Equipment)
- Total Marks: 200

Passing Marks 60% as per DUHS Policy

Certification:

Diploma Certificate awarded upon successful completion

Training Timings & Venue

Classroom lectures from 9 AM till 3 PM on every Sunday at Dow Institute of Radiology, Gulzar-e-Hijri, Ojha Campus, Suparco Road, Dow University of Health Sciences, KDA Scheme – 33, Karachi, Pakistan.

LOG BOOK: Submitted by the end of year, signed and attested by the parent institution

Program Benefits

This comprehensive curriculum ensures radiographers are skilled in:

- Understanding detailed radiologic anatomy for accurate imaging.
- Applying physics principles to optimize equipment performance and safety.
- Performing diverse imaging techniques with confidence.