



**CORE COMPETENCIES REFERENCE  
MANUAL FOR DIAGNOSTIC  
RADIOGRAPHERS  
TO PRACTISE IN ZAMBIA**

**CORE COMPETENCIES& MINIMUM STANDARDS**



## TABLE OF CONTENTS

### Contents

QUALIFICATION AND RESPONSIBILITIES:.....	3
1.0 INTRODUCTION .....	4
2.0 EXIT EXAMINATIONS AND AWARD OF THE DEGREE IN DIAGNOSTIC RADIOGRAPHY .....	4
3.0 LICENSURE EXAMINATIONS BY THE HEALTH PROFESSIONS COUNCIL OF ZAMBIA ..	4
4.0 COMPETENCE OUTCOME GUIDELINES.....	5
5.0 CORE COMPETENCIES: DIAGNOSTIC RADIOGRAPHERS .....	7
6.0 BLUEPRINT WEIGHTING.....	12
7.0 CORE PROCEDURES .....	13
8.0 REFERENCES MATERIALS.....	15

## QUALIFICATION AND RESPONSIBILITIES:

Title of the programme: Bachelor of Science Degree (BSc) Diagnostic Radiography or equivalent.

Key accountability for the job: Provide quality imaging services in health care facilities.

Primary roles and responsibilities:

- Knowledge of the basic and clinical sciences relevant to the practice of radiography
- Competence in clinical skills and patients care
- Professionalism and ethical practice
- Research
- Monitoring and evaluation
- Infection prevention
- Quality assurance
- Specialized radiographic examination
- Pattern recognition
- Patient care

## 1.0 INTRODUCTION

The Health Professions Council of Zambia (HPCZ) is a statutory body that was established by the Health Professions Act No. 24 of 2009. The Act renames and continues the existence of the Medical Council of Zambia established by the Medical and Allied Professions Act of 1977. The Health Professions Act No. 24 provides for the registration of health practitioner and regulation of their professional conduct; provides for the licensing of health facilities and the accreditation of health care services provided by health facilities; and provides for the recognition and approval of training programmes for health practitioners.

Following the issuance of the guidelines for introduction of licensing examinations for health professionals to be registered with the Health Professions Council of Zambia, this bulletin provides an outline of the core competencies and minimum standards for registrants who have completed the Bachelor Science in Diagnostic Radiography or its equivalent seeking registration as Diagnostic Radiographers in Zambia.

## 2.0 EXIT EXAMINATIONS AND AWARD OF THE DEGREE BSc DIAGNOSTIC RADIOGRAPHY

Training institutions, private or public(local and foreign) approved /recognised by the Health Professions Council of Zambia are mandated to examine and graduate their students under their own seal and authority as prescribed by the HPCZ act number 24 of 2009. The holder of the BSc Diagnostic Radiography or equivalent will be required to take and pass the HPCZ licensing examination to qualify for registration with the Council as a Diagnostic Radiographer.

## 3.0 LICENSURE EXAMINATIONS BY THE HEALTH PROFESSIONS COUNCIL OF ZAMBIA

A person shall not practise as a health practitioner, unless that person is registered as a health practitioner in accordance with the Health Professions Act No. 24 of 2009. In the exercise of its functions under this Act, the 2<sup>nd</sup> and the 3<sup>rd</sup> Council of the Health Professions Council of Zambia instituted Licensure Examinations to help maintain standards given the emergence of multiple private and public training institutions.

This bulletin on the Core Competencies and Minimum Standards for the Licensure Examinations for Diagnostic Radiographers to Work in Zambia binds all parties regulated under this Act. Examination fees for licensure examinations, as prescribed by the Council, are payable to the Health Professions Council of Zambia as part of the eligibility to sit for licensure examinations.

The HPCZ Licensure Examination assesses a Diagnostic Radiographer's ability to apply knowledge, concepts, and principles, and to demonstrate fundamental patient-centred skills, that are important in health and disease and that constitute the basis for safe and effective patient care. The HPCZ Licensure Examination includes, but is not limited to, theoretical and clinical examinations which complement each other as prescribed in the curriculum for which this programme was approved. No component is a stand-alone in the assessment of readiness for practice as Diagnostic Radiographer in Zambia.

The candidate will be assessed under three domains, namely:-

1. Knowledge
2. Skills

### 3. Attitude

The above domains will be assessed by means of a theory exam comprising of multiple choice questions followed by a composite objective structured clinical examination (OSCE) and practical.

The main subject areas assessed under all the three learning domains for Diagnostic Radiographers in Zambia are:

:

1. Patient care and Interpersonal effectiveness
2. Physics of Radiography
3. Human anatomy and physiology
4. Radiographic Pathology
5. Applied Imaging techniques
6. Specialised Imaging techniques
7. Pattern Recognition
8. Management and Entrepreneurship
9. Research

The overall expected outcome of the diagnostic radiographers Licensure examination is to ensure that the candidate will meet the minimum standards for the role as a Diagnostic radiographer.

## 4.0 COMPETENCE OUTCOME GUIDELINES

The curriculum must have identified attributes in each educational domain (knowledge, skills and attitude) and present them to guide student learning and assessment by examiners. HPCZ directs Diagnostic Radiographers to be compassionate and empathetic in caring for patients and to be trustworthy and truthful in all their professional dealings. Diagnostic Radiographers have a responsibility to respect and provide care that is up to standard for the lives and health that are entrusted by patients.

### Overall Outcomes

#### Knowledge, Skills and Performance

- Care of the patient is the first concern.
- Provision of a good standard of practice and care by keeping professional knowledge and skills up to date while recognizing the limits of one's competence.

#### Safety and Quality

- Prompt action if patient safety, dignity or comfort is compromised.
- Protect and promote the health of patients and the public.

#### Communication, Partnership, and Teamwork

- Uphold the respect of patient's autonomy and dignity.
- Uphold informed consent and confidentiality.
- Work with colleagues in ways that best serve the patient's interests.
- Work with honesty, integrity and fairness.

#### Maintaining Trust

- Work with honesty, openness and integrity.
- Uphold fairness with patients or colleagues.
- Safeguard the patient's and public's trust in the practitioner and the profession – never abuse the trust.

#### Management

- Demonstrate awareness and perform administrative duties and roles, and exhibit managerial skills
- Take up entrepreneurship challenges to complement public health services in the country.

5.0 CORE COMPETENCIES: DIAGNOSTIC RADIOGRAPHER

<b>DOMAIN : KNOWLEDGE</b>		
<b>COMPETENCY</b>	<b>COMPETENCY STATEMENT</b>	<b>SUBCOMPETENCIES</b>
Radiography techniques and rationale to the practice of the profession	demonstrate understanding and application of radiography techniques and rationale to the practice of the profession	<ul style="list-style-type: none"> <li>• Explain normal human body structure and function</li> <li>• Identify anatomical structures from radiographic images</li> <li>• Explain the radiographic techniques employed in the diagnosis of medical conditions</li> <li>• Analyse the disease process and identify disease patterns from radiological images</li> <li>• Explain the clinical reasoning underpinning decision making in medical imaging</li> </ul>

<p>radiobiology, radiation protection and radiation physics</p>	<p>demonstrate understanding and application of radiobiology, radiation protection and radiation physics to the Practice of the Profession</p>	<ul style="list-style-type: none"> <li>• Explain the radiation effects at the molecular and cellular level</li> <li>• Describe the effects of radiation on biological tissue</li> <li>• Apply the radiation protection principles to clinical practice</li> <li>• Describe the construction and operation of Imaging equipments and units</li> <li>• Discuss the radioactivity</li> <li>• Discuss x-ray production</li> <li>• Describe interactions of radiation with matter</li> <li>• Plan, Evaluate and Audit radiography quality assurance/control programs</li> <li>• Manage minor radiological and nuclear incidents and accidents</li> <li>• Develop an emergence response plan to a radiological/nuclear incidents and accidents</li> </ul>
---	--	---



<b>DOMAIN : SKILLS AND PERFORMANCE</b>		
<b>COMPETENCY</b>	<b>COMPETENCY STATEMENT</b>	<b>SUBCOMPETENCIES</b>
Plain film and Contrast studies	to perform plain x ray radiographs and contrast aided x ray examinations	i. Perform plain x ray radiographs and contrast aided x ray examinations according to protocol
		ii. Analyse and interpret medical imaging requests
		iii. Utilise immobilisation devices
		iv. Prepare room and equipment for imaging procedures
		v. Select appropriate imaging accessories
		vi. Obtain images of diagnostic quality
		vii. Recognise radiographic patterns
Ultrasound	perform ultrasound procedures	i. Analyse and interpreting medical imaging requests
		ii. Perform obstetric ultrasound
		iii. Perform gynaecological ultrasound
		iv. Perform general abdominal ultrasound
		v. Prepare patients and equipment
		vi. Identify contraindications for procedures
		vii. Care for equipment
CT, RNI , ANGIOGRAPHY and MRI	be able to work with minimal supervision in CT, RNI and MRI	i. Analyse and interpret MRI requests
		ii. Prepare patients for CT and MRI examinations
		iii. Screen patients
		iv. Conduct QA/QC procedures

		v. Conduct CT,RNI and MRI scanning of all regions using appropriate protocols
		vi. Perform Vascular studies
Patient care	be able to provide psycho and physical care to patients	i. Apply principles of multidisciplinary approach to patient management
		ii. Prepare patients for imaging procedures
		iii. Provide physical care to patient requiring imaging services
		iv. Assess the psychosocial requirements for patients accessing imaging services
		v. Manage interpersonal relationships and departmental work cooperation for best patient care
Quality Assurance	be able to participate in programmes that assure the delivery of quality radiography and adherence to radiation protection standards	i. Design and manage specific quality assurance checks and procedures required of radiographers
		ii. Oversee implementation of radiography quality assurance programme
		iii. Develop and implement Standard Operating Procedures that govern quality radiography
		iv. Assess and implement radiation protection requirements for a radiography department
Management and entrepreneurship	be able to effectively take up administrative and management responsibility in the health sector.	i. Provide leadership and mentorship
		ii. Plan and control resource management for a radiography department
		iii. Demonstrate awareness and apply administrative, management and finance principles.
		iv. Take up entrepreneurship challenges to complement public health services in the country.
Research	An entry level graduate	i. Conceptualize a research problem in radiography

	should be able to conduct research and disseminate research findings in form of a report.	ii. Carry out critical literature review using relevant data retrieval systems
		iii. Write a research proposal
		iv. Apply principles of scientific enquiry and collect data
		v. Utilize appropriate statistical methods and tools to analyse data
		vi. Interpret and discuss research findings in the context of published work
		vii. Demonstrate academic writing and research presentation skills

<b>DOMAIN : ATTITUDE</b>		
<b>COMPETENCY</b>	<b>COMPETENCY STATEMENT</b>	<b>SUBCOMPETENCIES</b>
Professionalism, medico-legal and ethics	Be able to apply professionalism, medico-legal and ethical principles in clinical practice	<ul style="list-style-type: none"> <li>i. Demonstrate awareness of ethics code of conduct and scope of practice</li> <li>ii. Be polite, considerate, trustworthy and honest, have integrity, maintain confidentiality, respect patients' and patients dignity and privacy, and understand the role of informed consent.</li> <li>iii. Respect colleagues and others irrespective of age, socio-economic status, political affiliation, race, religion or creed. Must teach and be teachable</li> <li>iv. Appreciate the role of multidisciplinary approach to care</li> <li>v. Appreciate the role of continuing professional development.</li> <li>vi. Be aware of own personal and professional limitations and enlist the help of colleagues and supervisors when necessary.</li> <li>vii. Communicate clearly, sensitively and effectively with colleagues, patients and their care-givers by active listening, sharing and responding appropriately.</li> </ul>

## 6.0 BLUEPRINT WEIGHTING

Outcome	Subject area	Sub-Subject	Assessment method	
			Theory	Practical
Radiography techniques and rationale to the practice of the profession	Applied Anatomy and physiology (Radiographic anatomy and physiology)		5	
	Radiographic techniques and clinical reasoning		10	10
Radiobiology, radiation protection and radiation physics to the Practice of the Profession	Radiobiology		10	5
	Applied Radiation Physics			
	Radiation Protection			
	Radiographic equipment		10	5
Plain film and Contrast aided studies	Plain Film	Axial Skeleton	18	20
		Appendicular Skeleton		
		Abdomen and pelvis		
		Chest		
		Head and Neck		
	Contrast Studies	GIT	15	15
		UGT		
		Others		
Pattern recognition		5	10	
Ultrasound	Obstetrics		10	5
	Gyne			
	General Abdomen			
Advanced Imaging techniques	CT		10	10
	MRI			
	NMR		2	

Patient care			5	10
Quality Assurance	Equipment		5	5
	Clinical			
Management and Administration	Management		5	
	Entrepreneurship			
professionalism, medico-legal and ethical principles in clinical practice	Ethics		5	5
	Medico-legal			
	Codes of conduct and scope of Practice			
			100	100

## 7.0 CORE PROCEDURES

The following procedures are the minimum standards and a full list could be found in the curriculum

<b>Specialized Radiographic Examinations</b>	i. Performs timely various specialised imaging examinations (Computed Tomography, Ultrasound, Magnetic Resonance Imaging, Cardiac catheterization Imaging procedures and Paediatric Imaging etc).
<b>Supervision</b>	ii. possess managerial skills required for department management ; clinical leadership and supervision of subordinates
<b>Radiographic Image Evaluation and</b>	iii. Make competent decisions pertaining to interpretation of medical diagnostic

<b>Interpretation</b>	images
<b>Assessment and Interpretation</b>	<ul style="list-style-type: none"> <li data-bbox="815 312 1411 528">iv. Conducts timely assessment on patients and interprets clinical requirements in order to determine the most appropriate imaging technique for the patient in order to get optimal diagnostic information.</li> <li data-bbox="815 528 1411 715">v. To manage complex and unpredictable situations including the ability to adapt planned diagnostic imaging examinations, interventions and to manage adverse, critical care incidents.</li> <li data-bbox="815 715 1411 821">vi. Critically evaluate radiographic equipment and assess suitability for intended examinations</li> </ul>

## 8.0 REFERENCES MATERIALS

Kindly refer to the curriculum for full list of books.

Imaging Procedures	Long, B., Rollins J.S., and Smith, B. (2016) Merrill's Atlas of Radiographic Positioning and Procedures, 13th ED. Mosby. ISBN: 9780323263412
	Whitley. A.S (2015), Clark's Positioning in Radiography, 13th Ed, CRC Press, ISBN 9781444122350. Long, B., Rollins J.S., and Smith, B. (2016) Merrill's Atlas of Radiographic Positioning and Procedures, 13th ED. Mosby. ISBN: 9780323263412
Patient Care & Interpersonal effectiveness	Ehrlich. R.A &Coakes.D.M (2016), Patient Care in Radiography, 9th Ed. Elsevier, ISBN : 9780323353762 Plotnik R. &Kouyoumdjian H. (2013), Introduction to psychology, 10th Edition
Imaging Processes & Analysis	Chesney D.N and Chesney M.O (2004). Radiographic Photography. Blackwell Scientific Publishers. ISBN-049802001
Physics of radiology	Bushberg J.T. (2016) The Essential Physics of Medical Imaging. ISBN-063801 Bushong.S.C (2013), Radiologic Science for Technologists, Mosby, Inc. ISBN: 978-0-323-08135-1
Human Anatomy and Physiology	Ryan, S., McNicholas, M., and Eustace, S. (2010) Anatomy in Diagnostic Imaging, 3rd Ed. ISBN 9780702048326
	Barett KE, Barman SM, Boitano S, Brooks H. (2012). Ganong's Review of Medical Physiology 24 <sup>th</sup> Edition. McGraw Hill Medical. 978-0071780032.
Radiographic Pathology	Robbins, S.L, Angell, M and Kumar, V (2012). Basic Pathology. W. B Saunders Company, Philadelphia

	Eisenberg R.L, Johnson N.M. (2015), <i>Comprehensive Radiographic Pathology</i> , 6th ed. Mosby. ISBN- 9780323353243
Specialized Imaging Techniques	
INTERPERSONAL & COMMUNICATION SKILLS	Rothmans, J K <i>Epidemiology: An introduction</i> , Oxford University Press
	Guffey ME (2007) <i>Essentials of Business Communication</i> 7th ed. Australia: South-Western College Publishing.
	Hybels S, Weaver R (2004) <i>Communicating Effectively</i> . 7th ed. New York: McGraw-Hill
PROFESSIONALISM	HPCZ (2016) <i>Guidelines for good practice in the Healthcare profession – Maintaining Patient Confidentiality</i> . HPCZ Lusaka
	HPCZ (2016) <i>Guidelines for good practice in the Healthcare profession – Generation and management of patient records</i> . HPCZ Lusaka
	HPCZ (2014) <i>Professional code of ethics and discipline: Fitness to Practice</i> . HPCZ Lusaka
	HPCZ (2016) <i>Patients rights and responsibilities</i> . HPCZ Bulletin, Lusaka
	Banda S.B. Healthcare Ethics and Professionalism Course. <a href="https://virtualsityacademy.com/">https://virtualsityacademy.com/</a>
SYSTEM-BASED PRACTICE	Cole A (2002) <i>Personnel and Human Resource Management</i> . London: Book Power.
	Handy CB (2000) <i>Understanding Organizations</i> . Oxford: Oxford University Press.



