No. 298 **20 March 2009**

SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)

In accordance with Regulation 24(c) of the National Standards Bodies Regulations of 28 March 1998, the Task Team for

Radiography and Clinical Technology

registered by Organising Field 09 – Health Sciences and Social Services, publishes the following Qualification for public comment.

This notice contains the title, field, sub-field, NQF level, credits, and purpose of the Qualification. The full Qualification can be accessed via the SAQA web-site at **www.saqa.org.za**. Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, SAQA House, 1067 Arcadia Street, Hatfield, Pretoria.

Comment on the Qualification should reach SAQA at the address below and ***no later than 20 April 2009.*** All correspondence should be marked **Standards Setting – Task Team for Radiography and Clinical Technology** and addressed to

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ACTING DIRECTOR: STANDARDS SETTING AND DEVELOPMENT

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

QUALIFICATION:
Master of Radiography

SAQA QUAL ID	*QUALIFICATION TITLE*		
66229	Master of Radiography		
ORIGINATOR		*PROVIDER*	
TT - Radiography and Clinical Technology			
QUALIFICATION TYPE	*FIELD*	*SUBFIELD*	
Masters Degree	9 - Health Sciences and Social Services	Curative Health	
ABET BAND	*MINIMUM CREDITS*	*NQF LEVEL*	*QUAL CLASS*
Undefined	180	Level 8 and above	Regular-ELOAC

This qualification does not replace any other qualification and is not replaced by another qualification.

PURPOSE AND RATIONALE OF THE QUALIFICATION
Purpose:

This qualification will enable successful learners to make a contribution to a chosen field of radiography through independent research, using advanced problem-solving skills and critical, reflective thinking. The learner will report the findings in a manner that meets accepted criteria and ethical principles of the profession. The research problem, its justification, process and outcome will be reported in a dissertation that complies with the generally accepted norms for research at a Master's level. In this way the learner will make a contribution to the existing body of knowledge for radiography ranging from fundamental concepts to advanced theoretical or applied knowledge that will develop and advance the Radiography profession.

Rationale:

The South African Government has expressed a need for both specialised radiographers who can operate independently at an advanced level in radiography departments, as well as those who will make a contribution, through independent research in a chosen field. This Qualification has been structured to meet the latter need and provide for research within radiography through the inclusion of a research dissertation that complies with the accepted norms, criteria and ethical principles for research at that level. Learners obtaining this qualification will be able to conduct research within the field of radiography and present their findings at local and international conferences/seminars as well as publish them in accredited publications. This is in keeping with the Government's need for education to develop the area of science and technology.

RECOGNIZE PREVIOUS LEARNING?
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LEARNING ASSUMED IN PLACE
> Successful completion of a Professional Degree in Radiography, or recognised equivalent.
> Knowledge of the fundamental principles and concepts of research and statistical methods.

Recognition of Prior Learning:

Recognition of Prior Learning (RPL) is awarded on application by the learner for RPL to the accredited educational institution. RPL is awarded at the discretion of the educational institution and in agreement with the relevant Education and Training Quality Assurance body.

Access to the Qualification:

Access to the Qualification is open to learners who meet the entry requirements of the institution offering the Qualification as well as the specifications of the Registering Statutory Professional Council.

QUALIFICATION RULES
This Qualification may be obtained in one of two ways:

> Research only resulting in the production and presentation of a dissertation at the required level.
> Research resulting in the production and presentation of a dissertation and/or report(s) at the required level to the value of at least 50% of the total credits of the Qualification, plus additional course work at the level of the Qualification to make up the balance of the required credits.

EXIT LEVEL OUTCOMES
1. Demonstrate advanced application of concepts, methods, ethics, theories and analytical processes in relation to a chosen focus area of radiography and associated fields.

2. Access, analyse and critically evaluate existing knowledge in radiography.

3. Access, process, produce and communicate information to colleagues and other groups.

4. Engage in independent research, selecting appropriate research designs, methods, techniques and technologies in the chosen focus area and produce findings in the form of a research report.

5. Demonstrate an in-depth understanding of own position in relation to major debates within the chosen field of radiography.

6. Demonstrate specialist forefront knowledge and expertise in the chosen field of radiography and the competency to apply these creatively within the chosen field.

7. Critically analyse and evaluate the outcomes of radiography interventions, techniques, strategies, or processes in the chosen field.

Critical Cross-Field Outcomes:

> Identifying, analysing and solving problems in the professional, individual and societal environments creatively are demonstrated through the process of writing up of a research proposal and dissertation and if a course work module is incorporated, though critical thinking and applying reflective skills.
> Working effectively with others as a member of a team, group, organisation and community in the health care and educational environment will be achieved by communicating the research findings to peers, stakeholders and through publication and presentations and skills gained through advanced study of specialised technologies.
> Organising and managing oneself and one's activities responsibly and effectively is demonstrated by the learner's ability to independently source information and logically present a proposal and finally a dissertation or research report(s) in liaison with a mentor and supervisor.
> Collecting, analysing, organising and critically evaluating information, enables the learner to develop a research proposal and follow the accepted research steps to achieve the completion of a dissertation or report(s).

> Communicating effectively within the health care and educational environment, using visual, mathematical and/or language skills in the modes of oral and or written presentation are demonstrated in the acquisition of research material which is presented to peers.
> Using science and technology effectively and critically, showing responsibility towards the environment and health of others is demonstrated in the design, acquisition of material and presentation of the research project.
> Demonstrating an understanding of the world as a set of related systems by recognising that the problem solving contexts do not exist in isolation is achieved in the research methodology and achievement of research outcomes.

> In order to contribute to the full personal development of each student and the social and economic development of the society at large it must be the intention underlying any programme of learning to make an individual aware of the importance of:
> Reflecting on and exploring a variety of strategies to learn more effectively.
> Participating as responsible citizens in the life of local, national and global communities.
> Being culturally and aesthetically sensitive across a range of social contexts.
> Exploring education and career opportunities.
> Developing entrepreneurial opportunities.

Medical and research ethics and legal issues pertinent to research in technology are critically reflected on, included in the proposal and adhered to during the research process:

> Data is gathered using the selected methodology.
> Data is analysed using the relevant statistical or other tools.
> Research results are critically analysed, evaluated and discussed.
> The dissertation is written up and presented according to specified criteria.
> Findings are communicated to a professional audience through oral/poster presentations and/or institutional seminars and/or publications.

ASSOCIATED ASSESSMENT CRITERIA
Associated Assessment Criteria for Exit Level Outcome 1:

1.1 Discussions reflect a clear understanding of the context (including policy, legislation and global issues), appropriate concepts, methods, ethics, theories and analytical processes in the chosen field.
1.2 Presentations reflect the appropriate application of the relevant concepts, methods, ethics, theories and analytical processes in the chosen field.
1.3 Written work on the chosen field displays critical analyses and intellectual independence.

Associated Assessment Criteria for Exit Level Outcome 2:

2.1 Current literature and research are accessed, analysed and evaluated systematically in the chosen focus area.
2.2 Evaluations demonstrate clear evidence of effective application of the principles of radiography research practice.
2.3 Conclusions and recommendations are justified by the use of appropriate evidence and arguments.

Associated Assessment Criteria for Exit Level Outcome 3:

3.1 Discussions reflect the ability to obtain process and communicate information effectively to colleagues and other groups.
3.2 Presentations display analytical skills and a degree of intellectual independence.
3.3 Written and oral communication conveys and appropriately highlight the information to specific target groups.

Associated Assessment Criteria for Exit Level Outcome 4:

4.1 The research inquiry is planned and conducted on the basis of a range of appropriate research designs, methods, techniques and technologies for the specific research problem.
4.2 Research themes are appropriately identified and demarcated.
4.3 Analyses of the selected research theme include a comprehensive and critical review of current literature and investigations.
4.4 Selected research methods, techniques and technologies are based on a clear understanding of radiography research theory and practice.
4.5 Research reports critically and coherently describe theoretical arguments, the research process, methodology, results, conclusions and recommendations.
4.6 Research reports display skill in extrapolating key findings, justifiable conclusions and making feasible recommendations.

Associated Assessment Criteria for Exit Level Outcome 5:

5.1 Motivations of own position to specific debates are based on a sound integration of relevant theory, practice, research and a degree of independent, creative thinking.
5.2 Discussions demonstrate understanding of own position and its feasibility in relation to major debates.
5.3 Written and oral formats clearly and cogently communicate explanations of own position.

Associated Assessment Criteria for Exit Level Outcome 6:

6.1 Analyses of the problems and issues reflect a purposeful and critical application of advanced theory, current knowledge and expertise in the focus area.
6.2 Interventions and/or recommendations reflect purposeful and creative plans to seek solutions based on theory and proven methods in the chosen field.
6.3 Discussions and/or interventions reflect advanced application of appropriate skills, strategies and techniques in accordance with corresponding theoretical assumptions in the chosen field.
6.4 Research and/or interventions include the appropriate and creative use of radiography tools and/or data relevant to the chosen field.

Associated Assessment Criteria for Exit Level Outcome 7:

7.1 Evaluations comprehensively describe outcomes of interventions, techniques, strategies or processes in relation to the stated goals and in accordance with corresponding theoretical assumptions.
7.2 Evaluations critically analyse outcomes in accordance with the identified needs and issues within the chosen focus area.
7.3 Evaluations are purposefully used as the basis for planning, implementation and recommendations.

Integrated Assessment:

Learners work is assessed in terms of the procedures of the provider institution.

INTERNATIONAL COMPARABILITY

The South African Government has expressed a need for both a specialised radiographer who can operate independently at an advanced level in radiography departments as well as a radiographer who will make a contribution, through independent research in a chosen field. The developed Qualification should further be comparable with qualifications offered else where in the world. This will ensure that South Africa is on par with international trends and that the learners who graduate with this Qualification will have employment opportunities both nationally and internationally. In trying to determine the comparability of this Masters programme for radiography, Australia and Hong Kong qualifications were used for comparison.

As a first-world country, Australia has proven to be advanced in the field of radiography as one of the first world countries. Hong Kong is among the developing countries and, as such, is more closer to the South African situation.

Master of Medical Imaging Science is offered by the Curtin University of Technology in Perth, Australia. This course is offered over a two year period on a full time basis.

Course entry requirements:

Learners wishing to enrol for this course should be in possession of a degree in health sciences and have knowledge of human biology, pathology and physics. Recognition of Prior Learning is considered on individual bases for professionals from other healthcare professions who wish to enter the field of medical imaging science.

Course organisation, assessment and accreditation:

Learners who enrol for this course should be ready to participate in full laboratory practical sessions where assessments are at levels higher than those applied in undergraduate programmes will be conducted. Successful learners receive a Statement of Accreditation from the Australian Institute of Radiography. This entitles them for employment in Australia and other internationally aligned states.

The course is designed to empower learners to develop higher levels of knowledge and skills in the field of medical imaging. Some of the subjects included are:

> Medical physics.
> Imaging anatomy.
> Medical imaging science.
> Clinical medical imaging science.
> Medical imaging instrumentation.
> Comparative imaging.
> Image interpretation.

From the list provided, there seems to be no research module undertaken or any research project competed by the learners in this programme. A further point of difference about this qualification is that it is designed for diagnostic radiographers only.

A Master of Diagnostic Radiography or Nuclear Medicine or Radiation Therapy is offered by the University of Sydney. These programmes are delivered as separate streams each as full-time study over a period of two years. Accreditation for the Diagnostic Radiography and Radiation Therapy is granted by the Australian Institute of Radiography while Nuclear Medicine is accredited by the Australian and New Zeeland Society of Nuclear Medicine. To be allowed to practice in Australia after completing any of these courses, successful learners are expected to complete an internship for a period of one year.

Course structure and delivery:

This takes the form of inquiry-based study and involves a blend of research-led teaching and self-directed learning. The common subjects among the three streams include:

Core:

> Medical radiation science, 1, 2 and 3.
> Foundations of Healthcare practice.
> Research studies 1 and 2.

> Integrated imaging and treatment.

Electives available (learners choose any one of these):

> Body function for health professionals.
> Clinical orientated musculo-skeletal anatomy.
> Evidence based healthcare.
> Function and dysfunction of body systems.
> Sociology for health professionals.
> Introduction to epidemiology.
> Occupational health.
> Patient/practitioner communication.
> Psychology for graduate students.

For each of the speciality courses, the learner must also complete professional practice 1, 2, 3 and 4 as well as the associated clinical studies one to four.

The masters programme offered at Sydney University compares relatively well to the course work masters programme developed for South Africa. One of the differences between the two qualifications is the wide selection of electives provided by the University of Sydney. The other difference is that the South African qualification is designed to encompass all four radiography disciplines whereas the Sydney University programme accommodates only three of the disciplines.

Masters in Health Science (Medical Sonography) at the University of Sydney requires that learners, to be accepted into this study programme, one should have one of the following qualifications:

> Degree or diploma in medical radiation sciences.
> Degree or diploma in a relevant area such as nursing. Candidates would be advised to make up for the deficiencies in physics and medical imaging modules.
> Associated diploma or certificate in Nuclear medicine.
> Any other qualification which will meet the approval of the Head of Discipline is sufficient merit for a learner to be granted admission to the programme.
> A candidate without ultrasound background would be expected to work in the ultrasound department for the duration of study.

A Master of Science in Health Technology (Medical Imaging and Radiation Therapy) is offered by the Polytechnic University in Hong Kong. This course is offered for professionals in medical imaging and radiation therapy with the aim of developing specialists to enhance their career paths. This course is further aimed at encouraging professionals in the field of imaging and radiation therapy to develop critical analytical skills for self evaluation of professional practices. The inclusion of the research project is aimed at equipping the learners with the necessary skills in research so that they can perform evidence-based practice in the delivery of healthcare services and industry.

Entrance requirements:

A bachelor's degree or equivalent in radiography or a related health sciences discipline from a recognised institution. A bachelor's degree offered at Polytechnic University runs for three years and an honours programme runs for a year; both are full time courses. There is neither a research project nor an introduction to research in either the undergraduate or honours programmes.

Course content, assessment and accreditation.

There are compulsory, weekly evening contact sessions over a period of 14 weeks. Subjects are grouped as follows:

> Research methods and Biostatics (compulsory).
> 9 other subjects may be chosen form speciality areas such as radiation therapy.

To be awarded the degree in full (30 credits), the learner should complete the following:

> Compulsory subject.
> Four core specialisation subjects.
> Two elective subjects (from any subjects in the Scheme).
> Research based dissertation or three other subjects form the Scheme.

Learners, who successfully complete the required 30 credits with fewer than the required four core specialisation subjects, are awarded a generic MSc without a specialisation field.

Learners who successfully complete 18 credits and decide to discontinue their studies at that point, may request to be awarded a postgraduate diploma, within their field of specialisation.

The learners may select from the following list of core subjects:

> Advanced technology and clinical application in computed tomography.
> Advanced technology and clinical application in magnetic resonance imaging.
> Radiotherapy planning and dosimetry.
> Multiplanar anatomy.
> Advanced ultrasonography.
> Independent study.
> Health services management.

The courses described above compare fairly well with the South African Masters in Radiography, in that they are all focused on enhancing the knowledge and skills of radiographers, as well as ensuring that radiographers develop research skills to evaluate the quality of services they deliver to the community. The entrance requirements and assessment processes also compare. This is specifically true for the course work masters programme.

The Hong Kong qualification is focused only on diagnostic radiography and radiation therapy while the Australian qualification extends into ultrasound and nuclear medicine. This means that in Hong Kong, ultrasound is not offered as a separate course but as part of diagnostic radiography. On this point, it appears that the Australian qualification is more in line with the South African qualification in as far as the demarcation of the four radiography categories is concerned.

The qualification from Hong Kong, in the various options provided for the awarding of the degree in full, without specialisation or even as post graduate diploma, compares fairly with the certificate courses which are offered by most of the institutions of higher learning in South Africa. The radiographers in South Africa have the option of enrolling either for the full masters programme with specialisation in the electives listed in the bachelor's degree, or enrol for post graduate courses. The courses that have been currently accredited by the relevant Professional Council for this purpose are:

> Mammography.
> Computed tomography.
> Magnetic resonance imaging.
> Radiobiology.

Neither of the two foreign qualifications discussed has a full research component for the masters degree as has the one developed in South Africa. The full masters' qualification is in line with other qualifications in the healthcare professions offered in South Africa and is in line with the Department of education's expectation for the research component of a master's degree. There is a need for South African learners to conduct applied research in an attempt to improve the knowledge base of the professions and thereby contribute to high quality service delivery and the needs of the country.

Conclusion:

This qualification has been structured to meet the needs of the South African society and provide for research within radiography through the inclusion of a research dissertation that complies with the accepted norms, criteria and ethical principles for research. This allows for the preparation of successful candidates to conduct research at the doctoral level. The developed Qualification compares fairly well with the international landscape.

ARTICULATION OPTIONS

> This Qualification articulates vertically with the Doctoral Degree in Radiography or other related qualifications.
> This Qualification articulates horizontally with like degrees in the field of radiography or other related fields.

MODERATION OPTIONS

> Assessment and moderation will be conducted by specifically appointed internal/external assessors/moderators at an equivalent or higher qualification in accordance with institutional policy and procedures and the requirements of the relevant ETQAs.

CRITERIA FOR THE REGISTRATION OF ASSESSORS

N/A

NOTES

N/A

UNIT STANDARDS

This qualification is not based on Unit Standards.

LEARNING PROGRAMMES RECORDED AGAINST THIS QUALIFICATION

None