SECTION A:	QUALIFICATION DETAILS

QUALIFICATION DEVELOPER (S)	University of Botswana

TITLE	Doctor of Philosophy in Design and Technology Education	NCQF LEVEL	10

STRANDS (where applicable)	1. 2. 3. 4.

FIELD	Education and Training	SUB-FIELD	Training	CREDIT VALUE	390

New Qualification	✓	Legacy Qualification	

SUB-FRAMEWORK	General Education		TVET		Higher Education	✓

QUALIFICATION TYPE	Certificate	I	II	III	IV	V	Diploma	Bachelor	
	Bachelor Honours		Post Graduate Certificate				Post Graduate Diploma		
	Masters						Doctorate/ PhD		✓

RATIONALE AND PURPOSE OF THE QUALIFICATION

RATIONALE:

The qualification has been designed to respond to Botswana's social and economic needs and that of the region, especially in areas of design and technology. It is aligned to the key strategic sectors of manufacturing, creative industries, research, innovation, science, and technology as identified by the Human Resource Development Council, which requires a high workforce demand to transform Botswana into a knowledge-based and circular economy. The qualification's core mandate is to produce researchers in Design and Technology. The qualification is in congruence with the Faculty of Engineering and Technology's vision of being the leading centre of excellence in engineering and the built environment in the world. The qualification contributes towards

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the strategic role of meeting the country's development needs through advancing human resource development and developing research and innovation capacity (Towards a Knowledge Society. Tertiary Education Policy, 2010; Revised National Policy of Education 1994; National Human Resource Development Plan, 2009-2022; Education and Training Sector Strategic Plan, 2015; National Development Plan 11, 2017 and HRDC, 2019 top occupations priority area report list University and Higher Education Teachers as top occupations in demand for Botswana. Furthermore, this qualification is commensurate with three pillars of Vision 2036 of producing 'sustainable economic development, human and social development, and sustainable environment' and key future imperatives of research, innovation, and sustainability.

PURPOSE: (itemise exit level outcomes)

The purpose of the qualification is to equip graduates with the most advanced knowledge, skills, and competences to:

1. Demonstrate the most advanced Knowledge at the frontier of a field of work to propose, design, and conduct research and inquiry to improve practice and promote equity in design and technology education.

2. Use advancement of frontiers of existing knowledge to make original contribution to knowledge in design and technology education practice.

3. Demonstrate the ability to undertake original and scholarly research of international standard to critical analyse, evaluate, and synthesise new and complex design and technology education areas to solve problems.

4. Demonstrate skills in oral and written communication sufficient to publish research work in renown peer-reviewed outlets and present work at conferences in design and technology education and prepare grant proposals.

5. Demonstrates strategic leadership, and high-level professional academic integrity in adherence to personal and professional ethics appropriate to design and technology education.

6. Exercise a high-level of authority in the application of research findings to improve professional practice in design and technology education.

MINIMUM ENTRY REQUIREMENTS (including access and inclusion)

The standard requirements for entrance to the Doctoral Degree qualification shall be:

• NCQF Level 9.

• Recognition of Prior Learning (RPL) and Credit Accumulation and Transfer (CAT) shall be considered according to the policies for access aligned with BQA/National policies.

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SECTION B	QUALIFICATION SPECIFICATION

GRADUATE PROFILE (LEARNING OUTCOMES)	ASSESSMENT CRITERIA
Demonstrate most advanced knowledge and understanding in the core knowledge areas of Design and Technology (learning theories, design theories, technology and its applications in education and learning).	• Guide research learners to complete a research paper as part of a module requirement. • Publish manuscripts in peer-reviewed journals. • Present papers at academic conferences, seminars & workshops. • Source and access current design and technology applications and best practices relating to education and learning.
Analyse the literature and identify key areas of research (gaps) in Design and Technology Education.	• Guide research learners to develop a comprehensive research proposal. • Publish manuscripts in peer-reviewed journals. • Present papers at academic conferences, seminars & workshops. • Identify and clearly articulate the key research gaps in Design and Technology Education. • Assess whether the identified research gaps have the potential to address significant issues or challenges in the field.
Demonstrate most advanced critical thinking skills and the ability to apply research findings to real-world problems in the field of Design and Technology Education.	• Guide research learners to develop a comprehensive research proposal. • Publish manuscripts in peer-reviewed journals. • Present papers at academic conferences, seminars & workshops. • Formulate appropriate research questions. • identify and apply methodologies needed to address them. • Develop innovative solutions, interventions, or strategies to address challenges in teaching, learning, or curriculum development.

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Apply knowledge and methodologies to create new knowledge in response to posed research questions and expand knowledge development.	- Guide research learners to create new knowledge, products and services that solve challenges in society. - Publish manuscripts in peer-reviewed journals. - Present papers at academic conferences, seminars & workshops. - Conduct comprehensive literature review to identify gaps that are significant for further research investigations. - Apply theory and most advanced research methodologies to contribute to knowledge development in Design and Technology. - Demonstrate the ability to develop original ideas to design and analyse intricate solutions in Design and Technology. - Statistically analyse high quality research data and validate the research data. - Apply acquired knowledge independently by determining the learning and research requirements, source of information and critically analyse assumptions and embrace new knowledge.
Demonstrate strong written and oral communication skills.	- Publish manuscripts in peer-reviewed journals. - Present papers at academic conferences, seminars & workshops. - Publish technical reports. - Convey ideas clearly and effectively through both written and oral communication, maintaining a coherent flow of information to the intended audience.
Communicate professionally to experts, practitioners, and non-professionals.	- Publish manuscripts in peer-reviewed journals. - Generate scientific outputs and reports in journals and present papers at academic conferences, seminars & workshops. - Publish technical reports.

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	• Produce and defend research findings using appropriate structure, style, and language.
Provide leadership resulting in the extension of professional and theoretical knowledge base.	• Demonstrate leadership skills and the ability to collaborate with other researchers, educators, and stakeholders in the field of Design and Technology Education. • Lead research projects, organising conferences or workshops, or working with industry partners to bridge the gap between academia and practice. • Invitation to key stakeholder's engagements (conferences, seminars, workshops, policy forums, etc.). • Invitation to serve in corporate boards. • Invitation to serve in national task forces or technical committees.
Demonstrate most advanced knowledge and understanding of professional standards of ethics and conduct.	• Conduct research ethically and according to educational policies and standards in the field of Design and Technology Education. • Apply for research permits in relevant Ministries. • Acknowledging other sources in own research work. • Engage and secure membership with professional organisations, conferences, and networks in the field of Design and Technology Education.
Demonstrate most advanced knowledge and understanding to teach university-level modules in the areas of specialisation.	• Develop modules as per the requirements of national and international accreditation bodies. • Facilitate assigned university modules. • Assess learners taught in each assigned module. • Evaluate modules taught through students' assessments.

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SECTION C	QUALIFICATION STRUCTURE				
COMPONENT	**TITLE**	**Credits Per Relevant NCQF Level**			**Total Credits**
		Level [8]	**Level [9]**	**Level [10]**	
FUNDAMENTAL COMPONENT *Subjects/ Courses/ Modules/Units*	Research methods			30	
CORE COMPONENT *Subjects/Courses/ Modules/Units*	Research proposal			60	
	Journal Articles			60	
	Thesis			240	

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STRANDS/ SPECIALIZATION	Subjects/ Courses/ Modules/Units	Credits Per Relevant NCQF Level			Total Credits
		Level [ ]	Level [ ]	Level [ ]	
1.					
2.					

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SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL	
TOTAL CREDITS PER NCQF LEVEL	
NCQF Level	*Credit Value*
10	390
TOTAL CREDITS	**390**

Rules of Combination:

(Please Indicate combinations for the different constituent components of the qualification)

A candidate will obtain the qualification by:

(i) Completing the fundamental coursework (research methods module - 30 credits) and Core coursework (research proposal - 60 credits and a thesis - 240 credits).

(ii) Publishing at least two (2) journal articles in reputable journals recognised by the university (60 credits)

Total credits: 390

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ASSESSMENT ARRANGEMENTS

All assessments, formative and summative, leading/contributing to the award of credits or qualifications should be based on learning outcomes.

Formative assessment

Formative assessment (proposal defence) will contribute 23% towards the award of the final standing.

Summative assessment

Summative assessment will contribute 77% to the final standing.

MODERATION ARRANGEMENTS

The qualification shall have an internal and external moderator following applicable policies and regulations for quality assurance to ensure fairness, validity, reliability, and consistency of assessments. The moderators shall be registered and accredited by the Botswana Qualifications Authority and/or equivalent accreditation board.

RECOGNITION OF PRIOR LEARNING

Learners may submit evidence of prior learning and current competence and/or undergo appropriate forms of RPL assessment for the award of credits towards the qualification in accordance with applicable RPL policy, credit accumulation and transfer system and relevant national-level policy and legislative framework.

CREDIT ACCUMULATION AND TRANSFER

The Credit Accumulation and Transfer System shall be used for credit transfer between institutions of higher learning towards the award of this qualification in accordance with applicable CAT policy.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Horizontal Articulation (related qualifications of a similar level (NCQF Level 10) that graduates may progress to):

- Doctor of Philosophy Education
- Doctor of Philosophy in Creative Education
- Doctor of Philosophy in Technology Education

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- Doctor of Philosophy Project Management
- Doctor of Philosophy in Science & Technology Studies
- Doctor of Philosophy in Education
- Doctor of Philosophy in Art & Design Education
- Doctor of Philosophy Design and Technology
- Doctor of Philosophy Creative Technology and Design

Vertical Articulation (NCQF Level 10) qualifications to which the holder may progress to:

This is the highest educational qualification, but candidates can proceed to do: Postdoctoral in various design and education disciplines, etc.

Employment

- Researchers
- Design and Technology Educators
- Consultants
- Design and Technology Policymakers
- Design and Technology Education Administrative Officers

QUALIFICATION AWARD AND CERTIFICATION

Minimum standards of achievement for the award of the qualification

To be awarded a Doctor of Philosophy in Design & Technology Education, a learner should have satisfied all exit learning outcomes and met the minimum credit requirements (390 credits), fundamental and core components as indicated in the qualification structure.

Certification

For a leaner to be awarded a Doctor of Philosophy in Design & Technology Education, qualification, he/she should have achieved a minimum of 390 credits. After satisfying all the requirements, a learner will be awarded a Doctor of Philosophy in Design & Technology Education certificate.

SUMMARY OF REGIONAL AND INTERNATIONAL COMPARABILITY

A comparability of the current qualifications was conducted against regional qualifications at the University of London, UK (https://www.gold.ac.uk/pg/mphil-phd-design/), University of Georgia, USA

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(https://coe.uga.edu/academics/degrees/phd-learning-design-technology/) and Monash University, Australia (https://www.monash.edu/study/courses/find-a-course/2023/education-0079).

There is no university in the region which offers PhD in Design & Technology Education or Technology Education.

The duration of the PhD in Design and Technology Education qualification from the benchmarked qualifications ranges from 3-5 years full-time and 4-7 years part-time study. The NCQF levels differ as in the UK, the qualification is at Level 8, and Australia and USA are at Level 10. The latter is comparable to this qualification because PhD qualifications are at Level 10. However, the credits for the benchmarked qualifications were not stated.

The entry requirements for a PhD qualification are similar to the benchmarked qualifications, as one needs to possess a minimum of a Master's degree in the relevant field.

The learning domains for PhD qualifications are similar in knowledge, skills, and competencies.

The exit learning outcomes of this qualification compare well with those of the benchmarked qualifications.

The modules are comparable as there is a taught module in the foundation year on research methodologies and other professional development activities such as conducting seminars. All qualifications require learners to conduct research and publications.

The assessment strategies in all the qualifications include submitting an original research thesis, completing coursework and a doctoral defence (viva voce). A PhD is awarded to a learner who produces substantial original research that contributes to knowledge in the field of study.

Employment pathways include academic leadership positions, educator, consultant, research and entrepreneurship, research and development, leadership in cultural and creative sectors, etc.

The Doctor of Philosophy in Design & Technology Education qualification aligns well with qualifications offered in the USA, UK, and Australia. Therefore, the qualification provides for the international mobility of graduates. It prepares graduates for research and teaching careers in higher education, government and research institutes, and industry, especially in research and development, and innovation.

REVIEW PERIOD

The qualification will be reviewed every five years.

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