QUALIFICATION SPECIFICATION							SECTION A
QUALIFICATION DEVELOPER	Limkokwing University of Creative Technology						
TITLE	Diploma in Product Design				**NCQF LEVEL**		6
FIELD	Manufacturing, Engineering and Technology				**SUB-FIELD**	Product Design	
New qualification	✓	Review of existing qualification					
SUB-FRAMEWORK	General Education		TVET		Higher Education		✓
QUALIFICATION TYPE	Certificate		Diploma	✓	Bachelor		
	Bachelor Honours		Master		Doctor		
CREDIT VALUE					**385**		

RATIONALE AND PURPOSE OF THE QUALIFICATION

The rationale for the qualification

This qualification is designed to mold an innovative generation of designers and manufacturers who would fit well into both the local and international markets. The continued growth of manufacturing industries and consumer product designs in the modern economy has sustained and shaped economies of many nations. It has created opportunities for graduates as professional manufacturers and designers in the Engineering and Product Design industry.

Botswana's market like any other developing country is dominated by products which are from other countries, even small and simple products like toothpicks are also imported from nearby states. Lack of qualified and skilled product designers has also contributed to the reliance on imports and thereby increasing the import bill (Botswana Statistics February 2017). Botswana is blessed with indigenous knowledge which is not exploited. The knowledge is getting extinct as the focus is only on what other countries can offer us, rather than working on improving, innovating and exploiting Botswana's indigenous knowledge and products. There are opportunities and enormous possibilities for the exploration of indigenous craft products for designers and crafts people in Botswana (Molokwane S & Moalosi R, 2010). But these opportunities are not taken up because of lack of relevant technical knowledge and skills. This has led to a situation where the few companies which are in the design and manufacturing industry only focus on assembling and fitting. The qualification, therefore, focuses on the development of local skills and abilities in the development and communication of ideas in consumer products, three-dimensional design, product styling, materials and processing, ergonomics, the techniques of planning, processes and the

production of prototypes and finished artifacts. The qualification takes a technologically innovative approach to the design and creation of beautiful, original and functionally viable products.

The aspirations of this qualification are echoed in a report titled “2002 A frameworks for a long-term vision for Botswana “The importance of technical training must be stressed throughout the education system. A more difficult task is however to emphasize the importance of technical skills to the Economy, and to upgrade the status of those who are employed in technical jobs. This can only be done through constant emphasis and recognition of the economic contribution of technical skills both within government and outside,” it is therefore clear that technical subjects or courses like this one would help and add value to the economy of Botswana.

The National Development Plan 11 of April 2017 – March 2023 under Diversified Industries, EDD *Strategy*: 6.136 states that efforts will continue to consolidate the EDD strategy’s achievements during NDP 11 by implementing the new Industrial Development Policy (IDP), whose main aim is to achieve diversified and sustainable industries, while ensuring beneficiation of locally available raw materials. Measures will be put in place to ensure that goods and services produced in Botswana are of the quality and standard to compete in both local and international markets. Diversification and quality goods and services can only be realized if the country has qualified professionals.

The National Human Resources Development Strategy (NHRDS), through its strategic plan 2009-2022 (Ministry of Education and Skills Development, 2009) “Realizing our Potentials” provides the basis for matching skills with national labour market requirements and promoting individuals’ potential to advance and contribute to economic and social development. This strategy reflects government realization that relevant knowledge and skills are essential requirements in moving Botswana’s development trajectory forward. To increase citizen ownership of and participation in economic activities of the country is one of the cardinal objectives of Vision 2016 and 2036. The vision points to the need to create job opportunities through diversification of economy into the services sector and the manufacturing industry.

Research conducted by Motlhanka and Mapfaira (2010), Growing Manufacturing: Assessing Botswana’s Diversification Efforts Through Manufacturing Sector Growth indicates the need for a Diploma in Product Design. Lack of an innovative qualification aimed at instilling a culture of continuous innovation among creative industries has been cited as an impediment to this sector’s growth in Botswana (Local Enterprise

Authority, 2008). Successful exploitation of new ideas has driven economic progress of many countries. "New technology and scientific understandings have unleashed new waves of innovation, creating many opportunities for creative industries to gain competitive advantage (Innovation Report, 2003)."

The qualification forms part of the top 20 skills in demand and industry priority areas as indicated in the Interim Sector Skills in Demand (December 2016) reports, Botswana labour market Observatory reports from HRDC.

The above demonstrates the need for Industrial Design practitioners in the Botswana workforce and the region.

Purpose of the Qualification

The purpose of this qualification is to produce graduates with knowledge, skills, and competencies to:

- create, integrate, and communicate ideas across industrial/ product design areas.
- solve product design-related problems in the workplace daily.
- apply technology, creativity and innovation in the invention and production of unique consumer products.
- apply technology to indigenous knowledge and come up with creative and innovative products and product designs that will solve people's problems.

ENTRY REQUIREMENTS (including access and inclusion)

The minimum entry requirement for this qualification is:

NCQF level 4, Certificate IV (General Education or TVET) or equivalent.

Recognition of Prior Learning (RPL):

There will be access through Recognition of Prior Learning (RPL) and Credit Accumulation and Transfer (CAT) in accordance with the RPL and CAT National Policies.

QUALIFICATION SPECIFICATION	SECTION B
GRADUATE PROFILE (LEARNING OUTCOMES)	**ASSESSMENT CRITERIA**
1. Conduct basic design research and communicate ideas and concepts using appropriate methodologies in Product design.	• Define research • Explain why it is important to do research • List down and explain characteristics of research • Describe the different types of research • Explain the purpose/functions of research in product design. • Explain at least ethical considerations that must be considered in conducting research • Differentiate qualitative research from quantitative research • Conduct research using different research methods • Relate research methods to appropriate types of research • Apply the most suitable research method(s) to answer a particular research question • Critique sample proposals and research reports • Write a basic research proposal for a product business
2. Demonstrate the knowledge and understanding of contemporary and ancient history of Product design.	• Define the history of product/industrial design. • Discuss the importance of history in product design. • Analyse historical and contemporary product trends to produce new solutions. • Identify major changes that have taken place in the product design industry. • Analyse the effect of developments in product history. • Assess the influence of Botswana's traditional handy-craft designs on the modern mass-production industry. • Infuse traditional product designs in the current manufacturing process.

3. Apply creativity and innovative process in Product/industrial design problem-solving.	• Define creativity in product design. • Discuss the creative process of generating new concepts in product design. • Apply problem-solving skills, through lateral thinking and 'mind mapping' techniques to generate new ideas and solutions. • Generate ideas using juxtaposition, what if the technique, Escape technique, analogy, and random word. • Translate concepts visuals into working models. • Interpret different design briefs and create solutions. • Design concept using relevant tools and innovative methods.
4. Apply drafting techniques to produce both 2D and 3D drawings for products.	• Apply basic drafting fundamentals. • Produce technical drawings by hand and using a computer. • Generate and conceptualize ideas and work using a variety of tools. • Interpret and apply drafting standards and terminologies. • Read and interpret technical drawings. • Produce ideas and concepts with the help of computer-aided design and assistive technology software such as CAD to enhance product outlook. • Apply computer rendering techniques to improve the visual appearance of the product. • Create 2D from 3D drawing
5. Demonstrate knowledge of entrepreneurial skills in product design and manufacturing	• Define entrepreneurship. • Describe the importance of entrepreneurship in product design. • Discuss the basic principles of entrepreneurship and the concept of innovation in product design.

	• Distinguish the types of entrepreneurships and business formation in product design. • Design a business plan for a small product/industrial design business. • Implement theoretical knowledge acquired by designing a small business venture.
6. Apply manufacturing processes and techniques to produce tangible products.	• Define manufacturing processes and techniques. • Explain the importance of manufacturing processes. • Design parts, components, and products for manufacturing. • Employ different manufacturing techniques to produce a variety of products. • Convert the manufacturing model into the actual materials. • Read and interpret technical drawings to assemble a wide range of products. • Machine the different parts of an envisaged product. • Join parts of a product into a complete and finished product. • Apply finishing to the completed item/product. • Justify the use of the selected manufacturing processes. • Join parts of a product into a complete and finished entity. • Plan and commission a product from start to finish
7. Demonstrate an application of photographic knowledge in product design visual communication.	• Describe cameras, types of cameras and their brands including camera components and their uses. • Set up and switch on and off a digital camera. • Operate a digital camera in a professional manner to take images. • Apply principles of photography in imagery to get correct and beautiful photos for product designs. • Determine proper lighting through knowledge of how lights are reflected from an object.

	• Apply different angles and angle techniques in taking images. • Evaluate the socio-economic impact of photography in a contextualized environment. • Produce creative, aesthetic, and persuasive images. • Apply composition and knowledge of assessing captured images to improve image quality.
8. Demonstrate a sense of accountability and personal responsibility for the work in the organization.	• Create good relationships with colleagues and customers in the organisation. • Demonstrate ability to apply different approaches in managing the business in the organisation. • Communicate professionally with all stakeholders in the organisation. • Report working on time daily. • Write the weekly report and submit it as required by the workplace or the university. • Follow instructions as given by the supervisor at work and the mentor at the institution. • Perform duties given by the supervisor ethically and responsibly. • Link theoretical knowledge from the lecture room to practicability in the workplace. • Prepare the materials for writing the final internship report. • Correctly fill in the logbook as required by the institution.
9. Apply graphic design and multimedia principles, techniques, and applications to product design.	• Apply graphic design knowledge in the use of scale, weight, direction, texture, and space in a visual form. • Employ creativity with effects and graphic styles. • Illustrate the use of colour, visuals, rhythm, and patterns in visual communication design in the software.

	• Prepare layouts or mock-ups of a design using illustration, text, photography, colour and computer-generated imagery, either by hand or using computer software.
10. Employ knowledge of marketing and advertising in product design.	• Describe the basic marketing concepts in product design. • Discuss the elements of the marketing environment for a product design organization. • Explain how companies create customer-driven marketing strategies. • Design marketing material production including posters, flyers, e-newsletters and more. • Examine in detail the 4Ps Marketing Mix – Product, Place, Price, and Promotion. • Plan advertising campaigns. • Promote campaigns, including media to advertise in such as radio, television, print, online media, and billboards. • Prepare promotional plans, sales literature, media kits, and sales contracts for marketing purposes. • Evaluate the effectiveness of advertising and marketing activities.

QUALIFICATION STRUCTURE SECTION C			
FUNDAMENTAL COMPONENT Subjects / Units / Modules /Courses	**Title**	**Level**	**Credits**
	Communication and Study Skills	6	10
	Introduction to Research	5	12
	Introduction to Computer Skills	6	10
	Creative and Innovative Studies	6	15
	Fundamentals of Design	5	12
	History of Industrial Design	6	12
	Sociology and Design	6	10
	Computer Graphics	6	20
	Photography	6	20
	Professional Practice	6	15
	Introduction to Business Management	6	12
	Multimedia for Designers	6	10
CORE COMPONENT Subjects / Units / Modules /Courses	Computer-Aided Design	6	27
	Creative Design Studio	6	39
	Technical Documentation	6	12
	Conceptual Skills for Product Designers	6	15
	Workshop Practice	5	12
	Design and Manufacturing technology	7	27
	Ergonomics	6	15
	Models and Prototypes	6	15
	Material & Process	6	15
	Industrial Attachment	6	40
ELECTIVE COMPONENT Subjects/units/course (Select 1)	Introduction to advertising	6	10
	Principles of Marketing	6	10

Rules of combinations, Credit distribution (where applicable):

Below shows the module distribution in relation to the fundamental component, core component and elective component. Students are to choose 1 subject out of the 2 as electives. The total number of credits required for a student to graduate in this qualification is **385** credits including 10 credits from elective modules.

Level	Total no of credits
5	36
6	322
7	27
Total	**385**

ASSESSMENT AND MODERATION ARRANGEMENTS.

FORMATIVE ASSESSMENT (60%)

The contribution of formative assessment to the final grade shall be **60%**

SUMMATIVE ASSESSMENT (40%)

The contribution of summative assessment to the final grade shall be **40%**

MODERATION ARRANGEMENTS.

Internal and external moderators to be engaged will be BQA accredited subject specialists in relevant fields with relevant industry experience and academic qualifications.
Both internal and external moderation shall be done in accordance with applicable policies and regulations.

RECOGNITION OF PRIOR LEARNING (if applicable)

There shall be provision for award of the qualification through Recognition of Prior Learning (RPL) in accordance with institutional Policies in line with the National RPL Policy.

Candidates may submit evidence of credits accumulated in related qualification in order to be credited for the qualification they are applying for.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Horizontal Articulation,

The qualification articulates horizontally with various diploma at NCQF level 6 such as:

- Diploma in Design and Technology
- Diploma in Furniture Design

Vertical Progression

Graduates of this qualification may progress to higher level qualifications level 7 such as:

- Bachelor of Arts in Industrial Design
- Bachelor of Design (Design and Technology)
- Bachelor of Design (Industrial Design)

Employment Pathways

The graduates from this qualification will have requisite competencies and attribute to work as:

- Draftspersons (manual and computer-aided design,2D & 3D) e.g., in mines
- Design and Technology demonstrator
- Workshop Technician & or assistant (metal, wood, plastic and other materials)
- Maintenance technician in government and private buildings
- Research assistant (design and consumer analysis)
- Product designer
- Furniture designer and manufacturer
- Exhibition planner

- Stall manager
- Manufacturing designer
- Graphic designer
- Fabrication technician

QUALIFICATION AWARD AND CERTIFICATION

For a Candidate to achieve this qualification they must have acquired a minimum of **385** credits. The Candidate should pass all the **FUNDAMENTAL, CORE, and ONE ELECTIVE** module.

Certification

A **Diploma in Product Design** will be awarded to a candidate upon completion of the qualification in accordance with applicable policies. A certificate and transcript will be issued at the award.

REGIONAL AND INTERNATIONAL COMPARABILITY

A comparison of this qualification with other qualifications of other Regional and International institutions offering similar and closely associated Diploma qualifications reflects as indicated in the table below. This Diploma qualification is practice-oriented.

Criteria	Kolej UNITI College Linggi, Malaysia	Temasek Polytechnic (Tampines, Singapore)	
Title	Diploma in Product Design	**Diploma in Product & Industrial Design**	
Level	6	**6**	
Duration	3 years	3 years	
Credits	No credits	123	
Structure	• Drawing Fundamentals • History Of Art & Design • Color Theory • Design Element and Principle • Technical Drawing, I • Digital Illustration • English for Academic Purpose I • Pengajian Malaysia • Studio Project I • Technical Drawing II • Digital Rendering • Photography • Computer Aided Design I	• Communication & Information Literacy • Workplace Communication • Persuasive Communication • Current Issues & Critical Thinking • Innovation & Entrepreneurship • Leadership: Essential Attributes & Practice 1 • Leadership: Essential Attributes & Practice 2 • Leadership: Essential Attributes & Practice 3 • Sports & Wellness • Career Readiness 1 • Career Readiness 2 • Career Readiness 3	

	• Malaysian Art History • Pengantar Pemikiran Kritis & Kreatif • Studio Project II • Advertising And Visual Communication • History Of Industrial Design • Computer Aided Design II • Material & Manufacturing Process • Reverse Engineering • English for Academic Purpose II • Studio Project III • Industrial Design • Ergonomics • Basic Marketing and Management • Product Design I • Etika dan Moral di Malaysia • Integrated Product Development • Product Design II • Design For Manufacturability • Khidmat Sosial • English for Academic Purpose III	• Global Studies • Managing Diversity at Work • Global Citizenship & Community Development • Expressions of Culture • Guided Learning • Student Internship Programme (PID) • Prototyping Workshop • Evolution of Industrial Design • Concept Visualisation • Form Aesthetics • Visual Presentation • Prototyping Lab • Design Fundamentals • Collaborative Design • Digital Essentials • Design for Usability • Design for Experience • Form Aesthetics 2 • Visual Presentation 2 • Prototyping Lab 2 • Studio Project • Studio Project 2 • Material & Fabrication Lab • Major Project: PID • Prototyping Lab 3 • Industry Studio Project • Design for Innovation • Studio Project 3	

Learning outcomes	• Provides a theoretical and practical approach to education, which offering professional skills, theoretical foundation • Emphasis on learning the concepts and skills for creating innovative design ideas and solution for industrial production. • Combine art, science, and technology to create new products which is user-oriented based	• Learn about how shapes and forms can be manipulated to communicate an idea. • Introduced to 3D printing and other prototyping tools. • Get the basics of visual presentation skills and be introduced to design research • Go deeper into understanding the design research process in terms of creating a better experience and improving usability. • Study trips are also on the cards to round out learner perspectives on different lifestyles, culture, social platforms. • Exposure to industry practice through actual 'live' briefs. • Prepare learners for life after graduation as young designers.	

Similarities

The following are noted similarities:

a. The duration of training is the 90% similar, only one University has an extra year for internship, the key core modules taught in the qualifications are 80% to 100% similar.
b. The number of modules offered for the qualifications are 90% to 100% the same.
c. The qualification graduates also progress Level 7 qualifications and the modules already covered are exempted.
d. The qualification is also offered as a specialization qualification meant to create special working professionals
e. All qualifications enroll from high school students, mature entry students and progression students.

Differences

Key differences are noted in the following areas:

a. The credits for modules are different this could imply the formula used.
b. Another difference is the names of modules. Most of them have different names but similar learning outcomes.

Trends in Product design qualification and the market outlook

The general trend noted is that many universities introduce hands on (Industry work) assessment in the qualifications to allow students to get Industry experience while still learning, which empower students with practical skills and new technologies applied in the industry.

Contextualization

This qualification in product design is designed to develop the students' capability to think, visualizes, design and conceptualize products in three-dimensional form. Students will gain an understanding of form and function, colour, market research and consumer demand, new technology as well as material and cultural studies, they will learn to execute projects in a professional manner from presentation sketches, research reports, visuals, computer-generated 3D models and actual prototypes, whilst also learning the technical side of manufacturing and materials in order to produce practical design. Learners are fully equipped with the latest design software skills required to meet the demands of Industrial design industry in this challenging and everchanging world of this Creative Industry.

REVIEW PERIOD

The qualification will be reviewed every five **(5) years**.