QUALIFICATION SPECIFICATION SECTION A								
QUALIFICATION DEVELOPER	Limkokwing University of Creative Technology							
TITLE	Bachelor of Arts in Industrial Design			**NCQF LEVEL**		7		
FIELD	Manufacturing, Engineering and Technology			**SUB-FIELD**	Industrial 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	**520**							

RATIONALE AND PURPOSE OF THE QUALIFICATION

Rationale

Industrial Design is a strategic problem-solving process that drives innovation, builds business success, and leads to a better quality of life through innovative products, systems, services, and experiences. Industrial Design bridges the gap between what is and what's possible. It is a trans-disciplinary profession that harnesses creativity to resolve problems and co-create solutions with the intent of making a product, system, service, experience or a business, better. At its heart, Industrial Design provides a more optimistic way of looking at the future by reframing problems as opportunities. It links innovation, technology, research, business, and customers to provide new value and competitive advantage across economic, social, and environmental spheres.

The qualification aims to the develop student skills and ability to: communicate ideas, interact, develop product styles, three dimensional designs, materials, ergonomics, the techniques of planning, processes and the production of prototypes and finished artifacts. It takes a technologically innovative approach to the design and creation of beautiful, ingenious, functionally viable products. Industrial designers contribute and support the development of the manufacturing industry.

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 through improved Salaries and incentives", it is therefore clear that technical subjects or courses like this would help and add value to the economy of Botswana.

Research conducted by Motlhanka and Mapfaira (2010), Growing Manufacturing: Assessing Botswana's Diversification Efforts Through Manufacturing Sector Growth indicates the need for a Bachelor of Arts in Industrial Design. The highlight the following as challenges faced by the manufacturing industries in Botswana:

Poor work ethic of the labour workforce

- Poor labour productivity
- Lack of creativity and innovation
- As a result, the sector is uncompetitive.

Lack of skilled labour which affects:

- Development of new goods
- Development of new markets for products
- Development new advanced production processes

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 National Development Plan 11 of April 2017 – March 2023 under Diversified Industries, EDD *Strategy:*6.136states that efforts will continue to consolidate on 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.

The National Human Resources Development Strategy (NHRDS), through its strategic plan 2009-2022 (Ministry of Education and Skills Development, 2009) "Realizing our Potentials" which provides the basis for matching skills with national labour market requirements and promoting individual's potential to advance and contribute to economic and social development. This strategy reflects government realization

that it is an essential requirement to move 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.

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 report from HRDC. The demand for industrial designers today is tremendous because the design communications industry is always developing new ways to communicate an idea, product, or service. With access to professional tools and software, this qualification is the most comprehensive qualification designed towards acquiring the necessary knowledge and developing the relevant research and design skills.

The Industrial design market in Botswana is flooded with individuals who are practicing as Industrial Designers without formal tertiary education as the profession is relatively new. Formalizing training requirements will ensure that professional standards are maintained and that potential Industrial designers are well equipped with the necessary practical and theoretical knowledge they require for the industry.

The essence of this qualification is to provide graduates with a competitive edge in terms of their vocational practical expertise when applying for jobs. Qualified students would be able to be employed by Industrial Design firms and various related industry role players. They can also open their own businesses in the Industrial Design industries; hence the qualification aims to develop responsible citizens, capable of leading independent and responsible lifestyles while contributing to economic growth and sustainability within Botswana and the world communities.

Purpose

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

- design, create, integrate, and communicate ideas visually and textually.
- solve industrial design related problems in the workplace.
- apply technology, creativity and innovation in the invention industrial designs.
- make a positive impact in the industrial design industry through creativity and versatility.
- apply the latest technologies to indigenous knowledge and come up with creative and innovative computer-aided visual messages and concepts.
- conduct research in order to develop industrial design briefs.
- solve problems within their communities and the world using international best design practices.

ENTRY REQUIREMENTS (including access and inclusion)

- **Minimum entry requirements**

  The minimum entry requirement for this qualification is NCQF Level 4, Certificate IV, with passes in English, Art, Design Technology and a science subject.

- **Recognition of Prior Learning (RPL) and Credit Accumulation Transfer (CAT)**

  Applicants who do not meet the above criteria but possess relevant performing arts industry experience may be considered through Recognition of Prior Learning (RPL) and Credit Accumulation Transfer (CAT) policies for access. This consideration will be done following guidelines of the ETP's policies which are aligned with National RPL and CAT policies.

QUALIFICATION SPECIFICATION	SECTION B
GRADUATE PROFILE (LEARNING OUTCOMES)	**ASSESSMENT CRITERIA**
1. Conduct extensive Industrial design research using appropriate methodologies.	a) Define research. b) Explain why it is important to do research. c) List down and explain characteristics of research. d) Describe the different types of research. e) Explain the purpose/functions of research in Industrial design. f) Explain at least ethical considerations that must be considered in conducting research. g) Differentiate qualitative research from quantitative research. h) Conduct research using different research methods. i) Relate research methods to appropriate types of research. j) Apply the most suitable research method(s) in order to answer a particular research question. k) Critique sample proposals and research reports. l) Write a research proposal for an Industrial design business.
2. Demonstrate the knowledge and understanding of contemporary and ancient history of Industrial design.	a) Define the history of product/industrial design. b) Discuss the importance of history in Industrial design. c) Analyse historical and contemporary industrial trends to produce new solutions. d) Identify major changes that have taken place in the industrial design industry. e) Analyse the effect of developments in industrial history. f) Assess the influence of Botswana's traditional handy-craft designs on modern mass production industry. g) Infuse traditional Industrial designs in current manufacturing process.
3. Apply creativity and innovative process in industrial design problem solving.	a) Define creativity in as it pertains to Industrial design. b) Discuss the creative process of generating new concepts in Industrial design. c) Use problem-solving skills, through lateral thinking and 'mind mapping' techniques to generate new ideas and solutions. d) Generate ideas using juxtaposition, what if technique, Escape

	technique, and analogy, and random word. e) Translate concepts visuals into working models. f) Interpret different design briefs and create solutions. g) Design concept using relevant tools and innovative methods. h) Utilise the latest technology and related tools to optimise the dissemination of information.
4. Apply design thinking principles and techniques to prove feasibility of concepts and ideas.	a) Define Industrial design process. b) Discuss Industrial design techniques for new idea generation. c) Explore design analysis to compare ideal concepts with previous workable products. d) Produce new ideas to solve the identified problem. e) Use evaluation matrix to select the idea that best solve the identified problem. f) Refine the selected idea to improve other design considerations such as visual and technical requirements. g) Produce technical drawings by hand and through the use of computer. h) Apply basic drafting fundamentals. i) Generate and conceptualize ideas and work using variety of tools. j) Draw sketches of the envisaged products. k) Create simple structural and decorative designs, in sketching pictorial drawings, and in making orthographic working sketches. l) Interpret and apply drafting standards and terminologies. m) Read and interpret technical drawings. n) Use technical drawings to manufacture products. o) Use computer aided design and assistive technology softwares such as CAD to enhance product outlook. p) Apply computer rendering techniques to improve visual appearance of the product. q) Create 2D from 3D drawing. r) Convert 3D drawings to new 2D drawings.
5. Produce goods from a wide range of materials.	a) Define Industrial/product design materials. b) Categorise materials into man-made and natural materials.

	c) Classify materials into metals, wood, plastics, and other composite materials. d) Discuss properties of different materials for product design. e) Determine the desired material for the prototype. f) Develop work stages and methods alongside product qualities. g) Determine the optimum configurations for performance, reliability, cost, modes of behavior under varying conditions, etc.
6. Apply manufacturing processes and techniques to produce tangible products.	a) Define manufacturing processes and techniques. b) Explain the importance of manufacturing processes. c) Design parts, components and products for manufacturing d) Employ different manufacturing techniques to produce a variety of products. e) Convert manufacturing model into the actual materials. f) Read and interpret technical drawings to assemble a wide range of products. g) Machine the different parts of an envisaged product. h) Join parts of a product into a complete and finished product. i) Apply finishing to the completed item/product. j) Justify the use of the selected manufacturing processes. k) Join parts of a product into a complete and finished entity. l) Plan and commission a product from start to finish.
7. Design and develop exhibitions.	a) Define exhibitions. b) Explain types of exhibitions. c) Recall places where exhibitions are found. d) Describe functional aspects of exhibition design. e) Apply visualization skills to make exhibition self-explanatory. f) Design and construct physical displays or stalls. g) Design layout for a variety of exhibitions h) Produce drawings of exhibition stalls and presentations. i) Produce a variety of innovative sketches for exhibition stalls. j) Create test models with materials like card to check proportion, scale and visual appearance. k) Discuss operational and effective information delivery of an exhibition

	stall. l) Describe the importance and purpose of graphic skills in exhibition design.
8. Scale up/scale down a model.	a) Define models. b) Differentiate models from prototypes. c) Draw models in different scales. d) Convert models from one scale to another by up-scaling or down-scaling. e) Convert a 2D drawing/pictorial drawing into a 3D prototype. f) Assemble a 3D prototype into a semi-finished product. g) Quantify components for a designed product.
9. Use photographic knowledge for Industrial/product design visual communication.	a) Describe camera, types of cameras and their brands including camera components and their uses. b) Set–up and switch on and off a digital camera. c) Operate a digital camera in a professional manner to take images. d) Apply principles of photography in imagery to get correct and beautiful photos for product designs. e) Determine proper lighting through knowledge of how lights are reflected from an object. f) Use different lenses in image capturing for their specific duties. g) Apply different angles and angle techniques in taking images. h) Evaluate the socio-economic impact of photography in a contextualized environment. i) Produce creative, aesthetic and persuasive images. j) Apply composition and knowledge of assessing captured images to improve image quality.
10. Apply graphic design principles and techniques to enhance Industrial designs.	a) Use computer software technology to generate new images and concepts. b) Apply graphic design knowledge in use of scale, weight, direction, texture, and space in a visual form. c) Use Computer based drawing tools to produce shapes, layers and apply effects and styles. d) Employ creativity with effects and graphic styles.

	e) Use pixel-based software to edit, retouch, and colour correct images, and create composites from multiple images. f) Illustrate the use of color, visual, rhythm, and pattern in visual communication design in the software. g) Use appropriate technologies for print based layouts. h) Prepare layouts or mock-ups of a design using illustration, text, photography, colour and computer-generated imagery, either by hand or using computer software.
11. Produce animated presentations combining still images and text to convey visual messages in industrial designing.	a) Use computer assistive software tools to create merge drawings, object drawing, line, text and apply break test command. b) Apply software selection tool to select, edit and make sub-selection on flash animation. c) Develop symbols and link them to frames in animating. d) Use various animation types (frame-by-frame, motion tween, shape tween, classic tween and classic motion guide) to create animations. e) Modify graphics to optimize load time, structure and layout of digital works.
12. Demonstrate knowledge of entrepreneurial skills in product design and manufacturing.	a) Define entrepreneurship. b) Describe the importance of entrepreneurship in Industrial design. c) Discuss the basic principles of entrepreneurship and the concept of innovation in Industrial design. d) Distinguish the types of entrepreneurships and business formation in Industrial design. e) Design business plan for a small product/industrial design business. f) Implement theoretical knowledge acquired by designing a small business venture.
13. Utilize knowledge of marketing and advertising in Industrial design.	a) Describe the basic marketing concepts in Industrial design. b) Discuss the elements of the marketing environment for a Industrial design organization. c) Explain how companies create customer-driven marketing strategies. d) Design marketing material production including posters, flyers, e-newsletters and more. e) Examine in detail the 4Ps marketing Mix – Product, Place, Price, and

	Promotion f) Plan advertising campaigns g) Promote campaigns, including media to advertise in such as radio, television, print, online media, and billboards. h) Prepare promotional plans, sales literature, media kits, and sales contracts for marketing purposes. i) Evaluate the effectiveness of advertising and marketing activities.
14. Communicate ideas and concepts using written, oral, visual and digital presentations.	a) Define communication. b) Explain the process of communication and its effect on giving and receiving information. c) Apply effective communication skills in a variety of public and interpersonal settings such as presentations. d) Discuss key points in a presentation. e) Identify appropriate visual presentation techniques. f) Present a set of design solutions to a specific target audience. g) Defend the integration of innovative ideas into design products. h) Justify the use of new materials and technologies in product design. i) Communicate design ideas and concepts in written reports. j) Use technology in communicating product design ideas and concepts.
15. Communicate ideas and concepts into written, verbal, visual and digital presentations.	a) Identify appropriate presentation techniques in visualization communication. b) Present a set of design solutions effective to a target audience. c) Interpret and use industrial terminology in problem solving. d) Integrate innovative ideas into design products through the use of new materials and technologies. e) Assess the reinterpretation of traditional designs in new markets.
16. Apply technical skill, knowledge and craftsmanship to prove feasibility of concepts.	a) Make decision on material and colour alternatives for the selected product. b) Archive the geometric form and texture of the design. c) Modify a product by creating the illusion of form space. d) Draw images from a modeled scene using shading and other techniques.

	e) Differentiate between positive space and negative space on a drawing medium such as paper. f) Generate and conceptualize ideas and work using variety of tools. g) Use a variety of media and/or process to demonstrate knowledge of rendering techniques.
17. Demonstrate a sense of accountability and personal responsibility for the work in the organization.	a) Create good relationships with colleagues and customers in the organisation. b) Demonstrate ability to apply different approaches in managing the business in the organisation. c) Communicate professionally with all stakeholders in the organisation. d) Report to work on time on daily basis. e) Write the weekly report and submit it as required by the workplace or the university. f) Follow instructions as given by the supervisor at work and the mentor at the institution. g) Perform duties given by the supervisor ethically and responsibly. h) Link theoretical knowledge from lecture room to practicability in the workplace. i) Prepare the materials for writing the final internship report. j) Correctly fill in the logbook as required by the institution.

QUALIFICATION STRUCTURE			SECTION C
FUNDAMENTAL COMPONENT Subjects / Units / Modules /Courses	**Title**	**Level**	**Credits**
	Communication and Study Skills	6	12
	Introduction to Research	6	12
	Introduction to Computer Skills	6	12
CORE COMPONENT Subjects / Units / Modules /Courses	Fundamentals of Design	6	12
	History of Industrial Design	6	15
	Illustration	5	10
	Photography	5	10
	Digital Presentation I	6	10
	Digital Presentation II	7	10
	Computer Graphics I	6	10
	Computer Graphics II	7	10
	Models & Prototype	6	12
	Materials & Processes	6	12
	Workshop Practice	6	12
	Ergonomics	6	12
	Sociology & Design	7	10
	Visual Culture	7	10
	Design Technology	7	12
	Design in a Global Context	7	12
	Design Reflective Practice	7	12
	Creative and Innovation Studies	5	12
	Conceptual Skills for Product Designers	5	15
	Technical Documentation	6	12
	Computer Aided Design I	6	18
	Computer Aided Design II	7	18
	Introduction to Industrial Design	6	12
	Design thinking Processes I	6	30
	Design thinking Processes II	7	30
	Industrial Design Research	7	12
	Manufacturing Technology	7	12

	Innovative Technology	7	12
	Portfolio Review for Design	8	12
	Exhibition Planning	7	16
	Professional Practice	7	10
	Entrepreneurship	7	12
	Industrial Attachment	7	40
ELECTIVE COMPONENT Subjects / Units / Modules /Courses	Introduction to advertising	7	10
	Principles of Marketing	7	10
	Photography 2	7	10
	Packaging Design	7	10
Total			**520**

RULES OF COMBINATIONS, CREDIT DISTRIBUTION (WHERE APPLICABLE):

The table below shows module distribution in relation to fundamental component, core component and elective component. Students are to choose 2 modules out of the 4 as electives, where students are to choose electives in a semester, they will be provided with 2 options, and this will apply to other semester where they have to choose electives. The total number of credits required for a student to graduate in this qualification is **520** credits including 20 credits from elective modules.

Module Classification	Module status	Total number of modules	Total number of Credits
Fundamental Component	Compulsory	3	36
Core Component	Compulsory	33	464
Elective Component	Students choose **2** out of 4 modules	2	20
Totals		**40**	**520**

ASSESSMENTS ARRANGEMENTS

Assessment Arrangements

The qualification will encompass both formative and summative assessment, which will be designed by assessors who are BQA registered and accredited.

The weightings for the assessments will be as follows:

Assessment Method	Weight (%)
Formative Assessments	60
Summative Assessments	40

MODERATION ARRANGEMENTS

Internal Moderation

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

External Moderation

- External moderators to be engaged will be subject specialists in relevant fields with relevant industry experience and academic qualifications.
- External moderation shall be done in accordance with applicable policies and regulations.

RECOGNITION OF PRIOR LEARNING (if applicable)

Candidate may gain the whole, or part, of the qualification through Recognition of Prior Learning (RPL), or Credit Accumulation Transfer (CAT). In applying for RPL/RPE or CAT, candidates will submit documentary evidence in the form of a learning portfolio.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

This qualification is designed to facilitate vertical and horizontal progression both locally and internationally.

Vertical Progression

Graduates from this qualification may progress to the following:

- Master of Arts in Industrial Design
- Master of Design (Design and Technology)
- Master of Design (Industrial Design)
- Master in Product Design and Development

- Master's in Manufacturing
- Masters in Furniture Design and Manufacturing

Horizontal Progression

Students may progress horizontally between qualifications if they meet the minimum requirements for admission to the target qualification. Other comparable qualification to this diploma include:

- Bachelor of Design (Design and Technology)
- Bachelor's degree in Furniture Design
- Bachelor of Design (Manufacturing)

Employment Pathways

Other than progressing academically students may get into the field and 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

To qualify for qualification award and certification, a students must

- Attain a minimum of 520 credits overall.
- Complete satisfactorily any additional and specified requirements of the qualification.
- Have official verification that the learner has covered and passed all the modules.

REGIONAL AND INTERNATIONAL COMPARABILITY

A comparison of this qualification with those of other Regional and International institutions offering similar and closely associated Degree qualifications reflects as indicated in the Table below. This Degree qualification is practice oriented. The duration is scoped to 4 years.

Regional and International Comparability

Table 2 Similar and closely related Diplomas

Criteria	Swinburne University of Technology (Australia)	PolyU Design (Hong Kong - China)	University of Bridgeport (US)
Duration	4 years	4 years	4 years
Total number of modules	45 Modules	42 Modules	43 Modules
Number Of Core modules	16Modules	12 Modules	10 Modules
Number of specialization Modules	None	None	None
Number of Elective Modules	38 Modules	15 modules	12 modules
Entry Requirements	Mature Entry/Working Experience	Mature Entry/Working Experience	Mature Entry/Working Experience
• **Progression**	Master of Design	Master of Design	Technology Management Masters – Manufacturing Management
	Yes	Yes	Yes

• **Exemptions**			
Mode of Study	1. Fulltime/part time	2. Fulltime	Fulltime
Common Modules	Technical Drawing	2D Communications	Drawing/Drafting
		2D Communications 2 - Sketch	Design Drawing I
	Computer Aided design and drawing	Computer 1 - Solid Modeling and Rendering	Solid Works I and II
	Cultural History and theory	Design History	History of Industrial Design
		Product Identity and Product Branding	Composition & Rhetoric
	Small Business Planning	Studio 4 – Entrepreneurship	
		Technology 2 – Materials and Processes	Materials & Manufacturing I and II
	Creative Design Process	Capstone Project 2 – Product Design	Industrial Design Studio
		Portfolio Review – Product Design	

Similarities

The following are noted similarities:

a. The duration of training is 100% similar; the core modules taught in the qualifications are 80% to 100% similar.
b. The number of modules offered for the qualification are 90% to 100% the same.
c. The Diploma graduates also progress to the Degree level and the modules covered are exempted.
d. The course is meant to create special working professionals regarding some significant technological advancement and offer competitive edge over other employees.
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 of names of modules as most of them have different names but similar learning outcome.

Trends in Industrial design qualifications and the market outlook

The general trend noted is that many universities introduce hands on (Industry work) assessment in the qualification to allow students to get Industry experience while still learning, which empower students with practical skills and new technologies applied in the industry. Students during their of study are required to visit companies relevant to their areas of study to get first hand experience on what they will be expected to do once they graduate, these companies forms part of mentorship program and prospective employees: engagements are meant to curb labour market and graduates skills mismatch.

Contextualization

This qualification is designed to develop the students' capability to think, design and develop product concepts, visualize them using the latest computer technology, and build models in a well-equipped model shop or computer lab. Students learn presentation skills to demonstrate their creative and unique solutions. Advanced industrial design topics include ergonomics, materials and manufacturing. 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 ever-changing world of Creative Industry. The leaner's will be prepared to be techno-savvy, highly competent, adaptive, ethical, creative, innovative and solve problems within their communities and world using international best design practices.

REVIEW PERIOD

The qualification will be reviewed every 5 years.