SECTION A:	QUALIFICATION DETAILS																	
QUALIFICATION DEVELOPER (S)	University of Botswana																	
TITLE	Master of Science in Geomatics													NCQF LEVEL	9			
STRANDS (where applicable)	1. Photogrammetry and Geoinformatics 2. Geodesy and Engineering Surveying 3. Land Tenure and Cadastral Systems																	
FIELD	Manufacturing, Engineering and Technology			SUB-FIELD	Engineering and engineering trades									CREDIT VALUE	255			
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 Master of Science in Geomatics qualification has been designed to respond to Botswana's social and economic needs and that of the region, especially in areas of Engineering and the Built-Environment. The qualification rationale and purpose are aligned to the key strategic sectors of engineering, construction, built environment, mining, water, research, innovation, science and technology as identified and in congruence by the Human Resource Development Council (HRDC 2016 and NDP 11: 2017), which requires a high workforce demand to transform Botswana into a knowledge-based and circular economy. The qualification

contributes towards 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, 2016 top occupations priority area of Surveying and Geoinformatics). Furthermore, this qualification responds to the 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.

As Botswana embraces sustainable development through the implementation of the Sustainable Development Goals (SDGs), the Master of Science in Geomatics qualification graduates will contribute towards human resource development in support of the Botswana's Domesticated SDGs targets as: ensuring ownership and control over land and other forms of property (SDG target 1.4); integrated water resources management at all levels (SDG target 6.5); developing quality, reliable, sustainable and resilient infrastructure (SDG target 9.1); ensuring access for all to adequate, safe and affordable housing and basic services and upgrade slums (SDG target 11.1), and to increase significantly the availability of high-quality, timely and reliable geospatial data (SDG target 17.18). The qualification is also in line with Botswana's Vision 2036 strategy, transforming the country from an upper middle-income country to a high-income country by 2036, by contributing the following: Pillar 1 (Sustainable Economic Development), Pillar 2 (Human and Social Development), and Pillar 3 (Sustainable Environment), as well as key future imperatives of research, innovation and sustainability.

The MSc in Geomatics will comprise of three (3) strands/specializations:

1. Photogrammetry and Geoinformatics
2. Geodesy and Engineering Surveying
3. Land Tenure and Cadastral Systems

The rationale for the MSc in Geomatics in advancing training and specialization in Geomatics through postgraduate studies will meet the emerging demands and challenges in the public and private sectors by:

(i) Providing advanced Geomatics specialization to cope with the required vertical progressions from Bachelors qualification to Masters qualification for the support and improvement of service provision in Geomatics nationally and in the region.

(ii) Equip graduates with specialized knowledge and skills required to meet the technical and emerging challenges in Geomatics and related disciplines in engineering and the built environment as researchers and managers.

(iii) Produce Geomatics specialists who will effectively contribute to the national sustainable development goals using advanced Geomatics technology, research, and methods.

PURPOSE: (itemise exit level outcomes)

The programme will prepare a specialized professional with advanced knowledge in the field of Geomatics, with scholarship, management and advanced understanding of methods of enquiry, and established code of practice for the profession.

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

1. Provide significant technical and management contributions in Geomatics and related engineering and the built environment disciplines through national and regional development.
2. Demonstrate sound theoretical and conceptual knowledge and skills for advanced research in Geomatics.
3. Think independently, creatively, and innovatively in multidisciplinary and interdisciplinary work and research environments.
4. Become entrepreneurs and practising Geomatics specialists and managers.
5. Meet the global standards for continuing education for Geomatics professionals and researchers.
6. Demonstrate sound communication skills, leadership ability and responsible teamwork.
7. Demonstrate professionalism and ethics as required in the work environment and special needs.

MINIMUM ENTRY REQUIREMENTS (including access and inclusion)

1. Bachelor's Degree in Geomatics or related field with minimum of NCQF Level 7.
2. There is provision for entry through Recognition of Prior Learning (RPL), or Credit Accumulation and Transfer (CAT). RPL and CAT will be assessed on application to determine the eligibility of the applicant.

SECTION B	***QUALIFICATION SPECIFICATION***
GRADUATE PROFILE (LEARNING OUTCOMES)	***ASSESSMENT CRITERIA***
LO1: Solve problems in Geomatics using the fundamental knowledge from mathematics, computer science and related engineering sciences.	AC1.1 Apply the essential mathematical representations for scenes with points and surfaces and corresponding geometrical observations. AC1.2 Evaluate the properties of the significant linear and linearized models used for adjustment and hypothesis testing applied as to observational data. AC1.3 Solve spatial and non-spatial data interpolation problems using interpolation methods. AC1.4 Utilize mathematical and statistical knowledge in the design of field and laboratory experiments, numerical simulations and modelling. AC1.5 Develop computer algorithms and programs for the solution of Geomatics research and practical problems. AC1.6 Combine mathematical and computing techniques in providing innovative solutions to complex open-ended and multidisciplinary engineering problems.
LO2: : Acquire and process data using photogrammetry and remote sensing technologies.	AC2.1 Apply the theoretical principles underpinning the use of photogrammetric and remote sensing sensors. AC2.2 Develop image feature extraction and matching procedures based on digital photogrammetry and computer vision. AC2.3 Propose solutions for image and point cloud classification and accuracy assessment. AC2.4 Select and justify appropriate systems and techniques, including the fusion of data from

	multiple sources for the provision of photogrammetric and remote sensing data sets. AC2.5 Apply the SAR processing chain for generating calibrated radar products. AC2.6 Model building information management (BIM) systems using geospatial methods and technologies. AC2.7 Use appropriate sources to solve errors in photogrammetric and remote sensing data and technologies. AC2.8 Solve photogrammetry and remote sensing problems using high-level and low-level image processing techniques. AC2.9 Translate complex photogrammetric and remote sensing problems into essential components and identify appropriate solutions. AC2.10 Source and access current research and best practices relating to photogrammetric and remote sensing systems and techniques. AC2.11 Advise on collection, processing, deliverables and management of photogrammetric and remote sensing data and projects. AC2.12 Identify the typical UAV data acquisition procedure and data processing for geoinformation purposes, understanding the technical decisions in real practical cases.
LO3: Develop and manage geospatial information systems and databases for modelling and applications.	AC3.1 Apply the fundamental concepts of GIS (raster vs. vector data representations, layers and objects, dimensions, topology, classification of GIS) for modelling and application.

	AC3.2 Implement relational and object-relational database systems and discuss their impacts on spatial data modelling. AC3.3 Synthesize and implement data models combining spatial and non-spatial data tasks with respect to different application domains on the conceptual, logical, and physical level. AC3.4 Analyze spatial and non-spatial data using structured query language (SQL) technique. AC3.5 Develop methods, computer programs and applications (apps) for the accomplishment of navigations and location identification tasks. AC3.6 Assess different geodetic reference systems and their transformation/conversion with respect to their relevance to GIS, Remote Sensing and Photogrammetry. AC3.7 Evaluate the results of different data and datum transformations/ conversions. AC3.8 Develop workflows for secondary data acquisition and data analysis in order to receive consistent spatial data. AC3.9 Design complex analysis workflow for spatial data for solving real world problems. AC3.10 Apply cartographic grammar to visualize and present analysis results on thematic maps.
LO4: Apply adjustments theory in correcting geodetic and engineering surveying observations.	AC4.1 Execute practical geodetic and special measurements, including measurements that involve laser, ultrasound and electromagnetic sensors. AC4.2 Carry out geodetic and engineering surveying measurements and implement algorithms for the

	detection, quantification and minimization of systematic observation errors. AC4.3 Evaluate the physical, functional and stochastic characteristics of satellite-based positioning procedures and systems. AC4.4 Demonstrate knowledge on the fundamentals of potential theory, boundary value problems, physical geodesy and geoid determination. AC4.5 Acquire knowledge in geometric space-geodetic techniques, dynamical satellite geodesy, spherical harmonics, gravity fields and space gravimetric and altimetric methods. AC4.6 Solve special tracking, ranging and gradiometry measurements using satellite geodetic measurements. AC4.7 Design and implement engineering survey projects for 2D and 3D mapping and modelling. AC4.8 Demonstrate the ability to setup, acquire and process GNSS signals for static and kinematic measurements. AC4.9 Use different 3D coordinate systems and different parameterizations for typical geodetic applications on local and global scales.
LO5: Develop internet and location-based GIS products for data access and visualization including spatial data infrastructure and land information systems.	AC5.1 Identify requirements, components and workflows for spatial and non-spatial data visualization. AC5.2 Customize internet-based architectures for 2D and 3D visualization. AC5.3 Leverage geospatial applications in the Internet using different approaches, applications and interfaces.

	AC5.4 Set up a multitier Internet/Intranet application based on standard software. AC5.5 Solve land management problems related to land policy, planning, cadastre and administration including the automation of land information systems. AC5.6 Apply the theoretical and practical concepts of Spatial Data Infrastructures (SDIs) and acquire techniques for the design, implementation, management, and evaluation of SDIs.
LO6: Develop effective business model that integrates planning, implementation, financing and management.	AC6.1 Distinguish between business types and identify the legal forms for businesses. AC6.2 Contrast the characteristics of marketing, market segmentation and pricing. AC6.3 Create business potentials based on the Business Model Canvas model. AC6.4 Construct a business plan with comparative financial and data requirement scenarios. AC6.5 Analyse the cost structures of a company and accuracy of financial plans and tenders. AC6.7 Determine the principal financial requirements for a potential start-up business. AC6.8 Apply fundamental project management principles in the implementation of projects. AC6.9 Use ICT applications for project planning and project management.
LO7: Apply theoretical knowledge in conducting original research to expand scientific knowledge development.	AC7.1 Use the acquired knowledge and skills in developing research proposals.

	AC7.2 Conduct comprehensive literature review to identify gaps that are significant for further research investigations. AC7.3 Apply theory and advanced research methodologies to contribute to knowledge development in Geomatics. AC7.4 Demonstrate the ability to develop original ideas to design and analyze intricate solutions in Geomatics. AC7.5 Apply advanced skills and techniques in the design of field and laboratory experiments and research data synthesis, analysis and management. AC7.6 Statistically analyze high quality research data and validate the research data. AC7.7 Apply acquired knowledge independently by determining the learning and research requirements, source of information and critically analyze assumptions and embrace new knowledge. AC7.8 Conduct ethical and responsible scientific research. AC7.9 Solve problems using mastery of critical and creative thinking methodologies.
LO8: Work individually and collaborate professionally and ethically in teams to conduct high quality research.	AC8.1 Produce and defend research findings using appropriate structure, style and language. AC8.2 Generate and present scientific outputs and reports in Journals, Conferences, Seminars and/or Workshops. AC8.3Participate in teams and multidisciplinary groups by effective contributions and role playing to deliver sound results. AC8.4 Document the system of professional development and ethical responsibility in Geomatics.

	AC8.5. Observe ethical codes and legal guidelines in the conduct of responsible scientific research and in service to society. AC8.6. Implement projects with sound environmental integrity measures.

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SECTION C	***QUALIFICATION STRUCTURE***				
COMPONENT	***TITLE***	***Credits Per Relevant NCQF Level***			***Total Credits***
		Level [9]	***Level [ ]***	***Level [ ]***	
FUNDAMENTAL COMPONENT *Subjects/ Courses/ Modules/Units*	Research Methods	***15***			
	Mathematical Methods for Engineers	***15***			
CORE COMPONENT *Subjects/Courses/ Modules/Units*	Dissertation	***120***			
STRANDS/ SPECIALIZATION	*Subjects/ Courses/ Modules/Units*	***Credits Per Relevant NCQF Level***			***Total Credits***
		Level [9]	***Level [ ]***	***Level [ ]***	
1. PHOTOGRAMMETRY AND GEOINFORMATICS	Advanced GIS Database Management Systems	***15***			
	Microwave and Hyperspectral Remote Sensing	***15***			
	Planning and Management in Geomatics	***15***			
	Advanced Photogrammetry	***15***			
	Environmental Geodesy	***15***			

	(Choose any TWO Optional courses from the list below)				
	Advanced Digital Image Processing	***15***			
	Geostatistics and Digital Terrain Modelling	***15***			
	Mobile GIS and Location Based Services	***15***			
	Geocomputation Methods	***15***			
	Geodata Visualization	***15***			
	Advanced Spatial Data Infrastructure	***15***			
	Land Information Systems and Models	***15***			
	Transportation Information Systems	***15***			
	Hydroinformatics	***15***			
	Geoinformatics for Disaster Risk Management	***15***			
	Earth Observation with Unmanned Aerial Vehicles (UAV) Systems	***15***			
2. GEODESY AND ENGINEERING SURVEYING	Satellite Geodesy	***15***			
	Advanced Engineering Surveying	***15***			
	Design of Geodetic Networks	***15***			

	Gravity and Geodynamics	***15***			
	Navigation	***15***			
	(Choose any TWO Optional courses from the list below)				
	Advanced Adjustment Computations	***15***			
	Physical and Integrated Geodesy	***15***			
	Multisensor Integration in Geodesy and Transport	***15***			
	Advanced Spatial Data Infrastructure	***15***			
	Land Information Systems and Models	***15***			
	Geoinformatics for Disaster Risk Management	***15***			
3. ***LAND TENURE AND CADASTRAL SYSTEMS***	Land Information Systems and Models	***15***			
	Advanced Spatial Data Infrastructure	***15***			
	Land Administration and Governance	***15***			
	Cadastral Surveying	***15***			
	Planning and Management in Geomatics	***15***			
	(Choose any TWO Optional courses from the list below)				

	Advanced GIS Database Management Systems	***15***			
	Advanced Adjustment Computations	***15***			
	Geodata Visualization	***15***			
	Advanced Engineering Surveying	***15***			
	Urban Spatial Planning	***15***			
	Land Valuation and Development	***15***			
	Geoinformatics for Disaster Risk Management	***15***			

SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL	
TOTAL CREDITS PER NCQF LEVEL	
NCQF Level	***Credit Value***
9	***255***
TOTAL CREDITS	***255***

Rules of Combination:

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

A candidate will obtain the qualification by successfully:

1. Fundamental – 30 credits
2. Core component – 120 credits
3. Strands – 75 credits
4. Electives 30

Total credits: 255

(Note: Please use Arial 11 font for completing the template)

ASSESSMENT ARRANGEMENTS

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

- **Formative assessment** comprising of Continuous Assessments for taught courses will contribute 60% to the overall learning programme.
- **Summative assessment** comprising of End of Semester Final Examinations for taught courses will constitute the other 40% of the overall learning programme.
- **Examination of MSc Dissertation**: Dissertation assessment is by formal examination of the written Dissertation through Internal and External Examination.

Assessments shall be carried out by BQA accredited Assessors or assessors with equivalent and recognised qualifications in line with institutional and national policies.

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 moderator 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.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Horizontal Learning Pathways

- Master of Science in Geodesy and Geoinformation
- Master of Science in Geomatics Engineering
- Master of Science in Engineering Surveying and Geodesy
- Master of Science in Photogrammetry and Geoinformatics

- Master of Science in Geodesy
- Master of Spatial Science Technology
- Master of Science in Earth Observation and Geoinformation Management

Vertical Learning Pathways

- PhD in Geomatics
- PhD in Photogrammetry and Remote Sensing
- PhD in Geospatial Information *Sciences*
- PhD in Geodetic Science
- PhD in Geomatics Engineering
- PhD in Engineering *Surveying* and Space *Geodesy*

Diagonal Learning Pathways

- PhD in Computer Science
- PhD *in Environmental Informatics*
- PhD in Geosciences
- PhD in Environmental Science

Employment Pathways

- Researchers
- Academics –Lecturers
- Senior Land Surveyors
- Senior Mine and Engineering Surveyors
- Senior Photogrammetrist
- Senior GIS Specialist
- Senior Remote Sensing Specialist
- Assistant/Deputy/Director of Surveys and Mapping

QUALIFICATION AWARD AND CERTIFICATION

Qualification Award

- To be awarded a Master of Science in Geomatics, a candidate should have satisfied all exit learning outcomes and met the minimum credit requirements (255 credits), fundamental, core and optional components as indicated in the qualification structure.
- Candidates shall be awarded a Master of Science in Geomatics upon obtaining a minimum of 255 credits.

Certification

- There will be issuance of an official transcript and a certificate at award of degree as follows and in accordance with the area of specialization/strand:
  Master of Science in Geomatics (Photogrammetry and Geoinformatics).
  Master of Science in Geomatics (Geodesy and Engineering Surveying).
  Master of Science in Geomatics (Land Tenure and Cadastral Systems).

SUMMARY OF REGIONAL AND INTERNATIONAL COMPARABILITY

The qualification is compared with similar qualifications at Makerere University (Uganda), Jomo Kenyatta University of Agriculture and Technology JKUAT (Kenya), Stuttgart University of Applied Sciences (Germany); Delft University of Technology (The Netherlands) and Oregon State University (USA). The choice of the compared programs was based on the programs offering accredited Master of Science in Geomatics qualification.

Makerere University (Uganda) offers a two (2) year Master of Science in Geo-information Science and Technology with qualification at UNQF Level 8 and comprising of 300 credits. The exit level outcomes are to:

- introduce students to GIS science and technology, thereby providing them with background knowledge to assist them advance the technology;
- develop students' confidence in handling new problems and processing, analyzing and visualizing data to support the decision-making process;
- build competence in independent learning skills, research methodology, research implementation, oral presentations, report writing, web-based and multimedia communication and team work skills; and
- educate students on both the potential and limitations of current software, spatial data resources and information quality.

The learning domains are knowledge, skills and competence. The assessment strategies include formative assessment (40%) and summative assessment (60%). For the dissertation, masters seminars, written documents (proposals and progress reports) and oral presentations will be marked and seminars account for 37.5% of the overall dissertation credits units. The learner will be awarded a qualification after achieving the stated learning outcomes. Employment pathways include Surveyors; Engineers; Physical Planners; Application Developers; Health Care Planners/Implementers; Natural Resource Managers; Emergency Workers; Defence (Armed) Forces-Engineers Brigade; Economic Planners; Conservationists.

Jomo Kenyatta University of Science and Technology (Kenya) offers 24-months Master of Science in Geospatial Information Systems (GIS) and Remote Sensing, a KNQF Level 9 with 240 credits. The qualification exit level outcomes are to:

- impart adequate knowledge in GIS and Remote Sensing to professionals to facilitate efficient
- decision making for better management of resources and Environment

- enable learners to use GIS and Remote Sensing technologies for specific applications in their fields.
- create GIS and Remote Sensing awareness and the potential of these technologies to professionals in different fields.
- provide learners with adequate practical hands-on experience in GIS and Remote Sensing.

Assessments shall normally comprise written tests and assignments. Continuous assessments shall contribute 40% of the total marks and written Ordinary University Examinations shall contribute 60% of the total marks. Where a unit consists solely of practical work. At Semesters 3 and 4, research methodology, seminars and research project are conducted. Employment Pathways are Surveyors; Geomatic Engineers; Civil Engineers; Environmentalist; Planners; Natural resource managers; Forest Managers.

Stuttgart University of Applied Sciences (Germany): the 18-24 months qualification in Master of Science in Photogrammetry and Geoinformatics is made of 90 Credit Points. The exit learning outcomes are:

- Awareness of the relevance of geodata for decision processes on different levels.
- Scientific based knowledge of basic theories and models.
- Ability to implement the knowledge in practice.
- Preparation for an international and intercultural environment in an increasing globalized working environment.
- Preparation for further academic education.

The focus is on gaining technical, management related skills, as well as economic and ergonomic basic skills. The assessments are through formative and summative assessments. The proposal for Master´s Thesis and proposal defence Research Seminar each constitute 50%. The Master Thesis comprises of the Thesis Report, Poster, and Presentation and defence of the thesis. Fields of occupation and career paths include public sector, private sector and NGOs as photogrammetry, remote sensing, data analysts and GIS experts.

Delft University of Technology (The Netherlands) offers Master of Science in Geomatics at NLQF Level 7 with 120 EC credits. With Geomatics for the Built Environment the graduates have the following exit level outcomes:

- Acquire advanced techniques in data collection and analysis, 2D and 3D modelling, and the visualisation of these data.
- Learn to use advanced techniques in data collection and analysis, spatial information modelling and the visualisation of data.
- Gain knowledge about the use, governance and application of geographic data for solving real-world problems in an innovative way.
- Become proficient in quickly analysing the needed geospatial information, performing the required processing and analysis steps and producing an appealing visualisation or presentation of your solutions.

The study programme tracks are compiled from main track (core), Civil Engineering (options) and electives with fundamentals in climate change, science & ethics. Written examinations in the first year are according to the Teaching and Examination Regulations (TER), and second year is devoted to Master's Thesis Project, which will be defended via oral presentation. Employment pathways include working in large international enterprises to national SMEs and start-ups, from research and development organisations to government and academia.

Oregon State University (USA) offers Master of Science (M.S.) in Civil Engineering (Geomatics) with NLQF Level 7 comprising of 45 credits. The M.S. graduate program at is designed to:

- Support a wide range of geomatics students from land surveyors to geo-computation professionals.
- Enable students to obtain breadth in geomatics while they master depth in specific topic areas.
- Acquire diverse range of skills and abilities, as well as be able to communicate with practitioners in many fields.
- Gain not only have a work-ready knowledge of technology, but understand critical theoretical concepts.
- Prepare graduates to become leaders in advancing the geospatial profession.

The M.S. degree is comprised of credits in the major, the project OR thesis, and minor (if minor is included). The final M.S. Thesis is defended through oral examinations. The Employment pathways are careers in Civil Engineering Geomatics Design, Consulting, Development, Regulation, or Construction; Teaching and Research.

Similarities

- The qualifications exit outcomes and objectives are closely related and address the needs in the Geomatics education and industry.
- The main areas of specialization that is common to the compared universities is on Photogrammetry; Remote Sensing; Digital Terrain Modeling; Python Programming for Geomatics; Geodesy; Navigation/GNSS, Control Surveying; 3D Laser Scanning and Imaging; Least Squares Adjustments; Property Surveys; Geo Database Management Systems, amongst others.
- The qualifications tend to have similar education and employment pathways.
- The structures of assessment of the qualifications are based on coursework and research Dissertation components.
- The duration of study is similar and stipulated at 24 months of full-time research study.
- The exit outcomes emphasize on coursework and advanced research in Geomatics and presentation of results as a Dissertation. The assessment of the Dissertation is mostly based on internal and external examination of the Dissertation and oral defence of the Dissertation.

Differences

- The Universities compared offer the equivalent MSc in Geomatics qualifications, however specific titles of the qualifications differ from one institution to another.
- It is noted that most of the Qualifications either combine the three disciplines (Photogrammetry and Geoinformatics, Geodesy and Engineering Surveying, and Land Tenure and Cadastral Systems) with emphasis on Photogrammetry and Geoinformatics.
- For the same qualification, the exit level credits differ based on the Region or Country that is: Makerere University (300 credits); JKUAT (240 credits); Stuttgart University of Applied Sciences (90 CP); Delft University of Technology (120 ECTS) and Oregon State University (45 credits). In addition, the qualification levels vary.

- The requirement of minimum one (1) peer-reviewed Journal paper is not a prerequisite for fulfilment of the award of the qualifications for all the Universities.
- The course module combinations vary from University to another, based on the emphasis especially in terms of electives/optional courses.

Summary

The Master of Science in Geomatics qualifications have the same structure and emphasizes on the purpose of providing students with extensive, detailed knowledge on the theory, scientific methods, and practices in Geomatics, combined with a high level of competence in the acquisition, processing, modelling, analysis and visualization of geospatial data. The exit level outcomes are largely similar as well as the pathways for further education and career growth.

REVIEW PERIOD

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