



MASENO UNIVERSITY
FOUNTAIN OF EXCELLENCE

eCampus



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Master of Science in Research Methods (eRM) eLearning Programme

SCHOOL OF MATHEMATICS, STATISTICS AND ACTUARIAL SCIENCE, DEPARTMENT OF
STATISTICS AND ACTUARIAL SCIENCE



ISO 9001:2008
CERTIFIED



Introduction

There is a need to provide an account of a range of quantitative research methods and strategies and to illustrate how these can be applied to a variety of research areas and work settings. There is a great demand for skills for quantitative design and data collection as well as access and use of major secondary and official data-banks. Quantitative Methods are needed in such areas as Biological Statistics and Social Statistics, presenting and discussing a range of descriptive and inferential techniques.

This programme leads to the degree of Master of Science in Quantitative Research Methods with specialization in either Biological or Social research methods. It is designed to be suitable to students in full time employment as well. The involvement of the employer is desired and it is possible for the program to be tailored, to some extent, to suit the needs of the employer as detailed below. This could allow the employer's data and problems to be integrated into the course content guaranteeing the relevance of the education. The uniqueness of this programme is the opportunity to gain core skills and knowledge across a wide range of quantitative methods, which will enhance future career opportunities, including entrance into competitive PhD programmes.

2. Programme Objectives

The objectives of the programme are to:

- i). Provide students with a comprehensive background to quantitative methods, underpinned with a sound understanding of the biological or social, statistical and mathematical aspects of the field, and how they are integrated.
- ii). Develop competence in quantitative methods required to address a range of topical 'real-world' questions in the respective specialization.
- iii). Develop an ability to choose an appropriate quantitative method for answering a particular biological or social question.
- iv). Develop an ability to develop, analyse, numerically simulate, fit to data and interpret quantitative models of biological or social systems
- v). Train professionals in quantitative research methods which are immediately applicable in their profession.
- vi). Prepare students for professional doctorate or PhD in Applied Statistics or Research Methods.

3. Expected Learning Outcomes

Graduates of MSc in Quantitative Research Methods, will demonstrate knowledge and understanding of;

- i). Basic principles of several fields within the respective specializations from a quantitative viewpoint.
- ii). An overview of quantitative and modelling methods appropriate for inquiry in these fields.
- iii). The nature of the modern interface between the respective specializations and mathematics, statistics and computation.
- iv). The fundamental role of mathematical models in in the respective specialization. What can and cannot be accomplished with models. Uses and misuses of models.
- v). Different modelling frameworks, their strengths and weaknesses, and fundamental problems to which various approaches have been applied.
- vi). Research techniques, including study design, information

retrieval, computational statistics, sampling, analysis and presentation of results.

- vii). Transferable skills including problem definition, project design, teamwork, written and oral reports, scientific publications.
- viii). Detailed knowledge and understanding of the essential facts, concepts, principles and theories relevant to the student's chosen area of specialisation.

4. Admission Requirements

To be eligible for registration for Master of Science (MSc.) programme in Quantitative Research Methods;

- i). Common regulations for the Master degree in Maseno University and all schools and institutes shall apply.
- ii). Candidates must have taken Mathematics as a major subject in their Bachelor's degree.
- iii). Holders of a Bachelor's degree of Maseno University in Applied Statistics, of at least Upper Second Class Honours, or equivalent qualification from an institution recognized by the Senate.
- iv). Holders of a Bachelor's degree in Applied Statistics of Lower Second Class Honours, of Maseno University, or an equivalent qualification from another institution recognized by Senate. In addition, a candidate must have at least two years relevant work experience.
- v). Holders of a Postgraduate Diploma in Applied Statistics of Maseno University, of a minimum credit grade or an equivalent qualification from an institution recognized by Senate.

5. The Programme Duration

The Master of Science degree course in Quantitative Research Methods shall cover a minimum duration of 4 semesters and a maximum duration of 8 semesters.

6. Programme Structure

The Master of Science degree course in Quantitative Research Methods shall be offered by: course work, supervised research project or thesis and examination. The courses are offered in units and a course unit is defined as a 3 hour lecture, a 6 hour tutorial or a 9 hour practical session per week per semester.

Thesis pathway, MSc by coursework and thesis

Semester 1: Coursework 4 core units and 2 elective units.

Semester 2: Coursework 1 core unit, 4 elective units

Research Proposal 1 unit

Semester 3: Research only 3 units

Semester 4: Research/Thesis 3 units

Project pathway, MSc by coursework and research project

Semester 1: Coursework 4 core units and 2 elective units.

Semester 2: Coursework 3 core units and 2 elective units.

Semester 3: Coursework 1 core unit, 3 elective units (minimum)

Research Proposal 1 unit

Semester 4: Research project. 3 units

7. Mode of Delivery

The courses are offered in various ways that are deemed appropriate for the program. A given course might be offered in more than one way to allow full flexibility to the students. Some might be fully online, others through face-to-face evening, weekend or other scheduled intensive learning sessions. Most will include some aspect of eLearning through the use of Maseno University's Learning Management System.

8. Examinations

Masters examinations shall be governed by the university common rules and regulations for Postgraduate Studies in all schools and institutes of Maseno University.

i). All course units taken in a semester shall normally be examined at the end of the semester.

ii). A candidate for the Masters of Science in Quantitative Research Methods shall be required to complete satisfactorily all such courses and assignments that may be required for the course of study.

iii). Each taught course unit shall be examined by a three hour written examination.

iv). The complete assessment of a taught course unit shall consist of continuous assessment test, course work or practical assignment and a written examination. The contribution towards the unit aggregate score shall be 40%

for course work and 60% for the final written examination.

v). There shall at least be two continuous assessment tests for every course unit.

vi). A candidate who fails to obtain a pass mark in any course unit may on the recommendation of the Board of Examiners and approval by Senate be allowed to take a resit or retake the failed units by the next examination session, a maximum of two times.

vii). The written report for the project shall constitute 60% and oral examination shall constitute 40% of the total marks.

viii). A student must pass an examination in all units offered. The pass mark for each unit shall be 50%.

9. Module Distribution

1. Biological Statistic Specialization

Semester 1

Code	Title	Units	Type
MRM 805:	Computational matrix Analysis	1	C
MRM 807:	Linear Statistical Models I	1	C
MRM 808:	Design and Analysis of Experiments	1	E
MRM 827:	Design and Analysis of Surveys I	1	E
MRM 831:	Statistical Theory	1	C
MRM 832:	Survey Sampling	1	E
MRM 833:	Interactive Data Analysis	1	C

Semester 2

Code	Title	Units	Type
MRM 804:	Non parametric Statistical Analysis	1	E
MRM 811:	Bayesian Statistics	1	E
MRM 812:	Applied Time Series Analysis	1	E
MRM 834:	Multivariate Statistics	1	C
MRM 835:	Survival Data Analysis	1	E
MRM 836:	Applied Stochastic Processes	1	E
Thesis pathway			
MRM 899:	Thesis Research Proposal	1	C

Semester 3

Code	Title	Units	Type
Project pathway			
MRM 898:	Project proposal	1	C
MRM 813:	Analysis of Categorical Data	1	E
MRM 814:	Analysis of Longitudinal Data	1	E
MRM 815:	Epidemiological Methods	1	E
MRM 816:	Design of Clinical Experiments	1	E
MRM 817:	Linear Statistical Models II	1	E
MRM 819:	Model Selection and Inference	1	E
MRM 820:	Statistical Demography	1	E
MRM 821:	Statistical Ecology	1	E
MRM 822:	Statistics for Psychosocial Research	1	E
MRM 823:	Statistics in Industrial Biotechnology	1	E
MRM 824:	Topics in Biometry	1	E
MRM 825:	Exploring, describing and presenting data	1	E

MRM 826: Communicating research	1	E
MRM 846: Climate variability and climate change	1	E
Thesis pathway MRM 899 Thesis Research	3	C

Semester 4

Code	Title	Units	Type
Project thesis			
MRM 898: Project research/report		3	C
Thesis pathway			
MRM 899: Thesis Research/writing		3	C

MRM 830: Survey Research Methods and Observation Studies	1	E
MRM 837: Design and Analysis of Surveys II	1	E
MRM 845: Topics in Social Statistics	1	E
MRM 846: Climate variability and climate change	1	E
Thesis pathway MRM09: Thesis research	3	C

Semester 4

Code	Title	Units	Type
Project pathway			
MRM 890: Project research/Report Thesis pathway		3	C
MRM091: Thesis research/Report		3	C

2 . Social Statistics Specialization

Semester 1

Code	Title	Units	Type
MRM 802: Stochastic Processes I		1	E
MRM 805: Computational matrix Analysis		1	C
MRM 807: Linear Statistical Models I		1	C
MRM 831: Statistical Theory		1	C
MRM 833: Interactive Data Analysis		1	C
MRM 835: Survival Data Analysis 1		E	
MRM 838: Modelling and Analysis of Social Data		1	E

Semester 2

Code	Title	Units	Type
MRM 804: Non parametric Statistical Analysis		1	E
MRM 812: Applied Time Series Analysis		1	E
MRM 834: Multivariate Statistics		1	C
MRM 827: Design and Analysis of Surveys I		1	C
MRM 839: Advanced Econometrics		1	E
MRM 840: Analytic Demography		1	E
Thesis pathway MRM 899: Thesis Proposal		1	C

Semester 3

Code	Title	Units	Type
Project pathway			
MRM 890: Project proposal	1	C	
MRM 813: Analysis of Categorical Data	1	E	
MRM 814: Analysis of Longitudinal Data	1	E	
MRM 822: Statistics for Psychosocial Research	1	E	
MRM 825: Exploring, describing and presenting data	1	E	
MRM 826: Communicating research	1	E	
MRM 828: Advanced Quantitative Economics	1	E	
MRM 829: Applied Demography	1	E	