

Semester II		
MMB 727	Populations Dynamics	4
MMB 725	Mathematical Epidemiology	4
	1 Elective	
MMI 720	Discrete Mathematics I	4
MMA 712	Dynamical Systems I	4
MMS 725	Data Analysis I	4
Recess Term		
MMC 701	Computing & Simulation	4
Semester III (3 Electives)		
MMB 739	Mathematical Ecology	4
MMB 736	Mathematical Bioeconomics	4
MMC 735	Dynamical System II	
MMI 719	Stochastic Processes II	4
Semester IV		
MMB 740	Project Report	8
(d) Mathematical Statistics		
Semester I		
MMA 711	Foundations of Mathematics	4
MMI 718	Stochastic Process I	4
MMS 711	Probability & Statistics	4
	No Electives	
Semester II		
MMS 722	Linear Statistical Models	4
2 Electives		
MMS 729	Probability Theory	4
MMS 725	Data Analysis I	4
MMS 727	Multivariate Methods I	4
Recess Term		
MMC 701	Computing & Simulation	4
Semester III		
MMA 731	Algebra	4
3 Electives		

MMA 712	Numerical Analysis I	4
MMS 726	Data Analysis II	
MMI 739	Stochastic Processes	4
MMS 739	Time Series	4
MMI 736	Optimization Methods	4
Semester IV		
MMS 740	Project Report	8
(e) Computational Mathematics		
Semester I		
MMA 711	Foundations of Mathematics	4
MMC 716	Database Design & Implementation	4
MMC 710	Programming Methodology	4
	No Electives	
Semester II		
MMI 752	Operations Research I	4
	2 Electives	
MMC 727	Database Management Systems	4
MMI 720	Discrete Mathematics I	4
MMC 721	Algorithms, Data Structures & Programming I	4
MMC 722	Software Engineering I	4
Recess Term		
MMC 701	Computing & Simulation	4
Semester III 3 Electives		
MMI 722	Operational Research II	4
MMC 772	Software Engineering II	4
MMI 736	Optimization Methods	4
MMC 735	Systems Development	4
MMI 736	Optimization Methods	4
Semester IV		
MMS 740	Project Report	8

MASTER OF SCIENCE IN MATHEMATICAL MODELLING

Objective of the Programme

The objectives of the programme are hinged towards the AMI-Net objectives being.

- To provide skills for high quality research and teaching in the field of mathematical modeling in Africa.
- To raise a critical mass of mathematical modelers in the region to popularize and meet challenges of computational

and mathematical applications to the industry and society.

- To support the application of the methods and results of mathematical modeling in the areas of industry.
- To facilitate efforts of researchers in biomathematics and modeling and draw them towards interdisciplinary research.

- (e) To have a combined effort at solving common regional problems such as common emerging and re-emerging tropical diseases.

STRUCTURE OF THE PROGRAMME

The Master of Science in Mathematical Modelling degree will comprise of three semesters of study (18 months). The programme will consist of a minimum of 47 credit (CU) spread over the three semesters, including a research project. The nature of the programme is such that the student takes five courses in Semester I and five courses in Semester II. In semester III, the student undertakes a research project (of 5 CU), and two course related to the project area. In addition, the students are required to get involved in seminar series in Semester III. There will be a Recess Term during which students will be involved in a computer and research writing skills. This will take 2 CU. The duration of each semester should be 17 weeks (i.e. one week of registration, 15 weeks for teaching and one week for examinations).

Research Project:

During the third and final semester a student will undertake a project and two advanced courses from the above related to the area of his/her project. The aim of the project is to introduce a student to research and Mathematical writing. The project will test how well a student has understood and can apply a given mathematical result or theory from the courses done to model real life situation. The student may, in addition get attached to an industry to gain insight on the operation of the organization, data collection for model validation and get to learn the terminology related to the industrial modeling aspect.

Structure of the Programme Year I Semester I		
CODES	Course Name	CU
MTM 7101	Differential Equations and Dynamical Systems	3
MTM 7102	Stochastic Processes	3
MTM 7103	Measure and Probability	4
Electives (Choose Two Courses)		
MTM 7104	Mathematical Epidemiology	3

MTM 7105	Introduction to Mathematics of Finance	3
MTM 7106	Operations Research and Optimization Theory	3
MTM 7107	Statistical Modelling	3
MTM 7108	Economic Modelling	3
MTM 7109	Systems Dynamics Modelling	3
Semester II Core Courses		
MTM 7201	Numerical Methods for Partial Differential Equations	4
MTM 7202	Stochastic Calculus	3
MTM 7203	Applied Functional Analysis	3
Electives (Choose Two Courses)		
MTM 7204	Mathematical Ecology and Natural Resource Modelling	3
MTM 7205	Life Insurance Mathematics	3
MTM 7206	Fundamentals of Bioinformatics	3
MTM 7207	Biostatistics and Data Analysis Techniques	3
MTM 7208	Mathematical Physiology	3
MTM 7209	Time Series and Forecasting	3
MTM 7211	Systems Dynamics Modelling and Decision Making	3
Recess Term (Compulsory Skills for all students)		
MTM 7210	Computational and Research Methods	2
Electives (Two courses chosen from the following electives related to the project area)		
MTM 8102	Control Theory	3
MTM 8103	Non-Life Insurance Mathematics	3
MTM 8104	Financial Mathematics	3
MTM 8105	Applied Bioinformatics	3
MTM 8106	Computational Neuroscience	3
MTM 8107	Mathematical Immunology	3
MTM 8108	Environmental Modelling	3
MTM 8109	Hydrodynamic Stability Theory	3