UNIVERSITY of TECHNOLOGY, MAURITIUS

School of Innovative Technologies and Engineering

Department of Applied Mathematical Sciences

MSc Financial Engineering

PROGRAMME DOCUMENT

VERSION 3.0
MFE v3.0
August 2021

University of Technology, Mauritius
La Tour Koenig, Pointe aux Sables 11134, Mauritius
Tel: (230) 207 5250 *Fax:* (230) 234 1747 *Email:* site@umail.utm.ac.mu
Website: www.utm.ac.mu

MSc FINANCIAL ENGINEERING

A. Programme Information

The financial sector is a dynamic industry involving much uncertainty and requires proper analytical and practical knowledge for efficient productivity. This Master degree is intended to provide students with the necessary understanding in financial data analysis, risk management, quantitative research, forecasting and efficient decision making, and financial information technology. The programme is designed as an intensive two-semester (full time mode) or three-semester (part time mode) programme to adequately empower students for effective lending of their abilities in the quantitative financial industry.

B. Programme Aims

The MSc Financial Engineering course has been designed to train students so that they can join the following fields/areas:

- Risk Analysis in Insurance and Banking Sectors
- Financial Engineering
- Stock Exchange

The degree programme also serves as an excellent basis for students wishing to pursue studies for an MPhil/PhD, hence leading to careers as researchers in the field of finance and risk analysis.

C. Programme Objectives

After successful completion of the programme, the students are expected to have developed

- considerable knowledge of the main numerical techniques used in quantitative finance;
- an understanding of modern econometric techniques used in the analysis of financial time series;
- an understanding of risk management tools and derivatives pricing and hedging methodologies, used in the financial sector;
- an understanding of the principal stochastic differential equations that are used in derivative modelling and other areas of quantitative finance;
- knowledge to apply optimization models, methods and software to solve problems in computational finance efficiently and accurately;
- knowledge of computer packages for financial applications.

PART I - Regulations

D. General Entry Requirements

As per UTM's Admissions Regulations.

E. Programme Entry Requirements

A bachelor degree with significant content of Mathematics / Statistics.

For instance, a bachelor degree in Computer Science, Engineering, Accounting, Economics, Finance or a closely related field, or other qualifications (academic or professional) acceptable to the University of Technology, Mauritius can be considered.

F. Programme Mode and Duration

Full Time:	Minimum 1 Year, Maximum 3 Years	(Minimum 2 Semesters, Maximum 6 Semesters)
Part Time:	Minimum 1½ Years, Maximum 3½ Years	(Minimum 3 Semesters, Maximum 7 Semesters)

G. Teaching and Learning Strategies

- Lectures (L), Tutorials (T), Practical (P) Sessions and Self-Development (SD) Activities
- Class Tests, Assignments and Dissertation/Projects;
- Self-Learning, Self-Study, Guest Lecture, Structured Discussions and Self-Directed Study;
- Workshops and Seminars;
- Case Study of real-world problems.

H. Student Support and Guidance

Each cohort of the programme is allocated a Programme Coordinator who acts as a liaison between the students and school management and provides support for academic management of the programme.

I. Attendance Requirements

As per UTM's Regulations and Policy

J. Credit System

This programme is aligned with the European Credit and Transfer System (ECTS).

Six-credit modules consist of 45 hours of delivery and 105 hours of self-learning, self-study, guest lecture, etc. The delivery could be any combination of face-to-face, blended, online, seminar, workshop or joint session.

For the award of

- a Postgraduate Certificate, a minimum of 30 credits are required;
- a Postgraduate Diploma, a minimum of 60 credits are required;
- a Master's Degree, 90 credits are required.

K. Student Progress and Assessment

The programme is delivered mainly through lectures, tutorials, and practical laboratory sessions. Students are expected to be as autonomous and research oriented as possible in their self-study and self-development activities, which may include reading, writing reports, delivering presentations, taking part in quizzes, and case-studying, amongst others. Each module carries 100 marks and unless otherwise specified, will be assessed as follows:

- written and/or practical examination, and coursework carrying 30% - 40% of total marks;
- coursework must consist of at least one class test and may also include assignments, field study, workshops and practical tests;
- modules 'Mathematics for Finance', 'Numerical Methods for Finance' and 'Mathematical Finance with Stochastic Interest Rates' will be assessed by 100% coursework. The coursework must consist of at least one class test and at least one assignment.

Module grading structure:

Grade	**Marks x (%)**	**Remarks**
A	$70 \leq x \leq 100$	Excellent
B	$60 \leq x < 70$	Very Good
C	$50 \leq x < 60$	Good
D	$40 \leq x < 50$	Satisfactory
F	$x < 40$	Referred

L. Evaluation of Performance

The percentage mark contributes a 100% weighting towards the degree classification.

M. Award Classification

Overall weighted mark y (%)	**Classification**
$70 \leq y \leq 100$	MSc with Distinction
$60 \leq y < 70$	MSc with Merit
$40 \leq y < 60$	MSc
$y < 40$	No Award

N. Programme Organisation and Management

Programme Director: Dr Arshad Ahmud Iqbal PEER

Contact Details:

- Telephone Number: (+230) 207 5250
- Email: apeer@umail.utm.ac.mu

Part II - Programme Structure

O. MSc Financial Engineering – Full Time (Version 3.0)

Semester 1				*Semester 2*			
Code	**Modules**	**Hrs/Wk L/T/P+SD**	**Credits**	**Code**	**Modules**	**Hrs/Wk L/T/P+SD**	**Credits**
QFIN 5211C	*Mathematics for Finance*	3+7	6	MATH 5350C	*Optimisation Techniques in Finance*	3+7	6
QFIN 5115C	*Financial Systems*	3+7	6	STAT 5351C	*Big Data for Finance*	3+7	6
MATH 5330C	*Stochastic Calculus for Finance*	3+7	6	QFIN 5117C	*Hedging*	3+7	6
STAT 5347C	*Statistics and Data Analysis for Finance*	3+7	6	QFIN 5214C	*Mathematical Finance with Stochastic Interest Rates*	3+7	6
QFIN 5118C	*Financial Risk Management*	3+7	6	STAT 5335C	*Financial Econometrics Modelling*	3+7	6
QFIN 5212C	*Numerical Methods for Finance*	3+7	6	STAT 5352C	*Machine Learning in Finance*	3+7	6
PROJ 5201C	*Master's Dissertation*						18

P. MSc Financial Engineering – Part Time (Version 3.0)

Semester 1			
Code	**Modules**	**Hrs/Wk L/T/P+SD**	**Credits**
QFIN 5211C	*Mathematics for Finance*	3+7	6
QFIN 5115C	*Financial Systems*	3+7	6
MATH 5330C	*Stochastic Calculus for Finance*	3+7	6
STAT 5347C	*Statistics and Data Analysis for Finance*	3+7	6

Semester 2				*Semester 3*			
Code	**Modules**	**Hrs/Wk L/T/P+SD**	**Credits**	**Code**	**Modules**	**Hrs/Wk L/T/P+SD**	**Credits**
QFIN 5118C	*Financial Risk Management*	3+7	6	QFIN 5117C	*Hedging*	3+7	6
QFIN 5212C	*Numerical Methods for Finance*	3+7	6	QFIN 5214C	*Mathematical Finance with Stochastic Interest Rates*	3+7	6
MATH 5350C	*Optimisation Techniques in Finance*	3+7	6	STAT 5335C	*Financial Econometrics Modelling*	3+7	6
STAT 5351C	*Big Data for Finance*	3+7	6	STAT 5352C	*Machine Learning in Finance*	3+7	6
PROJ 5201C	*Master's Dissertation*						18