



UNIVERSITY
TECHNOLOGY,
MAURITIUS

School of Innovative Technologies and Engineering

Department of Applied Mathematical Sciences

Proficiency Course in Financial Analysis
and
Modelling using Spreadsheets

COURSE DOCUMENT

VERSION 1.0
PCFAMS 1.0

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PROFICIENCY COURSE IN FINANCIAL ANALYSIS AND MODELLING USING SPREADSHEETS

A. Course Information

Financial decision making and planning processes in almost all major institutions are increasingly becoming data dependent. This short course is designed through a hands-on approach, to give a thorough insight into the world of financial analysis and modelling using spreadsheets. Concepts of financial analysis, decision making under risk, portfolio analysis and optimization, financial forecasting and options pricing along with a special focus on the tools mandatory for advanced and efficient spreadsheet modelling will be covered. This proficiency course is an intensive 5-day course, with three sessions scheduled for each day. A mini project will be expected to be submitted by the end of the course for assessment purposes.

B. Course Aims and Objectives

The course projects to add to the quality of the personnel in the financial market and train students who wish to pursue career in the field of financial analysis and modelling. It also serves as a good basis for those particularly wishing to broaden their spreadsheet modelling skills.

Upon successful completion of the course, students will be expected to have developed amongst others, a sound understanding in

- Employing graphical representations to represent and interpret financial data
- The basics of financial mathematics and capital budgeting
- Using spreadsheets for linear regression, forecasting, portfolio analysis and portfolio management.
- Bonds and Futures calculation, cost of capital, risk analysis and options valuation
- Efficient use of spreadsheet functions and macros for financial analysis and modelling

PART I - Regulations

C. Entry Requirements

At least 2 'A' level subjects including Mathematics.

Professional experience in the field of finance would be an advantage.

D. Mode and Duration

Five days with three sessions of two and a half hours each scheduled on a day:

Session 1: 08:30 - 11:00

Session 2: 12:00 - 14:30

Session 3: 15:00 - 17:30

The time schedules are tentative.

E. Teaching and Learning Strategies

Lectures, Practical Sessions and Structured Discussions

F. Attendance Requirements

A minimum of 80 % of attendance is required for a candidate to be eligible for a Certificate of Attendance or a Certificate of Proficiency in Financial Analysis and Modelling using Spreadsheets.

G. Credit System

The course is equivalent to two credits

H. Student Progress and Assessment

For the award of a Certificate of Proficiency, the student will be required to complete an assignment on the last session of the course.

I. Award

The student successfully clearing the assignment will be awarded a Certificate of Proficiency.

The student failing to clear the assignment will be awarded a Certificate of Attendance, subject to eligibility.

J. Organisation and Management

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Part II - Course Structure

K. Course Structure

DAY 1: BASICS OF FINANCIAL ANALYSIS WITH SPREADSHEETS	
Session1	Spreadsheet Basics
Session 2	Basic Financial Mathematics
Session 3	Cash Budgeting
DAY 2: FINANCIAL FORECASTING WITH SPREADSHEETS	
Session 1	Financial Statement Analysis
Session 2	Basic Financial Mathematics
Session 3	Regression and Forecasting
DAY 3: BREAK-EVEN, LEVERAGE AND PORTFOLIO ANALYSIS WITH SPREADSHEETS	
Session 1	Leverage and Capital Structure
Session 2	Time Value of Money
Session 3	Portfolio Analysis

DAY 4: YIELD, BONDS CALCULATION AND PORTFOLIO OPTIMIZATION WITH SPREADSHEETS

Session 1	Cost of Capital
Session 2	Yields and Bonds Calculation
Session 3	Portfolio Optimization

DAY 5: OPTIONS VALUATION WITH SPREADSHEETS

Session 1	American Option Valuation
Session 2	Black-Scholes Option Pricing
Session 3	Discussion and Assignment

L. Module Outline

Day 1: BASICS OF FINANCIAL ANALYSIS WITH SPREADSHEETS

Session 1: Spreadsheet Basics

The spreadsheet program
Components of the spreadsheet screen
Entering, correcting, moving data within sheet
Built-in functions: Mathematical operators, macro functions
Graphics, pivot tables and pivot charts
Writing formula in spreadsheets
References allowed in formula, block of cells, non-adjacent cells, entire rows and columns, worksheets.
The 'outline' tool.

Session 2: Basic Financial Mathematics

Simple and compound interests: nominal, effective rates
Continuous discounting
Conversions and comparisons
Income statement: construction in spreadsheet
Balance sheet, statement of cash flows

Session 3: Cash Budgeting

Cash budget, income statement
Cash collections, disbursements
Projected ending cash balance
Short term borrowing requirements
Ideal timing of major cash expenditures using spreadsheets

Day 2: FINANCIAL FORECASTING WITH SPREADSHEETS

Session 1: Financial Statement Analysis

Financial ratios: Liquidity, Efficiency, Leverage, Coverage, Profitability
Common ratios using income statement and balance sheet data
Financial ratios: short term creditors, long term creditors
Assessment of performance
Identification of current complications and find remedial strategies
Economic profit

Session 2: Basic Financial Mathematics

Present value: PV, NPV, XNPV
Discount cash flow analysis: IRR, MIRR, XIRR
Future values
Annuities
Depreciation and spreadsheet functions
Fixed declining and variable declining methods: accelerated depreciation

Session 3: Regression and Forecasting

Regression analysis with spreadsheet
Least-square line
Graphic approach
Smoothing techniques: moving average
Adaptive filtering
Exponential smoothing

Day 3: BREAK-EVEN, LEVERAGE AND PORTFOLIO ANALYSIS WITH SPREADSHEETS

Session 1: Leverage and Capital Structure

Fixed and variable costs
Operating leverage, financial leverage
EBIT-EPS analysis
Business risk and Financial risk
Risk measures with spreadsheets and changes as transaction level change

Session 2: Time Value of Money

Compounding, discounting
Required rate of return
Capital asset pricing model
Risk characteristic of financial assets
Risk in stock prices
Risk and capital budgeting decisions: RADR

Session 3: Portfolio Analysis

Graphing of portfolio returns
Efficient frontier and minimum variance portfolio
Effects of correlation on efficient frontier
Portfolio risk measures with spreadsheet
Risky portfolio and riskless assets
Optimal investment combinations
Portfolio mean for two asset portfolio
Portfolio statistics for multiple assets

Day 4: YIELD, BONDS CALCULATION AND PORTFOLIO OPTIMIZATION WITH SPREADSHEETS

Session 1: Cost of Capital

Individual and overall cost of capital: SML
Marginal cost of capital
Computation of WACC
Calculation of 'break points' in a firm's marginal WACC curve, graphing of curve
Efficient markets: security evaluation
Single price for single good
Additive pricing of bundles;
Worth of cheap information
Transaction cost

Session 2: Yields and Bonds Calculation

Yield, Yield to call
Price and yield relationship
Yield curve pricing, yield measures
Description, zero coupons
Bond risks, duration, and convexity comparison

Session 3: Portfolio Optimization

Mean-variance portfolio selection:
Computing mean-variance portfolios
Back-testing portfolio performance
Research on portfolio selection
Bond portfolio selection
Term structure estimation
Capital budgeting
Advanced risk analysis
Monte-Carlo simulation

Day 5: OPTIONS VALUATION WITH SPREADSHEETS

Session 1: American Option Valuation

Review of options
Binomial trees
Risk neutral valuation
American option valuation
Estimating volatility

Session 2: Black-Scholes Option Pricing

Black-Scholes model
Comparison with Binomial model

Session 3: Discussion and Assignment

Discussion on materials covered
Assignment