هيئة تقويم التعليم
Education Evaluation Commission
المركز الوطني للتقويم والاعتماد الأكاديمي
National Center for Academic Accreditation and Evaluation

ATTACHMENT 5.

T6. COURSE SPECIFICATIONS (CS)

ACTU 483
Lab Financial Mathematics

1439/2018

هيئة تقويم التعليم
Education Evaluation Commission

Course Specifications

Institution: King Saud University	Date: 01/02/2018
College/Department: Science, Mathematics	

A. Course Identification and General Information

1. Course title and code: Lab Financial Mathematics ACTU 483
2. Credit hours: 1(0+0+2)
3. Program(s) in which the course is offered.
   Actuarial and Financial Mathematics Program
4. Name of faculty member responsible for the course: Pr. Dr. Souhail Chebbi
5. Level/year at which this course is offered: 8/4
6. Pre-requisites for this course (if any): All Actu previous courses
7. Co-requisites for this course (if any): None
8. Location if not on main campus:
9. Mode of Instruction (mark all that apply):

a. traditional classroom	X	What percentage?	100%
b. blended (traditional and online)		What percentage?	
c. e-learning		What percentage?	
d. correspondence		What percentage?	
f. other		What percentage?	

Comments:

B Objectives

1. What is the main purpose for this course?

This course will allow students to learn to use the MATLAB Financial Toolbox™. It provides functions for mathematical modelling and statistical analysis of financial data. Optimize portfolios of financial instruments, optionally taking into account turnover and transaction costs. The toolbox is used to estimate risk, analyses interest rate levels, price equity and interest rate derivatives, and measure investment performance. Time series analysis functions and an app let you perform transformations or regressions with missing data and convert between different trading calendars and day-count conventions.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

Electronic materials and computer based programs have been utilized to support the lecture course material.

C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description:

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Financial Toolbox Product Description	2	4
Handle and Convert Dates **a.** Date Formats **b.** Date conversions **c.** Current Date and Time **d.** Determining Dates	1	2
Charting Financial Data a. High-Low close chart b. Bollinger Chart	1	2
Analyzing and Computing Cash Flows a. Interest rate, rate of return b. Present and future value c. Depreciation	1	2

Pricing and Computing Yields for Fixed-Income a. Fixed-Income Terminology b. Coupon, yield rate c. Pricing function, yield function, sensitivities	2	4
Computing Treasury Bill Price and Yield a. Treasury Bill Repurchase Agreements b. Treasury Bill Yields	2	4
Term Structure of Interest Rates	1	2
Pricing and Analyzing Equity Derivatives a. Sensitivity Measures **b.** Analysis Models	2	4
Life Tables	1	2
Analyzing Portfolios a. Portfolio Optimization Functions b. Portfolio Construction Examples c. Portfolio Selection and Risk Aversion d. Frontcon Migration to Portfolio Object ·		

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical (visit to companies)	Other:	Total
Contact Hours	Planed		28		None		28
	Actual		28		None		28
Credit	Planed		28		None		28
	Actual		28		None		28

3. Additional private study/learning hours expected for students per week. 6

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

On the table below are the five NQF Learning Domains, numbered in the left column.

First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**,

insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	**Knowledge**		
1.1	To be able to use MATLAB toolbox	Lab	Lab reports Midterm and final exams
1.2	To be able to get know the general purpose commands of Matlab	Lab	Lab reports Midterm and final exams
1.3	Become familiar with some of the elementary functions, matrix and numerical linear algebra functions, as well as some graphic and plot commands	Lab	Lab reports Midterm and final exams
1.4	Manipulate matrices (i.e. create and edit vectors and matrices, build a larger matrix from a smaller one, etc	Lab	Lab reports Midterm and final exams
1.6	To write and edit m-files and functions for solving a specific problem related to finance.	Lab	Lab reports Midterm and final exams
1.7	To compute prices, yields, and sensitivities for derivatives and other securities, and for portfolios of securities;		Lab reports Midterm and final exams
2.0	**Cognitive Skills**		
2.1	To solve various financial problems numerically via financial MATLAB toolbox	Problem solving	Quizzes Midterm and final exams
2.2	To analyze or manage portfolios.	Problem solving	Quizzes Midterm and final exams
2.3	To design and evaluate hedging strategies and many more.		
3.0	**Interpersonal Skills & Responsibility**		
3.1	Study, learn and work independently.	-Encourage students to: - participate lab discussion. - participate in college and university activities. - be members of department committees and college committees.	
3.2	Work effectively in teams.		
3.3	Meet deadlines and manage time properly.		
3.4	Exhibit ethical behavior and respect different points of view.		

4.0	**Communication, Information Technology, Numerical**		
4.1	Use MATLAB programming in some financial problems	Encourage students to: - use department and college computing facilities. - use e-mail, lms, internet, college and department websites, and central library.	
4.2	Use IT facilities as an aid to mathematical processes and for acquiring available information		
4.3	Use library to locate information.		
5.0	**Psychomotor**		
	Not applicable	Not applicable	Not applicable

5. Schedule of Assessment Tasks for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Tests, Quizzes	3	5%
2	First Midterm exam	6	25%
3	Tests, Quizzes	9	5%
4	Second Midterm exam	12	25%
5	Final	15 or 16	40%

D. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week) 1. 10 office hours weekly. 2. Encouraging students to get in touch with the instructor via e-mail.

E Learning Resources

1. List Required Textbooks a. Numerical Methods in Finance and Economics: A MATLAB based Introduction, 2end Edition, by Paolo Brandimarte. ISBN-13: 978-0471745037 , ISBN-10: 0471745030, John Wiley & Sons, Inc., 2006. b. Financial Toolbox, User's guide, MATLAB, MathWorks, R2016 A
2. List Essential References Materials (Journals, Reports, etc.)
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc. 1. http://www.mathworks.com/access/helpdesk/help/helpdesk.shtml 2. http://wwwhost.cc.utexas.edu/math/Matlab/Manual/ReferenceTOC.html
4. Other learning material such as computer-based programs/CD, professional standards or regulations and software. http://www.mathworks.com/web_downloads/.

F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (laboratories, demonstration rooms/labs, etc.)
2. Technology resources (AV, data show, Smart Board, software, etc.) AV, data show, Smart Board, LMS (Bb)
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching Surveys, Exams, quizzes 1. An evaluation sheet for the course to be filled by the students at the end of each semester. 2. Take the students' opinion about the course under consideration. 3. Discussing the course with instructors who teach the same course.
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department 1. The level of the students in solving homework and quizzes 2. Colleagues' opinions about students' performance in this course.
3. Processes for Improvement of Teaching 1. Encouraging students to get involved in the lecture. 2. Getting the use of tutorial classes. 3. Encouraging the students to read about the subject.
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) 1. Common Examination 2. Team grading. 3. Exchanging experience by comparing students' results in other departments. 4. Students who believe they are under graded can have their papers checked by a second reader.
5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement. 1. Providing reviews to develop the assigned book content.

2. Providing a discussion for the lab subject by a specialized committee.
3. View other math departments in well-known universities and getting help from them.
4. Consulting some course specialists for course evaluation.

Name of Course Instructor: Prof. Dr. Souhail Mohsen Chebbi
Signature:  Date Specification Completed: 1/02/2018

Program Coordinator: Prof. Dr. Souhail Mohsen Chebbi

Signature  Date Received: 1/02/2018