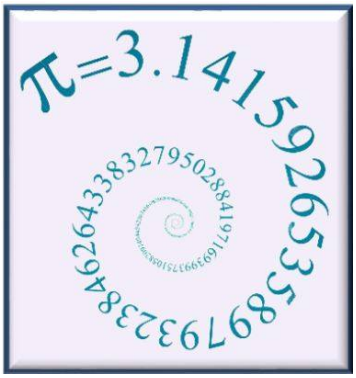
KingSaudUniversity
College of Science
Mathematics Department



Program of the degree of Bachelor of Science In ACTUARIAL AND FINANCIAL MATHEMATICS

(For Males and Females)

Preamble

In response to a directive from the rector, the department of Mathematics at King SaudUniversity formed a committee to draft a proposal for a Bachelor's degree program in Actuarial and Financial Mathematics. The fruits of its efforts are outlined below.

In arriving at this provisional program, the committee upheld a number of guiding principles:

1. The program should equip and train its graduates for passing the examinations for fellowships of international professional societies, such as the Society of Actuaries (SOA) and the Casualties Actuarial Society (CAS). This would not only ensure a high standard for the degree, but should also allow the graduates to compete well in the international job market.
2. The program should be on a par with comparable programs in reputable universities.
3. The program should have enough breadth to make graduates attractive to employers from related financial fields besides the insurance section.
4. The program should draw as much as possible from existing programs in the departments of Mathematics and Statistics of the College of Science and those of the College of Business Administration. This is desirable not only for better utilization of resources, but also to allow for smooth crossovers by the students to and from the program.
5. The program should have ample headroom to prepare graduates with academic inclinations for higher degrees and research in the burgeoning discipline of Mathematics of Finance.
6. The program should offer suitable training in mathematical modeling with applications in financial and economic analysis.

The committee sifted through the programs of a large number of universities in North America, the UK and the Arab World; we name them in no particular order: University of Illinois at Urbana-Champaign; University of California (San Diego); Chicago State university, University of Michigan; University of Washington; Central Washington University; Indiana-Purdue University; University of Maryland; New Jersey Institute of Technology; University of Texas; Florida State University; Concordia university (Canada); Leicester University (U.K.), Kent University (U.K.); Kuwait University; Jordan University; Neelein University (Sudan). The programs in all these universities intersect considerably; the common core is adopted in this proposal together with those courses required by universities that aim at preparing students for the examinations of SOA and CAS.

The committee suggests that this program be delivered in English. This is to satisfy the need of employers (such as those in the banking and insurance sections) for employees capable of dealing in the international markets on the one hand, and to make it possible for graduates to sit for the examinations of SOA and CAS on the other.

The committee would finally like to propose the setting up of a diploma program in Actuarial and Financial Mathematics for graduates who already hold a Bachelor's degree in Mathematics.

Degree Requirements

Students must successfully complete a minimum of 144 credit hours. The expected duration of the program is nine semesters.

Admission Requirements

1. GPA greater than 4.
2. Degree higher than B+ in Math 101
3. Competition based on the following criteria:

0.25 x Score of the aptitude test required by KSU + GPA x 6 + 1.5 x (score in Math 101).

Capacity

40 students (20 Male and 20 Female)

General Scheme of the Studying Plan

Requirement Type	Course Title	Prerequisites	Credit Hours
Common First Year	ENG 100 English Language		6
	MATH 101 Differential Calculus		3
	STAT 101 Introduction to statistics		3
	ARAB 100 Written skills		2
	CT 101 Computer Skills		3
	CI 101 University Skills		3
	CHS 101 Fitness and healthy culture		1
	CM 101 General Chemistry		4
	ENG 110 English Language		6
	ENT 101 Entrepreneurship		1
Total			**32**

University Requirements	
Students choose 8 credit hours from courses in Islamic Culture	**8**

Requirement Type	Course Title	Pre/Co requisites	Credit Hours
Mathematics Department Requirements	MATH 106 Integral Calculus	MATH 101	3(3+2+0))
	MATH 132 Logic Mathematics		3(3+2+0)
	MATH 206 Multi-variable Differential and Integral Calculus	MATH 106	4 (3+2+0)
	MATH 240 Introduction to Linear Algebra	MATH 132	4(3+2+0)
	MATH 280 Introduction to Real Analysis	MATH 206	4(3+2+0)
	ACTU 262 Actuarial Corporate Finance	FIN 200	3 (3+0+0)
	MATH 380 Stochastic Processes	MATH 280 &STAT 216	4(3+2+0)
	ACTU 371 Mathematics of Finance	MATH 106	4(3+2+0)
	ACTU 372 Actuarial Mathematical Models (1)	ACTU 371 &STAT 216	4 (3+2+0)
	ACTU 471 Financial Derivatives	ACTU 371	3(3+0+0)
	ACTU 472Actuarial Mathematical Models (2)	ACTU 372	3(3+0+0)
	ACTU 473 Models of Financial Economics	ACTU 471	4(3+2+0)
	ACTU 474 Risk Theory	MATH 380 & ACTU 372	3(3+0+0)
	ACTU 475 Credibility Theory and Loss Distribution	ACTU 474	4(3+2+0)

	ACTU 483 Lab Financial Mathematics	Complete 123 credit hours	1(0+0+2)
	ACTU 484 Lab Actuarial Mathematics	Complete 123 credit hours	1(0+0+2)
	ACTU 498 Field Training	Complete 138 credit hours	6
Total			**58**

Requirement Type	Course Title	Prerequisites	Credit Hours
Compulsory Requirements from Other Departments	ACCT 201: Principles of Accounting and Financial Reporting FIN 200 Principles of Finance	 ACCT 201	3(3+0+0) 3(3+0+0)
	ECON 101 Principles of Microeconomics		3(3+0+0)
	ECON 102 Principles of Macroeconomics	ECON 101	3(3+0+0)
	CSC 115 Introduction to Programming with C++	CT 140	4(3+0+2)
	STAT 105 Statistical Methods	STAT 150	4(3+2+0)
	STAT 328 Statistical Packages	STAT 105	3(2+0+2)
	STAT 332 Regression Analysis	MATH 240 & STAT 328	3(2+0+2)
	STAT 216 Actuarial Probability	Corequisites Math 206	4(3+2+0)
	STAT 336 Time Series and Forecasting	STAT 332	3(2+0+2)
	OPER 441 Modeling and Simulation	MATH 380	4(3+2+0)
Total			**37**

Students must successfully complete 9 credit hours to be chosen from this list.			
Requirement Type	Course Title	Prerequisites	Credit Hours
	MATH 204Differential equations	MATH 206	3 (3+2+0)
	MATH 251Optimization techniques	MATH 280 & MATH 204	3 (3+2+0)
	MATH 254Numerical methods	CSC 115 & MATH 240	3(3+2+0)
	FIN 220 Investment Essentials	FIN 200	3(3+0+0)
	FIN 240 Principles of Risk & Insurance	FIN 200	3(3+0+0)
	ECON 201 Microeconomics analysis	ECON 102	3(3+0+0)
	STAT 340Theory of Statistics (1)	STAT 216	3(2+2+0)
	ACTU 476 Insurance Mathematics	MATH 380	3(3+0+0)
	ACTU 477 Pension mathematics	ACTU 472	3 (3+0+0)
	ACTU 478 Mathematical Modeling of Islamic Finance	ACTU 371	3 (3+0+0)

Studying Plan distributed according to the semesters

1st Semester		
Course	Course Title	Credits
ARAB 100	Writing Skills	2
CM 101	General Chemistry	4
ENG 104 or ENG105 or ENG106	English Language	6
MATH 101	Differential Calculus	3
ENT 101	Entrepreneurship	1
Total		16

2nd Semester		
Course	Course Title	Credits
CT 101	Computer Skills	3
CI 101	University Skills	3
ENG 111 Or ENG112 Or ENG112	English Language	6
CHS 150	Health and Fitness (2)	1
STAT 101	Introduction to Statistics	3
Total		16

3rd Semester		
Course	Course Title	Credits
MATH 106	Integral Calculus	3(3+2+0)
STAT 105	Statistical Methods	4(3+2+0)
MATH 132	Logic Mathematics	3 (2+2+0)
ACCT201	Principles of Accounting and Financial Reporting	3 (3+0+0)
ECON 101	Principles of Microeconomics	3(3+0+0)
	University Requirement	2
Total		18

4th Semester		
Course	Course Title	Credits
MATH 206	Multi-variable Differential and Integral Calculus	4(3+2+0)
CSC 115	Introduction to programming with C++	4(3+0+2)
STAT 216	Actuarial Probability	4(3+2+0)
FIN200	Principles of Finance	3(3+0+0)
ECON 102	Principles of Macroeconomics	3(3+0+0)
	University Requirements	2
Total		20

5th Semester		
Course	Course Title	Credits
ACTU371	Financial Mathematics	4(3+2+0)
MATH 240	Introduction to Linear Algebra	4(3+2+0)
MATH 280	Introduction to Real Analysis	4(3+2+0)
STAT 328	Statistical Packages	3(2+0+2)
ACTU 262	Actuarial Corporate Finance	3(3+0+0)
Total		18

6th Semester		
Course	Course Title	Credits
ACTU372	Actuarial Mathematical Models (1)	4(3+2+0)
MATH 380	Stochastic processes	4(3+2+0)
STAT 332	Regression Analysis	3(2+0+2)
ACTU 471	Financial Derivatives	3(3+0+0)
Elective Course		3
Total		17

7th Semester		
Course	Course Title	Credits
ACTU473	Models of Financial Economics	4(3+2+0)
ACTU474	Risk theory	3(3+0+0)
ACTU472	Actuarial Mathematical Models (2)	3(3+0+0)
STAT 336	Time Series and Forecasting	3(2+0+2)
	University Requirement	2(2+0+0)
Elective Course		3
Total		18

8th Semester		
Course	Course Title	Credits
ACTU475	Credibility theory and loss distribution	4(3+2+0)
ACTU483	Lab Financial Mathematics	1(0+0+2)
OPER 441	Modeling and Simulation	4(3+2+0)
ACTU 484	Lab Actuarial Mathematics	1(0+0+2)
	University Requirement	2(2+0+0)
Elective Course		3
Total		15

9th Semester		
Course	Course Title	Credits
ACTU498	Field Training	6
Total		6