



UNIVERSITI TEKNOLOGI MARA

ASC454: ACTUARIAL PROGRAMMING

Course Name (English)	ACTUARIAL PROGRAMMING APPROVED
Course Code	ASC454
MQF Credit	3
Course Description	This course introduces the fundamental of using the spreadsheet tools (Microsoft Excel) and programming (Visual Basic Application) specifically to solve actuarial problems. It emphasizes the importance of understanding the root of the problems and solving problems in a structured manner by using Microsoft Excel and VBA. The actuarial problems mentioned include the problems and calculation in Actuarial Mathematics, Financial Mathematics, Statistics and others.
Transferable Skills	Demonstrate ability to apply creative, imaginative and innovative thinking and ideas to problem solving. Demonstrate ability to analyse issues/problems from multiple angles and make suggestions
Teaching Methodologies	Lectures, Lab Work
CLO	CLO1 Demonstrate the technical skills in the actuarial related softwares. CLO2 Develop and Use the decision-making software and spreadsheet in solving actuarial problems CLO3 Formulate, analyze and interpret data.
Pre-Requisite Courses	No course recommendations
Topics	
1. Microsoft Excel (Spreadsheet) 1.1) Introduction 1.2) Functions in Microsoft Excel 1.3) Matrices in Excel 1.4) Equation Solver	
2. Visual Basic for Applications 2.1) Introduction 2.2) Recording and Editing Macros 2.3) Objects Variable and Declaration 2.4) Modules and Procedures 2.5) Selection Structures 2.6) Repetition Structures (Iteration) 2.7) Array Statement 2.8) Random Numbers 2.9) User Define Function	
3. Actuarial Application 3.1) Introduction 3.2) Random number and simulation 3.3) Application in Financial Mathematics 3.4) Application in Life Insurance 3.5) Mortality table and Commutation Functions 3.6) Premiums calculation 3.7) Reserving	

Assessment Breakdown	%
Continuous Assessment	50.00%
Final Assessment	50.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Assignments CLO1 5%	5%	CLO1
	Assignment	Assignment CLO2 5%	5%	CLO2
	Group Project	Group Project CLO3 2%	2%	CLO3
	Group Project	Group Project CLO2 4%	4%	CLO2
	Group Project	Group Project CLO1 4%	4%	CLO3
	Quiz	Quiz CLO3 1%	1%	CLO3
	Quiz	Quiz CLO1 2%	2%	CLO1
	Quiz	Quiz CLO2 2%	2%	CLO2
	Test	Test 1 CLO3 3%	3%	CLO3
	Test	Test 1 CLO2 4%	4%	CLO2
	Test	Test 2 CLO2 4%	4%	CLO2
	Test	Test 2 CLO3 4%	4%	CLO3
	Test	Test 2 CLO1 5%	5%	CLO1
	Test	Test 1 CLO1 5%	5%	CLO1

Reading List	Recommended Text
	<ul style="list-style-type: none"> • Wayne Winston 2019, <i>Microsoft Excel 2019 Data Analysis and Business Modeling</i>, Microsoft Press [ISBN: 9781509305889] • Perry F. 2016, <i>Financial Mathematics with MATLAB</i>, Createspace Independent Publishing Platform [ISBN: 154045276X] • David C. M. Dickson, Mary R. Hardy, Howard R. Waters 2019, <i>Actuarial Mathematics for Life Contingent Risks</i>, Cambridge University Press [ISBN: 9781108478083] • Bill Jelen, Tracy Syrstad 2015, <i>Excel 2016 VBA and Macros</i>, Que [ISBN: 9780789755858] • Joe Francis 2017, <i>Interest Theory</i>, 17 Ed., ActuarialBrew [ISBN: 0998160407] • Rob Kaas, Marc Goovaerts, Jan Dhaene, Michel Denuit 2009, <i>Modern Actuarial Risk Theory</i>, Springer [ISBN: 9783642034077]
Reference Book Resources	<ul style="list-style-type: none"> • Wayne L. Winston 2014, <i>Microsoft Excel 2013</i> [ISBN: 0735669139] • C.D. Daykin, T. Pentikainen, Martti Pesonen 1993, <i>Practical Risk Theory for Actuaries</i>, CRC Press [ISBN: 0412428504] • Kellison 2008, <i>Theory of Interest</i>, McGraw-Hill Higher Education [ISBN: 9780071276276] • Humphrey K. K. Tung, Donny C. F. Lai, Michael C. S. Wong 2010, <i>Professional Financial Computing Using Excel and VBA</i>, John Wiley & Sons Incorporated [ISBN: 9780470824399] • Richard Mansfield 2013, <i>Mastering VBA for Microsoft Office 2013</i>, John Wiley & Sons [ISBN: 9781118695128] • S. I. Krishan 2008, <i>Computing with Excel and VBA</i>, Jones & Bartlett Publishers [ISBN: 9780763756680]
Article/Paper List	This Course does not have any article/paper resources
Other References	This Course does not have any other resources