Bachelor of Actuarial Science Honours Program

Information Booklet 2020

1. Program Overview
Emerging as a key growth sector of the 21st century, actuarial science applies elements of economics, finance, statistics and advanced mathematics to interpret, manage and evaluate risk. Never before have organisations had such extraordinary access to personal information, health statistics, buying habits, population movement, employment trends and much, much more. In these numbers lie the answers to the big questions that really matter.

Fully accredited by the Actuaries Institute, the Bachelor of Actuarial Science is an innovative and immersive program combining elements of economics, finance, statistics and advanced mathematics to develop techniques for the management of risk. Developed by Professor Terry O'Neill, one of Australia's leading academic authorities in the field, the Bachelor of Actuarial Science delivers smaller classes for personalised attention. Students gain unparalleled access to Bond Business School's two financial trading rooms and over 40 Bloomberg terminals - the most of any university in Australia.

An integral part of the program is the development of research skills and actuarial judgement through the Actuarial Control Cycle subjects and the Actuarial Research Thesis subject.

2. Introduction
The Bachelor of Actuarial Science Honours program is an 80CP supervised, two-semester program of independent research and study culminating in the production of a research thesis and presentation of a research seminar. Students undertake a program of course-work and research in which they conceptualise, plan, organise, undertake and report on an independent research project, whilst being supervised by a member of academic staff.

The program is a two-semester course of study which commences either in January semester or May semester (commencing in September is only possible if students have successfully completed ACSC71-400 Actuarial Control Cycle 1 or equivalent).

3. Aims of the Honours Degree
The Bachelor of Actuarial Science Honours program is designed primarily to provide graduates with the skills necessary to pursue a career in research. An Honours degree is a prerequisite for entry into most PhD programs. Further, the Honours program provides an opportunity to complete the university-based component of Part 2 actuarial accreditation. Completion of an Honours year will also help graduates gain employment in their discipline. Honours graduates are highly valued by employers as they have demonstrated skills in written and oral communication, critical thinking and interpretation, and project management. Most research assistant positions require applicants to have successfully completed an Honours year.

The Honours program within the Bond Business School aims to help graduates develop skills in:
- planning and conducting research
- written and oral professional / scientific communication
- information retrieval and organisation
- project management

4. Structure of the Program

The Honours program consists of 80 credit points comprising both coursework and research components. 2020 is scheduled as follows:

Semester	Code	Title	Requisites
Sequence Plan For students Commencing January 2020			
Semester	**Code**	**Title**	**Requisites**
1st Semester **January** **201**	ACSC71-400 ACSC72-403 Elective	Actuarial Control Cycle 1 Actuarial Research Thesis Part A (20cp)	ACSC13/71-304 CO-Req ACSC71-400
2nd Semester **May** **202**	ACSC71-401 ASC72-404 DTSC71-302	Actuarial Control Cycle 2 Actuarial Research Thesis Part B (20cp) Statistical Learning and Regression Models	ACSC13/71-301 or ACSC72-403 DTSC13/71-200
Sequence Plan For students Commencing May 2020			
Semester	**Code**	**Title**	**Requisites**
1st Semester **May** **202**	ACSC71-400 ACSC72-403 DTSC71-302	Actuarial Control Cycle 1 Actuarial Research Thesis Part A (20cp) Statistical Learning and Regression Models	ACSC13/71-304 CO-Req ACSC71-400 DTSC13/71-200
2nd Semester **September** **203**	ACSC71-401 ACSC72-404 Elective	Actuarial Control Cycle 2 Actuarial Research Thesis Part B (20cp)	ACSC13/71-301 or ACSC72-403

4.1 Coursework components

4.1.1 ACSC71-400: Actuarial Control Cycle 1 (10 CP) January or May semester

The Actuarial Control Cycle provides students with an understanding of how actuarial principles can be applied to a range of problems and issues in commercial and business environments. The Actuarial Control Cycle forms a 'bridge' between Part 1, where students learn specific technical skills in a well-defined environment, and Part 3, where students are taught to apply these skills in less well-defined business and commercial environments. During Part 2 students are expected to develop a holistic approach to practical problem solving, and develop a level of judgement and professional skills required to successfully apply actuarial principles to real-world problems. The Actuarial Control Cycle demonstrates a holistic approach to understanding how actuarial principles relate to actuarial practice in the financial services and other industries. It is presented in general terms to highlight its application beyond financial services. Examples will be drawn from traditional and non-traditional areas to illustrate and establish the underlying actuarial principles in a problem-based learning approach, using case studies and business-based examples.

Prerequisites

Admission into BN-10031 - Bachelor of Actuarial Science (Honours) OR BN-13120 - Master of Actuarial Practice AND ACSC13-304 - Stochastic Modelling OR ACSC13-302 - Advanced Modelling

4.1.2 ACSC71-401: Actuarial Control Cycle 2 (10 CP) May or September semester

The successful conduct of research requires advanced abilities in analysis and interpretation of data, critical thinking and written and oral presentation. This subject will build on skills developed in the subject ACSC71-400 Actuarial Control Cycle 1 to support Actuarial Sciences Honours students as they progress into the second semester of their program. The students will apply the theory learned previously to commercial scenarios, including product pricing, liability calculations and

profitability assessments for insurance business. A key part of the Actuarial Control Cycle relates to ongoing review of key business metrics, by applying an analysis of experience. The students will develop ways of suggesting business initiatives in response to the results of an experience analysis.

Prerequisites

Admission into BN-10031 - Bachelor of Actuarial Science (Honours) OR BN-13120 - Master of Actuarial Practice AND ACSC71-301 - Contingencies OR ACSC13-301 – Contingencies AND ACSC71-304 - Stochastic Modelling OR ACSC13-304 - Stochastic Modelling

4.1.3 DTSC71-302: Statistical Learning & Regression Models (10 CP) May or September semester

This subject covers the theory and practice of modern statistical learning, regression and classification modelling. Techniques covered range from traditional model selection and generalised linear model structures to modern, computer-intensive methods including generalised additive models, splines and tree methods. Methods to handle continuous, ordinal and nominal response variables and assessment of fit via cross-validation and residual diagnostics are also considered. All techniques will be investigated via practical application on real data using the statistical software package R.

Prerequisites

DTSC71-200 – Data Science OR DTSC13-200 – Data Science

4.2 Research/Dissertation Component

4.2.1 ACSC72-403: Actuarial Research Thesis Part A (20CP) – All semesters

This subject provides an opportunity for students to work on an applied research project in actuarial science or a related field. Students will work on a topic motivated by recent developments and innovations in actuarial industries or more generally in the financial services markets. Students need to approach potential supervisors before semester starts to discuss supervision and possible research topics. Once the supervisor(s) has/have confirmed the willingness to supervise and the research topic has been confirmed by the Honours program coordinator, a formal written agreement should be signed by the student, the supervisor(s) and the Honours program coordinator. In approximately Week 5 of the semester, students need to deliver an oral presentation to briefly describe the plan/outline and timeframe of their research.

Prerequisite

Admission into BN-10031 - Bachelor of Actuarial Science (Honours)

Co-Requisite

ACSC71-400 Actuarial Control Cycle 1

4.2.2 ACSC72-404: Actuarial Research Thesis Part B (20CP) – All semesters

This subject provides an opportunity for students to work on an applied research project in actuarial science. Students will work on a topic motivated by recent developments and innovations in

actuarial industries or more generally in the financial services markets. In Week 11 of the semester, students are required to deliver an oral presentation on their results and findings, and therefore receive feedback from audience before submitting the final written thesis. The presentation is worth 10% towards the final grade. By the end of Week 12, students are required to submit a professionally written thesis which is worth 90% towards the final grade.

Prerequisites

Admission into BN-10031 - Bachelor of Actuarial Science (Honours) and ACSC72-403: Actuarial Research Thesis Part A (20CP)

5. Entry Requirements

Completion of the Bachelor of Actuarial Science or equivalent with a GPA of 2.5/4 or higher and including successful completion of the unit DTSC13-200 Data Science or equivalent.

6. Approval of dissertation topic and supervision

All Honours dissertation topics and Supervisor(s) are approved by the Faculty prior to being offered to students.

It is essential that students discuss projects with potential supervisors prior to commencement:

1. *A student must find a supervisor or supervisors by the end of the orientation week.*

2. *Students and their supervisors should agree on the research topic by the end of Week 2 in the first semester.*

3. *A student/supervisor agreement must be signed by both parties and submitted by e-mail to the Honours Convenor.*

Requirements on supervisors:

1. *There can be more than one supervisor for one student, for example, one student can have a principal and a co-supervisor.*

2. *The supervisor must have a Ph.D. in a related discipline or hold a professional qualification (for example, FIAA for actuarial science research)*

7. Grades Awarded

The degree with Honours is awarded in the following classes:

- Honours Class 1 (85-100%)
- Honours Class 2 Division A (75-84%)
- Honours Class 2 Division B (65-74%)
- Honours Class 3 (50-64%)
- Fail (below 50%).

8. Study Load & enrolment status

The Honours program comprises 80CP over two semesters. Each semester has an enrolment of 40CP. Specific information about the Bachelor of Actuarial Science Honours program can be obtained from:

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Honours Administration
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