AUSTRALIAN SCHOOL OF BUSINESS™
THE UNIVERSITY OF NEW SOUTH WALES

UNSW Actuarial Studies Student Information Session 2008 Honours and Masters in Actuarial Studies at UNSW

Professor Michael Sherris
Head of Actuarial Studies
Australian School of Business

Monday 25th August 2008
12pm – 1pm
Chem Sci M11

Coverage

- The Actuarial Honours Program and Requirements
- Scholarships and other opportunities for honours students
- The Master of Actuarial Studies
- MPhil and PhD by Research

The Actuarial Honours Program and Requirements

- Minimum academic requirements
- **at least 71% average in Actuarial Courses (normally much higher) no failures, and an overall high credit/distinction average in your studies (normally distinction or high distinction)**
- **normally gained all (usually 8 as a minimum) of the Part I (CT) exemptions,**
- **a proposed thesis topic that can be supervised by the Actuarial Studies staff**
- Application due on last day of Session 2

Why do Honours?

- Complete more advanced courses possibly including Part II and Quantitative Risk Management course in MActSt
- Develop research skills and complete a thesis on a current advanced topic leading to a published paper
- To enter a Masters by Research or a PhD now or in the future (perhaps overseas)
- Scholarships and opportunities
  - Tutoring experience and interaction with academic staff
  - Research assistant positions and research project involvement
  - Scholarships:
    - UNSW Honours scholarships, Faculty Scholarships, APRA Brian Gray Scholarship, ARC Grant scholarships

Honours Requirements

- 50% for 4 courses including ACTL4003 Research Topics in Actuarial Science (Session 1) 6 UOC and Honours or Masters level courses:

  Masters courses ACTL5301, ACTL5302, ACTL5303, ACTL5304, an honours or Masters level ACTL course, MATH, FINS or ECON course

  ACTL4001 and ACTL4002 Actuarial Theory and Practice A and B

- 50% Thesis (thesis normally between 10,000 and 20,000 words and not exceeding 100 pages) – 24 UOC
- Total mark determines Honours grade:
  - >=90 Considered for University medal - need high overall grades throughout degree (normally above 80% WAM)
  - >=85 First class
  - >=75 2nd class 1st Division
  - >=65 2nd class 2nd Division
  - >=55 3rd Class

Honours Students

- Previous
  - Samuel Wills (going to Oxford), Christian Sutherland-Wong (Harvard MBA), Arlene Wong (Reserve Bank), Shaun Yow (BCG) – all 1st class honours and university medals
  - Samuel Fung, Aris Stavrou (PwC), Andrew Chernih (O/S), Hing Chan (Tillinghast), Andrew Tang (PwC), Thomas Wang (O/S), Kelvin Mo (CBA), Victor Chandra (E&Y)

- Current
  - Jack Jie

Part II courses at UNSW

- Year 4 and Masters students – two interactive groups with common hours
- Industry guest lectures
- High entry requirements at Honours level (minimum average in ACTL courses of 71%, usually all Part I exemptions, 3 months work experience)
- Covering Part II requirements for Associate membership of IAAust
- Focus on Risk Management across financial services and more broadly
- Developing presentation, communication and business skills

Honours Supervisors

- Topics and possible supervisors
  - Professor Michael Sherris
  - Associate Professor John Evans
  - Dr Changki Kim
  - Dr Bernard Wong
  - Dr Sachi Purcal
  - Dr Benjamin Avanzi
  - Dr Jinxia Zhu
  - Check web site for academic staff backgrounds and previous research

Professor Michael Sherris

- Proposed Honours Topic for 2009 – Longevity Risk
  - Longevity risk is a major risk facing most countries – ageing population and lack of insurance for surviving too long
  - New products and solutions are required
  - Better longevity models are required
  - Modelling longevity with advanced financial risk models
  - Application to product design, capital and pricing
- Part time RA position under ARC Discovery Grant available

Professor Michael Sherris

- Proposed Honours Topic for 2009 – Credit Risk
  - Credit risk is a significant research area combining actuarial and finance skills
  - Apply new results from recent research by Dr John van der Hoek and Professor Michael Sherris to pricing portfolios of credit risks
  - Develop and implement pricing models for securitisation of credit risks (CDO's, CLO's) using Gaussian copula distortion and fitting of multivariate risk distributions
  - Develop and implement pricing algorithms for tranches of credit risk
  - Compare results with standard market approaches to pricing CDO's
- Part time RA position under ARC Discovery Grant available

Professor Michael Sherris

- Proposed Honours Topic for 2009 – ERM and Insurer Financial Decision Making
  - ERM is a major focus of corporations, insurers, banks and other financial intermediaries
  - Capital allocation, pricing and risk management are major issues at an international level
  - This research will further develop an ERM Value Maximizing model for an insurer and investigate current methods used in practice using analytical and simulation based models
  - Major aim is to develop an understanding of value maximizing ERM strategies for insurers and how they can be used in practice
- Part time RA position under ARC Discovery Grant available

Associate Professor John Evans

- Proposed Honours Topic for 2009 – Funding for Retirement
  - Topic: The ability of the Superannuation Guarantee Levy to fund an adequate retirement for Australians
  - Professor John Piggott and I did some preliminary work in 2006 allowing for changes in investment returns, costs and projected longevity. This work is available on the website and was published in JASSA (The journal of FINSIA)
  - There is a need to expand this work by considering geographic location issues that effect both earning capacity and costs of living, workforce participation which effects the accumulation pre retirement, delaying of retirement, costs of medical services, differing investment returns and earnings increases
  - The investigation also needs to look at the Age Pension integration and the effect of income and assets tests
  - Very little work has been done on this topic and the results when published will contribute to understanding of the conditions necessary for the SGL to provide an adequate retirement

Associate Professor John Evans

- Proposed Honours Topic for 2009 – Credit Risk Assessment of Reinsurers
  - Topic: For capital adequacy reasons insurers need to take into account the possibility of a reinsurer failing to pay all or part of a claim in a timely manner
  - Traditionally insurers have used Rating Agencies to assess this risk, but recent events have suggested this is inadequate
  - There is a need to develop appropriate models for both the insurer and the regulator to ensure the probability of survival of the insurer is at the appropriate level
  - Modelling of this risk involves extreme risks with low frequency and high severity, and traditional normal distributions won't work in this situation
  - The research is to consider existing models, and to develop more appropriate approaches to this issue, with some possibilities being EVT and the "Black Swan" approach.

Dr Changki Kim

- Proposed Honours Topic for 2009 – Longevity Risk
  - Longevity risks and insurance risks are important for insurance and superannuation business combining actuarial and finance skills
  - Combining actuarial and finance skills, we will develop hedging strategies for longevity risks and insurance risks
  - Develop stochastic mortality models for securitisation of longevity risks using mortality-linked securities such as longevity bonds and swaps
  - Study the effects of the hedging strategies on the economic values of insurance companies
  - Consider the securitization of blocks of insurance businesses using economic/embedded values

Dr Sachi Purcal

- Proposed Honours Topic for 2009
  - Ageing populations have created significant academic interest in annuities. Demand for annuities has, however, remained muted
  - This has led to interest in alternative annuity designs
  - Stamos (2007) provides the analytics for the optimal behaviour of a consumer who participates in a pooled annuity fund. His work suggests very encouraging results for consumers with no bequest motive.
  - What happens in Stamos' model if consumers have a bequest motive?

Dr Bernard Wong

- Proposed Honours Topic for 2008 – Modelling of Long Term Equity Guarantees
  - Many insurance products have long term embedded guarantees.
  - Financial economic theory is one method commonly suggested to model the risks of these guarantees.
  - However many assumptions in the suggested models tend to be more suited for short time scales.
  - Project involves
    - Investigation of suitable alternative models, e.g. allowing for alternative equity models and stochastic interest rates.
    - Quantifying the effects of these alternative, more realistic models.
    - Developing practical numerical techniques for these models and guarantees.

Dr Benjamin Avanzi

- Proposed Honours Topic for 2009 - the dual model
  - The Cramer-Lundberg model is the classical model of risk theory:

$$U(t) = u + ct - S(t).$$

  - Its dual model,

$$U(t) = u - ct + S(t),$$

    is appropriate for companies that have occasional gains whose amount and frequency can be modelled by the process *{S(t)}* (such as pharmaceutical or petroleum companies).
  - The dual model has become a hot topic in research only recently.
  - Many applications or extensions can be studied: optimal dividend strategies, mergers, applications to the Cramer-Lundberg model, …

Master of Actuarial Studies

- For both graduates from quantitative undergraduate degrees and for graduates of Actuarial Undergraduate programs
- Actuarial majors can
  - Complete Part II (if meet requirements)
  - Complete Part I courses not studied in undergraduate major
  - Do advanced options in Quantitative Risk Management - ACTL5301, ACTL5302, ACTL5303, ACTL5304
  - Include up to 2 non ACTL Masters courses in Finance, Mathematics, Statistics
  - Gain credit for up to 2 modules of IAAust Part III completed while studying MActSt

MPhil and PhD by Research

- Some prior research expected (Honours, Masters Project)
- Require Honours for PhD and very good grades in MActSt for MPhil (Distinction average)
- Research degrees requiring advanced coursework and mostly a research thesis
- Scholarships APA, ARC Grants
- MPhil - Full time: 1.5 years: four coursework subjects usually undertaken in the first year of candidature and thesis of no more than 40,000 words on an approved topic
- PhD – 3 years full time, PhD Thesis with an original and significant contribution to knowledge and required coursework

Questions

- Questions about any topic covered
  - Part I Exemptions
  - The Part II courses at UNSW
  - The Actuarial Honours Program and Requirements
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