Australian School of Business
School of Actuarial Studies

ACTL5303
ASSET LIABILITY MANAGEMENT

COURSE OUTLINE
SEMESTER 2, 2009

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The University of New South Wales
Sydney 2052 Australia

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Dear Students

Welcome to ACTL5303, Asset-Liability Management. This course is one of four options in the Master of Actuarial Studies covering advanced topics in quantitative risk management.

Asset-liability management (ALM) is a major area of risk management for financial service providers particularly banks, insurers and reinsurers. This course will cover foundations for investment and asset liability management and will introduce practical aspects of ALM. We hope you find the course challenging and interesting. It has been designed to cover the syllabus of the International Actuarial Association and the Investment Module of the Institute of Actuaries of Australia.

This course outline has details of the course requirements, course aims and learning outcomes, content, teaching methods, assessment tasks, texts and readings, and expectations. Please read it carefully and thoroughly as it will be assumed that you are familiar with the contents.

If you have any questions about the course at any time then please contact us.

We look forward to guiding your learning through the duration of the course.

John Livanas and Bernard Wong
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1. COURSE STAFF
The Course Coordinator for this course is Dr Bernard Wong along with Course Lecturer John Livanas:

<table>
<thead>
<tr>
<th>Staff</th>
<th>E-mail</th>
<th>Room</th>
<th>Telephone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Bernard Wong</td>
<td><a href="mailto:bernard.wong@unsw.edu.au">bernard.wong@unsw.edu.au</a></td>
<td>Quad 2076</td>
<td>9385 2827</td>
</tr>
<tr>
<td>John Livanas</td>
<td><a href="mailto:jlivanas@unsw.edu.au">jlivanas@unsw.edu.au</a></td>
<td>TBA</td>
<td></td>
</tr>
</tbody>
</table>

John Livanas will teach the majority of the course. They will both be responsible for course administration and final assessment of the course.

1.1 Communication with Staff
If students have questions about the material covered in lectures then consult the Course Coordinator Dr Bernard Wong or the Course Lecturer John Livanas.

For administrative matters related to the course including enrolment, assessment, special consideration, and the course web site, students should consult the Course Coordinator or the School Administrator (Bindya Subba).

Bindya Subba
Actuarial Studies Office (Room 2058, 2nd Floor Quadrangle Building)
Telephone: 9385 1886
Fax: 9385 1883
E-mail: b.subba@unsw.edu.au

2. COURSE DETAILS
2.1 Teaching Times and Locations
This course will consist of 3 hours of lectures per week.

Lecture times and locations are as follows:

Monday 6:00 p.m. – 9:00 p.m. Biomed E

Timetables and locations are correct at time of printing. A full timetable of lectures and topics is provided later in this Course study guide. Any alterations to the lecture times or locations will be advised in lectures and via the Course WebCT Vista site.

Students should consult the WebCT Vista site on a regular basis, since assignment questions and other Course materials will be placed there. The web address is: http://vista.elearning.unsw.edu.au

2.2 Units of Credit
Each course is 6 UOC.
2.3 Summary of Course, Aims & Relationship to other Courses
This course is one of four options in the Master of Actuarial Studies covering advanced topics in quantitative risk management.

These courses are: ACTL5301 Models for Risk Management (S1), ACTL5302 Risk and Capital Management (S1), ACTL5303 Asset-Liability Management (S2) and ACTL5304 Risk Management Strategies (S2). The courses are normally completed by students as advanced options in the Master of Actuarial Studies or as a normal part of the program for students entering the Master of Actuarial Studies with an undergraduate major in actuarial studies. They develop more advanced topics related to the actuarial professional syllabus. They also provide a valuable background for graduates who are aiming to enter the risk management area in insurance, banking or funds management.

Prerequisites for the course are ACTL5108 Finance and Financial Reporting for Actuaries and ACTL5109 Financial Economics for Insurance and Superannuation. Students are assumed to have knowledge of finance and financial reporting and a good understanding of Financial Economics as covered these courses.

Students are also assumed to have a good mathematics background and a solid understanding of the concepts of probability and statistics and risk models as covered in ACTL5101 Probability and Statistics for Actuaries, and a good understanding of financial mathematics as covered in ACTL5102 Financial Mathematics. Students need to be able to use a word processing package (such as WORD) and a spreadsheet (such as EXCEL).

The aims of this course are to provide students with an understanding of:

- The economic and operating framework of Investments, including EMH and alternative hypotheses
- The fundamental principles of investing, with particular emphasis on risk and return characteristics of different asset classes including non traditional asset classes.
- Modern Portfolio Theory as the basis for efficient diversification of risk.
- The construction and management of multi asset class portfolios including a review of more contemporary models of asset/liability models
- Investment approaches including investment types and performance attribution
- Futures, options and other derivative security markets.
- Practical aspects of investment management and asset liability management.
2.4 Student Learning Outcomes (including Coverage of Institute of Actuaries of Australia Investments syllabus)

At the end of the course the student will have be able to:

1 [L01] Construct, critically evaluate, and apply asset models of a stochastic nature, that are appropriate to the management of liabilities. The outcome of such an exercise is usually an investment strategy for managing the liabilities. This includes, in particular, the ability to
   a. Define appropriate investment objectives based on the liability profile of a fund.
   b. Specify appropriate investment constraints, based on the liability profile of a fund.
   c. Identify the characteristics of different types of asset models.
   d. Critically evaluate the appropriateness of an asset model for a given context.
   e. Derive consistent asset assumptions for asset models, taking account of historical data, prevailing industry expectations, contemporary investment literature, and other practical considerations such as tax.
   f. Apply asset assumptions, and the linkages contained within asset models, to real world situations.
   g. Describe and critically evaluate different approaches to asset allocation.

2 [L02] Design and monitor investment arrangements as part of the process for implementing an investment strategy. This includes, in particular, the ability to
   a. Describe and critically evaluate the main passive equity investment approaches
   b. Describe and critically evaluate the main active equity investment approaches.
   c. Evaluate investment managers using qualitative and quantitative techniques.
   d. Assess the various approaches to portfolio construction and their merits.
   e. Identify the key items of information required to effectively monitor a portfolio and take appropriate control measures based on this information.
   f. Identify ways in which performance in the various asset classes can be benchmarked and assess the merits of different approaches to performance measurement.
   g. Apply risk management principles and techniques as part of the investment management process.

3 [L03] Use effective presentation, discussion and report writing skills for explaining asset-liability models.
Graduate Attributes
The Australian School of Business has as its core graduate attributes the development throughout a program of an awareness of and ability to:

1. Think critically [GA1]
2. Communicate [GA2]
3. Work in teams [GA3]
4. Have an appreciation of relevant social and global issues [GA4]
5. In-depth engagement with relevant disciplinary knowledge [GA5]
6. Professional skills [GA6]

This course contributes to your development of the following Australian School of Business Graduate Attributes, which are the qualities, skills and understanding we want you to have by the completion of your degree. Learning Outcomes 1–2 aim to enhance your capacity for critical thinking and problem solving (GA 1, 5), and also develop your skills in evaluating new developments in asset-liability management (GA 4, and 6). Learning Outcome 3 aims to develop your written communication skills (Graduate Attribute 2), in the context of an asset liability management context (GA 5, 6).

3. LEARNING AND TEACHING ACTIVITIES

3.1 Approaches to Learning and Teaching in the Course

The course textbooks, lectures and assessment tasks are designed to provide a framework for your learning. Every student has a different approach to learning. How much time you spend on reading in preparation for lectures, completing assessment tasks, reviewing course objectives, deepening your understanding and preparing for final examinations will depend on your learning approach. Lectures will generally cover the main concepts and issues and will not necessarily cover all the details of the course readings or texts. It is expected that you have read the reading material for the lecture in advance. Students who are successful in this course take an active approach to learning.

3.2 Learning Activities and Teaching Strategies

The learning activities of this course involve three key components – the lecture, the assignment, and your private study. Each lecture will provide a short overview of topic at hand and will then focus on explaining the difficult concepts and issues. The role of the lecture is to help you understand the context of the topic as well as work through the difficult points. To maximize your achievements in each lecture you should read the assigned notes prior to each class. The assignment presents you with a practical application of course concepts to a problem in risk management (see also assessments section, below). Your private study is the most important component of this course. Weekly readings, solving problems, and your own topic summaries form the basis of an excellent private study regime. Keeping up to date is very important and each week builds on the prior weeks so it is important that you get your study regime organised quickly.

4. ASSESSMENT

4.1 Formal Requirements

In order to pass the course students must complete and submit all components of assessment at or before the due times. Late assessment submissions will not be marked. It is important that students be punctual and reliable when submitting assessments. This is an important workplace requirement and students need to ensure they meet deadlines.
4.2 Assessment Details
The summary table below provides an overview of the assessment tasks and relative weighting:

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Weighting</th>
<th>Learning Outcomes assessed</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-Semester Test</td>
<td>12%</td>
<td>LO1-LO3</td>
<td>24 Aug</td>
</tr>
<tr>
<td>Major Assignment</td>
<td>15%</td>
<td>LO1-LO3</td>
<td>21 Sep</td>
</tr>
<tr>
<td>Final Examination</td>
<td>73%</td>
<td>LO1-LO3</td>
<td>TBA</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.2.1 Mid-Semester Test
There will be a mid-semester test of 50 minutes length to provide feedback to students on course progress and to assist students to develop an understanding of the key course concepts. They are intended to be part of achieving LO1-LO3, and GA1, GA2, GA4, GA5 and GA6.

Normal examination rules apply to the conduct of class tests. Calculators will be allowed in the class tests and the final examination but a clear indication of all of the steps involved in your calculations must be shown. The University will not supply calculators to students for use in examinations where the provision of calculators has not been requested by the course examiner. It is the student’s responsibility to be familiar with the rules governing the conduct of examinations.

The Mid-Semester Test require written responses, with students earning marks for correct explanations of the main concepts and issues examined in each question. Marks for calculation questions will be granted on mathematical working as well as part marks for incorrect responses with correct method and reasoning. They test not only your knowledge of the material, but also the depth of your understanding of it.

The dates for the test is

Mid-Semester Test  Monday 24 August 6:00 p.m.

The test will be held in class at the usual lecture room.

4.2.2 Major Assignment
There will be a major assignment requiring application of course concepts involving asset and liability management issues covered in the course. Details will be provided through the course WebCT web site. The assignment is intended to develop your skills in research and your ability to concisely and coherently present your ideas. It is intended to be part of achieving LO1-LO3, and GA1, GA2, GA4, GA5 and GA6.
Marks will be awarded for

- Accuracy of results
- Presentation
- Reasonableness checks applied
- Technical details

The assignment availability and due dates are:

<table>
<thead>
<tr>
<th>Available Date</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 August</td>
<td>21 September 5pm</td>
</tr>
</tbody>
</table>

Assignment questions will be posted on the course WebCT vista site on the above “Available Date”, Assignments are due at 5:00pm on the due date.

Students are reminded that the work they submit must be their own. While we have no problem (and in fact, it is encouraged to interact with your peers to enhance your learning) with students working together on the assignment problems, the material students submit for assessment must be their own. This means that: (i) The mathematical solutions you present are written up by you, without reference to any other student’s work; (ii) Any analysis and program you use and present is done by your own code, which you yourself wrote and ran, without reference to any other student’s work.

4.2.3 Final exam
The final examination will be a three-hour written paper. The examination will aim to assess the achievement of the learning outcomes of the course including the course aims. The examination will assess critical analysis and problem solving skills as well as written communication skills, and correspond to LO1-3 and GA 1, 2, 4, 5, and 6.

Assignment Submission Procedure
The assignment must be placed in the box provided outside Quad 2059, Level 2 Quadrangle Building, near the Actuarial Studies. A cover sheet must accompany these assignments. A copy of the cover sheet is available from the course web site on WebCT Vista. Additional copies of the cover sheet can be obtained outside Quad 2059.

**Please note that it is School policy that late assignments will not be marked.**

Remember to keep a copy of all work submitted for assessment and to keep returned marked assignments.

4.3 Late Submission
The School of Actuarial Studies has a policy of grading late assignments with a zero mark. We believe this policy fosters development of ASB Graduate Attribute 6. Punctual submission of work is required in order to satisfy the requirements of the course. The assignment may be marked at the discretion of the course co-ordinator if there is a valid reason for late submission and used in cases where your final overall results are marginal.
5. ACADEMIC HONESTY AND PLAGIARISM

The University regards plagiarism as a form of academic misconduct, and has very strict rules regarding plagiarism. For UNSW policies, penalties and information to help you avoid plagiarism see:
http://www.lc.unsw.edu.au/plagiarism/index.html

As well as the guidelines in the online ELISE tutorial for all new UNSW students:

To see if you understand plagiarism, do this short quiz:
http://www.lc.unsw.edu.au/plagiarism/plagquiz.html

For information on how to acknowledge your sources and reference correctly, see:
http://www.lc.unsw.edu.au/onlib/ref.html

For the ASB Harvard Referencing Guide, see:

School of Actuarial Studies Policy on Plagiarism

The School of Actuarial Studies views any form of plagiarism as unacceptable. The School follows University Procedures in the event of any student plagiarism. In cases of plagiarism for in session assessment the minimum penalty all students involved can expect is to receive a mark of zero for the particular assessment item. The Head of School will be informed, and the School will also keep a record of student Plagiarism cases. Students should familiarise themselves with the University Policy and Procedures and ensure they have consulted The Learning Centre web site so that they are aware of and understand the concepts and practices of academic honesty and plagiarism.

6. COURSE RESOURCES

Textbooks

There are many books of relevance to the course topics. The following book will be the main text reference for the majority of the course:


In addition, journal articles will be used to provide theoretical and practical insights to course topics. Links will be provided on the course WebCT site.

Other References

Other more advanced references that are useful for the course coverage include:


Course WebCT Vista

This course will use WebCT Vista for communication with students. The WebCT Vista site for this course will contain the course outline, lecture notes, assessment information, and any notices relevant to this course. It is important that you visit the site regularly to see any notices posted there by the course coordinator. The site can be accessed from the WebCT Vista log-in page at: http://vista.elearning.unsw.edu.au/.
7. COURSE EVALUATION AND DEVELOPMENT

Each year feedback is sought from students about the courses offered in the School and continual improvements are made based on this feedback. In this course, we will seek your feedback through the CATEI forms and you are welcome to pass comments to the Course Coordinator at any time. As a result of student feedback in previous offerings of this course and also related courses in the Master of Actuarial Studies program, in the 2009 offering of this course we will alter the format of the assessments, in particular the class tests, to improve additional student feedback and provide an opportunity for students to assess how they are performing in the course.

8. STUDENT RESPONSIBILITIES AND CONDUCT

Students are expected to be familiar with and adhere to university policies in relation to class attendance and general conduct and behaviour, including maintaining a safe, respectful environment; and to understand their obligations in relation to workload, assessment and keeping informed.


Special Consideration and Supplementary Examinations

You must submit all assignments and attend all examinations scheduled for your course. You should seek assistance early if you suffer illness or misadventure which affects your course progress.

UNSW policy and process for Special Consideration applies (see https://my.unsw.edu.au/student/atoz/SpecialConsideration.html). Specifically:

- Applications for special consideration (including supplementary examinations) must go through UNSW Central administration (within 3 working days of the assessment to which it refers) – applications will not be accepted by teaching staff;
- Applying for special consideration does not automatically mean that you will be granted additional assessment or that you will be awarded an amended result;
- If you are making an application for special consideration (through UNSW Central Administration) please notify your Course Coordinator or Lecturer in Charge;
- Please note: a register of applications for Special Consideration is maintained. History of previous applications for Special Consideration is taken into account when considering each case.

Students may be required to sit for an oral or written supplementary examination. Any supplementary examination date will be advised to students after the final examination. In general, a supplementary examination will only be offered to a student who has been prevented from taking the Final Examination, who has been placed at a serious disadvantage during the examination, and whose circumstances have improved considerably in the period since the relevant examination was held. Failure to attend a supplementary examination, if you have been granted one, will result in forfeiture of any additional assessment granted to you. Satisfactory performance in any course assessment is required in order to be granted a supplementary examination.
STUDENTS SHOULD NOTE THAT SPECIAL CONSIDERATION WILL NOT BE GRANTED UNLESS PERFORMANCE AND ATTENDANCE AT LECTURES IS SATISFACTORY. THIS WILL USUALLY MEAN THAT YOU WILL HAVE TO PASS ALL ASSESSMENT TASKS IN ORDER FOR ANY SPECIAL CONSIDERATION TO BE GIVEN.

Consideration for Missed Assessments (other than final examination)
If you miss a test or are unable to submit your assignment by the due time & date, and you have a valid reason, you need to inform the Actuarial Studies office as soon as possible. You must provide written documentation requesting consideration to the Actuarial Studies office, in the form of a letter explaining your reasons with evidence attached, i.e. medical certificate, police report etc. You should note the course details, your student ID and contact details in your letter as well. As per University rules these considerations must be submitted within 3 working days of the assessment date. If no request is received or it is received after 3 working days you will be awarded a zero mark for that assessment.

Review of Results of Assessments (other than final examination)
As per University rules, if you wish a piece of course assessment to be re-checked, for addition error or incorrect marking, you need to contact the Actuarial Studies office within 15 working days of the assessment being available for collection. You will need to bring in the assessment and provide a note as to the error or reason for review to the Actuarial Studies office. The assessment will be passed onto the relevant academic for review. Students will be able to collect back the assessment from the Actuarial Studies office.

9. ADDITIONAL STUDENT RESOURCES AND SUPPORT
The University and the ASB provide a wide range of support services for students, including:

1. ASB Education Development Unit (EDU) (www.business.unsw.edu.au/edu)
   Academic writing, study skills and maths support specifically for ASB students. Services include workshops, online and printed resources, and individual consultations. EDU Office: Room GO7, Ground Floor, ASB Building (opposite Student Centre); Ph: 9385 5584; Email: edu@unsw.edu.au

2. UNSW Learning Centre (www.lc.unsw.edu.au)
   Academic skills support services, including workshops and resources, for all UNSW students. See website for details.

3. Library training and search support services: http://info.library.unsw.edu.au

4. UNSW IT Service Desk: Technical support for problems logging in to websites, downloading documents etc. Library, Level 2; Ph: 9385 1333. Website: www.its.unsw.edu.au/support/support_home.html.

5. UNSW Counselling Service (http://www.counselling.unsw.edu.au)
   Free, confidential service for problems of a personal or academic nature; and workshops on study issues such as ‘Coping with Stress’ and ‘Procrastination’. Office: Level 2, Quadrangle East Wing; Ph: 9385 5418.

6. Student Equity & Disabilities Unit (http://www.studentequity.unsw.edu.au) Advice regarding equity and diversity issues, and support for students who have a disability or disadvantage that interferes with their learning. Office: Ground Floor, John Goodsell Building; Ph: 9385 4734.
10. COURSE SCHEDULE
This timetable is tentative and may change. Revisions will be advised as they occur through the course web site.

<table>
<thead>
<tr>
<th>Week</th>
<th>Day</th>
<th>Course Lecturer</th>
<th>Topic</th>
<th>Assessment Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20-Jul</td>
<td>BW</td>
<td>Asset Liability Management for Long Term Investors</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>27-Jul</td>
<td>JL</td>
<td>The Economic and Operating Framework of Investments, including EMH and alternative hypotheses</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3-Aug</td>
<td>JL</td>
<td>The Economic and Operating Framework of Investments, including EMH and alternative hypotheses</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>10-Aug</td>
<td>JL</td>
<td>Fundamental Principles of Investing, with particular Emphasis on Risk and Return characteristics of different asset classes including non traditional asset classes</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>17-Aug</td>
<td>JL</td>
<td>Fundamental Principles of Investing, with particular Emphasis on Risk and Return characteristics of different asset classes including non traditional asset classes</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>24-Aug</td>
<td>JL</td>
<td>Modern Portfolio Theory as the basis for efficient diversification of risk; The construction and management of multi asset class portfolios including a review of more contemporary models of Asset-Liability Models</td>
<td>Mid Semester Test</td>
</tr>
<tr>
<td>7</td>
<td>31-Aug</td>
<td>JL</td>
<td>The construction and management of multi asset class portfolios including a review of more contemporary models of Asset-Liability Models</td>
<td>Major Assignment Available</td>
</tr>
<tr>
<td>8</td>
<td>14-Sep</td>
<td>JL</td>
<td>Practical Aspects of Investment Management. Investment Approaches including investment types and performance attribution</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>21-Sep</td>
<td>JL</td>
<td>Futures, Options and other Derivative Security Markets</td>
<td>Major Assignment Due</td>
</tr>
<tr>
<td>10</td>
<td>28-Sep</td>
<td>BW</td>
<td>ALM for Superannuation and Annuity Funds</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>5-Oct</td>
<td></td>
<td>Labour Day Holiday – No Class Scheduled.</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>12-Oct</td>
<td>BW</td>
<td>ALM for General Insurance Companies (DFA)</td>
<td></td>
</tr>
</tbody>
</table>