UNSW Business School

School of Risk and Actuarial Studies

Risk 3003/5003
Risk Decisions

Course Outline
Semester 2, 2017

Course-Specific Information

The Business School expects that you are familiar with the contents of this course outline. You must also be familiar with the Course Outlines Policies webpage which contains key information on:

- Program Learning Goals and Outcomes
- Academic Integrity and Plagiarism
- Student Responsibilities and Conduct
- Special Consideration
- Student Support and Resources

This webpage can be found on the Business School website:
https://www.business.unsw.edu.au/degrees-courses/course-outlines/policies

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COURSE-SPECIFIC INFORMATION

1 STAFF CONTACT DETAILS

The Course Coordinator and Lecturer in Charge is Vincent Tu:

Name	Email	Room	Consultation
Vincent Tu	v.tu@unsw.edu.au	UNSW Business School, Level 6, East wing	Friday 6 pm – 7 pm

He is responsible for the lectures and related teaching and learning, as well as the administration and final assessment of the course. His weekly consultation times are **Friday 6 pm to 7 pm**, in front of the school office on Level 6 East wing of UNSW Business School. Exam preparation consultation times will be announced on the course website.

2 COURSE DETAILS

2.1 Teaching Times and Locations

Lectures and tutorials both start in Week 1.

- Lectures will be held on **Friday from 7 pm to 9 pm in Macauley Theatre**.
- Tutorials will be held on **Friday from 5 pm – 6 pm**.

A full timetable of lectures and topics is provided in Section 7. Any alterations to the lecture times or locations will be advised in lectures and via the course website.

2.2 Units of Credit

The course is worth 6 units of credit.

2.3 Summary of Course

This course aims at introducing students to the field of risk decision analysis. The course will cover solutions to basic decision problems involving uncertainty. There will be three components to the course coverage:

- Modelling decisions;
- Modelling uncertainty or risk with probabilities;
- Modelling preferences.

The use of decisions analysis and decision trees will be introduces including the importance of sensitivity analysis. The use of probability distributions to model risk along with subjective probabilities and Bayesian analysis will also be covered. Preference models will be introduced including multi-criteria and multi-objective decision-making. The course will be motivated by applications and problem-solving approaches to risk decision-making.

2.4 Course Aims and Relationship to Other Courses

This course is one of the five core courses for the Master of Risk Management. The aims of this course are to provide students with an understanding of:

- Decision analysis applied to problems involving risk;
- Modelling risks using probabilities and Bayesian analysis;
- Understanding decision-making objectives and criteria and how to incorporate them into decision analysis.

Specifically, the following topics will be covered:

- Decision problems
- Structuring decisions
- Introduction to the probability theory and models
- Sensitivity analysis
- Monte Carlo simulations
- Risk attitudes
- Utility Axioms
- Conflicting objectives

2.5 Student Learning Outcomes

The Course Learning Outcomes are what you should be able to DO by the end of this course if you participate fully in learning activities and successfully complete the assessment items.

The Learning Outcomes in this course also help you to achieve some of the overall Program Learning Goals and Outcomes for all students in the UNSW Business School. Program Learning Goals are what we want you to HAVE by the time you successfully complete your degree. You demonstrate this by achieving specific Program Learning Outcomes.

At the end of this course, students should be able to:

1. Understand the application of decision analysis of risk decision-making;
2. Understand how to help the decision maker think about the specific problem at hand given the structure of the problem as well as his or her preferences or beliefs;
3. Understand how to allow for subjective judgement in risk decision-making;
4. Understand the application of decision trees and influence diagrams to make risk decisions;
5. Apply probability models used for modelling uncertainty in decision-making;
6. Apply probability including subjective probabilities to decision-making;
7. Model preferences with expected utility;
8. Understand how to make decisions with conflicting objectives and criteria with multi-objective and multi-attribute utility functions;
9. Communicate, present and explain risk decisions concepts in practice.

For more information on Program Learning Goals and Outcomes, see the School's Course Outlines Policies webpage available at

https://www.business.unsw.edu.au/degrees-courses/course-outlines/policies

The following table shows how your Course Learning Outcomes relate to the overall Program Learning Goals and Outcomes, and indicates where these are assessed (they may also be developed in tutorials and other activities):

Program Learning Goals and Outcomes		Course Learning Outcomes	Course Assessment Item
This course helps you to achieve the following learning goals for all Business School students:		*On successful completion of the course, you should be able to:*	*This learning outcome will be assessed in the following items:*
1	Knowledge	Identify and apply current knowledge of disciplinary of interdisciplinary theory and profession practice to business in local and global environments,	• Mid-term exam • Final exam • Assignment
2	Critical thinking and problem solving	Identify, research and analyse complex issues and problems in business and/or management, and propose appropriate and well-justified solutions	• Mid-term exam • Final exam • Assignment
3a	Written communication	Produce written documents that communicate complex ideas and information effectively for the intended audience and purpose.	• Mid-term exam • Final exam • Assignment
3b	Oral communication	Produce oral presentations that communicate complex ideas and information in a succinct and clear manner.	• In-class presentations
4	Teamwork	Participate collaboratively and responsibly in teams, reflect on your own teamwork, and the team's processes to achieve outcomes.	• In-class presentations
5a.	Ethical, social and environmental responsibility	Identify and assess ethical, environmental and/or sustainability considerations in business decision-making and practice.	
5b.	Social and cultural awareness	Consider social and cultural implications of business and/or management practice.	

3 LEARNING AND TEACHING ACTIVITIES

3.1 Approach to Learning and Teaching in the Course

The learning experience will primarily involve guided self-learning through a combination of:

- Review of course material and lecture slides;
- Interactive discussion of issues with the course coordinator;
- Class discussions in small groups;
- Student presentations to the class;
- One to one discussion with the course coordinator where students have difficulties with particular concepts;
- Feedback through exercises, class test and comments on class discussions.

A guided self-learning approach is adopted as this is expected to allow students the best opportunity to learn and retain the course material through lectures and discussions to develop the main concepts. It also equips students to be able to develop the necessary analytical and communication skills to assess new problems encountered, rather than rote learning of particular problems, which are unlikely to be met in precisely the same format in practice. The course text plays an important role in this approach. Students will be expected to have reviewed the relevant chapters in advance of the class and be prepared to discuss exercises from the text in class.

3.2 Learning Activities and Teaching Strategies

The teaching strategies involve the following:

- Students are expected to have a cursory read through the relevant references prior to class and identify issues/points they are uncertain of for discussion in class;
- Exercises in class with presentation and discussion of issues and proposed approaches;
- Class discussion highlights the main points that need to be understood, accompanies by discussion points where the class is expected to contribute and to provide feedback to the lecturer demonstrating that the topics have been understood;
- Lectures consist of highlighting the main/difficult points that need to be understood;
- Overall the teaching strategies are aimed at equipping students with a solid understanding of the main points with discussion and feedback.

4 ASSESSMENT

4.1 Formal Requirements

To pass this course, you must:

- Achieve a composite mark of at least 50;
- Make a satisfactory attempt at all assessment tasks (see below); and
- Attend at least 80% of all lectures.

4.2 Assessment Details

The summary table below provides an overview of the assessment tasks, due dates and their relative weighting:

Assessment Task	Weighting	Length	Due Date
Mid-session exam	15%	60 minutes	Friday, 1 September 5 pm – 6 pm Location: TBC
In-class presentation	10%	15 minutes	As advised on Moodle
Assignment	15%		Sunday 1 October 9 pm sharp
Final Exam	60%	120 minutes	TBC

In class presentation

Presentations are intended primarily to develop your ability to engage with an audience and discuss a topic in risk decisions. They will develop your skills in research and your ability to concisely and coherently communicate your ideas. You are expected to spend at least 4-5 hours preparing and have 15 minutes to present. Some topics may require some research of your own. Some topics can be answered easily, but you are expected to give background and reasoning for your answers. Other topics are more complex, so the extend and depth of your research will necessarily be limited by the time available.

Presentation topics are set out in this Course Outline and will be allocated to students randomly. A schedule of presenters will be placed on Moodle. Students may agree between themselves to swap presentations provided that both students involved notify the LIC at least 1 week before the first presentation is due. Students may also suggest a replacement topic, but it must be agreed by the Lecture-in-Charge first.

Grading for presentations and responses to discussion from audience will take into account

- Knowledge and critical thinking: are your facts correct and are your arguments valid and well structured?
- Communication skills: have you engage the audience with your enthusiasm for the topic and your awareness of them and their interest?
- Keeping to time: presenters will be stopped when their time is up.

Presentations must include no more than 12 slides (excluding title page and references) and the final version of the slides must be sent to the Lecturer-in-Charge before the presentation. This will be made available to other students.

Detailed rubrics are provided below.

Criteria	<50% (Fail)	50% - 74% (Pass-Credit)	≥ 75% (Distinction-HD)
1. Analyses problem **(5 marks)**	– Does not understand the task – Does not adequately identify the main problem – Does not apply appropriate theories to analyse the problem, or applies them inaccurately – Does not demonstrate adequate logical reasoning – Does not summarise the main results of the analysis – Does not provide a discussion of the limitations of the work	– Understands the task – Adequately identifies the key elements of the problem, but may lack some clarity or not cover all relevant aspects – Applies some appropriate theories to analyse the problem – Demonstrates some logical reasoning but may have some weaknesses or over-simplification – Summarises some of the results of the analysis – Identifies some limitations of the work, but not in a comprehensive and clear way	– Demonstrates accurate understanding of all relevant, key aspects of the problem – Accurately applies appropriate theories to effectively interpret the problem – Accurately identifies and explains contextual issues, and demonstrates excellent problem-solving skills – Provides a clear and comprehensive answer to the task, and summarises the main findings – Clearly identifies the main limitations of the work
2. Communicates clearly and concisely **(2.5 marks)**	Does not express aim, key ideas and information clearly in language appropriate for the intended audience and purpose, e.g. – Does not adapt language for specific spoken context; does not use own words or explain terminology or concepts if necessary – Uses inaccurate vocabulary/grammar, often making meaning unclear Cannot answer audience questions or explain clearly if asked.	Generally, but not consistently, expresses aim, ideas and information clearly in language appropriate for the intended audience and purpose, e.g. – Adapts language for specific spoken context; uses own words and explains terminology or concepts if necessary – Uses sufficiently accurate vocabulary/ grammar for meaning to be generally clear Answers audience questions and explains points adequately if asked.	Consistently expresses aim, ideas, arguments and information clearly and concisely in language appropriate for the intended audience and purpose, e.g.: – Adapts language effectively for specific spoken context; uses own words and explains terminology/ concepts as appropriate – Uses accurate vocabulary and grammar (or has only minor errors which do not interfere with audience's understanding) – Uses language effectively to reinforce message – Answers audience questions; explains points clearly.
3. Structures presentation logically and coherently **(2.5 marks)**	Does not present material logically or make a coherent overall statement to achieve aim, e.g.: – Presentation does not have a clear focus; may contain irrelevant or repetitive material – Development of ideas is not clear; key points are not clearly identified – Presentation is poorly structured, having errors such as inadequate introductory and/or conclusion; parts of presentation are not clearly linked or sequential (or include smooth transitions between speakers, if relevant)	Generally presents key material logically and coherently to achieve aim, e.g.: – Presentation has a mainly clear focus, with little/no irrelevant material; – Development of main ideas is generally clear, although this could be more consistent; key points are identified – Presentation has an adequate structure, such as having an introduction and conclusion; sections are generally well-developed, progress the argument and are adequately linked (including smooth transitions between speakers, if relevant), although this could be more consistently effective	Presents all material logically, coherently and persuasively to achieve aim e.g.: – Presentation has a clear focus, with no irrelevant or repetitive material – Development of main ideas is clear; key points are clearly distinguished from supporting material – Presentation has a clear, coherent structure, e.g. introduction clearly defines aim/argument; presentation is well-developed, with clearly linked sections and supporting arguments (including smooth transitions between speakers, if relevant); clear conclusion follows from discussion and reinforces main argument

4. Engages audience through professional delivery (2.5 marks)	Does not engage audience or have a sufficiently professional delivery, e.g.: – Does not maintain eye contact or address audience; mainly reads from notes, slides or board – Speech is not clear or audible to all audience – Manner/body language is distracting (e.g. nervous) or unengaging (e.g. static, bored) – Style/appearance is unprofessional – Speaker is unprepared or disorganised, or does not manage time well	Achieves some audience engagement through a sufficiently professional delivery, e.g.: – Addresses audience and makes some eye contact; does not just read from notes, slides or board – Speech is generally clear and audible to all audience; voice is used to emphasise key points – Manner/body language is comfortable, friendly and conveys interest in the topic – Style/appearance is suitably professional – Speaker is prepared and organised, and manages time adequately	Engages audience effectively through a professional delivery, e.g.: – Addresses audience; maintains eye contact – Speech is clear and audible; voice (volume, pace, variety etc) is used effectively to engage audience and promote understanding – Manner/body language is confident, friendly, interested and engages the audience – Style/ appearance is very professional – Speaker is well-prepared and well-organised, and manages time effectively – Delivery may be creative or innovative
5. Uses tools and technologies effectively (2.5 marks)	Does not use tools/technologies effectively, e.g., visual aids are: – unclear/cluttered/inaccurate – not relevant, or not used appropriately by speaker (e.g. ignored or read out verbatim)	Uses tools/technologies effectively, e.g., visual aids are: – generally clear, uncluttered and accurate – relevant and used appropriately by speaker to support message and highlight key points	Uses tools/technologies very effectively, e.g. visual aids are: – well-prepared, clear, accurate, visually effective – highly pertinent and used very effectively by speaker to reinforce message and achieve aim

Mid-session exam

There will be a mid-session exam held during the class in week 6, **Friday, 1 September from 6 pm to 7 pm**. The exam will be for 1 hour plus 5 minutes reading time and will count towards 15% of the overall assessment for this course. The exam will be based on materials from the first 5 weeks of the course. The exam will consist of questions that cover knowledge in risk decision as well as require discussion and analysis.

Assignment

There will be one assignment for this course. The assignment offers students an opportunity to engage in independent research, participate in critical analysis, problem solving and written communication skills, as well as to demonstrate their understanding of the concepts and perspectives studied in the course. Students are reminded that the work they submit must be their own. While we have no problem with students working together on the assignment problems, the material students submit for assessment must be their own.

Final exam

The final exam will cover materials from weeks 1 to week 12 and will assess students' understanding of the concept covered in this course and their ability to apply them to risk decision problems.

The final examination will be a two-hour written paper with 10 minutes of reading time. The final examination will be closed book. Students may bring their own calculators. All calculators must be UNSW approved.

4.3 Assignment Submission Procedure

Assignments must be submitted via the Turnitin submission box that is available on the course Moodle website. Turnitin reports on any similarities between their own cohort's assignments, and also with regard to other sources (such as the internet or all assignments submitted all around the world via Turnitin). More information is available at: http://elearning.unsw.edu.au/turnitin/content/TurnItInStudentSupport.cfm?ss=0
Please read this page, as we will assume that its content is familiar to you. You will be able to make multiple submissions. You need to check your document once it is submitted (check it on-screen). **We will not mark assignments that cannot be read on screen.**

Students are reminded of the risk that technical issues may delay or even prevent their submission (such as internet connection and/or computer breakdowns). Students should then consider either submitting their assignment from the university computer rooms or **allow enough time (at least 24 hours is recommended) between their submission and the due time**. The Turnitin module will not let you submit a late report. **No paper copy will be either accepted or graded.**

In case of a technical problem, the full document must be submitted to the course coordinator before the due time by e-mail, with explanations about why the student was not able to submit on time. In principle, this assignment will not be marked. It is only in exceptional circumstances where the assignment was submitted before the due time by e-mail that it may be marked—and this only if a valid reason is established.

Avoid a 0 for your assignment (in the mildest case) because of plagiarism

Students are reminded that the work they submit must be their own. While we have no problem with students working together on the assignment problems, the material students submit for assessment must be their own. This means that:

- The mathematical solutions you present are written up by you, without reference to any other student's work.
- Students should make sure they understand what plagiarism is. Cases of plagiarism have a *very high* probability of being discovered. For issues of collective work, having different persons marking the assignment does *not* decrease this probability.

Students should consult the Turnitin section of the website accessible to all students well in advance, as this gives a (non-exhaustive) list of things that could go wrong and explains how the policies above are implemented.

4.4 Special Consideration, Late Submission and Penalties

For information on Special Consideration please refer to the Business School's Course Outlines Policies webpage**. Special consideration and assessments other than the Final Exam in undergraduate and postgraduate courses:**

For courses offered by the School of Risk and Actuarial Studies, the weight of the assessment items for which special consideration is granted is re-allocated to the Final Exam. Alternatively, in exceptional cases and only for assessment items with a submission deadline, a delayed deadline may be granted. This may be no more than 5 business days after the initial deadline, and must be before feedback is provided to students.
Special consideration **does not** entitle students to a supplementary opportunity to complete the assessment item.

Late submission of assessment items

When an assessment item had to be submitted by a pre-specified submission date and time and was submitted late, the School of Risk and Actuarial Studies will apply the following policy.

A penalty of 25% of the mark the student would otherwise have obtained, for each full (or part) day of lateness (e.g., 0 day 1 minute = 25% penalty, 2 days 21 hours = 75% penalty). Students who are late must submit their assessment item to the lecturer-in-charge (LIC) via e-mail. The LIC will then upload documents to the relevant submission boxes. The date and time of reception of the e-mail determines the submission time for the purposes of calculating the penalty.

4.5 Protocol for viewing final exam scripts

The UNSW Business School has set a protocol under which students may view their final exam script. Please check the protocol here.

Individual Schools within the Faculty may set up a local process providing it is in keeping with the Faculty protocol. The School of Risk and Actuarial Studies implements the abovementioned faculty guidelines in the following way:
1. There will be only one viewing.

2. Students must register (that is, lodge a request to view their final exam script) to rasadmin@unsw.edu.au after results are released, but no later than COB on Wednesday 6 December 2017.
3. The viewing will take place on Monday 11 December 2017, at a time and location to be announced to registered students by COB on Friday 8 December 2017. Student MUST remain available for the WHOLE of 11 December 2017 until the time of their viewing is communicated.

Note that students must make a separate, subsequent appointment with the LIC, should they wish to lodge a formal application for re-assessment.

Quality Assurance
The Business School is actively monitoring student learning and quality of the student experience in all its programs. A random selection of completed assessment tasks may be used for quality assurance, such as to determine the extent to which program learning goals are being achieved. The information is required for accreditation purposes, and aggregated findings will be used to inform changes aimed at improving the quality of Business School programs. All material used for such processes will be treated as confidential.

5 COURSE RESOURCES

Required textbook:

Making Hard Decisions with Decision Tools
Authors: Clemen Robert T. & Reilly Terence
Publisher: Cengage Learning Australia
Edition: 2013 (3rd edition)

Moodle
This course will use Moodle for communication with students. Moodle will contain the course outline, lecture notes, homework and tutorial exercises, 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 at: http://moodle.telt.unsw.edu.au/

6 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 completion of a university-run survey: myExperience. Previous student feedback indicated to place more emphasis on application of modelling involving scenarios. As a result of this feedback, there will be an assignment for students to apply knowledge in practical settings.

7 COURSE SCHEDULE

LECTURE SCHEDULE		
Week	Topic	References
Week 1 28 July	Introduction to Decision Analysis Elements of Decision Problems	Clemen and Reilly Chapter 1 and 2
Week 2 4 August	Structuring Decisions	Clemen and Reilly Chapter 3
Week 3 11 August	Making Choices	Clemen and Reilly Chapter 4
Week 4 18 August	Sensitivity Analysis	Clemen and Reilly Chapter 5
Week 5 25 August	Probability Basics	Clemen and Reilly Chapter 7
Week 6 1 September	Mid-session Exam	Clemen and Reilly Chapter 9
Week 7 8 September	Monte Carlo Simulation	Clemen and Reilly Chapter 11
Week 8 15 September	Subjective Probability	Clemen and Reilly Chapter 8
Week 9 22 September	Value of Information	Clemen and Reilly Chapter 12
Mid-semester break: Saturday 23 September – Sunday 1 October inclusive		
Week 10 6 October	Risk Attitudes	Clemen and Reilly Chapter 14
Week 11 13 October	Conflicting Objectives	Clemen and Reilly Chapter 16
Week 12 20 October	Revision	

8 PRESENTATION TOPICS

Students will be allocated a topic from the list below, which are taken from the prescribed textbook (Clemen and Reilly). Students are free to change topics with another student, but both must advise the Lecturer of the exchange at least 1 week in advance. Presentations will begin from week 3.

Week 3

- Case study: The Value of Patience (after Chapter 2)
- Exercise 3.9
- Exercise 3.11
- Exercise 3.17
- Exercise 3.18

Week 4

- Exercise 3.2
- Exercise 3.23
- Exercise 3.25
- Exercise 4.14
- Exercise 4.15

Week 5

- Exercise 4.16
- Exercise 4.18
- Case Study: Southern Electronic, Part I (after Chapter 4)
- Exercise 5.10

Week 6

- Mid-session exam, no presentation

Week 7

- Exercise 5.13
- Exercise 5.8
- Exercise 5.12
- Exercise 7.8
- Exercise 7.21

Week 8

- Exercise 7.26
- Exercise 7.30
- Exercise 9.17
- Exercise 9.36

Week 9

- Exercise 9.27
- Exercise 9.21
- Exercise 9.19
- Exercise 9.26
- Exercise 9.18

Week 10

- Exercise 9.25
- Exercise 8.11
- Exercise 8.15
- Exercise 8.25
- Exercise 12.7
- Exercise 12.12

Week 11

- Exercise 12.14
- Exercise 14.7
- Exercise 14.12
- Exercise 14.13
- Exercise 14.14
- Exercise 14.27

Week 12

- Exercise 14.32
- Exercise 14.34
- Exercise 16.14
- Exercise 16.22
- Exercise 16.25