RISK 5003
Risk Decisions

Course Outline
Semester 2, 2015

Part A: Course-Specific Information

Please consult Part B for key information on Business School policies (including those on plagiarism and special consideration), student responsibilities and student support services.
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PART A: COURSE-SPECIFIC INFORMATION

1 STAFF CONTACT DETAILS

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Email</th>
<th>Consultation times and location</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecturer-in-charge</td>
<td>Dr. Katja Ignatieva</td>
<td><a href="mailto:k.ignatieva@unsw.edu.au">k.ignatieva@unsw.edu.au</a></td>
<td>Mon 11am-12pm Thu 5pm-6pm (if you can’t make Mon 11am-12pm) Business School Room 651 East WIng</td>
<td>93855810</td>
</tr>
</tbody>
</table>

Consultation Times: as above or by appointment.
Communication: students may phone/email the Course Coordinator during normal university hours.

2 COURSE DETAILS

2.1 Teaching Times and Locations
Lectures start in Week 1: Thursday, 30 July 2015
The Time and Location: ASBus 119

The course is worth 6 units of credit.

2.2 Units of Credit
The course is worth 6 units of credit.

2.3 Summary of Course
This is one of the core courses in the Master of Risk Management program, which aims to introduce 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 introduced 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 risk using probabilities and Bayesian analysis
- Understanding decision making objectives and criteria and how to incorporate into decision analysis

Specifically the following topics will be covered:

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

2.5 Student Learning Outcomes

At the end of this course students should have further developed their:

1. Understanding of the application of decision analysis to risk decision making
2. Understanding how to help the decision maker think hard about the specific problem at hand given the structure of the problem as well as his or her preferences or beliefs
3. Understanding of how to allow for subjective judgement in risk decision making
4. Developing a set of tools with which a decision maker can construct and analyze a model or a decision situation
5. Learning to represent real-world problems using theoretical models that can be analyzed to gain insights and understanding about how the decisions can be improved
6. Understanding of the application of decision trees and influence diagrams to making risk decisions
7. Knowledge of the main probability models used for modelling uncertainty in decision making
8. Knowledge of how to apply probability including subjective probabilities to decision making
9. Understanding of how to model preferences with expected utility
10. Understanding of how to make decisions with conflicting objectives and criteria with multi-objective and multi-attribute utility functions
11. Communication, presentation and discussion skills for explaining risk decisions concepts in practice

2.6 Student Learning Outcomes

The Business School has its own core Postgraduate Coursework Program Learning Goals and Outcomes:

1. Knowledge: Our graduates will have current disciplinary or interdisciplinary knowledge applicable in local and global contexts.
You should be able to identify and apply current knowledge of disciplinary or interdisciplinary theory and professional practice to business in local and global environments.

2. Critical thinking and problem solving: Our graduates will have critical thinking and problem solving skills applicable to business and management practice or issues.
You should be able to identify, research and analyse complex issues and problems in business and/or management, and propose appropriate and well-justified solutions.

3. Communication: Our graduates will be effective communicators in professional contexts.
You should be able to:
   a. Produce written documents that communicate complex disciplinary ideas and information effectively for the intended audience and purpose, and
   b. Produce oral presentations that communicate complex disciplinary ideas and information effectively for the intended audience and purpose.

4. Teamwork: Our graduates will be effective team participants.
You should be able to participate collaboratively and responsibly in teams, and reflect on your own teamwork, and on the team’s processes and ability to achieve outcomes.

5. Ethical, social and environmental responsibility: Our graduates will have a sound awareness of ethical, social, cultural and environmental implications of business issues and practice.
You should be able to:
   a. Identify and assess ethical, environmental and/or sustainability considerations in business decision-making and practice, and
   b. Consider social and cultural implications of business and/or management practice.

This course contributes to student development of the following ASB learning goals and outcomes, which are the qualities, skills and understandings we want you to have by the completion of your degree.

The ASB learning goals and outcomes are developed through the course learning outcomes as follows:

<table>
<thead>
<tr>
<th>Course Outcomes</th>
<th>Learning Outcomes</th>
<th>Program Learning Goals and Outcomes</th>
<th>Course Assessment Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,6,7,9</td>
<td></td>
<td>Knowledge</td>
<td>Exam, class test</td>
</tr>
<tr>
<td>3,4,5,6,8,10</td>
<td></td>
<td>Critical thinking and problem solving</td>
<td>Exam, class test</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Communication</td>
<td>In-class presentation, exercises and class participation</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Teamwork</td>
<td>In-class presentation, exercises and class participation</td>
</tr>
<tr>
<td>1,2,3</td>
<td></td>
<td>Ethical, social and environmental responsibility</td>
<td>Exam, class test</td>
</tr>
</tbody>
</table>
These attributes are developed primarily through interactive class discussions, exercises and assessed by class participation, class test, exam and ability to concisely answer the assignment and other assessment tasks.

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 text 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 discussions 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 strategy involves 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 the class
- Exercises in class with presentation and discussion of issues and proposed approaches
- In class discussion highlighting the main points that need to be understood, accompanied 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, accompanied by discussion points where the class may be expected to contribute
- Overall the teaching strategies are aimed at equipping students with a solid understanding of the main points, accompanied by discussion and feedback
4 ASSESSMENT

4.1 Formal Requirements
In order to pass this course, you must:
- Achieve a composite mark of at least 50%; and
- Make a satisfactory attempt at all assessment tasks (see below)
- 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 relative weighting:

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Weighting</th>
<th>Length</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid session class test</td>
<td>15%</td>
<td>60 min</td>
<td>As advised on course web site</td>
</tr>
<tr>
<td>In class presentation 1</td>
<td>10%</td>
<td>10-15 min</td>
<td>As advised on course web site</td>
</tr>
<tr>
<td>In class presentation 2</td>
<td>10%</td>
<td>10-15 min</td>
<td>As advised on course web site</td>
</tr>
<tr>
<td>In class participation</td>
<td>5%</td>
<td>N/A</td>
<td>Every week</td>
</tr>
<tr>
<td>Exam</td>
<td>60%</td>
<td>120 min</td>
<td>According to UNSW exam schedule</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Whilst feedback will be provided to students after their in session assessment has been completed, students should note that the final assessment can involve scaling of overall marks to adjust for varying difficulty across years and to adjust for variations in marking standards of different examiners.

4.2.1 In-class exercises and class participation
In-class presentation counts 15% towards final assessment. Class participation counts 5% towards final assessment. Students will complete a number of exercises throughout the course requiring the application of the course material to risk decision problems. They will present the exercises in class. Class participation includes discussion of exercises presented by other students will count to assessment. The allocation of exercises will be advised to students at the commencement of the course.

4.2.2 Mid Session Test & Final Exam
There will be mid-session class test held during the class in week 6. The exam will be for 1 hour and will count for 20% of the overall assessment for this course. The Assessment will consist of questions covering both knowledge and risk decision exercises requiring discussion as well as analysis. Marks will be awarded for accuracy,
clarity and conciseness in answering. The mid-session exam will be for 1 hour and based on materials from the first 5 weeks of the course. The final exam will cover materials from weeks 1 – 12. Format and other details will be advised in due course.

4.2.3 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 Suite with Bind-In
Author: Clemen Robert T., Reilly, T.
Publisher: Cengage Learning Australia
Edition: 2013 (3rd edition)

The Course website site for this course will contain the Course Outline, lecture slides, 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.

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 completion of CATEI forms. Previous student feedback indicated that the provision of recorded lectures, student presentations and group discussions were most valuable. As a result of this feedback, these will be continued in the current course.

7 COURSE SCHEDULE

The topics to be discussed each week, and the references in the recommended reading and other reading that students will be assumed to have read will be:

<table>
<thead>
<tr>
<th>Week Number</th>
<th>Week Commencing (Classes Thursday 6-9pm)</th>
<th>Topic Covered</th>
<th>Reference</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Reading Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30 July</td>
<td>Introduction to Decision Analysis</td>
<td>Clemen and Reilly Chapter 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Elements of Decision Problems</td>
<td>and 2</td>
</tr>
<tr>
<td>2</td>
<td>6 August</td>
<td>Structuring Decisions</td>
<td>Clemen and Reilly Chapter 3</td>
</tr>
<tr>
<td>3</td>
<td>13 August</td>
<td>Making Choices</td>
<td>Clemen and Reilly Chapter 4</td>
</tr>
<tr>
<td>4</td>
<td>20 August</td>
<td>Sensitivity Analysis</td>
<td>Clemen and Reilly Chapter 5</td>
</tr>
<tr>
<td>5</td>
<td>27 August</td>
<td>Probability Basics</td>
<td>Clemen and Reilly Chapter 7</td>
</tr>
<tr>
<td>6</td>
<td>3 September</td>
<td>Mid Session Class Test</td>
<td>Theoretical Probability Models</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clemen and Reilly Chapter 9</td>
<td>Chapter 9</td>
</tr>
<tr>
<td>7</td>
<td>10 September</td>
<td>Monte Carlo Simulation</td>
<td>Clemen and Reilly Chapter 11</td>
</tr>
<tr>
<td>8</td>
<td>17 September</td>
<td>Subjective Probability</td>
<td>Guest Speaker CBA Clemen and Reilly Chapter 8</td>
</tr>
<tr>
<td>9</td>
<td>24 September</td>
<td>Value of Information</td>
<td>Chapter 12</td>
</tr>
<tr>
<td></td>
<td>1 October</td>
<td>Mid-session Break</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>8 October</td>
<td>Risk Attitudes</td>
<td>Clemen and Reilly Chapter 14</td>
</tr>
<tr>
<td>11</td>
<td>15 October</td>
<td>Conflicting Objectives</td>
<td>Clemen and Reilly Chapter 16</td>
</tr>
<tr>
<td>12</td>
<td>22 October</td>
<td>Revision</td>
<td></td>
</tr>
</tbody>
</table>