THOMPSON RIVERS UNIVERSITY

Course Outline

Department of Management
School of Business and Economics

BUSN 6250/1-3
Decision Analysis and Modelling (3,0,0)

Calendar Description

Students learn to integrate personal judgment and intuition in realistic business situations with the most widely applicable methodologies of decision and risk analysis, probability and statistics, competitive analysis, and management science. Topics include an introduction to decision analysis and modelling; spreadsheet engineering and error reduction; framing decision analysis problems; framework for analyzing risk; data analysis; resource allocation with optimization models; multi-period deterministic models; multi-factor deterministic models; regression modelling; strategic interactive decisions; and interpreting models, data, and decisions.

Educational Objectives/Outcomes

After completing this course, students should be able to:

1. Describe the range of cognitive, psychological and social pitfalls, which decision makers should avoid.
2. Critically evaluate decisions of others and develop ways they could have improved their decision-making.
3. Demonstrate translating descriptions of decision problems into formal models, and investigate those models in an organized and systematic fashion.
4. Illustrate best practice modeling techniques such as the FAST Modeling Standard®, strategies for reducing errors and other methods to ensure consistent and easy to understand models.
5. Demonstrate how analytical techniques and statistical models can help enhance decision making by converting data to information and insights for decision-making.
6. Categorize and construct multistage decision analysis problems using decision trees.
7. Categorize and construct multifactor problems with multiple objectives and uncertainty.
8. Demonstrate linear, non-linear and goal programming models for resource allocation and optimization.
9. Critically evaluate various short-term forecasting and regression models and identify their appropriate use and limitations.
10. Effectively use online data sources and internet resources to access necessary information for model development.
11. Interpret model results in the context of the business situation and address the inherent assumptions through sensitivity and scenario analysis.

12. Effectively communicate the analysis, outcomes, assumptions and implications through spreadsheet models and presentations.

Prerequisites

Meets the admission requirements to the MBA

Co-requisites

Texts/Materials

Textbook

This course requires a monthly subscription to Safari online. A basic monthly subscription will allow you to put up to 10 textbooks on your bookshelf. Some of the books that will be required for this course are:

- Charlesworth, David. Decision Analysis for Managers, Business Expert Press, 2013.
- Fairhurst, Danielle Stein. Using Excel for Business Analysis: A Guide to Financial Modelling Fundamentals. John Wiley & Sons, 2012.
- Frame, J.Davidson. Framing Decisions: Decision-Making that Accounts for Irrationality, People and Constraints - Seven Lessons For Highly Effective Decision-Makers. Jossey-Bass Publishing. 2012
- Tillman, Frank A and Deandra T. Cassone. A Professional's Guide to Decision Science and Problem Solving: An Integrated Approach for Assessing Issues, Finding Solutions, and Reaching Corporate Objectives: FT Press. 2012
- Keith Allman, Keith, Josh Laurito and Michael Loh. Financial Simulation Modeling in Excel:. John Wiley & Sons. 2011.
- Winston, Wayne L. Microsoft Excel 2010: Data Analysis and Business Modeling, 3rd Edition. Microsoft Press. 2011
- Carlberg, Conrad. Predictive Analytics: Microsoft® Excel. Que Publishing. 2012
- Baker, Kenneth R. Optimization Modeling with Spreadsheets, Second Edition. John Wiley & Sons. 2011.
- Verlander, Edward G. The Practice of Professional Consulting. Pfeiffer Publishing. 2012

Student Evaluation

Campus		
Case studies	60%	
Final exam	40%	
Online		
Case Studies	45%	

On-line Discussions	15%
Final Exam	40%

Students must pass the final exam with 50% or higher to pass the course.

Course Topics

1. Introduction To Decision Making
   - Introduction to course and resources
   - The Decision Making Continuum: Modeling
   - The Decision Making Continuum: Structured to Unstructured Decisions

   Case: Icebergs for Kuwait

2. Spreadsheet Engineering and Error Reduction
   - Critical spreadsheet modelling skills
   - Reducing spreadsheet errors and the FAST modelling standard

   Case: TRU Sports Museum & Archives

3. Framing Decision Analysis Problems
   - Determining objectives hierarchy
   - Assessing level of uncertainty
   - Synthesizing models into a client presentation

   Case: Bob's Retirement Planning

4. Framework for Analyzing Risk I
   - Asking the right questions
   - Scenario analysis, best, worst and base cases
   - Multi-period pro forma and simulating NPV

   Case: TRU Coffee Pub

5. Simulation – A Risk Analysis Tool
   - Building the base or static case
   - Selecting the correct input distributions
   - Performing a simulation and statistical analysis

   Case: TRU Bookstore

6. Data Analysis
   - Data sources and reliability
   - Statistical Analysis and presentation of data
   - Analyzing large volumes of data to make decisions

   Case: Histograms, Statistics and Pivot Tables

7. Resource Allocation – Optimization Models

- Allocation of resources, data considerations, conflicts and model selection
- Decision engineering and sensitivity analysis

Case: Five problems in workbook format

8. Deterministic Models – Multi-Period
   - Information gathering and sensitivity analysis
   - Multi-stage decision problem analysis
   - Value of information and control, risk aversion

   Case: Bonaparte Winery

9. Deterministic Models – Multi Factor
   - Multiple objectives and multi-criteria decision making
   - Analytical Hierarchical Process (AHP)
   - Data Envelopment Analysis (DEA)

   Cases: AHP – Selecting Projects at TRU & DEA – Rating Franchise Outlets

10. Forecasting – Predicting the Future
    - Forecasting using historical data (moving average, exponential and Holt-Winters)
    - Using Regression to Forecast

    Cases: Forecasting using time series and regression

11. Presenting the Results, Dashboards and Visual Representation
    - Creating visuals to represent data
    - Creating executive dashboards

    Case: Dashboard for Kamloops Chamber of Commerce

12. Data and decisions - A Management Consultant Perspective
    - Business analysis and management consulting
    - Selecting the appropriate model and delivering client value

    Case: Management consulting and business analytics

Methods for Prior Learning Assessment and Recognition

Students can apply for PLAR in any course but it cannot be used to meet the program residency requirement.

Attendance Requirements – Include if different from TRU Policy

As per TRU policy

Special Course Activities – Optional

Use of Technology – Optional