

Course Title	: Spreadsheet-Based Decision Making
Course Code	: CLD9014/CDS256
Number of Credits/Term	: 3
Mode of Tuition	: Sectional approach
Teaching Hours	: 3 hours per week
Category in Prog.	: Core Curriculum Cluster (in 4-year system) / Free elective (in 3-year system)
Core Curriculum Cluster	: Science, Technology and Society
Prerequisite(s)	: None

Brief Course Description

Organizations and individuals often need to make decisions in their best interests in different situations, which may involve uncertainty and constraints. In this course, we introduce quantitative techniques that facilitate scientific and systematic decision making. Students will learn how to apply Microsoft Excel to effectively and efficiently implement appropriate decision-making techniques and obtain the best decision. We present concepts and decision-making techniques by solving a broad variety of practical problems in the social context, business and economics, daily life, and sports. Through practicing these techniques and Excel functions, students are expected to develop basic analytical skills and acquire competency in Excel, which can help them improve their performance at work or in daily life.

Aims

This course aims to:

1. introduce a range of quantitative decision-making techniques that can be used for modelling real-life decision problems;
2. develop students' ability to think critically and make decisions in a scientific and systematic way;
3. enhance students' quantitative and analytical skills as well as computer-based problem-solving skills;
4. enable students to apply appropriate decision-making techniques and Excel to formulate computer-based models and obtain the best decisions for real-world problems;
5. provide practical training to students in arriving at solutions for practical problems.

Learning Outcomes

Upon successful completion of the course, students will be able to:

1. demonstrate critical thinking and logical reasoning when making decisions;
2. identify appropriate quantitative techniques for making decisions in various contexts;
3. integrate knowledge from different disciplines when making decisions;
4. employ Microsoft Excel to model and solve practical problems;
5. interpret results of spreadsheet analysis and make recommendations.

Indicative Content

Students will learn decision-making methodologies and spreadsheet modeling through solving a variety of practical problems in four application areas as follows.

1. Decision making in business and economics:

Finance and Accounting: Cost projection; breakeven analysis; calculating net present value for new drug development; finding an optimal investment strategy; portfolio planning; personal financial planning; capital budgeting.

Marketing: Determining a marketing survey plan; advertising budget allocation; sales territory assignment; sales management.

Operations Management: Ordering T-shirts for a sports event (news vendor); ordering with quantity discounts; scheduling workers; assigning workers to jobs; product mix optimization; aggregate planning; blending petroleum; fixed-cost problem; transportation; logistics problems; airline flight scheduling.

Economics: Foreign exchange trading; international investments.

2. Decision making in a social context:

Comparing the efficiency of hospitals; assigning school buses to routes; hospital location; fire station location.

3. Decision making in daily life:

Choosing a phone plan; planning dessert; McDonald's diet problem.

4. Decision making in sports: Rating sports teams.

Teaching Method

The *spreadsheet-based teaching method* will be used throughout the course. We will teach decision-making techniques and Excel functions and tools through solving practical problems and guiding students to build spreadsheet model for each problem step by step. Microsoft Excel will be employed for obtaining quantitative solutions for every problem. Students will be able to extensively practice using Excel.

Assessment

Class Attendance and Participation:	5%
Assignments:	25%
Test:	15%
Group Case Study:	15%
Final Exam:	40%
Total	100%

Measurement of Learning Outcomes

1. Problem-based individual assignments and a group case study are used to facilitate and evaluate students' understanding of concepts and techniques of decision-making in various contexts and their competency of using Excel to formulate the problems and find the best decisions.
2. A test and a final examination are used to assess students' comprehension of the concepts and theories, and to assess their ability to apply quantitative techniques and Microsoft Excel to decision-making problems.

Reference Books

1. C. Ragsdale. *Spreadsheet Modeling & Decision Analysis*, 6th ed., South-Western, Cengage Learning, USA, 2010.
2. W. L. Winston and S. C. Albright. *Management Science Modeling*, 4th ed., South-Western, Cengage Learning, USA, 2012.

Supplementary Readings

J. H. Moore and L. R. Weatherford. *Decision Modeling with Microsoft Excel*, 6th ed., Prentice Hall, New Jersey, 2001.