



## Graduate Course Syllabus

### **DAT 520: Decision Methods and Modeling**

Center: Online

#### **Course Prerequisites**

DAT 510

#### **Course Description**

The role of many analysts is as much about interpreting the results of data analysis as it is about gathering the data and “crunching the numbers.” In this course, students will learn how to evaluate data in context, interpret data trends, and receive an overview of decision support management techniques such as predictive modeling, risk assessment and optimization, and analytics algorithms, which will set the stage for more advanced study in subsequent courses. Concepts from enterprise data management, including data warehousing and business intelligence, will provide a foundation for examining the topics of data mining, advanced and dimensional data modeling, and decision support system development as techniques for an organization's competitive advantage.

#### **Course Outcomes**

- Appraise data in context according to industry-standard methods and techniques for its utility in supporting decision making
- Determine suitable data manipulation and modeling methods for decision support
- Articulate data frameworks for organizational decision support by applying data manipulation, modeling, and management concepts
- Evaluate the ethical issues surrounding organizational use of decision-orientated data based on industry standards and one’s personal ethical criteria
- Create and assess the agility of solutions through application of data-mining procedures for decision support in various industries

#### **Required Materials**

Using your learning resources is critical to your success in this course. Your textbook is available for free through the Shapiro Library.

[\*Data Mining With Rattle and R\*](#)

Graham Williams

Springer

2011

ISBN: 978-1-4419-9889-7

## **Software Requirement**

In this course, you will use the Virtual Lab to access the following software:

- R: BASE
- R-Studio
- Rattle

Please create accounts when prompted to do so, if you do not already have them.

All data sets needed for this course will be found in Start Here within the DAT 520 Data Files folder.

## **Diversity, Equity, and Inclusion**

As indicated in our core values, SNHU is committed to “embrace diversity where we encourage and respect diverse identities, ideas, and perspectives by honoring difference, amplifying belonging, engaging civilly, and breaking down barriers to bring our mission to life.”

This may or will be reflected in SNHU’s curriculum as we embrace and practice diversity, equity, and inclusion (DEI) to provide the most transformative experience for our students, faculty, and staff. Because topics pertaining to DEI can be sensitive, please remember that embodying and practicing diversity, equity, and inclusion is one of our core values that you will encounter throughout the academic experience. In higher education, we are expected to think and engage critically. Use a growth mindset to embrace the diverse readings, course assignments, and experiences of your peers and faculty.

For more information about DEI at SNHU, please visit our website at the [Office of Diversity and Inclusion](#).

## **Instructor Availability and Response Time**

Your class interaction with the instructor and your classmates will take place on a regular, ongoing basis. Your instructor will be actively engaged within the course throughout the week. You will normally communicate with your instructor in the weekly discussions or the General Questions discussion topic so that your questions and the instructor’s answers benefit the entire class. You should feel free, however, to communicate with your instructor via SNHU email at any time, particularly when you want to discuss something of a personal or sensitive nature. Your instructor will generally provide a response within 24 hours. Instructors will post grades and feedback (as applicable) within seven days of an assignment’s due date, or within seven days of a late submission.

## Grade Distribution

Assignment Category	Number of Graded Items	Point Value per Item	Total Points
Discussions	8	20	160
Journals	2	20	40
Problem Sets	7	35	245
Final Project			
Milestone One	1	40	40
Milestone Two	1	40	40
Milestone Three	1	40	40
Final Submission	1	395	395
Peer Review Activity	1	40	40
			<b>Total Course Points: 1,000</b>

This course may also contain practice activities. The purpose of these non-graded activities is to assist you in mastering the learning outcomes in the graded activity items listed above.

## University Grading System: Graduate

Grade	Numerical Equivalent	Points
A	93–100	4.00
A-	90–92	3.67
B+	87–89	3.33
B	83–86	3.00
B-	80–82	2.67
C+	77–79	2.33
C	73–76	2.00
F	0–72	0.00
I	Incomplete	
IF	Incomplete/Failure *	
W	Withdrawn	

\* Please refer to the [policy page](#) for information on the incomplete grade process.

## Grading Guides

Specific activity directions, grading guides, posting requirements, and additional deadlines can be found in the Assignment Guidelines and Rubrics section of the course.

## Weekly Assignment Schedule

All reading and assignment information can be found within each module of the course. Assignments and discussion posts during the first week of each term are due by 11:59 p.m. Eastern Time. Assignments and discussion posts for the remainder of the term are due by 11:59 p.m. of the student's local time zone.

In addition to the textbook readings that are listed, there may be additional required resources within each module.

Module	Topics and Assignments
1	Decision Analysis Essentials and Examples <i>Technical Data Mining With Rattle and R</i> , Chapter 1 and 2 1-1 Discussion: Introductions and Problem Set 1 1-2 Explore Your Course Tools 1-3 Problem Set 1: R for Probability Matrices 1-4 Final Project Review
2	Probability Refresher and First Steps with Decision Analysis <i>Technical Data Mining With Rattle and R</i> , Chapter 3 2-1 Problem Set 2: Simple Proportions and Binomials 2-2 Final Project: Milestone One
3	Conditional Probability and Applied Decision Analysis <i>Technical Data Mining With Rattle and R</i> , Chapter 4 3-1 Discussion: Choosing a Research Question 3-2 Problem Set 3: Cumulative and Conditional Probability
4	Utility, Outcomes, Endpoints <i>Technical Data Mining With Rattle and R</i> , Sections 11.1, 11.2, and 11.3 of Chapter 11 4-1 Discussion: Decision Tree Use 4-2 Problem Set 4: Introductory Decision Trees
5	Modeling I: Bottom-Up and Top-Down Decision Trees 5-1 Discussion: Bottom-Up vs. Top-Down Decision Modeling 5-2 Problem Set 5: Conditional Probability in Decision Trees 5-3 Final Project: Milestone Two
6	Modeling II: Markov Processes in Decision Trees 6-1 Discussion: Markov Processes 6-2 Problem Set 6: Markov Modeling in Decision Trees
7	Modeling III: Model Diagnostics <i>Technical Data Mining With Rattle and R</i> , Section 11.5 (Turning Parameters) to the end of Chapter 11 7-1 Discussion: Strategies for Revising Your Decision Model 7-2 Problem Set 7: Sensitivity Analysis and Model Diagnostics 7-3 Final Project: Milestone Three
8	Effective Scientific Reporting 8-1 Journal: Final Project Process Reflection 8-2 Discussion: Final Project Check-In (Pass/Fail)
9	Bias, Error, and Confounding in Decision Models 9-1 Discussion: Bias and Ethics in Decision Analysis 9-2 Final Project: Submission

Module	Topics and Assignments
10	Effective Peer Review 10-1 Peer Review Activity 10-2 Journal: Personal Reflection

### Attendance Policy

Online students are required to submit a graded assignment/discussion during the first week of class. If a student does not submit a graded assignment/discussion during the first week of class, the student is automatically dropped from the course for non-participation. Review the [full attendance policy](#).

### Late Assignments Policy

Meeting assigned due dates is critical for demonstrating progress and ensuring appropriate time for instructor feedback on assignments. Students are expected to submit their assignments on or before the due date. Review the [full late assignment policy](#).

### SNHU Student Handbook

Review the [student handbook](#).

### ADA/504 Compliance Statement

In accordance with Section 504 of the Rehabilitation Act of 1973, Title III of the Americans with Disabilities Act (ADA) of 1990, and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008, Southern New Hampshire University does not discriminate on the basis of disability, including intellectual disability, in admission, treatment, or access to its programs or activities, nor does it discriminate in employment in its programs or activities.

The university prohibits unlawful discrimination on the basis of disability and takes action to prevent such discrimination by providing reasonable accommodations to eligible individuals with disabilities. A disability is a condition or impairment that impacts a “major life activity” or “major bodily function.”

- **Major life activities** include, but are not limited to, caring for oneself, performing manual tasks, seeing, hearing, eating, sleeping, walking, standing, lifting, bending, speaking, breathing, learning, reading, concentrating, thinking, communicating, and working.
- **Major bodily functions** include, but are not limited to, functions of the immune system, normal cell growth, and digestive, bowel, bladder, neurological, brain, respiratory, circulatory, endocrine, and reproductive functions. Disabilities include physical, medical (including pregnancy), mental health, and learning needs.

At the beginning of each term, or as soon as you become aware of a disability or accessibility concern, we encourage you to contact the Online Accessibility Center (OAC) to discuss accommodations for which you may be qualified. Reasonable accommodations are established through an interactive process between the student and the OAC.

Note that accommodations are not retroactive and that disability accommodations are not provided until acceptable documentation of a disability and its impact is received and an accommodation letter has been processed. If you are unsure whether your condition qualifies as a disability or accessibility concern, please contact the OAC for determination.

**Contact Information:**

Online Accessibility Center

Phone: 866-305-9430

Email: [oad@snhu.edu](mailto:oad@snhu.edu)

**For questions concerning support services, documentation guidelines, or general disability issues, please visit the [Online Accessibility Center](#) website.**

If you feel you have been denied appropriate disability-related accommodations, including appropriate auxiliary aids and services, you may file a grievance as described in the ADA/504 Grievance Policy found on the [Disability and Accessibility Services](#) website.

**Academic Honesty Policy**

Southern New Hampshire University requires all students to adhere to high standards of integrity in their academic work. Activities such as plagiarism and cheating are not condoned by the university. Review the [full academic honesty policy](#).

**Copyright Policy**

Southern New Hampshire University abides by the provisions of United States Copyright Act (Title 17 of the United States Code). Any person who infringes the copyright law is liable. Review the [full copyright policy](#).

**SNHU Withdrawal Policy**

Review the [full withdrawal policy](#).

**Southern New Hampshire University Policies**

More information about SNHU policies can be found on the [policy page](#).

**Student Work Samples**

For the purpose of continuous improvement of our educational training, Southern New Hampshire University may, on occasion, utilize anonymous student work samples for internal professional development and staff training. If you would like to withdraw permission for use of your work, please complete the [Student Work Sample Survey](#).