



NORTHWESTERN
UNIVERSITY

SCHOOL OF
CONTINUING
STUDIES

PREDICT 402: Introduction to Predictive Analytics and Data Collection Summer 2012

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Course Description

This course describes the appropriate uses of analytics and its limitations while defining how to approach the various stakeholders within an organization. Included is a review of the ethical, regulatory, and compliance issues related to a given business problem and/or solution. Time is spent interpreting performance-based organizational issues while concurrently identifying solutions for these same performance-based organizational issues. In addition, time is spent identifying best practices to plan for engaging, implementing, and sustaining organizational change.

Texts

Davenport, T. H., & Harris, J. G. (2007). *Competing on analytics: The new science of winning*. Boston, MA: Harvard Business School. [ISBN-13: 978-1422103326]

Few, S. (2009). *Now you see it: Simple visualization techniques for quantitative analysis*. Oakland, Calif.: Analytics Press. [ISBN-13: 978-0970601988]

Laursen, G., & Thorlund, J. (2010). *Business analytics for managers: Taking business intelligence beyond reporting*. Hoboken, NJ: Wiley. [ISBN-13: 978-0470890615]

Groves, R.M., Fowler, F. Jr., Couper, M.P., Lepkowski, J.M., Singer E., & Tourangeau, R. (2009). *Survey methodology* (2nd ed.). Hoboken, NJ: Wiley. [ISBN-13: 978-0470465462]

Software

None.

Prerequisites

None.

Learning Goals

The goals of this course are to:

- Articulate the value of predictive analytics in business.
- Select the appropriate analytic approach given a business situation.
- Collect the data necessary for predictive analytic techniques.
- Formulate solutions for resolving data quality issues.
- Evaluate organizations based on the business analytic model.
- Use the five stages of analytical competition to evaluate the analytic capabilities of an organization.
- Determine the necessary business intelligence architecture elements for analytically oriented organizations.

Evaluation

The student's final grade will be determined as follows:

- Case Study Collection Mid-Course Check-In (50 points)
- Dashboard and Executive Summary (100 points.)
- Case Study Collection (200 points)
- Survey Design and Implementation (150 points)
- Discussion Board Participation (100 points, 10 points per session)

Total Points: 600 pts.

Grading Scale

A = 93%–100% (558–600 points)
A- = 90%–92% (540–557 points)
B+ = 87%–89% (522–539 points)
B = 83%–86% (498–521 points)
B- = 80%–82% (480–497 points)
C+ = 77%–79% (462–479 points)
C = 73%–76% (438–461 points)
C- = 70%–72% (420–437 points)
F = 0%–69% (0–419 points)

Discussion Board Etiquette

The purpose of the discussion boards is to allow students to freely exchange ideas. It is imperative to remain respectful of all viewpoints and positions and, when necessary, agree to respectfully disagree. While active and frequent participation is encouraged, cluttering a discussion board with inappropriate, irrelevant, or insignificant material will not earn additional points and may result in receiving less than full credit. Frequency is not unimportant, but content of the message is paramount. Please remember to cite all sources—when relevant—in order to avoid plagiarism. The due date and time for posting to each week's discussion forum is Sunday, 11:55 p.m. (Central Time).

Attendance

This course will not meet at a particular time each week. All course goals, session learning objectives, and assessments are supported through classroom elements that can be accessed at any time. To measure class participation (or attendance), your participation in threaded discussion boards is required, graded, and paramount to your success in this class. Please note that any scheduled synchronous or "live" meetings are considered supplemental and optional. While your attendance is highly encouraged, it is not required and you will not be graded on your attendance or participation.

Late Work

Unless otherwise noted, all work is due on the assigned day by 11:55 p.m. (Central Time). This includes exams and participation in the discussions. Late work is not accepted.

One more piece of advice—do not fall behind. We cover a lot of material in this course, and falling behind is the primary reason why folks fail. To that end, you have below the due dates for the entire course. It is much, much better to be ahead than behind.

Academic Integrity at Northwestern

Students are required to comply with University regulations regarding academic integrity. If you are in doubt about what constitutes academic dishonesty, speak with your instructor before the assignment is due and/or examine the University Web site. Academic dishonesty includes, but is not limited to, cheating on an exam, obtaining an unfair advantage, and plagiarism (e.g., using material from readings without citing or copying another student's paper). Failure to maintain academic integrity will result in a grade sanction, possibly as severe as failing and being required to retake the course, and could lead to a suspension or expulsion from the program. Further penalties may apply. For more information, visit www.scs.northwestern.edu/student/issues/academic_integrity.cfm.

Plagiarism is one form of academic dishonesty. Students can familiarize themselves with the definition and examples of plagiarism, by visiting www.northwestern.edu/uacc/plagiar.html. A myriad of other sources can be found online.

Some assignments in this course may be required to be submitted through SafeAssign, a plagiarism detection and education tool. You can find an explanation of the tool at <http://wiki.safeassign.com/display/SAFE/How+Does+SafeAssign+Work>. In brief, SafeAssign compares the submitted assignment to millions of documents in large databases. It then generates a report showing the extent to which text within a paper is similar to pre-existing sources. The user can see how or whether the flagged text is appropriately cited. SafeAssign also returns a percentage score, indicating the percentage of the submitted paper that is similar or identical to pre-existing sources. High scores are not necessarily bad, nor do they necessarily indicate plagiarism, since the score does not take into account how or whether material is cited. If a paper consisted of one long quote that was cited appropriately, it would score 100%. This would not be plagiarism, due to the appropriate citation. However, submitting one long quote would probably be a poor paper. Low scores are not necessarily good, nor do they necessarily indicate a lack of plagiarism. If a 50-page paper contained all

original material, except for one short quote that was not cited, it might score around 1%. But, not citing a quotation is still plagiarism.

SafeAssign includes an option in which the student can submit a paper and see the resultant report before submitting a final copy to the instructor. This ideally will help students better understand and avoid plagiarism.

Other Processes and Policies

Please refer to your SCS student handbook at <www.scs.northwestern.edu/grad/information/handbook.cfm> for additional course and program processes and policies.

Course Schedule

Important Note: Changes may occur to the syllabus at the instructor's discretion. When changes are made, students will be notified via an announcement in Blackboard.

Session 1

Learning Objectives

After this session, the student will be able to:

- Define analytics.
- State the importance of analytics in business competition.
- Assess common attributes of analytically competitive businesses.
- Rank the stages of analytic competition.

Course Content

Textbook Reading

Competing on Analytics, Chapters 1–3

Now You See It, pages 1–10

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard. The due date and time for posting to each week's discussion forum is Sunday, 11:55 p.m. (Central Time).

Assignments

None.

Sync Session

Monday evening, June 18, 2012, from 7 to 9 p.m. (Central Time).

Session 2

Learning Objectives

After this session, the student will be able to:

- Identify analytic techniques used to analyze internal business processes.
- Select the appropriate analytic applications for a given internal business process.
- Identify analytic techniques used to analyze external business processes.
- Select the appropriate analytic applications for a given external business process.

Course Content

Textbook Reading

Competing on Analytics, Chapters 4 and 5

Now You See It, Chapters 1–3 (pg. 11–53)

Multimedia

Analytic Technique

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard. The due date and time for posting to the discussion for this session is Sunday, July 1, 11:55 p.m. (Central Time).

Assignments

None.

Sync Session

None.

Session 3

Learning Objectives

After this session, the student will be able to:

- Assess the analytic capabilities of an organization.
- Distinguish the stages of organizational analytic competition.
- Evaluate the way organizations navigate the stages of becoming an analytic competitor.
- Compare the roles played by analytic executives, analytic professionals, and analytic amateurs.
- Integrate the six elements of business intelligence architecture.
- Specify the relationship between the six elements of business intelligence architecture.

Course Content

Textbook Reading

Competing on Analytics, Chapters 6–9

Now You See It, Chapter 5 (pg. 93–125)

Multimedia

Organizational Analytic Competition

Business Intelligence

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard. The due date and time for posting to the discussion for this session is Sunday, July 8, 11:55 p.m. (Central Time).

Assignments

Case Study Collection Mid-Course Check-In is due Sunday, July 8, 2012 at 11:55 p.m. (Central Time). For more information, click Assignments on the left navigation panel in Blackboard, and scroll to this assignment's item.

Sync Session

None.

Session 4

Learning Objectives

After this session, the student will be able to:

- Organize the components of the business analytics model.
- Assess the role of data in the business analytics model.
- Classify the different types of links between business analytics and strategy.
- Recognize the types of analytic information available to inform the three disciplines outlined.

Course Content

Textbook Reading

Business Analytics for Managers, Chapters 1 and 2

Now You See It, Chapter 6 (pg. 127–139)

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard. The due date and time for posting to the discussion for this session is Sunday, July 15, 11:55 p.m. (Central Time).

Assignments

Dashboard and Executive Summary is due Sunday, July 15, 2012 at 11:55 p.m. (Central Time). For more information, click Assignments on the left navigation panel in Blackboard, and scroll to this assignment's item.

Sync Session

None.

Session 5

Learning Objectives

After this session, the student will be able to:

- Compare and contrast lag and lead information.
- Distinguish how lead versus lag information can be used in the development and management of a new business process.
- Distinguish how lead versus lag information can be used to optimize existing processes.
- Assess each of the business processes listed on the three disciplines.
- Classify key performance indicators into their suggested business functions.

Course Content

Textbook Reading

Business Analytics for Managers, Chapter 3

Survey Methodology, Chapters 1–2 (pg. 1–64)

Multimedia

Lead vs. Lag

Performance Indicators

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard. The due date and time for posting to the discussion for this session is Sunday, July 22, 11:55 p.m. (Central Time).

Assignments

Survey Design and Implementation Topic is due Sunday, July 22, 2012 at 11:55 p.m. (Central Time). For more information, click Assignments on the left navigation panel in Blackboard, and scroll to this assignment's item.

Sync Session

Monday evening, July 16, 2012, from 7 to 9 p.m. (Central Time).

Session 6

Learning Objectives

After this session, the student will be able to:

- Apply a strategy mapping process to match analytic techniques to information requirements.
- Explain the difference between data, information, and knowledge.
- Evaluate the importance of each of the analyst competencies.
- Evaluate the advantages and disadvantages of different types of analytic reports.
- Formulate business examples of when the use of data-driven versus data mining versus explorative analytic methods would be appropriate.
- Compose effective business requirement documents.

Course Content

Textbook Reading

Business Analytics for Managers, Chapter 4

Survey Methodology, Chapters 3–4 (pg. 69–95)

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard. The due date and time for posting to the discussion for this session is Sunday, July 29, 11:55 p.m. (Central Time).

Assignments

None.

Sync Session

None.

Session 7

Learning Objectives

After this session, the student will be able to:

- Explain the relationship between components in a data warehouse.
- Identify business systems that may generate data.
- Organize the steps in the extraction transformation loading (ETL) process.
- Propose potential sources of poor quality data.
- Evaluate the effects of poor quality data.
- Identify potential sources of data in an organization.
- Assess the relationship between the usability and the availability of data.

Course Content

Textbook Reading

Business Analytics for Managers, Chapters 5 and 6

Survey Methodology, Chapters 5–6 (pg. 137–182)

Multimedia

Extraction Transformation Loading

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard. The due date and time for posting to the discussion for this session is Sunday, August 5, 11:55 p.m. (Central Time).

Assignments

None.

Sync Session

None.

Session 8

Learning Objectives

After this session, the student will be able to:

- Evaluate the benefits and limitations of data collection methodologies.
- Evaluate the benefits and limitations of data collection modalities.
- Apply the fundamentals of survey design to develop an effective survey.

Course Content

Textbook Reading

Survey Methodology, Chapters 6–8 (pg. 183–288)

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard. The due date and time for posting to the discussion for this session is Sunday, August 12, 11:55 p.m. (Central Time).

Assignments

Case Study Collection Final Assignment is due Sunday, August 12, 2012 at 11:55 p.m. (Central Time). For more information, click Assignments on the left navigation panel in Blackboard, and scroll to this assignment's item.

Sync Session

None.

Session 9

Learning Objectives

After this session, the student will be able to:

- Explain the importance of sampling in analytics.
- Compare and contrast different sampling techniques.
- Assess the impact of missing data on the analytic process.
- Appraise the benefits and limitations of different data imputation techniques.

Course Content

Textbook Reading

Survey Methodology, Chapters 9–11 (pg. 291–400)

Multimedia

Sampling Techniques

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard. The due date and time for posting to the discussion for this session is Sunday, August 19, 11:55 p.m. (Central Time).

Assignments

None.

Sync Session

Monday evening, August 13, 2012, from 7 to 9 p.m. (Central Time).

Session 10

Learning Objectives

After this session, the student will be able to:

- No new learning objectives will be introduced.

Course Content

None.

Discussion Board

Each session you are required to participate in the session-specific discussion board forum. Your participation in both posting and responding to other students' comments is graded. For this session's discussion topic(s), visit the discussion board in Blackboard. The due date and time for posting to the discussion for this session is Sunday, August 26, 11:55 p.m. (Central Time).

Assignments

Survey Design and Implementation is due Sunday, August 26, 2012 at 11:55 p.m. (Central Time). For more information, click Assignments on the left navigation panel in Blackboard, and scroll to this assignment's item.

Sync Session

None.