

Note:

Course content may be changed, term to term, without notice. The information below is provided as a guide for course selection and is not binding in any form, and should not be used to purchase course materials.

COURSE SYLLABUS

INFO 668

HEALTH DATA ANALYTICS AND DECISION-MAKING

COURSE DESCRIPTION

This course introduces students to data science for good decision-making in the healthcare industry. It prepares health informatics in the data analytics domain, including statistical analysis, data mining, text analytics, and predictive analytics.

RATIONALE

The primary goal of this course to introduce the student to analytics as well as statistics in healthcare. This course will provide the foundation in statistical analysis which will serve as the cornerstone for the capstone project. Assessments focus on developing appropriate research questions and solving them through rigorous statistical analysis.

I. PREREQUISITE

For information regarding prerequisites for this course, please refer to the [Academic Course Catalog](#).

II. REQUIRED RESOURCE PURCHASE

Click on the following link to view the required resource(s) for the term in which you are registered: <http://bookstore.mbsdirect.net/liberty.htm>

III. ADDITIONAL MATERIALS FOR LEARNING

- A. Computer with basic audio/video output equipment
- B. Internet access (broadband recommended)
- C. Microsoft Office
- D. *CRISP-DM 1.0* (available as a free PDF in Blackboard)

IV. MEASURABLE LEARNING OUTCOMES

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

- A. Discuss the relevance of course material and the use of health informatics to a biblical worldview.
- B. Explain information technology standards surrounding data analytics in healthcare.
- C. Compare data mining algorithms in healthcare.

- D. Produce intelligent decision-making data using predictive models.
- E. Conduct a predictive analytics project that ranges from defining a health problem to model implementation.

V. COURSE REQUIREMENTS AND ASSIGNMENTS

- A. Textbook readings and lecture presentations
- B. Course Requirements Checklist

After reading the Course Syllabus and [Student Expectations](#), the student will complete the related checklist found in Module/Week 1.

- C. Discussion Board Forums (2)

Discussion boards are collaborative learning experiences. Therefore, the student is required to create a thread in response to the provided prompt for each forum. Each thread must be at least 500 words and demonstrate course-related knowledge. In addition to the thread, the student is required to reply to 2 other classmates' threads. Each reply must be at least 350 words.

- D. Tutorials (5)

The student will complete practical exercises (tutorials) designed to (1) create experience with the software used in the course, (2) provide real-world examples of problems facing a variety of business sectors, (3) build understanding of how to methodically approach solving a data mining hypothesis, and (4) foster a greater understanding of the potential value of corporate data and the impact of big data.

- E. Project

The student will incorporate all aspects of the course into an integrated, holistic project on data mining. This effort will follow the scientific method outlined in the course textbook and be completed in the following phases.

Topic Selection

After reading through all the instructions for the project, the student will submit a 2-page summary outlining the topic he/she would like to address. At least 3 scholarly sources other than the course textbooks must be included, and the intended sources of data must be identified. This summary must demonstrate an overall understanding of the issue the student will investigate and must be submitted to the instructor for approval.

Phase I

The student will submit a paper of at least 5 pages that outlines the problem, identifies the sources of data, and explains the student's initial hypothesis. The paper must be in current APA style and include at least 8 scholarly sources other than the course textbooks.

Phase II

The student will submit a paper of at least 5 pages that outlines the processes implemented for collecting and preparing the data for examination. This phase must be a natural continuation of Phase I, describing in detail what steps the student followed to prepare the data sets used as well as the analytics selected and reasoning for those selections. Identification of key variables and significant descriptive statistics must be included. The paper must be in current APA style, include at least 3 images to augment the content, and include at least 8 scholarly sources other than the course textbooks.

Phase III

The student will submit a paper of at least 5 pages that builds on the work conducted in Phases I and II. The submitted document will be comprehensive and include the findings, analysis, and next steps recommended as a result of the information generated by the data mining model(s) utilized. The student's analysis of the data must be presented in a manner that would be appropriate for repeatability by a fellow data miner. The paper must be in current APA style, include at least 3 images to augment the content, and include at least 5 scholarly sources other than the course textbooks.

Phase IV

The student will create a persuasive slide presentation (e.g., PowerPoint) for the purpose of communicating the project (Phases I–III) and the recommendations coming from this effort. The target audience for this information must be consistent with C-level management and other organization decision makers. Details might include cost, schedule, impact, implementation planning, change management issues, risks, benefits, etc. This presentation must include at least 15 slides and at least 3 graphs depicting the model results. The student will also finalize the report coming from the work from Phases I–III into a cohesive product. The report must be at least 15 pages and include at least 4 relevant visualizations. At least 10 scholarly sources other than the course textbooks are required.

F. Quizzes (3)

Each quiz will cover the Reading & Study material for the modules/weeks in which it is assigned. Each quiz will be open-book/open-notes, contain 15 multiple-choice and true-false questions, and have a 30-minute time limit.

VI. COURSE GRADING AND POLICIES**A. Points**

Course Requirements Checklist	10
Discussion Board Forums (2 at 30 pts ea)	60
Tutorials (5 at 50 pts ea)	250
Project	
Topic Selection	0
Phase I	150
Phase II	150
Phase III	120
Phase IV	120
Quizzes (3 at 50 pts ea)	150
Total	1010

B. Scale

A = 940–1010 A- = 920–939 B+ = 900–919 B = 860–899 B- = 840–859
 C+ = 820–839 C = 780–819 C- = 760–779 F = 0–759

C. Quizzes/Tests/Exams

For timed quizzes/tests/exams, the student is required to complete the quiz/test/exam within the assigned time. For the student who exceeds this time limit, a penalty of 1 point will be deducted for each minute, or part thereof, he/she exceeds the assigned time limit.

D. Disability Assistance

Students with a documented disability may contact Liberty University Online's Office of Disability Academic Support (ODAS) at LUOODAS@liberty.edu to make arrangements for academic accommodations. Further information can be found at www.liberty.edu/disabilitysupport.

COURSE SCHEDULE

INFO 668

Textbooks: *CRISP-DM 1.0* (1999).

Joyner et al., *Writing the Winning Thesis or Dissertation* (2013).

Miner et al., *Practical Predictive Analytics and Decisioning Systems for Medicine* (2014).

MODULE/ WEEK	READING & STUDY	ASSIGNMENTS	POINTS
1	<i>CRISP-DM 1.0</i> : pp. 1–12 Joyner et al.: chs. 3–5 Miner et al.: chs. 1–4, Tutorial A 1 presentation	Course Requirements Checklist Class Introductions DB Forum 1 Tutorial E Project – Topic Selection	10 0 30 50 0
2	Joyner et al.: ch. 8 Miner et al.: chs. 5–8 1 presentation	Project – Phase I Quiz 1	150 50
3	<i>CRISP-DM 1.0</i> : pp. 13–18 Joyner et al.: ch. 9 Miner et al.: chs. 9–10, Tutorial M 1 presentation	Tutorial M	50
4	<i>CRISP-DM 1.0</i> : pp. 19–24 Joyner et al.: ch. 11 Miner et al.: chs. 11–14, Tutorial G 1 presentation	Tutorial G Quiz 2	50 50
5	<i>CRISP-DM 1.0</i> : pp. 25–31 Miner et al.: ch. 15, Tutorial T 1 presentation	Tutorial T Project – Phase II	50 150
6	<i>CRISP-DM 1.0</i> : pp. 32–34 Joyner et al.: ch. 15 Miner et al.: chs. 16–17, Tutorial X 1 presentation	Tutorial W	50
7	<i>CRISP-DM 1.0</i> : pp. 35–39 Joyner et al.: ch. 16 Miner et al.: chs. 18–20 1 presentation	DB Forum 2 Project – Phase III	30 120

MODULE/ WEEK	READING & STUDY	ASSIGNMENTS	POINTS
8	Miner et al.: chs. 21–25 1 presentation	Project – Phase IV Quiz 3	120 50
TOTAL			1010

DB = Discussion Board

NOTE: Module/Week one begins on Monday and ends at 11:59 p.m. (ET) on Friday. Modules/Weeks 2-8 begin on Saturday and end at 11:59 p.m. (ET) on Friday.