Spring 2014

Quantitative Methods in Health Management
(32.506)

College of Health Sciences
Department of Community Health & Sustainability
Health Informatics and Management

A. James (Jim) Lee, PhD
Associate Professor
301 Pinanski Hall
AJames_Lee@uml.edu
(978) 934-4522 (Office)
(978) 710-9310 (Google Voice)

The course teaches analytic methods that can be used to improve the decision making of healthcare managers, clinicians and others within the healthcare industry.

Course Objective

Students learn the following:

- The conceptual foundations of quantitative analysis—e.g., what statistics is all about, how to think statistically and how to understand and interpret statistical findings;
- The importance of quantitative methods in rationalizing healthcare decision-making and supporting the development of evidence-based practices;
- Bivariate and multivariate statistical methods for analyzing data and testing hypotheses; and
- How to use an industry-standard data analysis and statistical software in developing and reporting analytic findings.

Textbooks


The latter book has been reprinted many times and pricing fluctuates wildly. It is also available as:


Both are available from www.amazon.com, as well as the South Campus Bookstore.
Software
A 6-month academic license ($29.95) for the JMP 11 statistical software is required. The software is available in both Windows and Mac versions at:

http://e5.onthehub.com/WebStore/ProductSearchOfferingList.aspx?ws=49c547ba-f56d-dd11-bb6c-0030485a6b08&vsro=8&srch=JMP&JSEnabled=1

Face-to-Face Classes
The course is taught on a “blended” basis, with both face-to-face and “synchronous” online classes. The class meets face-to-face six times on Thursday evenings from 5:30 to 8:30 pm, with each class scheduled two or three weeks apart (see Face-to-Face Class Calendar below).

You have reading assignments for all classes. For each face-to-face class, you will also have a JMP assignment, as indicated below from the Face-to-Face Class Calendar. Beginning with the second face-to-face class, you will post, prior to class, your JMP PowerPoint assignment to the Assignments area in Blackboard.

The face-to-face classes will be recorded, and the recordings will be available from the class web site. If you are not able to attend a class, you must listen to the recording on your own schedule and prepare a one-page report reflecting on what you learned.

Online Classes
On the Thursday nights when the class does not meet face-to-face (except Spring Vacation week), the class will meet online from 7:30 pm to 9:00 pm (see Online Class Calendar below). The online classes will be also recorded. If you are not available to participate in an online class, you must listen to the recording on your own schedule and prepare a one-page report reflecting on what you learned.

You will have reading assignments for each online class. Prior to class, you are asked to answer a discussion question in writing and post your answer to Blackboard. All postings will be available for review and comment by the entire class, and you are required to read everyone’s post in preparation for class.

I recommend that you draft postings offline in Word and then “cut and paste” your document into the posting message box. Please do not attach the posting as a Word document. Each week’s posting is due on the Tuesday night before class so that everyone will have time to read all posts.

The online classes will be conducted using Blackboard Collaborate, an Internet-based communications facility accessed through Blackboard. To use Collaborate, you will need a computer microphone and speaker (or headset). A noise cancelling microphone is strongly recommended. Any webcam sold today will also include a noise cancelling microphone.

The procedures for posting discussions to Blackboard will be demonstrated during the first face-to-face class. If needed, technical support is available.

---

1 JMP is a SAS product that is similar to SPSS but easier to learn and use. While the Windows and Mac versions are not exactly the same (e.g., the Mac version does not include Project functionality), either version is fine. A 12-month license is available for $49.95, just $20 more than a 6-month license.
Grading
Numeric grades will be calculated using the following weights:

- 15%-- Class Attendance
- 15%--Class Participation
- 40%-- JMP Analysis Assignments
- 30%--Discussion Board Postings

Each assignment posted to Blackboard (i.e., both JMP analysis assignments and Discussion postings) will be graded using a 10-point scale. Up to two points “extra credit” will be available to anyone making unusual effort. Unless preapproved, you will be penalized for late submissions.

If you miss more than one Face-to-Face class, your grade for the entire course will be reduced.

Letter grades will be assigned as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>GPA Equivalent</th>
<th>Numeric Range</th>
<th>Grade</th>
<th>GPA Equivalent</th>
<th>Numeric Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4.0</td>
<td>93-100</td>
<td>C</td>
<td>2.0</td>
<td>73-76</td>
</tr>
<tr>
<td>A-</td>
<td>3.7</td>
<td>90-92</td>
<td>C-</td>
<td>1.7</td>
<td>70-72</td>
</tr>
<tr>
<td>B+</td>
<td>3.3</td>
<td>87-89</td>
<td>D+</td>
<td>1.3</td>
<td>65-69</td>
</tr>
<tr>
<td>B</td>
<td>3.0</td>
<td>83-86</td>
<td>D</td>
<td>1.0</td>
<td>60-64</td>
</tr>
<tr>
<td>B-</td>
<td>2.7</td>
<td>80-82</td>
<td>F</td>
<td>0.0</td>
<td>&gt;60</td>
</tr>
<tr>
<td>C+</td>
<td>2.3</td>
<td>77-79</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Academic Integrity

There is a University policy regarding academic integrity. For details, see the Academic Integrity Policy at [http://www.uml.edu/Catalog/Graduate/Policies/Academic-Integrity.aspx](http://www.uml.edu/Catalog/Graduate/Policies/Academic-Integrity.aspx). It is your responsibility to review and understand this policy.
# Face-to-Face Class Calendar

<table>
<thead>
<tr>
<th>Class Date</th>
<th>Reading Assignment</th>
<th>JMP Analysis Assignment</th>
</tr>
</thead>
</table>
| January 23 | *Statistics without Tears*—Chapters 1, 2, 3 and 4  
*Practical Data Analysis with JMP*—Chapter 1 | Purchase, download and install the JMP software. Download the *Cardiac Admissions* dataset from the class folder; then open in JMP and investigate the program's features. |
| February 13 | *Practical Data Analysis with JMP*—Chapters 2, 3 and 4 | Use the *Tabulate, Distribution* and *Graph Builder* procedures to analyze a sample dataset. Prepare a PowerPoint report that integrates your findings. |
| February 27 | *Practical Data Analysis with JMP*—Chapters 7, 8 and 9 | Use the *Fit Y by X* procedure to run independent group t tests and one-way ANOVAs. Use the *Matched Pairs* procedure to run dependent group t tests. Prepare a PowerPoint report that integrates your findings. |
| March 13 | *Practical Data Analysis with JMP*—Chapters 12, 13 and 14 | Use the *Multivariate Methods>*Multivariate procedure to conduct correlation analyses; and use the *Fit Model* procedure to conduct several bivariate linear regression analyses. Prepare a PowerPoint report that integrates your findings and includes scatterplots. |
| April 3 | *Practical Data Analysis with JMP*—Chapter 15  
*Multiple Linear Regression Regression Methods in the Empiric Analysis of Health Care Data* | Use the *Fit Model* procedure to conduct several multiple linear regression analyses, and report your findings in PowerPoint report that also includes descriptive information and charts as appropriate. |
| April 24 | *Practical Data Analysis with JMP*—Chapters 16, 18 and 19  
*Trend Analysis and Interpretation* | Use multivariate methods to test significant research hypotheses from sample data. Prepare a PowerPoint briefing that fully reports your investigation. This report should include descriptive information and charts as appropriate. For extra credit, include a logistic regression analysis. |
## Online Class Calendar

<table>
<thead>
<tr>
<th>Class Date</th>
<th>Reading Assignment</th>
<th>Discussion Question(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 30</td>
<td><em>Statistics without Tears</em>—Chapters 5 and 6</td>
<td>What did you learn from the reading assignment?</td>
</tr>
</tbody>
</table>
| February 6     | *Statistics without Tears*—Chapters 7, 8 and Postscript  
*Tumbling Dice & Birthdays: Understanding the Central Limit Theorem* | What did you learn from the reading assignment?                                         |
| February 20    | *Practical Data Analysis with JMP*—Chapters 5 and 6                                | What did you learn from the reading assignment?                                         |
| March 6        | *Practical Data Analysis with JMP*—Chapters 10 and 11                              | Use the *Fit Y by X* procedure to conduct a Chi Square analysis and report your findings in narrative format. |
| March 27       | *Principles of Clinical Decision Making*  
*Evidence-based decisions: the role of decision analysis* | Find a health-related "decision analysis" study; describe the decision analysis model and findings, and review critically. |
| April 10       | *Health Technology Assessment 101*, Sections II and IV                              | Find a health-related cost effectiveness study; describe the analysis and findings, review critically. |
| April 17       | *Basic Concepts in Meta-analysis--A Primer for Clinicians*  
*Evidence-Based Case Management Practice--Meta-analysis*  
*Health Technology Assessment 101*, Section III | Find a health-related meta-analysis in the literature; describe the analysis and findings, review critically. |
| May 1          | *How to Predict Market-Share Sensitivity to Price Change*                           | How might conjoint analysis be usefully applied elsewhere in healthcare? What questions might it answer? |