Business Analytics

# **MSCI: 9100:0 Fall 2016 Syllabus**

### **Course Syllabus**

**Meeting Times:** Wednesdays, August 24 to November 9, 6:00 PM to 9:15 PM

Suite 201 in Pappajohn Education Ctr., 1200 Grand Avenue

**Optional Reference:** *Statistics, Data Analysis, and Decision Modeling*, 4th Edition, by J.R. Evans, Prentice Hall (2010); ISBN 0-13-606600-3 (not needed for the class, but listed for those who want an additional reference)

**Course Web Site:** (ICON) http://icon.uiowa.edu/index.shtml

**Instructor:** Philip Jones **Office:** S282 PBB

**Email:** philip-c-jones@uiowa.edu **Office Hours:** before & after class

**Office Phone:** (319) 335-3737 **Fax:** (319) 335-0297

**Home Phone:** (319) 358-7102

Please feel free to contact me during the week via e-mail or, if time is of the essence, at my home phone number. Course policies are governed by the Tippie College of Business.

**Course Description:** This course provides an introduction to techniques of quantitative modeling and statistical analysis that form the basis of business analytics. A unifying element of the course is the utilization of Excel to perform various kinds of analysis in a spreadsheet environment. The major topics of the course are probability, statistical inference, regression, and linear programming.

The basic goals of this course are: (1) to help the student gain an exposure to business analytics; (2) to introduce a variety of tools and techniques from business analytics for helping managers implement their decisions and reach their goals; and (3) to provide the student experiences of how objective data analysis using business analytics can help managers make better decisions.

**Course Materials:** We will use several different sources throughout the course, primarily Microsoft Excel (described below), and various handouts posted to the course web site each week. Handouts will include lecture supplements, case assignments, spreadsheets, etc. In some cases, spreadsheets demonstrating the “solutions” to problems/cases developed by the University of Iowa instructional team will be posted after the problems/cases have been discussed in class.

Although it is not required, some of you may find it useful to refer to a reference statistics text at times during the course. Many such books are available, and I have listed one suggestion at the top of the syllabus.

The course will make extensive use of Microsoft Excel. Please see the handout “*Using a Personal Macintosh Computer in Courses Offered by the Department of Management Sciences at the University of Iowa.”*

Excel *must* be used to perform the analysis required in the course assignments. Note that the menuing features of different versions of excel can differ, so the exact sequence of menus in your version to get to a particular feature may not be exactly the same as for the classroom version.

Two standard features of Excel, *Data Analysis Toolpak* and *Solver* will be required at certain points throughout the course. Depending on your installation of Excel (eg. which options were installed), you may or may not have these features readily available. If available, both will appear under the Tools menu of Excel. If not available, then you can add these features by going to the *Tools -> Add-Ins* menu.

Each student is responsible for ensuring that his/her copy of Excel has both the *Data Analysis Toolpak* and *Solver* installed.

The course web site is maintained on the College’s *ICON* server (web address listed above). Directions for logging into the server are provided at the above address. After logging in for the first time, please change your password and provide a correct e-mail address in the *Personal Information* section. For those who have registered late, a guest login will be permitted for the first few weeks of the term. Please notify the instructor if you have any trouble accessing the system.

**Class Participation:** The approach to the course includes both lecture and case/problem analysis. The course materials have been carefully selected by the Management Sciences faculty to illustrate the basic concepts of business analytics as they apply to a variety of organizations. Please note that you should always review the class handouts/class notes prior to attempting to analyze assigned problems and cases.

Discussion between you and your classmates will form a major source of concepts. Thus, class participation is an important element in the learning process. All students are expected to be prepared to participate in the discussion. Attendance at each class meeting is mandatory. However, if business travel or other extenuating circumstances force you to miss a class meeting, please contact the instructor beforehand. Note that attendance is necessary for participation, but it is not sufficient for *active* participation. Up to six percentage points will be awarded for participation. Each person starts with a basis of 4.5 percentage points and additional points are either added or subtracted based upon good or poor performance respectively.

**Class Activities:** The exams are intended to be performed in study groups of about 5-6 students. You should plan to organize yourselves into self-selected study groups by the second week which will remain in place for the entire semester. It is important to note that while you will be working in groups, each member needs to master the material to be prepared for the quizzes taken individually.

**Assignments: Practice Problems.** You are encouraged to do practice problems in groups and to be prepared to discuss them in class. Although practice problems will not be formally graded, understanding the concepts they illustrate is essential to the learning process. Exams and quizzes will, to a large extent, be based on extensions of the practice problems.

**Group Exams**. Over the semester, students will be assigned 3 group exams. The group exams will be available on ICON approximately 8 days before they are due. In the class period prior to the due date of the exam, time will be allotted for groups to begin work on the exam and ask clarifying points of the instructor. Groups will complete work on their exam and submit it (one copy with all students’ names) the following week. The exams may involve both computational work requiring the use of Excel and conceptual work requiring only pencil and paper. All exams, including the last one, will be open-book, open-note, and are cumulative. You should feel free to contact the instructor for guidance, but **you should not discuss or communicate about the exam with anyone (other than the instructor) outside your group**.

Completed exams must be submitted in class (preferred) or to the appropriate dropbox. Late exams will not be accepted.

* **Answers to Exams:** Answers to exams will be posted on ICON by 5 PM the day after the exam is turned in.

**Individual Quizzes:** Sixshort quizzes will be due on weeks as noted below in the class calendar. These quizzes are open book, open notes, open computer/calculator, but you must work **entirely on your own** with the caveat that you should feel free to contact the instructor for guidance. Quizzes will be available on ICON by 5 PM 6 days before they are due (eg. if a quiz is due Wednesday the 12th, it will be available on Thursday the 6th) . The lowest quiz grade will be discarded and the remaining 5 quizzes will be used to compute the quiz grade.

* **Answers to Quizzes:** Answers to quizzes will be posted on ICON by 5 PM the day after the quiz is turned in.

**Grading:** Each student’s final grade will be based on the following items:

Exams (3) 54% (18% on each exam)

Quizzes 40% (8% on each quiz, discarding the lowest)

Participation 6%

Final grades will be assigned according to the following scale:

|  |  |
| --- | --- |
| **Percentage** | **Grade** |
| 98.0 – 100 | A+ |
| 94.0 – 98.0 | A |
| 90.0 – 94.0 | A- |
| 88.0 – 90.0 | B+ |
| 84.0 – 88.0 | B |
| 80.0 – 84.0 | B- |
| 70.0 - 80.0 | C |
| 60.0 – 70.0 | D |
| 0.0 – 60.0 | F |

The top 2 percentage points in each regular grade range will be plus grades and the bottom 4 percentage points will be minus grades. For example, someone scoring between an 88% and a 90%, will receive a B+ for the course. Likewise, if someone scoring between a 90% to a 94% will receive an A-. Someone exactly on the dividing line (eg., 94%) will receive the higher of the two grades (eg., A instead of A-).

If you have a concern regarding the grading of an assignment, all re-grade requests must be submitted to the instructor within one week. However, the instructor reserves the right to re-grade the entire document.

**Accommodations:**

Students seeking classroom and/or exam accommodations should first register with Student Disability Services (SDS): <http://www.uiowa.edu/sds/>. If you have a disability which may require some modification of seating, testing, or other class requirements, please contact the instructor and appropriate arrangements will be made. Similarly, if you have any pertinent emergency medical information, or if you need special arrangements in the event of a building evacuation, please notify the instructor.

**Sexual Harassment**

The University will not tolerate sexual harassment, nor will it tolerate unwelcomed behavior of a sexual nature toward members of the University community when that behavior creates an intimidating or hostile environment for employment, education, on-campus living, or participation in a University activity. Incidents of sexual harassment should be reported immediately. See the UI Comprehensive Guide on Sexual Harassment for assistance, definitions, and the full University policy: http://www.sexualharassment.uiowa.edu/index.php. Concerns regarding sexual harassment should be directed to the Office of the Sexual Misconduct Response Coordinator (http://osmrc.uiowa.edu/.

**Academic Misconduct**

All Tippie College programs have an Honor Code; and students enrolled in Tippie College courses are bound by this Code even if they are not Tippie College of Business students (http://tippie.uiowa.edu/honor-code.cfm).

As with all courses in the Tippie College, personal integrity is essential to your success. Integrity is an important part of effective management and is absolutely critical for creating an environment of trust in any organization (and of that organization by public stakeholders). One part of integrity is abstaining from acts like cheating, so cheating either on the tests or the assignments will result in an appropriate consequence, usually a zero for the grade in question. Moreover, all incidents of cheating will be reported to the appropriate academic office at the Tippie College of Business, and the student may be placed on disciplinary probation for the remainder of his or her undergraduate work at the University of Iowa. In general, the decision of the Professor may be appealed to a Judicial Board, then to Associate Dean of the Undergraduate Program.

**Cell Phone policy:**

Please pay a professional courtesy to the instructor and your classmates by please turning off all cell phones and pagers during class.

# **MSCI: 9100:0 Fall 2016 Course Calendar**

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| **Week** | **Date** | **Topic** | **Class Preparation** | **Due** |
| 1 | 24 Aug | Introduction;  Pivot Tables;  Basic Probability |  |  |
| 2 | 31 Aug | Basic Probability;  Bayes’ Rule / Bayes’ Flip; | **Homework 1** |  |
| 3 | 7 Sep | Discrete Random Variables;  Binomial Distribution | **Homework 2** | Quiz 1 |
| 4 | 14 Sep | Continuous Random Variables;  Sums of Random Variables; | **Homework 3**  **Group work on Exam 1** | Quiz 2 |
| 5 | 21 Sep | Central Limit Theorem  Summary Measures;  Sampling Distributions;  Confidence Intervals; |  | Exam #1 |
| 6 | 28 Sep | Confidence Intervals | **Homework 4** | Quiz 3 |
| 7 | 5 Oct | Hypothesis Testing;  Tests on means  Tests on Variances | **Homework 5** | Quiz 4 |
| 8 | 12 Oct | Chi-square Tests | **Homework 6**  **Group work on Exam 2** | Quiz 5 |
| 9 | 19 Oct | Inference in Regression;  Multiple Regression |  | Exam 2 |
| 10 | 26 Oct | Regression | **Homework 7** | Quiz 6 |
| 11 | 2 Nov | Linear Programming | **Homework 8**  **Group work on Exam 3** |  |
| 12 | 9 Nov | Exam 3 due/course eval. |  | Exam #3 |