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On-line office hours: see instructions. Full electronic availability with .luc e-mail address.

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### **ISSCM 241- Business Statistics, Spring, 2018**

**10E – MWF; 10:25 – 11:15 CLC 207 (Engaged Learning/Service Learning Section)\***

**101 - MWF; 9:20 – 10:10 CLC 207 (Traditional Section)**

#### **Catalog Description – All Sections**

This course examines the steps and procedures required to solve problems in science, social science, and business where data are useful - from the definition of the managerial problems to the use of statistical analysis to address these problems. **Outcome:** Students will be able to demonstrate understanding of statistical thinking and data analysis technique for decision-making purposes.

#### **Course Overview – All Sections**

This core course is designed to focus the importance of statistical methods, or, more broadly, the logic of measuring and diagnosing data, for various undergraduate majors. The course includes text readings and problem solving exercises, as well as the lecture focus to cover quantitative models. The course also includes extensive student interaction, and team and faculty-led discussions.

#### **Course Objectives and Learning Outcomes – All Sections**

##### **The learning objectives are:**

- To understand the role of statistics in management decision-making processes.
- To learn data management, measurement, and testing methods for use in decision-making situations.
- To use quantitative, analytical, and reflective thinking skills to evaluate and solve business problems.
- To engage in a service learning activity (EL/SL section only)

#### **Required Materials – All Sections: *Open Intro Statistics* by Diaz, Barr, & Çetinkaya. 3<sup>rd</sup> ed. ISBN:**

**9781943450039.** This book can be downloaded free as a pdf at

<https://www.openintro.org/stat/textbook.php> or purchased in paperback format for around \$15. A statistical software package (Decision Analysis add-ins to Excel) will be required for some problems. These programs are available as a free download; instructions are posted on the course Sakai website.

#### **Suggested Supplementary Resources – All Sections**

Supplemental materials are provided on the course website.

\* See notes below

## Course Grading – All Sections

**Examinations:** Each of the three exams contains 2 parts: a take-home short-answer section and an in-class problem section. The take-home section is electronically available one week prior to the exam date and **must be submitted before taking the in-class exam**. The in-class section is a roughly 100 minute in-class exam. Students may bring to the in-class exam appropriate tables as well as one 3" x 5" formula" card, which will be signed & turned in. All calculations must be shown on the exam form.

**Homework Assignments:** Three homework assignments with three/four parts each will be submitted. Homework is selectively graded based on accuracy and completeness. Students must work together in three-to-four-person teams to solve homework problems with **one submission/team**. Teams are responsible for managing member contributions. **A single-page summary sheet must cover the assignment**. After the due date, the solution is visible on the course website; late submissions are penalized. Either manual solutions or spreadsheet applications are acceptable.

**Team Written Cases:** Groups of **three - four** students prepare a one-page, typewritten, single-space discussion of each case, using a decision recommendation format of: **1) Introduction & Parameters, 2) Body of the Report, 3) Conclusions & Recommendations**. Data and calculations should be placed in Appendices. Teams submit one report and all members receive the same grade. Student teams should manage themselves. (See EL/SL written case requirement below.)

**Discussion Forum Questions:** Each class section contains either one or two Discussion Forum Questions. During the week after each topic, students should submit one 100 to 200 word comment to 10 of the 12 Forum topics. Students are expected to read comments of other students and they may respond. Comments should contain relevant examples. One point is given for each qualified Forum entry.

**Attendance & Participation:** Students who fail to e-mail the instructor before an absence and miss three or more times or who are unable to demonstrate basic and fundamental knowledge during a class discussion of course materials will receive a reduced participation grade. Laptops/tablets may be used in class; however, screens must be focused on course materials. Facebook, e-mail, etc. programs must be closed. Failure to do so will result in loss of participation credit.

**Extra Credit:** 1) For one point of extra credit, students may attend a statistical or decision-making presentation and write a one-page, single-spaced paper on the content of the presentation (include handouts as appendices). 2) Students may also submit one-page, single-spaced reports of materials at the Extra Credit link on the course website. 3) Students may also view a Video On Demand and write a one-page single space report. A maximum of 3 points extra credit may be attempted for these options. For five points of extra credit, students may read and write a two-page single space report on Keeping Up with the Quants by T. H. Davenport & J. Kim; If you do the book report, the maximum extra credit is 5 points. Failing grades may not be improved by extra credit. These Extra Credit options are not available for the EL/SL section; see below for EL/SL Extra Credit options.

Grading:	Point Structure		percent	
Examinations (3)	(weights = 10, 16, 22)	Individual	48	(students should periodically check the Sakai course grade site to confirm their grades)
Homework Assignments (3)		Team	15	
Forums		Individual	10	
Case Evaluations (2)	(weights = 10, 12)	Team	22	
Attendance & Participation		Individual	<u>5</u>	
			100	

Course Grading Scale				Loyola University Grading Scale & Weights			
A	100-93%	C	<77-73	A	4.00	C	2.00
A-	<93-90	C-	<73-70	A-	3.67	C-	1.67
B+	<90-87	D+	<70-67	B+	3.33	D+	1.33
B	<87-83	D	<67-60	B	3.00	D	1.00
B-	<83-80	F	<60 & below	B-	2.67	F	0
C+	<80-77			C+	2.33		

## University and Quinlan School of Business Policies:

### Attendance

Class attendance and participation are fundamental components of learning, so punctual attendance at all classes, for the full class meeting period, is expected of all Quinlan students. Students are required to notify the instructor prior to an anticipated absence and to submit all work for the period. In the event of unexpected or unplanned-for absence, the student must notify the instructor by e-mail **before or directly after** the class and make arrangements to submit required work as scheduled on the syllabus. The student is responsible for all class material missed during an absence.

### Make-Up Examinations

Loyola University academic policy provides that tests or examinations may be given during the semester or summer sessions as often as deemed advisable by the instructor. Because Quinlan faculty believe examinations represent a critical component of student learning, required examinations should be taken during the regularly scheduled class period. **Make-up examinations are discouraged.** Exceptions may be granted only by the faculty member or department chair, and only for unavoidable circumstances (illness verified by a signed physician's note, participation in intercollegiate athletic events, subpoenas, jury duty, military service, bereavement, or religious observance). A make-up final examination may be scheduled only with the permission of the appropriate Quinlan Assistant or Associate Dean. Failure to take an exam, or to notify the instructor in advance of the circumstances, will result in a grade of "0" for the exam.

If a make-up examination must be given, it is the responsibility of the faculty member to prepare, schedule, and proctor the exam. Limited assistance in proctoring make-up exams may be available through a designated Quinlan administrative assistant. For a student with a documented special testing need, please consult the University policy concerning use of the testing center in Sullivan Center at Lake Shore Campus.

### Academic Integrity

All members of the Quinlan School shall refrain from academic dishonesty and misconduct in all forms, including plagiarism, cheating, misrepresentation, fabrication, and falsehood...Plagiarism or cheating on the part of the student in individual or group academic work or in examination behavior will result minimally in the instructor assigning the grade of "F" for the assignment or examination. In addition, all instances of academic dishonesty must be reported to the chairperson of the department involved.

For further information about expectations for academic integrity and sanctions for violations, consult the complete Quinlan School of Business Honor Code and Statement of Academic Integrity on the Quinlan website: <http://www.luc.edu/media/lucedu/quinlanschoolofbusiness/pdfs/Honor-Code-Quinlan-July2012.pdf>

### Engaged Learning / Service Learning Section

Section 10E of this course will be conducted consistent with the Engaged Learning / Service Learning program guidance. Specifically, it will require an additional 20+ hours of community-based service work beyond the course, and comply with the Engaged Learning / Service Learning / Project-Based objectives and partnership agreements. Five or six four-to-five-person teams will be identified and work with a corporate executive or team to do a pilot study and participate in a corporate decision process. Team members of successful teams will get credit for the University Engaged Learning / Service Learning requirement, as well as for ISSCM 241. This student project will be substituted for the Case Evaluation. Additionally, EL/SL Extra Credit options will vary. See the last section of this syllabus.

## Week by Week, Class by Class Course Outline – All Sections

		Assignments			
Week/Date	Topic	Reading	Forum	HW	Other
		Asgt	Closes	Due	Exam/Case
		(assignments close on Fri of Week at 11:55 pm)			
#1 Jan 17,19	Introduction to Course, Instructor, and Students. Fundamentals of Statistics and Data Collection <b>Designation of ELT</b>	Ch. 1 (pp. 7-26)			
#2 Jan 22,24, 26	Data Presentation: Tables, & Graphs Describing Data: Numerical Measures <b>Jan 26, ELT students view video of HPCC in class</b>	Ch. 1 (pp. 26-45)	DF #1	1-1	
#3 Jan 29,31 Feb 2	Describing Data; Probability Concepts <b>Feb 2 - Presentation in class by Engaged Learning / Service Learning Staff (1 hr.)</b>	Ch. 1 (pp. 28-39)	DF #2	1-2	
#4 Feb 5,7 9	Discrete Probability Distributions <b>Period of Coordination by ELT with client (4 hrs.)</b> <b>Feb 9 - Client Guest Speaker to ELT Class (1 hr.)</b>	Ch. 2, 3 (pp. 76-108) (pp. 145-157)	DF #3	1-3	
#5 Feb 12,14 16	Further coverage of materials as required Review for First Exam		DF #4	1-4	
#6 Feb 19, 21 23	First Exam (Weeks 1 - 4) Continuous Probability Distributions	Ch 2, 3 (pp. 113-115) (pp. 127-141)			Exam #1
#7 Feb 26,28 Mar 2	Feedback – First Exam Continuous Probability Distributions	Ch. 4 (pp. 168-194)	DF #5	2-1	
#8 Mar 12,14 16	Sampling Methods, the Central Limit Theorem Estimation & Confidence Intervals	Ch. 4 (pp. 194-199) Ch. 5 (pp. 219-227, 243-245)	DF #7	2-2	
#9 Mar 19 21 23	Hypothesis testing – One Sample Tests, Case Evaluation <b>Mar 23 - Initial Interim Written Report submitted to client (6 hrs.)</b>	Ch 5 (pp. 219-227) Ch. 6 (pp 274-284)	DF #8		WC #1
#10 Mar 26,28	Further coverage of materials as required Review for Second Exam		DF #9	2-3	
#11 Apr 4,6	Second Exam (Weeks 5-9, Two Sample Tests of Hypothesis <b>Receipt of client feedback &amp; final guidance (2 hrs.)</b>	Ch. 5 (pp. 230-238)			Exam #2
#12 Apr 9,11 13	Feedback – Second Exam Two Sample Tests of Hypothesis - Analysis of Variance	Ch. 5 (pp. 246-256)		2-4	
#13 Apr 16,18 20	Linear Regression and Correlation Case Evaluation <b>Apr 20 3:00 - PP Briefing and Final Written report delivered to client (9 hrs.)</b>	Ch. 7 (pp. 331-355)	DF #10	3-1	
#14 Apr 23,25 27	Multiple Regression Review for Final Exam	Ch. 8 (pp. 372-385)	DF #12	3-2	WC #2
#15 Apr 30 102/10E	Examinations – 10E: 9:00; 102:1:00		DF #13	3-3	Exam #3 (HW 3-3 visible on website-Apr 20)

**Please note:** This class may occasionally deviate from the course outline. The instructor reserves the right to make changes as needed to the course syllabus.

**Expected use of class time:** This chart shows the **approximate** use of weekly class time.

a. Introduction, Administrative	- 5 min	d. Lecture on quant topics	- 65 min
b. Prior Homework/Review Problems	- 15 min	e. In-class group problem exercises	- 45 min
c. Video (either DVD or Web) (where feasible & available)	- 15 min	f. Closing reminders	- <u>5 min</u>
		Total	150 min
		Case studies and exam prep	- as appropriate

### Course Policies – All Sections:

- a. **Student Preparation:** Students are responsible for reading assigned materials **before** class. On occasion, the course agenda may not be fully covered in class and students will be asked to review website materials or video recordings.
- b. **Attendance & Participation:** Students are expected to attend and actively participate in all required sessions. **Students in section 101 must attend all classes in person; students in Section 10E must attend all classes & scheduled Engaged Learning activities in person.**
- c. **Use of the Computer:** Use of the computer is mandatory in this course. Students are expected to review the appropriate chapter appendices which discuss computer applications.
- d. **Cell Phones.** As a courtesy to other students and the instructor, audio devices, including cell phones, audible PDAs, & beepers are expected to be silenced during the class.
- e. **Student Study Groups:** Students are encouraged to select a two-to-four person study group (study buddies) to work with on HW and case study assignments and other study activities. Students are required to manage their work team and to submit one work product (homework or case) for the team.
- f. **Submission of Course Work:** All course work, except examinations, will be submitted as a **single file** on the Sakai site. Electronic spreadsheets, word or .pdf files, scans or photos of handwritten work are accepted by the Sakai or Turn-It-In software. Apple Pages or Notes are not acceptable. Students should computer-enter materials or use a **medium black ball point pen** to assure that their document is legible. All electronically submitted materials should be in **portrait format** and **correctly oriented**.
- g. **Materials for Exams.** Tables, 3"x5" formula cards, calculators, & writing materials are the only permissible items on desktops during exams. All other materials must be placed on the floor.
- h. **Attendance at other Sections.** Students may not attend other sections of this course without **prior** approval of the instructor.
- i. **Course Methodology:** Course topics are developed by readings in *Diaz et al* to introduce conceptual and mathematical ideas. **Lectures assume students have read assignments**, & amplify concepts & solve example problems. Homework assignments, Supplemental Materials & Cases permit application of both concepts & mathematical problems, & exams evaluate understanding of all materials.
- j. **Video on Demand:** The Video Series "Against All Odds" is accessible on the Sakai site and is optional viewing or may be used for extra credit (except EL/SL section).
- k. **Supplemental Materials:** are available on the Sakai site for additional practice on problem formats.
- l. **Loyola E-mail.** Students are required to regularly check their .luc mail for course updates.
- m. **Missed or Review Materials:** Most sessions of the Traditional and EL Sections will be recorded/archived. These materials are available to all sections for review.
- n. **Software Releases:** Some recent software releases of Mac and Windows Office Suites are not compatible with Loyola equipment and protocols. Students are responsible to assure compatibility of their devices and software or to use the university computer laboratories.
- o. **On-Line Office Hours.** Dr. S can be on line as requested for On-Line Office Hours. First, schedule an appointment by e-mail then, at the scheduled time, go to Adobe Connect & click on the "Office Hours" link.

## Further Details about the Engaged Learning / Service Learning Requirement.

- A. The Engaged Learning / Service Learning section requirements are the same as those for the Traditional section except that the Engaged Learning /Service Learning section includes work with a client database that is substituted for the case study of the Traditional section.
- B. Further, the Engaged Learning / Service Learning section is project-based and is driven by the client.
1. Within the first four weeks of the course, six student teams of about five persons each will be designated and will organize themselves. They will meet with the client to receive a sample data base and be given the client's guidance for the specified research questions.
  2. Research questions developed by the clients involve pending business decisions or anticipated expenditures and will focus toward hypotheses that students could test with the client database.
  3. The student teams use written case analysis formats to diagnose their data & provide two written reports to the client. Teams will use the same statistical models as the other sections, except that the EL/SL teams will use the client database, not the case study data.
  4. The first report is submitted as an electronic document by the students in week 9 of the course as a 1 page written summary diagnostic report using four statistical models (tables/graphs, range /standard deviation, normal probability evaluation and variation) with appropriate appendices.
  5. Feedback and further guidance for the second report would be received from the client by week 11.
  6. The second report, summarizing and amplifying the results of the first report and based on the additional client guidance, consists of a written summary diagnostic report using four further statistical models (confidence intervals, hypothesis tests, analysis of variance, and regression), with appropriate appendices, will be submitted as an electronic document in week 14 of the course.
  7. A 15-minute client briefing with visual presentation (PowerPoints) followed by a discussion period will be conducted by each team in week 14 of the course. All team members must participate in the briefing.
  8. For two additional course points, by the end of the semester students must present an individual two page single-spaced **reflective document** to assess their experience.
    - a. These papers must be focused toward Loyola's Mission Statement, which is:  
*"We are Chicago's Jesuit Catholic university- a diverse community seeking God in all things and working to expand knowledge in the service of humanity through learning, justice, & faith."*
    - b. Referencing Loyola's mission statement above, compose a written reflection that connects your in-class and out-of-class experience responding to the following:
      - How did your Engaged Learning experience help you to connect to the mission?
      - How did your Engaged Learning experience in this course impact your personal, intellectual, civic, and/or professional development?
    - c. Submit your completed reflection in Taskstream. You will find a tutorial Taskstream [here](#).
    - d. These papers may address specific aspects of the client service relationship, such as:
      1. The realism of the client's stated needs and how teams could have better served those needs.
      2. The contribution / relevance of statistics to address the stated client needs.
      3. An evaluation of several of the statistics models in terms of their strengths and weaknesses in real-world applications.
      4. The effectiveness of team and/or client communications, and recommendations to improve the communications processes.
      5. Whether and how the methods and processes used in this situation might be applicable to other businesses, industries, or not-for-profit organizations.
  9. For three points of Extra Credit, student teams may brief their projects in the Engaged Learning/Service Learning case competition. (Details to be provided in class)
  10. For one point of Extra Credit, students may participate in a Labre 3 hour activity on Thursday evenings. The Labre point of contact is Patrick Oster [poster @luc.edu](mailto:poster@luc.edu) .
- C. Non-class time client meetings will take place on Friday afternoon (particularly 28 April), and, like any class activity, will be required attendance. Those students who miss this session without permission will lose two participation points, those who miss two or more sessions will lose all participation points.
- D. In deference to the client's time, students will submit communications/questions to the client through the instructor or during face-to-face sessions. Submitted questions will be aggregated on a weekly basis.