**(Prerequisite: MAT 300)**

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| Quarter: | Spring, 2016 |
| Day & time course meets: | Asynchronous online |
| Class Number: | MAT510-056 |
| Instructor: | Dr. Raymond Chen |
| Instructor phone number: | 919-301-6523 |
| Instructor email address: | raymond.chen@strayer.edu |
| Instructor office hours, office location: | Mondays, 4:00 pm – 5:00 pm  Wednesdays, 4:00 pm – 5:00 pm |
| Strayer University Campus Coordinator phone number | 919-301-6526 |
| Strayer University Technical Support | 1-877-642-2999 |

**COURSE DESCRIPTION**

This course explores how business leaders can apply statistical thinking to improving business process and performance. The course presents concepts related to statistical thinking with a business environment, statistical tool and techniques and formalized statistical methods.

**INSTRUCTIONAL MATERIALS**

**Required Resources**

Hoerl, R., & Snee, R. (2012). *Statistical thinking: Improving business performance* (2nd ed.).

Hoboken, NJ: John Wiley and Sons, Inc.

**Supplemental Resources**

Balestracci, D. (1988). *Data “sanity”: Statistical thinking applied to everyday data*. Milwaukee, WI: American Society for Quality Statistics Division. Retrieved from <http://www.donaldpoland.com/documents_and_links/5-Other_Documents/Statistical_Thinking.pdf>.

Paulk, M. C., & Hyder, E. B. (2007). *Common pitfalls in statistical thinking*. Carnegie Mellon University. Retrieved from <http://repository.cmu.edu/cgi/viewcontent.cgi?article=1000&context=isr>.

Peck, R., Casella, G., Cobb, G. W., Hoerl, R., & Nolan, D. (2006). *Statistics: A Guide to the unknown* (4thed.). Pacific Grove, CA: Duxbury Press.

Snee, R. D., & Hoerl, R.W. (2003). *Leading six sigma: A Step-by-step guide based on experience with GE and other six sigma companies.* Upper Saddle River, NJ: Financial Times / Prentice Hall.

**COURSE LEARNING OUTCOMES**

1. Describe how organizations use statistical thinking to be more competitive.
2. Apply the basic principles of statistical thinking to business processes.
3. Apply the SIPOC model to identify OFIs in business processes.
4. Apply problem-solving frameworks to business processes.
5. Apply process-improvement frameworks to business processes.
6. Build regression models for improving business processes.
7. Design experiments to test cause-and-effect relationships in business processes.
8. Use statistical inference to provide recommendations for business process improvement.
9. Use technology and information resources to research issues in business process improvement.
10. Write clearly and concisely about business process improvement using proper writing mechanics.

**WEEKLY COURSE SCHEDULE**

The standard requirement for a 4.5 credit hour course is for students to spend 13.5 hours in weekly work. This includes preparation, activities, and evaluation regardless of delivery mode.

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| **Week** | **Preparation, Activities, and Evaluation** | **Points** | **Due Dates** |
| 1  (4/4-4/10) | Preparation   * Reading(s)   + Chapter 1: Need for Business Improvement   Activities   * Discussion   Evaluation   * Homework Assignment 1 | 20  30 | 4/10 |
| 2  (4/11-4/17) | Preparation   * Reading(s)   + Chapter 2: Statistical Thinking Strategy   Activities   * Discussion   Evaluation   * Homework Assignment 2 | 20  30 | 4/17 |
| 3  (4/18-4/24) | Preparation   * Reading(s)   + Chapter 3: Understanding Business Processes   Activities   * Discussion   Evaluation   * Homework Assignment 3 | 20  30 | 4/24 |
| 4  (4/25-5/1) | Preparation   * Reading(s)   + Chapter 4: Statistical Engineering: Tactics to Deploy Statistical Thinking   Activities   * Discussion   Evaluation   * Homework Assignment 4 * Case Study 1: Statistical Thinking in Health Care | 20  30  150 | 5/1 |
| 5  (5/2-5/8) | Preparation   * Reading(s): None   Activities   * Discussion   Evaluation   * Midterm Exam: Chapters 1 through 4 | 20  100 | 5/8 |
| 6  (5/9-5/15) | Preparation   * Reading(s)   + Chapter 5: Process Improvement and Problem-Solving Tools   Activities   * Discussion   Evaluation   * Homework Assignment 5 | 20  30 | 5/15 |
| 7  (5/16-5/22) | Preparation   * Reading(s)   + Chapter 6: Building and Using Models   Activities   * Discussion   Evaluation   * Homework Assignment 6 | 20  30 | 5/22 |
| 8  (5/23-5/29) | Preparation   * Reading(s)   + Chapter 7: Using Process Experimentation to Build Models   Activities   * Discussion   Evaluation   * Homework Assignment 7 * Case Study 2: Improving E-Mail Marketing Response | 20  30  160 | 5/29 |
| 9  (5/30-6/5) | Preparation   * Reading(s)   + Chapter 8: Applications of Statistical Inference Tools; page 307-329   Activities   * Discussion   Evaluation   * Homework Assignment 8 | 20  30 | 6/5 |
| 10  (6/6-6/12) | Preparation   * Reading(s)   + Chapter 8: Applications of Statistical Inference Tools; page 330-353   Activities   * Discussion   Evaluation   * Homework Assignment 9 | 20  30 | 6/12 |
| 11  (6/13-6/18) | Preparation   * Reading(s): None   Activities   * Discussion   Evaluation   * Final Exam: Chapters 1 through 8 | 20  100 | 6/18 |

**GRADING SCALE – GRADUATE**

|  |  |  |
| --- | --- | --- |
| **Assignment** | **Total Points** | **% of**  **Grade** |
| Case Study 1: Statistical Thinking in Health Care | 150 | 15% |
| Case Study 2: Improving E-Mail Marketing Response | 160 | 16% |
| Homework Assignment (9 homework assignments worth 30 points apiece) | 270 | 27% |
| Midterm Exam (Chapters 1 through 4)  (open book, 2-hour time limit, with 25 multiple-choice questions worth 4 points apiece) | 100 | 10% |
| Final Exam (Chapters 1 through 8)  (open book, 2-hour time limit, with 25 multiple-choice questions worth 4 points apiece) | 100 | 10% |
| Participation (11 discussions worth 20 points apiece) | 220 | 22% |
| Totals | 1,000 | 100% |

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| --- | --- | --- |
| **Points** | **Percentage** | **Grade** |
| 900 – 1,000 | 90% – 100% | A |
| 800 – 899 | 80% – 89% | B |
| 700 – 799 | 70% – 79% | C |
| Below 700 | Below 70% | F |

**Weekly Discussion Questions Grading Rubric:**

Each week, the class will consider a discussion question that is posted online. To earn possible full participation credit in a threaded discussion, students must post a minimum of 2 posts per online discussion thread.  Students must have one original post and a minimum of one other post per discussion thread. The final post for the week must be made by 9:00 am EST on Monday of the following week (i.e. final post for week 1 will be due no later than 9 am on Monday of week 2). No late postings will be accepted or graded. Please think about the question and formulate your response thoughtfully before replying. Your responses to other students’ posts need to be substantive (30 words or more) in order to score well. Responses such as, “I agree”, or “Good Job” will not be considered substantive, and will not receive high marks.

Postings will be graded based on the rubric below. Bonus points ( max 2 points per week) will be awarded for posting early (on or before Wednesday of the current week), active participation in the discussion board (posting thoughtfully and more frequently than required) and also for original ideas, or postings which serve to facilitate constructive discussion.

Threaded Discussion Rubric: 

|  | **Levels of Achievement** | | | | |
| --- | --- | --- | --- | --- | --- |
| **Criteria** | **Distinguished** | **Proficient** | **Basic** | **Below Expectations** | **Non-Performance** |
| **Critical Thinking Skills Content/Subject Knowledge  Demonstrated in Original Post**  **Weight 50.00%** | **100 %** | **80 %** | **70 %** | **60 %** | **0 %** |
| **Participation**  **Weight 30.00%** | **100 %** | **83.3 %** | **66.6 %**  . | 33.3 % | **0 %** |
| **Coherence & Organization**  **Weight 10.00%** | **100 %** | **80 %** | **60 %** | **40 %** | **0 %** |
| **Mechanics**  **Weight 10.00%** | **100 %** | **80 %** | **60 %** | **40 %** | **0 %** |

For detailed description of the discussion grading rubric please refer to the document “Discussion Rubric.docx” in the Blackboard Student Center Class Information.

**Late Work Policy:**

Please refer to Strayer Late Policy in the Blackboard class shell Student Center Class Information. **No late work for week 11 assignments will be accepted!!**  If you are experiencing a legitimate and long-term obstacle to completing your coursework, please contact me and we will discuss your options for completing your work.

**APA Requirement:**

All papers or written assignments must be in APA format. Please refer to “Resource Center” for APA format guideline. You may also find APA format in the following links.

<http://owl.english.purdue.edu/owl/resource/560/01>

[http://www.apastyle.org/](https://email.strayer.edu/OWA/redir.aspx?C=e4de2068cb8448e7abf5d5121c36b2a3&URL=http://www.apastyle.org/.-is)

**Homework Assignment**

9 homework problems worth 30 points a piece

Each homework assignment will be submitted based on the following:

1. Download the homework assignment, located in the online course shell.
2. Answer all the questions and / or complete all the specified activities using the file that you downloaded.
3. Write clearly and concisely about business process improvement using proper writing mechanics.
4. Submit the homework assignment file to the online course shell.