
B. **Course Description:** Overview of data collection and analysis; focus on fundamentals needed to understand the research of others or to collect surveys oneself. The interpretation of common statistics; the use of graphing software; correlation analysis and regression.

C. **LSER Objective:** Access high-quality historical, qualitative, and quantitative evidence or research

D. **Meeting Times:** 6:00-10:00 PM, M/W, **May 27 – July 3**
   **Meeting Location:** LEC 115

E. **Professor:** Sheila M. Lawrence, Ph.D.

F. **Email ID:** smlawren@rci.rutgers.edu
   **Phone:** 973-596-6425 - please call between 9 AM and 9 PM

G. **Office Hours:** Prior to (by appointment) and after class


I. **Grades:** Detailed project specifications are under separate cover on Sakai, under Resources under #4. Assignment Related Materials

<table>
<thead>
<tr>
<th>No.</th>
<th>Grade Component</th>
<th>Weight of Grade</th>
<th>Target Due Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Website QA (Individual)</td>
<td>12%</td>
<td>June 10</td>
</tr>
<tr>
<td>2A</td>
<td>Force Field Analysis (Individual)</td>
<td>8</td>
<td>June 10</td>
</tr>
<tr>
<td>2B</td>
<td>Survey Design Project (Individual, In-Class)</td>
<td>10%</td>
<td>June 19</td>
</tr>
<tr>
<td>2C</td>
<td>Process Map (Group Project, In-Class)</td>
<td>10%</td>
<td>June 24</td>
</tr>
<tr>
<td>3</td>
<td>Pareto Analysis (Individual)</td>
<td>12%</td>
<td>June 17</td>
</tr>
<tr>
<td>4</td>
<td>Cause and Effect Diagram (Group, In-Class)</td>
<td>4%</td>
<td>June 12</td>
</tr>
<tr>
<td>5</td>
<td>Excel Data Analysis Project (Individual)</td>
<td>40%</td>
<td>July 3</td>
</tr>
<tr>
<td></td>
<td>(20% Part 1; 20% Part 2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Guest Lecturers</td>
<td>4%</td>
<td>TBD</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100%</td>
<td></td>
</tr>
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</table>
Grading Policy:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Scores Based on Course Components</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>90-100</td>
</tr>
<tr>
<td>B+</td>
<td>85-89</td>
</tr>
<tr>
<td>B</td>
<td>80-84</td>
</tr>
<tr>
<td>C+</td>
<td>75-79</td>
</tr>
<tr>
<td>C</td>
<td>70-74</td>
</tr>
<tr>
<td>D</td>
<td>60-69</td>
</tr>
<tr>
<td>F</td>
<td>&lt; 60</td>
</tr>
</tbody>
</table>

**J. Project Civility:** Common courtesy is expected at all times.

**K. Attendance:** Attendance will be taken in each class. If a student misses/will miss a class, then the student needs to send a courtesy e-mail message to the professor.

**L. Study Groups:** Forming study groups will facilitate learning by keeping you focused, involved, and current in the course.

**M. Projects:** It is expected that projects will be done on time and available to be turned in upon request.

**N. Communication Devices:** No communication devices (cell phones, pagers, etc.) can be used in the classroom. PCs and Macs should be brought for Excel and other in-class work.

**O. Communication:**

1. **Student E-Mail and Phone Numbers:**
   a. The student has the obligation to insure that the official Rutgers student record reflects his/her valid e-mail address. A student can forward mail from his/her Eden/Pegasus address to a preferred e-mail address. Go to [http://www.eden.rutgers.edu/tools.php](http://www.eden.rutgers.edu/tools.php) and click on forwarding. Enter your NetID and PW. Then fill in your preferred e-mail address.
   
   **Cautions:** Hotmail has problems with e-mails with attachments. Also, some corporations spam e-mails with attachments. - If you have any problems, please contact your local RUCS helpdesk at help@nbcs.rutgers.edu

   b. Students also have the responsibility to then inform the professor of any changes to their phone numbers (day and evening). **Please do not send attachments** to the professor, due to risk of viruses; rather, copy/paste the document into the e-mail message. Please use “Rutgers Problem Solving Tools & Analysis” in the Subject section to avoid being spammed.

   c. Please check your e-mail regularly, especially on the day of class, to learn if there are any changes in the class schedule, class requirements, or for other general announcements.

   d. **Please do not Reply All to the Instructors.** Otherwise, several members of the staff and instructors will receive your correspondence.
2. **Sakai**
To facilitate class learning, please access and print course documents needed for class from the communication platform known as Sakai. Course documents are posted under Resources.  
**Quick Start for Sakai:**
https://sakai.rutgers.edu/access/content/public/quickmember.html
Also, to access the material, you will need your NETID and PW.  
**Sakai website:**
http://sakai.rutgers.edu/portal

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### Q. Lecture Schedule

The following is an approximate lecture schedule. Project due-dates are tentative until confirmed. Assignments and readings represent the material to be covered during that class session. Students are expected to complete the readings and assignments on the syllabus prior to the class date on which they are listed.

<table>
<thead>
<tr>
<th>Dates</th>
<th>Six Sigma Topic</th>
<th>Problem Solving Tools</th>
<th>Statistics Topics (Handouts have been posted on Sakai.)</th>
</tr>
</thead>
</table>
| May 27 | Ch-1 Foundations of Six Sigma: Principles of Quality Management | Overview Excel Checklist; Intro: Pareto Analysis (Assignment #3 document on Sakai); Intro: Assignment #5 Excel Data Analysis Project | The Where, Why and How of Data Collection  
- What is Statistics?  
- Tools for Collecting Data  
- Populations, Samples and Sampling Techniques  
Data Types and Data Measurement Levels [qualitative and quantitative data; time series and cross-sectional data; data measurement levels (nominal, ordinal, interval, ratio)] |
| May 29 | Ch-2 Principles of Six Sigma | Brainstorming; Affinity Diagram | Graphs, Charts and Tables  
- Frequency Distributions and Histograms; bar charts, pie charts, line charts, and scatter diagrams  
Describing Data Using Numerical Measures  
- Measures of Center and Location  
- Measures of Variation  
Using the Mean and Standard Deviation Together  
**Guest Lecturer:** Deborah Lewitter |
| June 3 | Ch-3 Project Organization, Selection and Definition; | Intro: Website QA for Assignment #1 | Introduction to Sampling Distributions  
- Sampling Error: What It Is and Why It Happens  
Sampling Distribution of the Mean |
| June 5 | Excel Workshop | Bring your PCs/Macs | RU/CTAAR Rep, **Marcie Anszperger** |
| June 10 Assign. #1 Due; Assign. #2A Due | Ch-4 Process Measurement | Intro: Assignment #2A: Force Field Analysis; In-Class | Estimating Population Values  
- Point and Confidence Interval Estimates for a Population Mean  
- Determining the Required Sample Size for Estimating the Population Mean (Most important) |
<table>
<thead>
<tr>
<th>Date</th>
<th>Assignment</th>
<th>Topic</th>
<th>Reading/Activities</th>
</tr>
</thead>
</table>
| June 12    | Assign. #4 | Ch-5 Process Analysis                                                | Introduction to Hypothesis Testing  
Hypothesis Tests for Means  
Guest Lecturer – Deborah Lewitter |
| June 17    | Assign. #3 | Ch-6 Process Improvement                                            | Estimation and Hypothesis Testing for Two Population Parameters  
- Estimation for Two Population Means  
- Hypothesis Tests for the Difference between Two Population Means  
- ANOVA  
  - One Way Analysis of Variance  
  Guest Lecturer – Jane Borden  
  Six Sigma, 6:00-7:00 PM |
| June 19    | Assign. #2B| Ch-7 Process Control                                                | Correlation Analysis  
- Scatter Plots, Association, and Correlation:  
  Looking at Scatter Plots and Scatter Plot Details  
  Roles for Variables  
  Correlation Conditions  
  Looking at Association  
  Correlation Properties and Tables |
| June 24    | Assign. #2C| Ch-8 Design for Six Sigma                                            | Regression  
- Simple Linear Regression Analysis:  
  Residuals  
  “Best Fit” Means Least Squares  
  Correlation and the Line  
  How Big Can Predicted Values Get?  
  Working in Real Units  
  Calculating a Regression Equation  
  Residuals Revisited  
  \( R^2 \) – The Variation Accounted For  
  How Big Should \( R^2 \) Be?  
  Assumptions and Conditions  
  Regression: Step-by-Step  
  Reality Check: Is the Regression Reasonable? |
| June 26    |            | Ch-9 Design for Six Sigma – Optimization and Verification           | SIPOC |
| July 1     | --         |                                                                      | Guest Lecturer: Mike Kamarek,  
  7 Step Improvement Cycle |
| July 3     | Assign. #5 | Ch-10 Implementing Six Sigma; Catch Up                               | Voice of the  
  Customer Table;  
  House of Quality  
  Larry the Golfer 6σ Case Study  
  Work Force Focus |