This document contains the following information:

- Instructor Information
- Course Name, Number and Prerequisite
- Course Description
- Course Requirements and Evaluation
- Required Course Materials
- Course Policies
- Final Comments
- Manufacturing Engineering ABET Outcomes
- Student Learning Outcomes

INSTRUCTOR INFORMATION

Instructor:        Dr. Doug Timmer
Office:            ENGR 3.258
Office phone:      956-665-2608
e-mail:            douglas.timmer@utrgv.edu
Skype user:        douglas.timmer@utrgv.edu

Course Schedule

MTWRF 9:40 - 11:10 am, STAC 1.101

Office Hours

- Monday 8:00 - 9:00 am
- Tuesday 8:00 - 9:00 am
- Wednesday 8:00 - 9:00 am
- Thursday 8:00 - 9:00 am
- Friday 8:00 - 9:00 am

In office or by Skype

COURSE NAME, NUMBER AND PREREQUISITE

Engineering Statistics, MANE 2332

Prerequisite: Successful completion of Calculus I with a grade of D or better (Math 1401, Math 1460, Math 2413, Math 2487)
Please note: Students not satisfying the prerequisite will be dropped from the course.

COURSE DESCRIPTION

"Fundamentals of probability, commonly encountered density functions, distribution functions, statistical tests and experimental designs as used in manufacturing and product design. Includes use of microcomputer based statistical analysis software (3-0)."

Course Format

This course will be taught in a lecture-mode that utilizes the BlackBoard LMS. The course materials consist of a required textbook, assigned readings, and the BlackBoard course site. The BlackBoard site will contain lessons and communications tools including a bulletin board and an e-mail system.

It is important to keep up with the course work. You are required to prepare for our limited classroom time by completing reading assignments, online learning activities and homework problems. Your out-of-classroom preparation will greatly improve your learning and your ability to get the maximum benefit for our in-class sessions. For a detailed look at the course calendar, refer to the course schedule and table of important university dates.

Once the course reaches steady-state, I anticipate the following classroom structure:

- Attendance
- Review of any overnight problems
- Lecture
- Preview of next session's material and assignments

COURSE REQUIREMENTS AND EVALUATION

Your performance in this course will be evaluated in the following manner:

<table>
<thead>
<tr>
<th>Component</th>
<th>% of Overall Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation</td>
<td>20%</td>
</tr>
<tr>
<td>Attendance</td>
<td>10%</td>
</tr>
<tr>
<td>Online Quizzes</td>
<td>10%</td>
</tr>
<tr>
<td>3 Exams</td>
<td>60%</td>
</tr>
</tbody>
</table>

Participation

I expect all students to fully participate in the course and exhibit professional behavior. There is only one method to learn and master material of a mathematical or statistical nature - work problems. Your participation grade will be based upon your score on online practice problems and overnight problems. Course activities will be undertaken to ensure that you interact with the course materials, other students and myself. Most classroom session will have a pre-class assignment that will involve reading selections from the textbook, watching micro lectures, answering questions and preparing problems for class.
Attendance

You are expected to prepare and actively participate in the classroom. Daily attendance will be conducted within the first few minutes of the beginning of class using bubble sheets.

Quizzes

Quizzes will be administered using BlackBoard following completion of major sections. The quizzes will be 30 minutes in duration and can only be attempted one time. Practice Problems will be available for all quizzes (and typically given as pre-class assignments) and will be included in your participation grade. The practice problems are generated from the same program that creates the quiz questions. Thus, practice problems provide you an opportunity to prepare for the quizzes.

Examinations

There will be three examinations in this course: two during the school term and a final examination. The exams will be equally weighted. Students can prepare a single hand-written 4 inch by 6 inch notecard for each exam. In addition, your textbooks will be rubber-banded in such a manner as to only allow access to the statistical reference tables. Otherwise the exams will be closed book.

The first exam will cover EDA, probability and discrete distributions. The second exam will cover continuous distributions and the final exam will cover hypothesis testing and linear regression.

Letter Grade Assignment

An overall course average will be calculated using the weighting scheme specified above. Your course average will be a value between 0 and 100. Your final letter grade will be assigned using the following definition.

<table>
<thead>
<tr>
<th>Course Average</th>
<th>Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 - 100</td>
<td>A</td>
</tr>
<tr>
<td>80 - 89</td>
<td>B</td>
</tr>
<tr>
<td>70 - 79</td>
<td>C</td>
</tr>
<tr>
<td>60 - 69</td>
<td>D</td>
</tr>
<tr>
<td>&lt; 60</td>
<td>F</td>
</tr>
</tbody>
</table>

[return to top of page]

REQUIRED COURSE MATERIALS

The following materials are required for completion of Engineering Statistics.

Textbook

The following textbook is required for this course. It may be purchased through the University Bookstore or is available on-line through various companies. You may use an electronic copy to save money.


Please note that international versions of this textbook have different problem sets. In addition, it may be helpful to have a second statistics textbook as a source of example problems.

Blackboard
This course will utilize Blackboard for its course management software. Blackboard is maintained by the Center for Online Teaching and Technology. You can access Blackboard through any Java-enabled web browser. Suitable web browsers are installed in the Intel computing lab in the Engineering building.

To access Blackboard you need an UTRGV e-mail account. Most student should have an e-mail account as this is the method required to access the computers in the Engineering computer labs.

Minitab

This course will utilize Minitab software for analysis of statistical problems. UTRGV has a network license for Minitab that is installed in the Intel computing lab and in the ASB Computing Labs. Should you desire a copy of Minitab for your home computer, you can rent a copy for either a semester or a full year. Information for this offer is available from Minitab.

COURSE POLICIES

Students with Disabilities

If you have a documented disability (physical, psychological, learning, or other disability which affects your academic performance) and would like to receive academic accommodations, please inform your instructor and contact Student Accessibility Services to schedule an appointment to initiate services. It is recommended that you schedule an appointment with Student Accessibility Services before classes start. However, accommodations can be provided at any time. Brownsville Campus: Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at ability@utrgv.edu. Edinburg Campus: Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at ability@utrgv.edu.

Sexual Harassment, Discrimination, and Violence

In accordance with UT System regulations, your instructor is a “responsible employee” for reporting purposes under Title IX regulations and so must report any instance, occurring during a student’s time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect in an environment free from sexual misconduct and discrimination.

Attendance Policy

Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences. UTRGV's attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; for observance of religious holy days; or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

Late Work

Descriptions of each assignment, including due dates, will be provided throughout the course. All assignments should be completed by their due date. The course policy for late work is a 10% penalty per day for work submitted after the deadline. After one week, no credit will be given for
late work. Certain assignments may not be accepted late to accommodate examination preparation. These assignments will be clearly identified. No late work will be accepted after study days.

Students who miss graded assignments will receive a grade of zero. If you are ill or have a serious problem that prevents you from submitting an assignment on the day it is due, please contact me prior to the due date and we will arrange an alternative date.

**Scholastic Integrity**

As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism, and collission; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

**Course Drops**

According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the “3-peat rule” and the “6-drop” rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.

**Incomplete Grades**

"Incomplete" grades are not issued for student or faculty convenience; they may be used for compelling, non-academic circumstances beyond the student's control. Should a situation arise that you believes meets this criteria contact me to schedule an appointment so that we may discuss the situation.

**Mandatory Course Evaluations period**

UTRGV usually provides a statement regarding mandatory course evaluations. At the time of preparation of this document, this information was not available. If this information becomes available, it will be added to the syllabus.

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**FINAL COMMENTS**

I would ask you to be diligent and persistent in your studies. On-line learning courses are just as demanding as traditional lecture courses. Remember the rule of thumb for time management in engineering courses, expect to spend three hours of preparation for each hour of lecture. That means to expect nine hours of studying, reading and practicing statistics per week beyond the three scheduled hours of lecture.
Keep a sense of humor. You will be learning new software and mastering new analytical techniques. Some times the best medicine is laughter.

Don't give up. If you are having problems, look to me or your fellow students for help. You have a variety of methods to contact me: in person at my office, by phone, by UTRGV e-mail or by BlackBoard e-mail.

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Dates</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>June 4</td>
<td>Introduction to BlackBoard; Chapter 1: The Role of Statistics in Engineering</td>
</tr>
<tr>
<td>2</td>
<td>June 5</td>
<td>Introduction to Minitab; Chapter 2: Probability</td>
</tr>
<tr>
<td>3</td>
<td>June 6</td>
<td>Chapter 2: Probability</td>
</tr>
<tr>
<td>4</td>
<td>June 7</td>
<td>Chapter 2: Probability; Chapter 3: Discrete Random Variables and Probability Distributions</td>
</tr>
<tr>
<td>5</td>
<td>June 8</td>
<td>Chapter 3 - CDF, Uniform, Binomial</td>
</tr>
<tr>
<td>6</td>
<td>June 11</td>
<td>Chapter 3 - Hypergeometric, Poisson</td>
</tr>
<tr>
<td>7</td>
<td>June 12</td>
<td>Chapter 3 - Geometric, negative binomial</td>
</tr>
<tr>
<td>8</td>
<td>June 13</td>
<td>Chapter 4: Continuous Random Variables and Probability Distributions (not on Test 1)</td>
</tr>
<tr>
<td>9</td>
<td><strong>June 14</strong></td>
<td><strong>Test 1 (Covers Chapters 1 - 3)</strong></td>
</tr>
<tr>
<td>10</td>
<td>June 15</td>
<td>Chapter 4 - Standard Normal</td>
</tr>
<tr>
<td>11</td>
<td>June 18</td>
<td>Chapter 4 - Normal, normal approximation to binomial</td>
</tr>
<tr>
<td>12</td>
<td>June 19</td>
<td>Chapter 4 - Exponential and Weibull</td>
</tr>
<tr>
<td>13</td>
<td>June 20</td>
<td>Chapter 4 - Lognormal; Chapter 5</td>
</tr>
<tr>
<td>14</td>
<td>June 21</td>
<td>Chapter 6</td>
</tr>
<tr>
<td>15</td>
<td>June 22</td>
<td>Chapter 6; Chapter 7</td>
</tr>
<tr>
<td>16</td>
<td>June 25</td>
<td>Chapter 8 (not on Test 2)</td>
</tr>
<tr>
<td>17</td>
<td><strong>June 26</strong></td>
<td><strong>Test 2 (Covers Chapters 4 - 7)</strong></td>
</tr>
<tr>
<td>18</td>
<td>June 27</td>
<td>Chapter 8 - Case 2, Case 3</td>
</tr>
<tr>
<td>19</td>
<td>June 28</td>
<td>Chapter 8 - Case 4, Prediction Interval, Tolerance Interval</td>
</tr>
<tr>
<td>20</td>
<td>June 29</td>
<td>Chapter 9 - Case 1</td>
</tr>
<tr>
<td>21</td>
<td>July 2</td>
<td>Chapter 9 - Cases 2 &amp; 3</td>
</tr>
<tr>
<td>22</td>
<td>July 3</td>
<td>Chapter 9 - Case 4</td>
</tr>
<tr>
<td>23</td>
<td>July 4</td>
<td>Independence Day Holiday (no class)</td>
</tr>
<tr>
<td>24</td>
<td>July 5</td>
<td>Chapter 11 - Regression Analysis</td>
</tr>
<tr>
<td>25</td>
<td>July 6</td>
<td>Chapter 11 - Regression Analysis and Review</td>
</tr>
<tr>
<td>26</td>
<td><strong>July 9</strong></td>
<td><strong>Study Day (no Class)</strong></td>
</tr>
<tr>
<td>27</td>
<td>July 10</td>
<td>Final Exam (to be announced)</td>
</tr>
<tr>
<td>28</td>
<td>July 11</td>
<td>Grades Due</td>
</tr>
</tbody>
</table>

Note: all dates are tentative and subject to change. Adequate advanced notice of all exams will be provided.
### Important University Dates

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/4/2018</td>
<td>First Day of Classes</td>
</tr>
<tr>
<td>6/5/2018</td>
<td>Last day to add or register for Summer I Classes</td>
</tr>
<tr>
<td>6/7/2018</td>
<td>Census day</td>
</tr>
<tr>
<td>6/28/2018</td>
<td>Last day to drop (DR grade) a class or withdraw (W grade)</td>
</tr>
<tr>
<td>7/4/2018</td>
<td>Independence day (no classes)</td>
</tr>
<tr>
<td>7/9/2018</td>
<td>Study day. No classes</td>
</tr>
<tr>
<td>7/10/2018</td>
<td>Final Exams</td>
</tr>
<tr>
<td>7/11/2018</td>
<td>Grades due</td>
</tr>
</tbody>
</table>

### Manufacturing Engineering General Learning Outcomes

The educational outcomes were derived from the Accreditation Board for Engineering and Technology (ABET) program education objectives, and are the skills students acquired by the time of graduation. It will be demonstrated that the student is:

1. is able to use knowledge of mathematics, basic sciences and engineering to analyze problems in manufacturing engineering,
2. is able to design and conduct experiments and interpret the results,
3. is able to design devices, systems or processes that meet given specifications,
4. is able to use computers and software for analysis, design and documentation,
5. is able to communicate ideas effectively in graphical, oral and in written media,
6. is able to function as a team member to solve engineering problems,
7. understands the professional responsibility of an engineer and how engineering solutions impact safety, economics, ethics, politics, society and cultural issues,
8. understands the need for life long learning to keep abreast of current practice.

### Manufacturing Engineering Specific Learning Outcomes

Students graduating from the manufacturing engineering department will have proficiency in the areas of

- **A. materials and manufacturing processes**
  - A1. understands the effect of processes on the properties of materials,
  - A2. has the ability to design and conduct experiments to measure the performance of materials, components and systems, and to communicate results,
  - A3. has the ability to select and evaluate materials and specify manufacturing steps for manufacturing processes.
- **B. process and product engineering**
  - B1. has the ability to create and annotate two dimensional drawings, and generate three dimensional computer based solid models of components and assemblies,
  - B2. has the ability to design products, tooling or equipment,
  - B3. has the ability to design manufacturing process and specify the process plan.
- **C. manufacturing productivity and quality**
  - C1. has the ability to analyze and improve the methods used in the manufacture of products,
  - C2. has the ability to do designed experiments and apply statistical concepts of quality to all aspects of manufacturing.
- **D. manufacturing systems engineering**
  - D1. has the ability to build and analyze models of manufacturing systems,
- D2. has the ability to design control systems for manufacturing,
- D3. has the ability to establish systems to plan and control the manufacturing of products using modern methods.

**Student Learning Outcomes and Assessment**

Students will be able to:

1. apply binomial, hypergeometric, Poisson and normal distributions to solve manufacturing engineering problems (H, T, Q),
2. identify correct distribution for solving common manufacturing engineering problems (H, T, Q),
3. apply appropriate graphical and numerical tools to analyze manufacturing engineering problems (H, T, Q),
4. perform statistical test of hypothesis for single and two samples and construct confidence intervals for single samples and two samples (H, T, Q),
5. identify correct test of hypothesis and confidence interval formula for manufacturing engineering problems (H, T, Q),
6. perform simple and multiple linear regression analysis (H, T, Q).

Assessment key: H-homework, T-Test, Q-Quiz.