Syllabus

Course Number: 470A  
Course Title: Mathematical Statistics

Course Description:  
Introduces probability, distribution functions and moments generating functions, correlation and regression, development and applications of binomial, normal, T, chi square and F distributions.

Prerequisite Courses:  
MT 360B Calculus II

Course Outcomes:  
Upon completion of this course, learners should be able to:

- Demonstrate that they are well informed, so that they may provide the public with information and expert judgment as part of the basis for social and political decisions.
- Demonstrate an awareness of the socially beneficial uses of mathematics, as well as harmful uses of mathematics.
- Articulate current trends in statistical theory and provide an indication of the relevance and importance of the theory in solving practical problems in the real world.
- Illustrate and use procedures for analyzing and interpreting data.
- Evaluate the validity of experimental design and the collected data.
- Demonstrate the ability to make inferences based on sample data and the theory of probability.
- Demonstrate the use of appropriate statistical tests to analyze experimental data.
- Articulate the limitations imposed by the underlying probability models on the interpretation of results from various statistical test.

Course Materials:  

Required Texts:  
**Recommended Supplemental Resources:**


**First Class Assignment:**

Write a one page, double-spaced discussion of why you are taking this class, what you expect to learn from the class, and any experiences you have had with statistics.

**Course Assignments and Activities:**

*(Syllabus Author: fill in Week, Topics, Readings, Activities, Assignments Due, and Points or % of Grade)*

<table>
<thead>
<tr>
<th>Topics &amp; Activities</th>
<th>Readings</th>
<th>Due Dates</th>
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</thead>
</table>
| 1 Descriptive Statistics and Probability Theory | Chapter 1: Sections 1 to 6  
Chapter 2: Sections 1 to 10 | First Night Assignment  
Solve the following problems:  
Chapter 1: 3, 4, 6, 12, 13, 24, 29, 33  
Chapter 2: 2, 7, 8, 13, 16, 19, 27, 31, 36, 39, 41, 51, 64, 68, 71, 72, 77, 81, 92, 95, 99, 104, 111, 115, 120, 128, 133 |
| 2 Discrete and Continuous Random Variables | Chapter 3: Sections 1 to 10  
Chapter 4: Sections 1 to 6 | Solve the following problems:  
Chapter 3: 4, 9, 12, 19, 25, 34, 39, 41, 44, 57, 62, 121, 122, 125, 135, 139  
Chapter 4: 6, 7, 13, 16, 21, 26, 31, 41, 45, 46, 51, 52, 59, 64, 73, 82, 93, 96, 108 |
| 3 Multivariate Random Variables          | Chapter 5: Sections 1, 2, and 5 to 8  
Chapter 6: Sections 1 to 4 | Solve the following problems:  
Chapter 5: 1, 3, 10, 15, 16, 72, 77, 81, 85, 89, 96, 103, 106, 109, 113  
Chapter 6: 2, 5, 10, 15, 18, 19, 23, 26, 31, 34 |
| 4 Sampling Distributions                 | Chapter 7: Sections 1 to 3  
Chapter 14: Sections 1 to 3 | Solve the following problems:  
Chapter 7: 10, 13, 16, 29, 33, 38, 42, 45, 49, 52, 57, 62, 71, 74, 77, 82, 85  
Chapter 14: 3, 5, 8, 11 |
| 5 Statistical Estimators and Confidence Intervals | Chapter 8: Sections 1 to 10 | Solve the following problems:  
Chapter 8: 6, 7, 9, 12, 15, 18, 21, 23, 24, 27, 28, 32, 37, 39, 40, 45, 59, 61, 62, 64, 67, 73, 77, 81, 83, 88, 91, 94, 96, 99, 100 |
| 6 Hypothesis Testing                     | Chapter 10: Sections 1 to 9 | Solve the following problems:  
Chapter 10: 3, 4, 5, 22, 25, 28, 33, 40, 43, 47, 49, 51, 53, 56, 62, 65, 70, 77, 81, 83, 86 |
7 Analysis of Variance
Chapter 12: Sections 1 to 5
Chapter 13: Sections 1 to 7
Solve the following problems:
Chapter 12: 1, 2, 3, 5, 7, 10, 15, 18, 20, 25, 27
Chapter 13: 1, 2, 6, 7, 13, 16, 17, 18, 19, 20, 23, 29

8 Non-Parametric Statistics
Chapter 15: Sections 1 to 3 and 9
Solve the following problems:
Chapter 15: 1, 4, 5, 7, 9, 46, 49, 50, 51, 52

Grading Criteria:

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Point Value</th>
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<tr>
<td>First Night Assignment</td>
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<td>Homework</td>
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<tr>
<td>Mid-Term Test</td>
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<tr>
<td>Final Test</td>
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<tr>
<td>Participation</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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CC&IS Grading Scale

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<tr>
<th>Letter Grade</th>
<th>Percentage</th>
<th>Grade Point</th>
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<tbody>
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<tr>
<td>A–</td>
<td>90 to less than 93</td>
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<tr>
<td>B+</td>
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<td>B–</td>
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<tr>
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Additional information about grading can be found in the latest edition of the University Catalog, available at http://www.regis.edu/Academics/Course%20Catalog.aspx.

CC&IS Policies and Procedures

Each of the following CC&IS Policies & Procedures is incorporated here by reference. Students are expected to review this information each term, and agree to the policies and procedures as identified here and specified in the latest edition of the University Catalog, available at http://www.regis.edu/Academics/Course%20Catalog.aspx or at the link provided.

- The CC&IS Academic Integrity Policy.
- The Student Honor Code and Student Standards of Conduct.
- Incomplete Grade Policy, Pass / No Pass Grades, Grade Reports.
- The Information Privacy policy and FERPA. For more information regarding FERPA, visit the U.S. Department of Education.
- The HIPPA policies for protected health information. The complete Regis University HIPAA Privacy & Security policy can be found here: http://www.regis.edu/About-Regis-University/University-Offices-and-Services/Auxiliary-Business/HIPAA.aspx.

The CC&IS Policies & Procedures Syllabus Addendum summarizes additional important policies including, Diversity, Equal Access, Disability Services, and Attendance & Participation that apply to every course offered by the College of Computer & Information Sciences at Regis University. A copy of the CC&IS Policies & Procedures Syllabus Addendum can be found here: https://in2.regis.edu/sites/ccis/policies/Repository/CCIS%20Syllabus%20Addendum.docx.