Mathematics for Middle School Teachers III
MATH 3263
Spring 2016

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Office Hours: M W 12 – 1, 2 – 4
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Required Materials

Access to Microsoft EXCEL© and a TI-83 or TI-84 graphing calculator.
Dice, Coins, and other probability stuff.

Catalog Description

A study of functions, data analysis, and probability. Topics include understanding and representing functions, families of functions, applications of functions, methods of data collection, statistical graphs, measures of center and variation, basic inferential statistics, and experimental and theoretical probabilities. (This course will not count toward a major or minor in mathematics.) Prerequisite (s): Admission to Teacher Education and Permission of Instructor.

Course Objectives

This course satisfies the following from the College of Education conceptual framework:

Standard: Prepared

Disposition: To think critically about the process of teaching, learning and assessment.

Competencies: Candidates who are prepared will:

P1 - demonstrate strong content and pedagogical preparation in their respective subject area or professional field.

Specifically, the purpose of this course is to engage students in experiences that will enable them to

- Understand a function as a rule of correspondence between two sets
- Understand sequences and their connection to functions
- Understand and use representations of functions including arrow diagrams, function machines, sets of ordered pairs, tables, algebraic formulas, and graphs
• Understand the defining characteristics of families of functions such as constant, linear, quadratic, cubic, rational, root, and absolute value functions
• Identify linear functions by their equations and interpret the slope and y-intercept in different contexts.
• Use functions to model relationships between quantities in different situations both mathematical and otherwise
• Use technology to analyze functions and their graphs
• Pose statistical questions and recognize that such questions anticipate variability
• Use sampling to collect data and draw inferences from a population
• Collect data using surveys, observations, and simple experiments
• Represent and organize data with statistical graphs including pictographs, bar graphs, charts and tables, circle graphs, stem-and-leaf plots, and line plots.
• Use statistical graphs to summarize and draw conclusions from data
• Describe and compare data sets using measures of center such as the mean, median, and mode
• Describe and compare the variation in data sets using 5-number summaries, box plots, the mean absolute deviation, and the standard deviation
• Use the standard deviation to interpret normal distributions
• Use hypothesis testing and confidence intervals to compare data
• Describe and model bivariate data using two-way tables, boxplots, correlation and lines of best fit
• Understand probability as a measure of chance
• Develop and use probability models and simulations to compute experimental probabilities
• Use sample spaces and other probability models to compute theoretical probabilities for simple and compound events
• Use properties of probability
• Use counting techniques to compute probabilities
• Use probability to draw inferences from data

Course Requirements

1. Complete all homework assignments. Written homework assignments must adhere to the following guidelines. **Failure to meet any one of these guidelines will result in an automatic score of zero.**
   • Homework assignments are to be written neatly in pencil. Any old work or errors should be cleanly erased, not scribbled out. No work should appear in the margins.
   • Problems should be listed in the same order in which they are assigned.
   • The answer to each problem should be clearly identified.
   • At least one line should be left between the end of one problem and the start of the next.
   • A statement of the original problem should not be included.
• The answers to some questions will be easily obtained and may only require a single word, phrase, number, figure, or symbol. Writing the limited answer is sufficient.
• The answers to some questions will require computation or problem solving. It is expected that work will be shown and neatly organized.
• The answers to some questions will require explanation. It is expected that the explanation will be written in complete, grammatically correct sentences.

All assignments are due at the beginning of the period on the date assigned. Any assignment that is submitted late, but within one week of the due date will be automatically reduced 25%. NO ASSIGNMENT WILL BE ACCEPTED LATER THAN ONE WEEK AFTER THE GIVEN DUE DATE. Due dates typically coincide with test dates.

2. Complete in-class exploration activities. It is expected that when explorations are not completed in class, they will be finished as homework and turned in during the next class period.

3. All phases of the statistical study project.

4. Complete all reading assignments.

5. Complete all tests including a comprehensive exam at the end of the semester. The final exam is scheduled for **Tuesday May 6, 2 – 4**.

6. The Augusta University attendance policy is in effect. If the student is absent for more than the equivalent of 10% of class time, or 4.5 hours, regardless of cause, then the professor may withdraw the student from the class for excessive absences. However, there is some flexibility in the policy to allow students a reasonable number of absences without penalty for extraordinary personal reasons or for officially representing the university.

7. The academic regulations with regard to academic dishonesty as stated in the current Augusta University Catalog are in effect. Violations of academic honesty include cheating of all kinds, plagiarism, fraudulent research activity and/or scholarship, collusion, and false statements made to avoid negative academic consequences. Students caught cheating on any type of assignment in this course will receive a score of zero on the assignment. Written notification of unauthorized activities will be given to the student and be sent to the office of the Dean of Students.

**BY ENROLLING IN THIS COURSE, YOU ACCEPT ALL CONDITIONS STATED ON THIS SYLLABUS.**
Standards of Performance

Grading will consist of six types of assignments: homework assignments, in-class explorations, a statistical study project, reading assignments, tests, and a final exam. A point total for each type of assignment will be kept, and then point totals will be weighted a certain percentage for determining the final grade. Grades will be determined in the following manner:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
<th>Grade Interval</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework Assignments</td>
<td>25%</td>
<td>100 – 90</td>
<td>A</td>
</tr>
<tr>
<td>Explorations</td>
<td>10%</td>
<td>89 – 80</td>
<td>B</td>
</tr>
<tr>
<td>Statistical Study</td>
<td>10%</td>
<td>79 – 70</td>
<td>C</td>
</tr>
<tr>
<td>Reading Assignments</td>
<td>5%</td>
<td>69 – 60</td>
<td>D</td>
</tr>
<tr>
<td>Tests</td>
<td>35%</td>
<td>59 ↓</td>
<td>F</td>
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<tr>
<td>Final Exam</td>
<td>15%</td>
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