ARIZONA STATE UNIVERSITY

GENERAL STUDIES PROGRAM COURSE PROPOSAL COVER FORM

Courses submitted to the GSC between 2/1 and 4/30 if approved, will be effective the following Spring.

Courses submitted between 5/1 and 1/31 if approved, will be effective the following Fall.

(SUBMISSION VIA ADOBE.PDF FILES IS PREFERRED)

DATE Oct. 26, 2011

1. ACADEMIC UNIT: Mary Lou Fulton Teachers College

2. COURSE PROPOSED: EDT 184 Modeling, Inquiry, & Analysis w Tech Tools 3
   (prefix) (number) (title) (semester hours)

3. CONTACT PERSON: Name: Keith Wetzel Phone: 602 543 6369
   Mail Code: 3151 E-Mail: k.wetzel@asu.edu

4. ELIGIBILITY: New courses must be approved by the Tempe Campus Curriculum Subcommittee and must have a regular course number. For the rules governing approval of omnibus courses, contact the General Studies Program Office at 965-0739.

5. AREA(S) PROPOSED COURSE WILL SERVE. A single course may be proposed for more than one core or awareness area. A course may satisfy a core area requirement and more than one awareness area requirements concurrently, but may not satisfy requirements in two core areas simultaneously, even if approved for those areas. With departmental consent, an approved General Studies course may be counted toward both the General Studies requirement and the major program of study. (Please submit one designation per proposal)

   Core Areas
   Literacy and Critical Inquiry—L □
   Mathematical Studies—MA □ CS □
   Humanities, Fine Arts and Design—HU □
   Social and Behavioral Sciences—SB □
   Natural Sciences—SQ □ SG □

   Awareness Areas
   Global Awareness—G □
   Historical Awareness—H □
   Cultural Diversity in the United States—C □

6. DOCUMENTATION REQUIRED.
   (1) Course Description
   (2) Course Syllabus
   (3) Criteria Checklist for the area
   (4) Table of Contents from the textbook used, if available

7. In the space provided below (or on a separate sheet), please also provide a description of how the course meets the specific criteria in the area for which the course is being proposed.

CROSS-LISTED COURSES: □ No □ Yes; Please identify courses: __________________________

Is this a multisection course?: □ No □ Yes; Is it governed by a common syllabus? yes

Dr. Elizabeth Hinde
Chair/Director (Print or Type)

Date: Oct. 26, 2011

Rev. 1/94, 4/95, 7/98, 4/00, 1/02, 10/08
Rationale and Objectives

The Mathematical Studies requirement is intended to ensure that students have skill in basic mathematics, can use mathematical analysis in their chosen fields, and can understand how computers can make mathematical analysis more powerful and efficient. The Mathematical Studies requirement is completed by satisfying both the Mathematics [MA] requirement and the Computer/Statistics/Quantitative Applications [CS] requirement explained below.

The Mathematics [MA] requirement, which ensures the acquisition of essential skill in basic mathematics, requires the student to complete a course in College Mathematics, College Algebra, or Precalculus, or demonstrate a higher level of skill by completing a mathematics course for which any of the first three courses in a prerequisite.

The Computer/Statistics/Quantitative Applications [CS] requirement, which ensures skill in real world problem solving and analysis, requires the student to complete a course that uses some combination of computers, statistics, and mathematics.

Approved: Feb. 2000
Proposer: Please complete the following section and attach appropriate documentation.

## ASU--[CS] CRITERIA

A COMPUTER/STATISTICS/QUANTITATIVE APPLICATIONS [CS] COURSE MUST SATISFY ONE OF THE FOLLOWING CRITERIA: 1, 2, OR 3

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>Identify Documentation Submitted</th>
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### 1. Computer applications*

- **a.** Course involves the use of computer programming languages or software programs for quantitative analysis, modeling, simulation, animation, or statistics.
- **b.** Course requires students to analyze and implement procedures that are applicable to at least one of the following problem domains *(check those applicable)*:
  - i. Spreadsheet analysis, systems analysis and design, and decision support systems.
  - ii. Graphic/artistic design using computers.
  - iii. Music design using computer software.
  - iv. Modeling, making extensive use of computer simulation.
  - v. Statistics studies stressing the use of computer software.

*The **computer applications** requirement **cannot** be satisfied by a course, the content of which is restricted primarily to word processing or report preparation skills; learning a computer language or a computer software package; or the study of the social impact of computers. Courses that emphasize the use of a computer software package or the learning of a computer programming language are acceptable, provided that students are required to understand, at an appropriate level, the **theoretical principles embodied in the operation of the software and are required to construct, test, and implement procedures that use the software to accomplish tasks in the applicable problem domains.**

### 2. Statistical applications

- **a.** Course has a minimum mathematical prerequisite of College Mathematics, College Algebra, or Precalculus, or a course already approved as satisfying the MA requirement.
- **b.** The course must be focused principally on developing knowledge in statistical inference and include coverage of all of the following:
## ASU--[CS] CRITERIA

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>Identify Documentation Submitted</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>i. Design of a statistical study.</td>
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<td>ii. Summarization and interpretation of data.</td>
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<td>iii. Methods of sampling.</td>
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<td>iv. Standard probability models.</td>
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<td>v. Statistical estimation</td>
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<td>vi. Hypothesis testing.</td>
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<td>vii. Regression or correlation analysis.</td>
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</tbody>
</table>

### 3. Quantitative applications: courses must satisfy both a and b.

#### a. Course has a minimum mathematical prerequisite of College Mathematics, College Algebra, or Precalculus, or a course already approved as satisfying the MA requirement.

- Linear programming.

#### b. The course must be focused principally on the use of mathematical models in quantitative analysis and design making. Examples of such models are:

- i. Linear programming.
- ii. Goal programming.
- iii. Integer programming.
<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>ASU--[CS] CRITERIA</th>
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<tbody>
<tr>
<td></td>
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<td>iv. Inventory models.</td>
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<td>v. Decision theory.</td>
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<td></td>
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<td>vi. Simulation and Monte Carlo methods.</td>
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<td>vii. Other (explanation must be attached)</td>
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</tbody>
</table>
Explain in detail which student activities correspond to the specific designation criteria. Please use the following organizer to explain how the criteria are being met.

<table>
<thead>
<tr>
<th>Criteria (from checksheet)</th>
<th>How course meets spirit (contextualize specific examples in next column)</th>
<th>Please provide detailed evidence of how course meets criteria (i.e., where in syllabus)</th>
</tr>
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<tbody>
<tr>
<td>[See attached]</td>
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</table>
EDT 184 Modeling, Inquiry & Analysis Using Technology Tools

Course Description

This project-based course is an overview of modeling, simulation, statistics, probability, and the role of technology in education, business and personal tasks. Exploration and presentation of emerging technology will be investigated along with their acquisition, use and implementation into society. This course includes the use of software programs and online simulations for scientific investigation, internet research, data collection, visual representation of data, probability, measures of central tendency, Action Research, 3D modeling, and web page design. EDT184 is conducted in a project based student-centered environment, which requires active student participation. This means that the instruction features illustrated lectures, on-line research and discussion, student generated information, demonstrations, and hands-on activities and projects. Students are active participants in their own learning experience. This course meets in a computer lab.
Syllabus – EDT 184
Modeling, Inquiry & Analysis Using Technology Tools
Fall 2012

August 18, 2012 – December 6, 2012
Arizona State University
COURSE OVERVIEW
This project-based course is an overview of modeling, simulation, statistics, probability, and the role of technology in education, business and personal tasks. Exploration and presentation of emerging technology will be investigated along with their acquisition, use and implementation into society. This course includes the use of software programs and online simulations for scientific investigation, internet research, data collection, visual representation of data, probability, measures of central tendency, Action Research, 3D modeling, and web page design.

COURSE FORMAT
EDT184 is conducted in a project based student-centered environment, which requires active student participation. This means that the instruction features illustrated lectures, on-line research and discussion, student generated information, demonstrations, and hands-on activities and projects. Students are active participants in their own learning experience. This course meets in a computer lab. When assistance with technology tools is necessary, ASU/MLFTC offers the following as support to computer-using students:

1:1 Technology Studio: Each campus hosts a laptop help office for any brand of laptop. Free assistance is available with on-campus Wi-Fi connectivity, virus problems, and other software and hardware issues. At-home access: 602-543-TECH. Walk-in access for West (Sands 125), Downtown (University Center, Information Commons), Tempe (Computing Commons, 140), and Poly (Academic Center Building, Lower Level)

Student Computing: Each campus has a computer access area with most of the equipment and software needed for this course. Staff is available for basic technical assistance but cannot provide support related to the content of this course. Walk-in availability is at West (Commuting Commons in the basement of Fletcher Library), Downtown (Information Commons in the lower level of the University Center building), Tempe (Computing Commons building or Payne 122), and Poly (Computer Lab in the Center building).

Lab for Education Students: On the West campus, the primary lab location for drop in use is the Teaching Resource Library (TRL) located in the basement of CLCC in L1-20 (9 AM to 9 PM M-Th, 9 AM to 3 PM F); on the Tempe campus, the Education Multimedia Lab is located in
Williams 2012

Payne 122 (8am-8pm M-F). These labs are available for education student use on a varied schedule. When open, the lab personnel are available to assist students primarily with multimedia projects associated with coursework.

**Help Desk:** The ASU Help Desk provides phone and online support to students 24 hours a day, 7 days a week. Students can request help with their own computer, report a problem with university services, and track progress. Contact: 480-965-6500, helpdesk@asu.edu, or chat via http://help.asu.edu

**My ASU:** Is a personal start page that combines ASU Interactive and resources to create an enhanced personalized experience. Members of the ASU community to be able to find all of the resources they need at http://my.asu.edu

**COURSE OBJECTIVES**

The terminal goal of EDT 184 is modeling, inquiry and analysis utilizing technology tools that can be employed in education, business and/or personal life. The course has five areas of concentration through which the student will learn to:

1. Apply statistical analysis, probability, and measures of central tendency.
2. Utilize simulations and models for scientific investigation, internet research, data collection and visual representation of data.
3. Collect and analyze data using spreadsheet software.
4. Conduct Action Research, 3D modeling and design a web page utilizing computer applications.
5. Discuss issues surrounding computers, software and the use of technology in the classroom and workplace.

Students are provided a solid introduction to computers and the software applications they will use in their professional and personal lives. Upon completion of this course, students will:

- Collect and analyze data using the functions of spreadsheet software (Module I)
- Use a minimum of three formulas to analyze data. (Module I)
- Create data-appropriate visual representations of data. (Module I)
- Create a presentation on an emerging technology with the intent to “sell” that technology. (Module I)
- Find the probability of a simple event. (Module II)
- Describe the relationship between the probability of an event happening and not happening. (Module II)
- Identify overlapping and mutually exclusive events (Module II)
- Conduct and replicate an experiment using theoretical probability and compare results. (Module II)
• Construct and interpret bar graphs, line plots, box-and-whisker plots, histograms, and double bar graphs. (Module III)
• Determine the appropriate graphical display for a given set of data and contextual situation. (Module III)
• Compare the outcome of an experiment to predictions made prior to performing the experiment, given a graph. (Module IV)
• Calculate probability, measures of central tendency in addition to constructing graphs to visually display data and draw conclusions in a written report following project details. (Module IV)
• Collect data to support their position and include both a numerical and visual representation of the data within the presentation. (Module V)
• Conduct internet research to determine background information, feasibility, cost, and expert opinion on their topic choice. (Module V)
• Apply critical thinking skills to determine appropriate experts on chosen topic. (Module V)
• Given an Action Research Case Study, Identify a sample population, design and construct a survey for data collection, analyze data and recommend a course of action based on analysis. (Module VI)
• Calculate and determine the appropriateness of measures of central tendency (Module VI)
• Conduct an experiment using a computer simulation of projectile motion and write a report to detail findings. (Module VII)
• Create a 3-D model, compare, and contrast the model with the original object. (Module VII)
• Create a web page utilizing currently accepted design standards. (Module VIII)
• Embed video in the web page. (Module VIII)
• Include/upload files to web page. (Module VIII)
• Demonstrate electronic information management habits (e.g. backing up files, organizing files in a logical fashion, transferring files to various storage areas) in the appropriate situations
• Discuss and analyze the functions of computers in classrooms, businesses, homes, and other environments
• Analyze and discuss social and ethical issues related to the increased use of technology in education, business, and society
REQUIRED MATERIALS

1. Students must have an ASURITE ID in order to participate electronically in the course. To obtain a student ASURITE ID and an email account go to http://www.asu.edu/asurite. ALL course email goes to your ASU address. Click the Activate your ASURITE User ID selection and follow the directions. Be sure to make a note of your password in a secure place. Only help desk personnel or special kiosks in the Computing Commons sites will be able to reset your password in the future – instructors do not have access to passwords and are unable to reset them.

2. ASU Blackboard Course shells at http://my.asu.edu (All ASU students have FREE access to this web resource)

3. Microsoft Office Suite 2007 (especially Word and PowerPoint) - The Microsoft Office Suite is installed on all student-access computers on campus. Office is also available for purchase through the ASU bookstore.

   PLEASE NOTE: Microsoft WORKS is not compatible with WORD, thus documents created in Works cannot be read by campus computers.

4. Reliable device or method to back up and transfer data-
   a. Preferred: USB drive (also known as Jump, Flash, or Pen drives).

5. Web-based activities and projects available on Blackboard (see Appendix A for reading list)

6. Online Resources Required (Fee Charge $75)

CLASS WEEKLY SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Module and Resource</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Introduction</td>
<td></td>
</tr>
<tr>
<td>Week 2</td>
<td>Spreadsheet Analysis</td>
<td>Module I</td>
</tr>
<tr>
<td>Week 3</td>
<td>Spreadsheet Analysis</td>
<td>Module I</td>
</tr>
<tr>
<td>Week 4</td>
<td>Probability</td>
<td>Module II Online Resource-Unit 1</td>
</tr>
<tr>
<td>Week 5</td>
<td>Data Analysis</td>
<td>Module III Online Resource-Unit 2</td>
</tr>
<tr>
<td>Week 6</td>
<td>Statistical Applications</td>
<td>Module IV Online Resource-Unit 3</td>
</tr>
<tr>
<td>Week 7</td>
<td>Emerging Technology Project</td>
<td>Module V</td>
</tr>
<tr>
<td>Week 8</td>
<td>Emerging Technology Project</td>
<td>Module V</td>
</tr>
<tr>
<td>Week 9</td>
<td>Action Research</td>
<td>Module VI</td>
</tr>
<tr>
<td>Week 10</td>
<td>Action Research</td>
<td>Online Resource-Unit 4</td>
</tr>
<tr>
<td>Week 11</td>
<td>Action Research</td>
<td>Module VI</td>
</tr>
<tr>
<td>Week 12</td>
<td>Modeling and Simulation</td>
<td>Module VII</td>
</tr>
<tr>
<td>Week</td>
<td>Topic</td>
<td>Online Resource- Unit 5</td>
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<tr>
<td>Week 13</td>
<td>Modeling and Simulation</td>
<td>Module VII</td>
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<td>Week 14</td>
<td>E-Portfolio</td>
<td>Module VIII</td>
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<tr>
<td>Week 15</td>
<td>E-Portfolio</td>
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ATTENDANCE POLICY

Attendance to all classes is mandatory; however, circumstances happen during the course of the semester. In the event that you miss a class, please contact the instructor immediately.

PLEASE NOTE: In class assignments cannot be made up. You must be present in class in order to receive credit for all in class work.

EMAIL COMMUNICATION POLICY

Emails will be responded to within 24-48 hours. Please make sure to email me from your ASU email account. I cannot respond to messages sent from other email accounts per university policy.

GRADING

Assignments will be submitted on Blackboard on the date the assignment is due. Points will be assigned as follows:

<table>
<thead>
<tr>
<th>Projects</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>Spreadsheet Analysis Project</td>
<td>100 points</td>
</tr>
<tr>
<td>Statistical Application Project</td>
<td>100 points</td>
</tr>
<tr>
<td>Emerging Technology Project</td>
<td>150 points</td>
</tr>
<tr>
<td>Action Research Module</td>
<td>200 points</td>
</tr>
<tr>
<td>Simulation Project</td>
<td>100 points</td>
</tr>
<tr>
<td>Modeling Project</td>
<td>100 points</td>
</tr>
<tr>
<td>E-portfolio</td>
<td>200 points</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Activities</th>
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<tbody>
<tr>
<td>Online Resource</td>
<td>250 points</td>
</tr>
<tr>
<td>Final Reflection</td>
<td>150 points</td>
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</tbody>
</table>

**Total** 1350 points

Completed work will be graded and returned to students within one week (if not sooner). Major projects may necessitate a 2-week turnaround.
LATE ASSIGNMENTS

Any assignment submitted after the scheduled due date is considered late, unless previous arrangements have been made with the instructor. All late assignment grades will be reduced 50%.

Please Note: Late assignments can only be accepted up to two weeks after the scheduled due date.

Digital Backups: Students frequently ask for an extension when their computer or storage device crashes and they lose an assignment. A backup storage device is a requirement for this course; it is expected that you dutifully back up your digital work. You will not be granted an exception for late work in a situation where a document or machine crashes.

Please practice safe storage by backing up your documents 😊

Grading Scale

Grades will be recorded in Blackboard. Please verify periodically for accuracy (BB > Tools > My Grades). Final grades will be calculated based on the following scale (number of points you received divided by number of points possible):

- 100+ A+ 80-82.9 B-
- 93-100 A 78-79.9 C+
- 90-92.9 A- 70-77.9 C
- 88-89.9 B+ 60-69.9 D
- 83-87.9 B 0 - 59.9 E

Note: Mary Lou Fulton Teachers College requires anyone receiving a grade of D or E (failing) to retake the course.

COURSE ASSIGNMENTS

In order to complete instruction in data collecting, analysis, interpretation and representation along with probability analysis the students will use a learning environment known as Online Resource (Adaptive Curriculum)©. These interactive online simulation and modeling lessons, known as “activity objects” (AO’s,) contain animation, modeling and simulations that allow students to have hands-on project based online learning in all of the concepts listed. Students are introduced to the concept via a real world simulation followed by interacting with a set of activities. After completion of the lesson, students will be given an online evaluation.
Additionally, the course covers computer applications used in education, business and personal life. These applications include Google Documents, Google applications, word processing, spreadsheets, design and presentation, Online Resource (Adaptive Curriculum) and Google Sites.

In the process of learning about software and technology packages such as Microsoft Office, the student will be doing hands-on project based learning and researching how technology can be integrated into both the workplace and into classroom learning activities. Some of these projects will be completed using topics the student selects. In addition, students will be encouraged to use online search engines such as Bing™ and/or Google to support their understanding and research on various areas of technology, along with online simulation and modeling lessons, data collecting, analysis, interpretation, representation and probability analysis. The course also includes a project on action research where the student conducts a research project and analyzes the data collected.

Each of the modules are discussed briefly below:

**Module 1: Spreadsheet Analysis**

**Students will:**

- Use spreadsheet functions, to collect and analyze data constructing visual representations including graphs or charts.

**Module II: Probability - Online Resource (Adaptive Curriculum-Unit 1)**

**Students will:**

- Find the probability of a simple event and describe the relationship between the probability of an event happening and not happening.
- Identify overlapping and mutually exclusive events
- Use theoretical probability to conduct and replicate an experiment and compare results.

**Probability, Fundamental Counting Principle and Permutations**

Students will log into the Online Resource (Adaptive Curriculum) in order to complete the activity objects listed below.

1. Factorial Notation
2. Permutations and Their Properties
3. Find the Given Probability
4. Experimental and Theoretical Probabilities
5. Playing with Probability
6. Probability Using Tree Diagrams
7. The Concept of Probability
8. Overlapping and Mutually Exclusive Events
9. Fundamental Counting Principle
Module III: Data Analysis Online Resource (Adaptive Curriculum- Unit 2)

Students will:
- Construct and interpret bar graphs, line plots, histograms, and double bar graphs.
- Determine the appropriate graphical display for a given set of data and contextual situation.

Data, Collecting, Representing, & Interpreting Data

Students will log into the Online Resource (Adaptive Curriculum) in order to complete the activity objects listed below.

1. Find the Appropriate Graph
2. Drawing Bar Graphs
3. Line Plot
4. Histogram
5. Bar Graphs and Line Graphs
6. Interpreting Bar Graphs
7. Double Bar Graphs

Module IV: Statistical Applications-Online Resource (Adaptive Curriculum- Unit 3)

Students will:
- Construct and interpret box-and-whisker plots, stem-and-leaf plots, tally charts, and circle graphs.
- Determine the appropriate graphical display for a given set of data and contextual situation.
- Compare the outcome of an experiment to predictions made prior to performing the experiment, given a graph.

Unit 3: Data, Collecting, Representing, & Interpreting Data

Students will log into the Online Resource (Adaptive Curriculum) in order to complete the activity objects listed below.

1. Box and Whisker Plots
2. Stem and Leaf Plot
3. Tally Charts
4. Circle Graphs
5. Analyze Experimental Probability Using Graphs
Module V: Emerging Technology Project

- Working in teams with a group chosen topic, students will create a presentation to include spreadsheets, internet research and informational text.

Module VI: Action Research

Utilizing a case study, students will:

Given an Action Research Case Study, Identify a sample population, secure permission, design and construct a survey for data collection, analyze data, recommend a course of action based on analysis create a final report to present findings to administration and peers. Students are encouraged to select a focus based on their program areas, e.g., teacher education students will be encouraged to analyze student data to plan instruction in a K-12 classroom.

Measures of Central Tendency -Online Resource (Adaptive Curriculum-Unit 4)

Students will:

- Calculate mean, median and mode and determine the appropriateness of each measure to solve problems.
- Analyze how the addition or subtraction of data affect the calculation of mean, median and mode

Unit 4: Analyzing Data

Students will log into the Online Resource (Adaptive Curriculum) in order to complete the activity objects listed below.

1. Mean, Mode and Median
2. Calculate Mean, Median, Mode
3. Use Percent Proportion to Solve Problems
4. Using Percent Model

Module VII: Modeling and Simulation-Online Resource (Adaptive Curriculum-Unit 5)

- Utilizing a computer simulation, students will conduct an experiment to examine the concept of projectile motion.
- Students will discuss various computer models and simulations of particular events.
- Students will construct a model using graphic editing software.

Unit 5: Modeling and Simulation

Students will log into the Online Resource (Adaptive Curriculum) in order to complete the activity objects listed below.

1. Modeling and Mathematics in Physics (Animation)
2. Projectile Motion
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3. Flight of the Arrow
5. Driving and Velocity Graphs

Module VIII: E-Portfolio

- Students will present their action research results by constructing an e-portfolio to display their coursework to include hyperlinks, embedded video, images, and text utilizing currently accepted web page design standards.

Course/Instructor Evaluation

The course/instructor evaluation for this course will be conducted online 7-10 days before the last official day of classes of each semester or summer session. Response(s) to the course/instructor are anonymous and will not be returned to your instructor until after grades have been submitted. The use of a course/instructor evaluation is an important process that allows our college to (1) help faculty improve their instruction, (2) help administrators evaluate instructional quality, (3) ensure high standards of teaching, and (4) ultimately improve instruction and student learning over time. Completion of the evaluation is not required for you to pass this class and will not affect your grade, but your cooperation and participation in this process is critical. About two weeks before the class finishes, watch for an e-mail with "ASU Course/Instructor Evaluation" in the subject heading. The email will be sent to your official ASU e-mail address, so make sure ASU has your current email address on file. You can check this online at the following URL: http://www.asu.edu/epoupdate/.

University/Mary Lou Fulton Teachers College Policies

- Professional Behavior:
  - It is expected that students exhibit professional behavior inside the classroom, during intern placements, and working with other students outside of the class on assignments related to this class in addition to behavior in the classroom on ASU’s campus.
  - If at any time your behavior is ‘unprofessional’, the instructor may complete a Professional Improvement Plan (PIP) for the student.

- Writing Expectations:
  - All assignments and written communications in this class (including email and discussion board postings), are expected to be word-processed and conform to University-level writing standards. Your writing should be professional, clear, and when appropriate or required, include proper citations of expert knowledge and media in American Psychological Association (APA) format. Errors in spelling and/or grammar are expected to be rare. Colloquial, informal (texting-style) writing is not appropriate for formal or informal communications.
When grading or reviewing student work that does not meet these standards, your instructor will return the work for revision. The revised assignment will be issued ZERO points until resubmitted. Revisions will be due at the beginning of the next class session. Once re-graded, 10% of the total points possible will be deducted from your score. If more than one assignment is rejected for writing issues, a Personal Improvement Referral may be submitted to your department chair. At their discretion a Personal Improvement Plan may be issued.

- The course BlackBoard shell contains a tutoring button with web-based resources to help you with your writing skills in areas such as APA, grammar, second language issues, etc. Additionally, the Learning Enhancement Center on campus offers one-on-one support for students. This center is in the basement of the library. Appointments are recommended.

- **FERPA and Privacy Regulations**

  - The Family Educational Rights and Privacy Act (FERPA) and ASU policies are designed to protect student privacy. The following is a brief overview of the main ways your private information will be treated in this class:

  - Your name and ASU email address are available in BlackBoard to all other enrolled members of the class. Your name and TK20 email address are available to all ASU CTELE students and faculty members with TK20 memberships. Your name may be used as a folder and/or document name on a network server used in conjunction with the class. These services are integral to this course; there is no way to use them anonymously.

  - Your instructor will not discuss your grades in the presence of anyone else even if you give verbal permission to do so. It takes WRITTEN authorization from you for an instructor to share any of your private information.

  - Your instructor may request written authorization from you to facilitate communications and the sharing of information. You are free to accept or reject these requests for authorization.

If you do not understand any of these policies, ask your instructor or consult ASU privacy policies at [http://www.asu.edu/aad/manuals/acd/acd121.html](http://www.asu.edu/aad/manuals/acd/acd121.html)
• Academic Integrity/Plagiarism
  
  o The ASU Student Handbook contains the following information: “The highest standards of academic integrity are expected of all students. The failure of any student to meet these standards may result in suspension or expulsion from the university and/or other sanctions as specified in the academic integrity policies of the individual academic unit. Violations of academic integrity include, but are not limited to, cheating, fabrication, tampering, plagiarism, or facilitating such activities. The university and unit academic integrity policies are available from the Office of the Executive Vice President and Provost of the University and from the deans of the individual academic units.”

The rest of the code, which consists of several pages, is available at the following URL.
http://www.asu.edu/studentaffairs/studentlife/judicial/academic_integrity.htm

• Disability Accommodations for Students
  
  o Students who feel they may need a disability accommodation(s) in class must provide documentation from the Disability Resource Center (Downtown campus UCB 160, Polytechnic campus Sutton Hall 240, Tempe campus Matthews Center, or West campus UCB 130) to the class instructor verifying the need for an accommodation and the type of accommodation that is appropriate. Students who wish accommodations for a disability should contact DRC as early as possible (i.e. before the beginning of the semester) to assure appropriate accommodations can be provided. It is the student’s responsibility to make the first contact with the DRC.

• Religious Accommodations for Students
  
  o Students who need to be absent from class due to the observance of a religious holiday or participate in required religious functions must notify the faculty member in writing as far in advance of the holiday/obligation as possible. Students will need to identify the specific holiday or obligatory function to the faculty member. Students will not be penalized for missing class due to religious obligations/holiday observance. The student should contact the class instructor to make arrangements for making up tests/assignments within a reasonable time.

• Military Personnel Statement
  
  o A student who is a member of the National Guard, Reserve, or other U.S. Armed Forces branch and is unable to complete classes because of military activation may request complete or partial administrative unrestricted withdrawals or incompletes depending on the timing of the activation. For information, please see http://www.asu.edu/aad/manuals/usi/usi201-18.html.

• Harassment Prohibited
ASU policy prohibits harassment on the basis of race, sex, gender identity, age, religion, national origin, disability, sexual orientation, Vietnam era veteran status and other protected veteran status. Violations of this policy may result in disciplinary action, including termination of employees or expulsion of students. Contact Student Life (Downtown campus 522 N. Central Ave., Post Office Room 247, 480-496-4111; Polytechnic campus Administration building suite 102, 480-727-1060; Tempe campus Student Services Building room 263, 480-965-6547; or the West campus UCB 301, 602-543-8152) if you feel another student is harassing you based on any of the factors above; contact EO/AA (480-965-5057) if you feel an ASU employee is harassing you based on any of the factors above.

Grade Appeals

The professional responsibility for assigning grades is vested in the instructor of the course, and requires the careful application of professional judgment. A student wishing to appeal a grade must first meet with the instructor who assigned the grade to try to resolve the dispute. The process for grade appeals is set forth in the undergraduate and graduate catalogs, which are available at http://www.asu.edu/catalog.

Electronic Communication

Acceptable use of university computers, internet and electronic communications can be found in the Student Code of Conduct (http://www.asu.edu/aad/manuals/usi/usio4-01.html) and in the University’s Computer, Internet, and Electronic Communications Policy (http://www.asu.edu/aad/manuals/acd/acd125.html).

Discussion boards and email communications are an important instructional tool in this course. Here are some of the most important rules for this class regarding the use of discussion boards and email:

1. Do not say anything in the discussion that you would not say in a face-to-face classroom situation. Use your professional judgment.
2. Contributions to discussion board should be for “the good of the group”; email your instructor directly with questions or issues that only apply to you.
3. Be polite. Choose your words carefully. Do not use derogatory or sarcastic statements.
4. Contribute constructive comments and suggestions.
5. “Flaming” – expressing anger, often rudely – has no place in a classroom situation, either in the discussion area or in private email. Students receiving any sort of inappropriate email from other students should forward a copy to the instructor.
6. Do not use all capital letters. This is considered to be “shouting,” and is therefore rude. Likewise, do not use all lower case letters. In other words, use professional writing, not “IM” writing.
7. The Q&A discussion board located in our Blackboard shell is meant for questions and answers that would benefit you as well as your classmates. Please post “good for the group” questions there. Questions of a personal nature should be emailed directly to the instructor.
This syllabus and due dates contained within are subject to change at instructor’s discretion.

EDT 184 – Course Curriculum

Modeling, Inquiry & Analysis Using Technology Tools
Fall 2012

August 18, 2012 – December 6, 2012
Arizona State University
**Module I: Spreadsheet Analysis**

**Objectives:**

Students will:

- Collect and analyze data using the functions of spreadsheet software.
- Use a minimum of three formulas to analyze data.
- Create appropriate visual representations of data.
- Employ the use of conditional formatting.

**Evidence:** Students will complete a project using a common spreadsheet application.

**Spreadsheet Application Project Outline**

For your Spreadsheet project, you will be creating a "real" spreadsheet for your own personal purposes such as a personal budget, a personal checking/savings ledger, a personal stock portfolio tracker, personal health or training goals tracking for such things as:

- blood pressure
- blood glucose levels
- mileage walked, run, or biked during training
- weight lifted
- timed trials of some sort
- pounds/inches lost/gained
- calories consumed/burned any other topic with some personal meaning to you that can benefit from keeping and analyzing data.

At a minimum, create one spreadsheet that has these characteristics and features:

- At least 30 cells of data (don't count labels, empty cells or calculations)
  - Different font and font size
- Choose your own dimensions for whatever makes sense for your data e.g. 5 rows by 10 columns, 25 rows by 2 columns, 12 rows by 5 columns (that's 60 cells which obviously is more than the minimum of 30)
  - At least one instance of different row height
  - At least one instance of different column width
  - At least one instance of different cell alignment
- Use at least three formulas in it.
- Use any function or straight math operation you wish. SUM, AVERAGE, MEDIAN, MODE, MAX, and MIN are the functions we learned about but use others if you wish.
- At least one instance of conditional formatting.
- At least one instance of merged cells.
- At least one chart from the data. You may either insert the chart on your spreadsheet or create it as a full size chart in your Excel workbook.
Spreadsheet Project Rubric

<table>
<thead>
<tr>
<th>Component</th>
<th>Points/Criteria</th>
</tr>
</thead>
</table>
| **Use of Excel functions**       | **25**  
Student correctly uses 9–11 of the listed MS Excel functions in the project.  
**20**  
Student correctly uses 6–8 of the listed MS Excel functions in the project.  
**15**  
Student correctly uses 4–5 of the listed MS Excel functions in the project.  
**10**  
Student correctly uses 0–3 of the listed MS Excel functions in the project.  |
| **Use of formulas**              | **25**  
Project uses formulas appropriately to create less work for the user.  
**20**  
Project uses formulas that a user may or may not use.  
**15**  
Project does not use formulas in places that assist the user well.  
**10**  
Project does not use formulas.  |
| **Charts**                       | **25**  
Chart type is appropriate for type of information displayed and is inserted correctly.  
**20**  
Chart type is appropriate for type of information displayed but may not be inserted correctly.  
**15**  
Chart type is not correct for type of information being displayed and is inserted incorrectly.  
**10**  
No chart is used.  |
| **Professionalism – Content, grammar, spelling, etc** | **25**  
Project content is professional and appropriate for chosen field with minor or no data errors.  
**20**  
Project content is professional and mostly appropriate for chosen field with some data errors.  
**15**  
Project content is questionably professional or appropriate for chosen field with noticeable data errors.  
**10**  
Project content is not professional or not appropriate for chosen field or has significant data errors. |

**Module II: Probability**

**Objectives:**

Utilizing Online Resource (Adaptive Curriculum) Activity Objects, students will:

- Find the probability of a simple event.
- Describe the relationship between the probability of an event happening and not happening.
- Students will identify overlapping and mutually exclusive events
- Students will use theoretical probability to conduct and replicate an experiment and compare results.

**Evidence:** Students will complete Online Resource (Adaptive Curriculum) Unit 1 and appropriate adaptive object assessments.
Module III: Data Analysis

Objectives:

Students will:
- Construct and interpret bar graphs, line plots, histograms, and double bar graphs.
- Determine the appropriate graphical display for a given set of data and contextual situation.

Evidence: Students will complete Online Resource (Adaptive Curriculum) Unit 2 and appropriate adaptive object assessments.

Module IV: Statistical Applications

Objectives: Students will:

- Construct and interpret bar Box-and-whisker plots, stem-and-leaf plots, tally charts, and circle graphs.
- Determine the appropriate graphical display for a given set of data and contextual situation.
- Compare the outcome of an experiment to predictions made prior to performing the experiment, given a graph.
- Calculate probability, measures of central tendency in addition to constructing graphs to visually display data and draw conclusions in a written report following project details.

Evidence:

Students will:
- Complete Online Resource (Adaptive Curriculum) Unit 3 and accompanying assessments.
- Complete a project employing probability and statistical calculations.
A Game of Poker

Your best friend has decided to enter a poker competition. The prize is $75,000. However, the entry fee is $10,000. Before the player uses all of his/her life savings to pay the entry fee, the player asks you to help calculate the probability of selecting certain cards. Perform the following experiment to determine the probability of selecting particular cards.

In groups of two or three perform three experiments and answer the questions below.

Make sure to complete Math goodies Probability Lesson for Dependent events before beginning this project. ([http://www.mathgoodies.com/lessons/vol6/dependent_events.html](http://www.mathgoodies.com/lessons/vol6/dependent_events.html))

To Begin:

1. Take a deck of cards and remove the jokers. A complete deck should have 52 cards. Count the cards to make sure the deck is complete. If you are missing cards, notify your instructor.
2. Using your deck, count the number of cards listed below.
3. Using Excel, prepare a table to collect data. The table should contain the following information

<table>
<thead>
<tr>
<th>Type of Card</th>
<th>Number of Cards in Deck</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Cards</td>
<td></td>
</tr>
<tr>
<td>Red Cards</td>
<td></td>
</tr>
<tr>
<td>Face Cards</td>
<td></td>
</tr>
<tr>
<td>Diamonds</td>
<td></td>
</tr>
<tr>
<td>Kings</td>
<td></td>
</tr>
<tr>
<td>One Eyed Royals</td>
<td></td>
</tr>
<tr>
<td>(Jack of Spades, Jack of Hearts, King of Diamonds)</td>
<td></td>
</tr>
<tr>
<td>Ace of Spades</td>
<td></td>
</tr>
</tbody>
</table>

Part I - Data Collection

1. Shuffle the deck three to four times.
2. Place the deck face down on the table.
3. Draw cards from the top of the deck until you draw the first type of card (Black cards).
4. Record how many cards it took for you to draw the first type of card (Black cards).
5. Repeat this process for Trial II, Trial III and Trial IV.
6. When you have finished the trials for Black Cards, move on to the next type of cards (Red Cards).
7. Repeat Steps 1-5 until you have completed trials for all seven types of cards on the list.
8. Using Excel, prepare a table to collect data. The table should contain the following information
### Part I - Trial Data

<table>
<thead>
<tr>
<th>Type of Card</th>
<th>Trial 1</th>
<th>Trial 2</th>
<th>Trial 3</th>
<th>Trial 4</th>
<th>Totals</th>
<th>Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Cards</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Cards</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Face Cards</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diamonds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One Eyed Royals (Jack of Spades, Jack of Hearts, King of Diamonds)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ace of Spades</td>
<td>Totals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Means</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Part II - Data Analysis

After you have completed the trials for each of the seven types of cards, answer the following questions. Report all of your findings, charts, tables and answers in a word document.

1. How many total cards were in the deck?
2. How many of each type of card listed above were found in the deck? (Black Cards, Red Cards, Face Cards, Diamonds, Kings, One Eyed Royals, Ace of Spades)
3. Create a 3D clustered column graph comparing the Trials of 1-4 for each type of card. You can display all of this information on one cluster graph.
   a. What types of cards required are the easiest to draw?
   b. What types of cards required are the most difficult to draw?
4. If you selected a card at random from a complete deck of 52 cards, what is the probability that the card is:
   a. Black
   b. Queen of Hearts
   c. A Face Card
   d. A One Eyed Royal
   e. A Jack
   f. A Red four (4)
5. Using Excel, and the totals for Trials 1-4, create three pie charts, one for each of the following types of cards:
   a. Diamonds, 
   b. One Eyed Royals, and 
   c. Ace of Spades.
6. Using Excel, complete the following calculations for Trials 1, 2, 3 & 4:
   Totals, Range, Mean, Median, Mode, Minimum and Maximum.
<table>
<thead>
<tr>
<th>Type of Card</th>
<th>Totals for Trials 1-4</th>
<th>Range</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Cards</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Cards</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Face Cards</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diamonds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One Eyed Royals</td>
<td>(Jack of Spades, Jack of Hearts, King of Diamonds)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ace of Spades</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. Create a stacked column in 3-D graph comparing the **means** for each of the seven types of card.
   a. What types of cards had the highest means?
   b. What types of cards had the lowest means?
   c. Based on the data, how difficult would it be for me to draw a black nine (9)?
   d. What is the probability of this occurring?

8. Create a line graph showing the results of Trials 1, 2, 3 & 4 for the Ace of Spades.

9. Calculate the probabilities of acquiring the following poker hands:
   (To answer this question, assume the following:
   There is one person playing with a complete deck of 52 cards.
   The probability of receiving any one exact hand is 1 in 2,598,960)
   a. A Jack and A Queen
   b. A One Eyed Jack and a number card (2 through 10)
   c. A King, An Ace, and a Number Card.
   d. A Royal Flush (There are four possible per deck)
   e. A Straight Flush (There are forty possible per deck)

**Statistical Applications Project Rubric**

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Collection</td>
<td>20</td>
</tr>
<tr>
<td>Analyses</td>
<td>20</td>
</tr>
<tr>
<td>Appropriate Responses to Questions</td>
<td>20</td>
</tr>
<tr>
<td>Report</td>
<td>20</td>
</tr>
<tr>
<td>Professional looking document</td>
<td>20</td>
</tr>
<tr>
<td>(labels to graphs, title page, references – if any, wording, page layout, etc.)</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL** 100
Module V: Emerging Technology Project

Objectives:

Students will:

- Create a presentation on an emerging technology with the intent to “sell” that technology.
- Utilize collected data to support their position and include both a numerical and visual representation of the data within presentation.
- Conduct internet research to determine background information, feasibility, cost, and expert opinion on their topic choice.
- Employ critical thinking skills to determine appropriate experts on chosen topic.

Evidence: In teams, select and research an emerging technology and give a 5 - 8 minute presentation utilizing, word processing, spreadsheet and presentation software

Emerging Technology Project Outline

For your Emerging Technology project, you will make a presentation and a demo on a contemporary educational topic on the Internet. This is a team project. The possible topics include but are not limited to:

- Using Macs in the classroom, Macs vs. PCs
- Social Networking
- Internet browsers
- Cell phones in class
- IPod Touch
- Educational Apps (IPhone, IPad, Android, Google Apps, etc.)
- Wireless K-12 school with every student with a laptop or every class with a laptop cart
- Educational Videos (YouTube, TeacherTube videos etc.)
- Online gaming, or computer games for learning
- Simulations
- Smart boards, LCD projectors, document cameras
- Podcasts / webinars / webcasts
- Blogging in education
- Wikis in the classroom

Your Emerging Technology project must include the following:

- A website review with 5 websites that support your topic (this is exactly the same as what you did for your Google project just on a different topic). Please note that links to research papers are not acceptable.
- Two (2) experts you would like to consult and why? You must also provide the affiliation and contact information for each of your experts.
- A table with statistical data and a graph visually showing the data relating to your topic. The data must be real and you have to provide a reference to where you retrieved your data from.
- An educational video related to your topic; you will be asked to play the first 1-2 minutes of your video in class.
- A presentation of 5-8 minutes that will be presented to the class by the group with the website review, spreadsheet, and chart included
- At least two instances of creativity

The entire project must be completed using presentation software. However, you are encouraged to collaborate through file sharing capabilities of Google Docs to exchange information among the other members of your group.
Williams 2012
In all, your presentation must contain at least the following ingredients:

- Title Slide where you indicate the title, group members and their affiliations
- Outline slide
- 5 websites (3 – 5 slides)
- 2 experts (2 slides)
- Data slides (2 slides, 1 for the table and 1 for the graph)
- An educational video (1 slide)
- 2 slides where you state why the topic has educational value and how it can be made useful in classrooms or in business environment (with at least one concrete example)
- Conclusion Slide

Please note that for the Emerging Technology presentation, you have to perform a fair division of labor and each member of the team must fulfill their duties.

Website reviews:

- Website address (URL)
- Title of the Webpage (found along the top of the page above the URL)
- A brief description of how it is related to your topic
- Why it will be useful to you and others in your field

Experts:

- Full Name
- Affiliation
- Why you would like to contact that expert

Example:

- Jane Doe
  - Professor of Social Studies at John Doe University
  - Professor Doe has performed extensive research on social networking, has published more than 50 scholarly articles, she is a consultant to a number of social networking sites and has actively participated on their improvement.

Spreadsheet and graph:

Example:   Table: Unique visitors per month to major social networking sites, as of February 2010

<table>
<thead>
<tr>
<th>Social Networking Site</th>
<th>Number of Visitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facebook</td>
<td>133,623,529</td>
</tr>
<tr>
<td>MySpace</td>
<td>50,615,444</td>
</tr>
<tr>
<td>Twitter</td>
<td>23,573,178</td>
</tr>
<tr>
<td>LinkedIn</td>
<td>15,475,890</td>
</tr>
</tbody>
</table>
Emerging Technology Project Rubric

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Website reviews</td>
<td></td>
</tr>
<tr>
<td>URL</td>
<td>15</td>
</tr>
<tr>
<td>Title</td>
<td>15</td>
</tr>
<tr>
<td>Description</td>
<td>15</td>
</tr>
<tr>
<td>Usefulness</td>
<td>15</td>
</tr>
<tr>
<td>Experts</td>
<td></td>
</tr>
<tr>
<td>Name, affiliation, contact information</td>
<td>15</td>
</tr>
<tr>
<td>Reasoning</td>
<td>15</td>
</tr>
<tr>
<td>Statistical Data</td>
<td></td>
</tr>
<tr>
<td>Table</td>
<td>10</td>
</tr>
<tr>
<td>Graph</td>
<td>10</td>
</tr>
<tr>
<td>Why the topic has educational value</td>
<td>25</td>
</tr>
<tr>
<td>How the topic can be exploited in classrooms (at least one concrete example)</td>
<td>25</td>
</tr>
<tr>
<td>Presentation</td>
<td></td>
</tr>
<tr>
<td>Overview - Presentation Document</td>
<td>10</td>
</tr>
<tr>
<td>Clarity of Information</td>
<td>10</td>
</tr>
<tr>
<td>Clarity of Speech Organization</td>
<td>10</td>
</tr>
<tr>
<td>Appropriate Target Audience</td>
<td>10</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>200</td>
</tr>
</tbody>
</table>


---

[Number of Unique Visitors as of February 2010]

<table>
<thead>
<tr>
<th>Social Networking Site</th>
<th>Number of Visitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facebook</td>
<td>100,000,000</td>
</tr>
<tr>
<td>MySpace</td>
<td>72,000,000</td>
</tr>
<tr>
<td>Twitter</td>
<td>60,000,000</td>
</tr>
<tr>
<td>Linkedin</td>
<td>40,000,000</td>
</tr>
</tbody>
</table>

---

Facebook: 20,000,000
MySpace: 40,000,000
Twitter: 60,000,000
LinkedIn: 80,000,000
Williams 2012

Module VI: Action Research

Objectives:

Utilizing a case study, students will:

- Define Action Research and design an Action Research project.
- Design a presentation to explain the concepts of Action Research to their peers.
- Write a letter to administration and design permission forms to secure permission to conduct the research.
- Analyze their population and sample in order to construct an age appropriate survey for data collection.
- Conduct data analysis through the use of spreadsheet programs. This analysis will include calculations, interpretations and data representation through the construction of graphs and charts.
- Create a final action research report to present their findings to administration and peers.

Utilizing Online Resource (Adaptive Curriculum) Activity Objects, students will:

- Calculate mean, median and mode
- Determine the appropriateness of mean, median and mode to solve problems.
- Analyze how the addition or subtraction of data affect the calculation of mean, median and mode

Evidence:

Students will:

- address a case study and complete an action research report
- complete Online Resource (Adaptive Curriculum) Unit 4 and appropriate adaptive object assessments.
Action Research Case Study

The Case:
You are an executive at Big Business Incorporated and the Administration would like to implement a work at home project that entails computer based work assignments in which the employees will have to complete at home. You have been asked to design a study for your division and to present a report to the administration about your findings.

Assignment Details
In order to complete your assignment, you have been assigned to a group of "executives" within the company. Your job is to create a 10 question survey and administer it to your division in order to determine:

- What types of computers and other technologies employees have in their homes
- How much access the parents and children have to technologies in their homes.
- How employees feel about using computers
- How employees feel about using computer aided training.
- Whether the employees would enjoy doing online work assignments and completing training programs via computer from home.
- How family members would feel about employee computer usage (i.e., would an employee's usage of computers interfere with a student’s ability to complete their homework assignments.)

Your instructor will assign you a specific audience with which to direct your survey. Examples: Administration, executives, employees, children of employees-high school, junior high students and elementary (4th or 5th grade). Therefore if your group is children of employees - junior high, then your questions should be written so that Junior High Students can understand them.
<table>
<thead>
<tr>
<th>Items</th>
<th>Points</th>
<th>Points Earned</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LETTER HEADER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The group members and group name have both been identified</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LETTER CONTENT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The sample audience has been identified</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The distribution location has been identified</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The group member signatures have been included</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1) Parent Consent letter has been included</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) Statement justifying why a parent consent letter is not needed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has been included in the submission</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Demographic Info</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A statement with statistics has been written about number of responses collected and a calculation of the response rate.</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A statement with statistics has been written about the total number of participants.</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statements with statistics have been written for participant’s age including:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. total number of participants</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Calculations of mean, median, mode and range.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statements with statistics have been created describing:</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Total participants,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Participant Gender,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Academic Disciplines,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Race Ethnicity and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Experience</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Survey Responses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statements with statistics have been written for each of the twelve (12) survey questions. (Gr Q’s 3 pts, Req Q’s 1 pt each)</td>
<td>32</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Graph &amp; Tables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The age table includes the total number of participants, along with the calculations of mean, median, mode and range.</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Participant Experience table includes the four categories of experience and total participants in each category</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A frequency distribution/histogram of participant experience</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One pie chart was created for one survey question.</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One bar graph was created for one survey question.</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One Line graph has been created for the survey question created to collected series data.</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Survey has been copied into the Action Research Report</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>RECOMMENDATION</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final recommendation with statistical justification</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PROJECT CONTENT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professionalism, content, grammar &amp; spelling</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Module VII: Modeling and Simulation

Objectives:

Students will:
- Construct a model using graphic editing software.
- Conduct an experiment and write a report to detail findings surrounding the concept of projectile motion, utilizing a computer simulation.
- Discuss various computer models and simulations of particular events.

Evidence: Students will conduct an experiment using an Online Resource (Adaptive Curriculum) Activity Object and write a report to explain findings.

Simulation Project Outline

Flight of the Arrow

Sir William wishes to win the Royal Archery Tournament. He has commissioned you to investigate how to win the Queen's Prize. Conduct an experiment so that you can inform Sir William how to be a more effective competitor.

Form a team of three members to complete this project.

In this activity object, you will conduct an experiment to determine what techniques Sir William can use to win the Royal Archery Tournament.

You will use the following method to conduct your analysis.

1) Construct a hypothesis (make a prediction)
2) Test your hypothesis
3) Analyze your data
4) Draw a conclusion
5) Report your results (writing a letter to Sir William)

Do not skip through the unit! Answer questions before proceeding through each section of the lesson.

Experiment I

Begin by opening the Online Resource (Adaptive Curriculum) Activity object entitled Flight of the Arrow.

Make a hypothesis:

Does how far back the bow is pulled affect how far the arrow travels? Explain your answer.

Conduct an experiment:

1) Click on the arrow
2) Select the first notch
3) Click on the Archery range button
4) Click on the crossbow
5) Record your results

<table>
<thead>
<tr>
<th>Notch</th>
<th>Distance Traveled (meters)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Review your prediction:

Does changing the initial speed affect how far the arrow travels? Explain your answer.

Conduct another experiment:

1) Click on the second (2nd) notch
2) Click on the archery button
3) Click the crossbow

Was your prediction correct?
In your own words, explain the phenomenon of pull back (initial speed) and distance.

Make another prediction:
How are the arrow’s initial speed and how far it travels related? Explain your answer.
Was your prediction correct?
In your own words, explain the phenomenon.

Before moving to the next section, conduct one more trial:
1) Click on the arrow
2) Click on the third (3rd) notch.
3) Click the archery range button
4) Click the crossbow
5) Record your results in the chart above.

Using Excel, enter the data and graph the results. What does the graph display?

Experiment 2

Make a prediction.
Does the angle of the crossbow affect how far the arrow travels? Explain your answer.

Conduct an experiment:
1) Click on the arrow
2) Select the third (3rd) notch
3) Click on the Archery range button
4) Select Fifteen degrees (15˚)
5) Click on the crossbow
6) Record your results
7) Next, select thirty degrees (30˚)

<table>
<thead>
<tr>
<th>Angle</th>
<th>Notch</th>
<th>Distance Traveled (meters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Was your prediction correct?
Explain the phenomenon.
Make a prediction:
What crossbow angle will make it travel the farthest?

Conduct an experiment:
1) Select forty five degrees (45˚)
2) Click on the crossbow
3) Record your results
4) Next, select sixty degrees (60˚)
5) Click on the crossbow
6) Record your results
7) Next, select sixty degrees (75˚)
Click on the crossbow
9) Record your results
Was you prediction correct?
What angle will the arrow travel the farthest?

Make a prediction
How are the angle of the crossbow and the distance the arrow travels related?
Was your prediction correct?
Explain the phenomenon.
1) Complete the Chart above.
2) Graph the results (Angle verses Distance)
What does the graph display?

Experiment 3

Make a prediction
Does the mass of the arrow affect how far it travels? Explain your answer.

Conduct an Experiment
1) Click on the 100g arrow
2) Select the third notch
3) Click on the Archery range button
4) Click on the crossbow
5) Record your results

<table>
<thead>
<tr>
<th>Mass of the Arrow (g)</th>
<th>Angle</th>
<th>Notch</th>
<th>Distance Traveled (meters)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>45°</td>
<td>Third</td>
<td></td>
</tr>
<tr>
<td></td>
<td>45°</td>
<td>Third</td>
<td></td>
</tr>
<tr>
<td></td>
<td>45°</td>
<td>Third</td>
<td></td>
</tr>
</tbody>
</table>

Was your prediction correct?
Explain the phenomenon.
1) Complete the chart above.
2) Graph your results (Mass verses Distance)
What does the graph display?

Data Analysis
Answer the following Questions:
1) Are mass and weight the same? Define each term in your answer.
2) If you are using a crossbow and want to shoot an arrow the farthest distance, what three things should you do?
3) Sketch the motion of the arrow shot at 45° from the ground in the direction of the motion. What is this phenomenon called?
4) Does an object projected horizontally and an object dropped from the same height reach the ground at the same time? Explain your answer.

Write a letter to Sir William explaining your findings. In your letter complete the following. Your letter can be comical and humorous. Have fun with it. Just make sure all of the follow questions have been answered.
1) Define the following terms (Use the Online Resource (Adaptive Curriculum) glossary or search the Internet)
   a. projectile motion
   b. inversely proportional
   c. directly proportional.

2) Answer the following questions based on your results.
   a. How are the initials speed of an arrow and the distance it travels related?
   b. When an arrow is fired at an angle less than 45° from the ground to the direction of the motion, what is the relationship between the angle and the distance the arrow travels?
   c. When an arrow is fired at an angle greater than 45° from the ground to the direction of motion, what is the relationship between the angle and the distance the arrow travels?
   d. How are the mass of the arrow and its initial speed related?

3) Include all three graphs in your explanations.

Simulation Project Rubric

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Collection</td>
<td>20</td>
</tr>
<tr>
<td>Analyses</td>
<td>20</td>
</tr>
<tr>
<td>Appropriate Responses to Questions</td>
<td>20</td>
</tr>
<tr>
<td>Completed Report</td>
<td>20</td>
</tr>
<tr>
<td>Completed letter to Sir William with including required information</td>
<td>20</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>100</td>
</tr>
</tbody>
</table>
Objectives: Students will create a 3-D model and compare it to the original object

Evidence: Students will complete a modeling project using graphic design software

Simulation Project Outline

An Earth Model

This project is a Tutorial Park Project entitled Animated Earth. The original tutorial can be viewed here: http://www.tutorialpark.com/animated-earth/

1. The first part of the project will be done in Photoshop.
2. Open Photoshop and create a new 600×600 px document with a transparent background.
3. Select the Ellipse tool, set the Shape Layers in the tool’s properties and draw a circle in the center sized 500×500 px. It doesn’t matter what color you use. This will be the basis for our globe. Call this layer Back.
4. Now apply the following Blending Options: Inner Shadow and Gradient Overlay.

1. And don’t forget to set the Opacity at 40%. It should look like this:

2. Duplicate this layer, hide the lower layer, and for the upper layer set the parameters for Blending Options as follows:
3. Also set Opacity at 60%. Call this layer “Background”. You should have something like this:

4. Duplicate this layer once more, hide the lower layer, and for the upper layer change Blending Options in the following way:

5. Set Opacity at 100%, and call this layer Foreground. You will have something like this:

6. Now hide these circles, we'll get back to them later.
   We need these three circles for showing different parts of the Earth: first for the transparent part, second for the continents, which are moving from the invisible side of the Earth, third for continents which are moving from the visible side. Now I'll show you how it looks in reality.

7. Download a file containing the map of the earth's surface from here and import it into your document. It fits the height, but it is a little wider than we need. Everything is OK, just make the canvas wider too: set the width to 2000 pixels.
8. For our goals we need a stretched map. Duplicate the map layer, then move it to any side by 800 px. Merge all map layers. Repeat this procedure moving layers to the opposite side. The result looks like this:

9. Duplicate this layer so that you get two maps. Send backward one of them until it’s place is under the Foreground layer (I’ll call this layer “Map Foreground”). Do the same for the other layer until it is situated under the Background layer (I’ll call this layer Map Background). This is how my panel with the layers looks.:

10. Now Ctrl+click on one of the circle layers, then select the map layer and Add Layer Mask. Repeat this procedure for the second map layer. Then unlink Layer Masks. After that select the Foreground layer and create a clipping mask. Do the same for the Background layer. You’ll get the following in the layers list:

11. Now make all layers visible and look at what you’ve done:

Here, the student can clearly discern the contours of the continents and our home planet. However, only the front part of the globe is visible, and the back one, semi-transparent, is hidden, because it corresponds to the front part and is covered by it. The front layer continents will be moving from left to right and on the back layer, vice versa, from right to left.

12. Correspondently, you have to flip the map on the front layer horizontally.
13. Also you need to shift the front or back map in such a way that Foreground map will show one part of the map and Background map – its opposite part (just move the layer with map left or right). This is how it looks after the shift:
14. Now you have your own model of the Earth. Enjoy it!

Examine your model and answer the following questions:

1. What is the purpose model?
2. How is a model created?
3. Does your model resemble the planet earth? If so how?
4. How does your model different from the earth?
## Modeling Project Rubric

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circle Created</td>
<td>10</td>
</tr>
<tr>
<td>Gradient and Overlay Applied</td>
<td>20</td>
</tr>
<tr>
<td>Blending Options Applied</td>
<td>20</td>
</tr>
<tr>
<td>Map downloaded, duplicated and applied</td>
<td>20</td>
</tr>
<tr>
<td>Both sides of map are apparent</td>
<td>20</td>
</tr>
<tr>
<td>Model resembles the planet earth.</td>
<td>10</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>100</td>
</tr>
</tbody>
</table>
Module VIII: E-Portfolio

Objectives:

Students will:
- create a web page utilizing currently accepted design standards.
- embed video in the web page.
- include / upload files to web page.

Evidence: Students will create a webpage to display the projects and work they accomplished throughout the semester.

E-Portfolio Project Outline

For your project, you will create a website, your e-portfolio, using Google Sites. This is your final project and each of you will create an individual website; this is NOT a group project. The website should have the following ingredients:

- An introduction page where you introduce yourself and what the website is about. On this page, you must also insert an image, i.e. a picture, of a technology related object, which is school appropriate. If you download the image from the Internet, make sure you give a reference to the image by providing the link from where you downloaded it, in small font size right underneath the picture. Make sure the image size does not exceed 50KB (if you want your website to load quickly) and is not too big on the page.
- A page for each of the projects you created as your previous projects (i.e. Spreadsheet Application, Action Research Project, Statistical Analysis Project etc.). These pages should contain a brief description of what each project was about (topic and 1 sentence summary) and you must also upload the office documents on this page so that anyone who has access to your e-portfolio can download them.
- A page for the Emerging Technology Project you carried out as a team. You must provide a brief description of what your Emerging Technology project was about (topic and 1 sentence summary) as well as the names and duties of each person in your group. You must also upload the PowerPoint presentation you created as a team on this page. And yes, every team member has to upload the same presentation to their individual websites.
- A page where you will ask your visitors to complete a survey on what they think about your website. The survey must be an html form that you will create using Google Docs; there must be 5 questions on the form and every question must be a different type. Then, you will embed this to the survey page, meaning that the survey should be accessible not as a link but as a live form on the page; you should use the insert feature for this.
- A page where you will insert a YouTube video that pertains to your theme. Again, this video must be accessible through the page directly by clicking on it, giving the link to the video will not suffice. The page must also contain a brief explanation of what the video is about.
- A website theme must be applied to the site.
## E-Portfolio Project Rubric

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction page</td>
<td>20</td>
</tr>
<tr>
<td>Theme</td>
<td>20</td>
</tr>
<tr>
<td>Layout</td>
<td>20</td>
</tr>
<tr>
<td>Picture / image included</td>
<td>20</td>
</tr>
<tr>
<td>All projects included</td>
<td>20</td>
</tr>
<tr>
<td>Minimum 6 pages</td>
<td>20</td>
</tr>
<tr>
<td>Technical design</td>
<td>20</td>
</tr>
<tr>
<td>Video included and embedded</td>
<td>20</td>
</tr>
<tr>
<td>Survey form</td>
<td>20</td>
</tr>
<tr>
<td>Gadget / games (2)</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
</tr>
</tbody>
</table>
Appendix A

Reading List


<table>
<thead>
<tr>
<th>Criteria (from checksheet)</th>
<th>How course meets spirit (contextualize specific examples in the next column)</th>
<th>Provide detail evidence how course meets criteria (i.e. where in syllabus)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>Course involves the use of computer programming languages or software programs for quantitative analysis, modeling, simulations, animation or statistics.</td>
<td>Student will: &lt;br&gt;•Utilize collected data to support their position and include both a numerical and visual representation of the data within presentation. (Module V) &lt;br&gt;•Conduct internet research to determine background information, feasibility, cost, and expert opinion on their topic choice. (Module V) &lt;br&gt;•Use critical thinking skills to determine appropriate experts on chosen topic. (Module V) &lt;br&gt;•Given an Action Research Case Study, Identify a sample population, design and construct a survey for data collection, analyze data and recommend a course of action based on analysis. (Module VI) &lt;br&gt;•Calculate and determine the appropriateness of measures of central tendency. (Module VI) &lt;br&gt;•Construct and interpret bar graphs, line plots, histograms, and double bar graphs. (Module III) &lt;br&gt;•Determine the appropriate graphical display for a given set of data and contextual situation. (Module III) &lt;br&gt;•Compare the outcome of an experiment to predictions made prior to performing the experiment, given a graph. (Module IV) &lt;br&gt;•Calculate probability, measures of central tendency in addition to constructing graphs to visually display data and draw conclusions in a written report following project details. (Module IV)</td>
</tr>
<tr>
<td>B</td>
<td>Course requires students to analyze and implement procedures that are applicable to at least one of the following problem domains.</td>
<td>Student will: &lt;br&gt;•Collect and analyze data using the functions of spreadsheet software (Module I) &lt;br&gt;•Use a minimum of three formulas to analyze data. (Module I) &lt;br&gt;•Create data-appropriate visual</td>
</tr>
</tbody>
</table>
| i. Spreadsheet analysis, systems analysis and design, and decision support systems. | representations of data. (Module I)
| • Create a presentation on an emerging technology with the intent to “sell” that technology. (Module I) |  |
| B | iv. Modeling, making extensive use of computer simulations | Student will:
| • Use a computer simulation of projectile motion to conduct an experiment and write a report to detail findings. (Module VII)
| • Create a 3D model, compare, and contrast the model with the original object. (Module VII) | Module VII pp 29-36 |
| B | v. Statistics studies stressing the use of computer software | Student will:
| • Find the probability of a simple event. (Module II)
| • Describe the relationship between the probability of an event happening and not happening. (Module II)
| • Identify overlapping and mutually exclusive events (Module II)
| • Use theoretical probability to conduct and replicate an experiment and compare results. (Module II)
| • Construct and interpret bar graphs, line plots, histograms, and double bar graphs. (Module III)
| • Determine the appropriate graphical display for a given set of data and contextual situation. (Module III)
| • Compare the outcome of an experiment to predictions made prior to performing the experiment, given a graph. (Module IV)
| • Calculate probability, measures of central tendency in addition to constructing graphs to visually display data and draw conclusions in a written report following project details. (Module IV) | Module II, III and IV pp 18-22 |