1. Contact Information

<table>
<thead>
<tr>
<th>Name</th>
<th>Abebe Rorissa</th>
</tr>
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<tbody>
<tr>
<td>Course role</td>
<td>Instructor</td>
</tr>
<tr>
<td>Office</td>
<td>Draper 140B</td>
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<tr>
<td>E-Mail</td>
<td><a href="mailto:arorissa@albany.edu">arorissa@albany.edu</a></td>
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<td>Telephone</td>
<td>518-442-5123</td>
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<tr>
<td>Office hours</td>
<td>Mondays, 12:00–4:00PM; by appointment (phone or email/Blackboard)</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Name</th>
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<tr>
<td>Course role</td>
<td>Teaching Assistant (TA)</td>
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<tr>
<td>Office</td>
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<td>E-Mail</td>
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<tr>
<td>Office hours</td>
<td>No office hours. Please use the Blackboard Learning System to contact the TA</td>
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2. Course Information

2.1 Course Description
Basic research methods and statistics for students entering the information science professions. Covers descriptive and inferential statistics through correlation and regression; basic research process methods, quantitative and qualitative, and the creation of grant or research proposals.

2.2 Objectives
It is expected that students who finish this course will have been exposed to, and be able to:

- Evaluate the design and results of published research that uses both quantitative and qualitative methodologies;
- Describe the strengths and weaknesses of a variety of research methodologies;
- Calculate basic descriptive statistics, and describe the purpose of bivariate and multivariate techniques in applied and basic research;
- Demonstrate ability to analyze the results of basic descriptive statistical techniques;
- Prepare a research/grant proposal that draws upon both research design and statistical knowledge gained in this class.

2.3 Class Meetings
The course will meet 12 times. Check the weekly course schedule (page 17 of this syllabus) for meeting dates. There will be two quizzes, a final project (grant/research proposal), and a final examination. Please check the course schedule for the date and time of the final examination. In the event of inclement weather, please call (518) 442-SNOW for announcements on university closings.

Each member of the class should bring a calculator to each session. Square roots, factorials, and memory are the most sophisticated functions that will be needed. A ruler, highlighter, and some graph paper are also needed for this class. A ring binder to store handouts is helpful.

2.4 Prerequisites
None. It is assumed that students have an understanding of basic concepts in mathematics. It is required that students NOT take IIST 608 during the first semester of their graduate work in information science.

2.5 Textbook
There is one required text: Brase & Brase for statistics, 9th edition. Connaway & Powell is highly recommended since there will be readings from it. A copy of the Brase & Brase book is on reserve in the Dewey Library. The 2nd, 3rd, 4th, or 5th edition is fine for Connaway & Powell. Readings in the weekly course schedule should be read for the date listed. Bring Brase & Brase to class each week.


Additional readings from the professional and scholarly literature are also required. For a list of these readings, see section 6 of this syllabus. The additional required readings will be available in Blackboard.
Where to Get the Books: Only Mary Jane Books has the required text (Brase & Brase) for the course, although you should be able to order it from other bookstores, walk-in or virtual.

3. Technology Requirements

3.1 Internet access and Blackboard

Reliable Internet access is required to access the course’s Blackboard site. High-speed Internet access is recommended. Blackboard recommends a number of Web browsers. You can check a list of supported technology here: http://help.blackboard.com/en-us/Learn/9.1_SP_12_and_SP_13/Instructor/010_Browser_Support/015_Browser_Support_for_SP_13. You can also obtain Blackboard Mobile Learn: https://wiki.albany.edu/display/public/askit/Blackboard+Mobile+Learn.

If you don’t have Internet access or you are unable to access the Internet from your home, you may wish to consider using a computer on campus (here is a list of computer labs on campus: http://www.albany.edu/~drmgr/test/labmaps/l-1.html, http://library.albany.edu/infocommons/) or in a public library.

If you experience problems accessing Blackboard, please read the Blackboard Help pages at: http://www.albany.edu/blackboardhelp (UAlbany) & http://help.blackboard.com (Blackboard). If you can’t find a solution on the Blackboard Help pages, please contact the University at Albany Information Technology Services (ITS) Help Desk at http://www.albany.edu/its/currentstudent.html or call (518) 442-3700.

3.2 Technology competencies

Spreadsheets: This class does require the use of spreadsheets for some statistical & other calculations. Students in the class are expected to have some familiarity with spreadsheets, completing one assignment in a spreadsheet package of their choice (with Microsoft Excel the default package for students without a preference). Spreadsheet programs allow for univariate, bivariate, and multivariate analysis. The spreadsheet software is on many of the computers in computer labs on campus. The “Using Technology” sections at the end of each chapter of Brase & Brase give descriptions of how to use various statistical software packages.

IST 608 personnel do not provide training in entry-level technology skills. We assume that you possess basic computer skills, including the ability to browse the Web; create, send, receive, and read email, including attachments; access and respond to interactive web pages; use word processing functions such as copying, cutting, and pasting text; and the ability to open, edit, and store/save computer files. If you lack skills in these areas, we recommend that you take IST 523 and/or expect to devote extra time to learning these skills.

However, we do provide course-related help and personal assistance. You will be given a brief orientation to Blackboard at the beginning of the semester, during our first class session. You will also complete a warm-up module that includes specific tasks that require the use of Blackboard. However, if you are relatively new to Blackboard, we recommend taking the tutorials available at: https://help.blackboard.com/en-us/Learn/Reference/Blackboard_Learn_Videos.

4. Assignments & Course Requirements

There will be two quizzes, a final project (grant/research proposal), and a final examination in this course. Any changes to assignment deadlines will be posted to Blackboard and a note will be sent via Blackboard Mail.

4.1 Assignments

Please note the following specifications for all the assignments for the course:

- See the “Weekly Course Schedule” for due dates of assignments.
- Papers should be word-processed, double-spaced, and with 12 point type the rule.
- Papers should be submitted, via Blackboard, to their respective drop boxes as electronic documents.
(single file for each assignment/project).

- All assignments should be submitted before midnight on the due date.
- When you do quote or refer to a piece of writing, please follow APA, MLA, or Chicago Manual of Style. (see the Web for more information; search "APA style"; "MLA style"; or "Chicago Manual of Style"). This is your choice.
- Please make sure to paginate your papers.

**Trees:** This course takes up a lot of paper for problem sets. Please feel free to use the back of whatever paper you have at home that has something else on the front side. The TA and I will assume that only the **front side** is for your IIST 608 work. This policy includes all papers as well as problem sets for the course.

### 4.1.1 Final Project: Prospectus, Draft, and Final Proposal

The final project has three parts:

1. A **prospectus** for the project—**one to two double-spaced pages**.
2. A **draft** of the final paper which will expand on your prospectus and contain the major sections of your final proposal, including literature review, description of your population, variables, budget, limitations, data collection, and data analysis methods, as well as a final section on hypothesized findings and future research.
3. A final written **proposal/paper**—**seven to ten double-spaced pages**, plus letter, bibliography, and appendices/attachments as appropriate.

Throughout this course you should feel free to speak with the instructor about your final proposal/paper. The best way to find a topic will be to think about your interests, other courses you have taken, and previous literature. An hour or two spent looking at the most recent issues of *College & Research Libraries, Library Trends, the Journal of the Association for Information Science and Technology*, or *The Reference Librarian* (only a partial list of the options) might give you a taking-off place, one of the two articles for the prospectus, and a topic to work with. Check the library for the recent issues of periodicals on the main floor.

#### 4.1.1.1 The Prospectus (S/U grade)

In **one to two double-spaced**, typed pages, please describe a research project that you might undertake and for which you are writing a grant proposal. Keep in mind that you will do no data gathering for this course, so you could choose any population and any data gathering method(s), even if really doing the project would be too costly in time, talents, or funds. Keep in mind that one section of the paper is for a project budget, nonetheless. You may want to select a topic (as close as you can) that will really be your research project for a project at your work/internship, thus making double use of your course work here.

The prospectus should include:

- The research problem and question(s). Why does this research need to be done? What light will it shed on a theoretical or practical problem in information science?
- At least two research projects/sources (based upon journal articles) that have already addressed this or a related issue. What theory have these research projects/sources drawn upon? What questions did they address? How will your research be similar to or different from these? Please cite these journal articles appropriately in the text of your prospectus, and give complete citations in footnotes or endnotes or as a reference list.
- Proposed population. Why?
- At this early stage, a list of variables that you will probably measure in your research.
- Proposed methods that you will use to collect and analyze your data.
- Strengths and limitations of this research and possible future, follow-up research.
- A one-paragraph section on what you expect your research to find (although you might be surprised).

#### 4.1.1.2 The Draft Proposal (S/U grade)

The draft proposal will follow the format of “The Final Proposal” below and it will be an expanded version of your prospectus, requiring a minimum of 5 double-spaced pages, and containing the major sections of your final proposal, including:

- the outline for a letter to the agency from which you are asking for money
You may put notes in italics (or highlighted) to the instructor for areas of concern or special attention.

4.1.1.3 Final Proposal/Paper Description and Checklist

In order to help you with the preparation of the final copy of your research proposal, the following checklist highlights required items for the paper. You do not need to turn this checklist in at the end of the semester. Use it to keep yourself on track. A rubric is used to grade the final proposal. Read the assignment again while preparing your final proposal/paper.

_____ 1. Letter to the institution that sent out the RFP (request for proposal). This will be one page, single spaced, introducing yourself, your project, the final budget amount, and some rationale about why you have selected this institution. You may find an actual organization that grants funds or make one up.

_____ 2. Title that reflects the research being conducted.

_____ 3. 200 word abstract in one paragraph including problem, method, hypothesized findings. An abstract of the proposed research (approximately 200 words). This should be a single-spaced paragraph.

_____ 4. Statement of the research problem—what you want to clear up, discover, prove. A statement of the research problem including a statement of themes and theory that are associated with the problem.

_____ 5. Purpose statement. You could do a single purpose or multiple bullets of purposes. This section should state why you believe the funding institution should give you money to complete this project—the “so what?” of the paper.

_____ 6. Literature review. This will be the area to cite at least ten research articles that form background and basis for your research—from your bibliography. Use the articles to support points made in your statement; avoid starting sentences with “Bond and Adams said…..” Furthermore, this section could include your hypotheses (in the form of null and research hypotheses) or research questions. Divide the literature review into subject areas, theoretic areas, and avoid “he said” “she said” paragraphs. Discuss/focus on theory not people. Each subject area should have a separate heading in your final proposal/paper.

_____ 7. Methodology section that includes
   a. Population: a description of the population under study and why it was chosen
   b. Sample and sampling method including why this sample was chosen
   c. Human subjects review considerations and accommodations
   d. Variables and how they will be measured (with each variable mapped to survey or interview questions)
   e. Data collection method(s)
   f. Data analysis methods

Items (a) through (f) will each have their own subheadings in the methodology section.
8. **Strengths of your study.** Here you can include issues of bias, validity and reliability. Discuss issues with the work that you propose to do.

9. **Limitations of your study.** Here you can include issues of bias, validity and reliability. Discuss issues with the work that you propose to do.

10. **Strengths of your method(s).** Here you should discuss the strengths of surveys, interviews, focus groups, or whatever method you are using to collect data.

11. **Limitations of your method(s).** Here you should discuss the limitations of surveys, interviews, focus groups, or whatever method you are using to collect data.

12. **The budget.** This is the dollar amount that you are asking for cost in time, labor, and materials to complete this project. This is the spreadsheet of costs with formulas that add up the columns (with some attention to the visual appeal) that you created for problem set #4. Include it as a table, with discussion, in your final paper.

13. **Hypothesized findings** should deal with your educated appraisal of what you will find (based upon your readings, the theories of others, and your knowledge of the subject area). In an actual research paper, reporting findings, the hypothesized findings would be up front in the form of null and research hypotheses that you were testing either qualitatively or quantitatively.

14. **Future research possibilities** (if you or someone else were doing it)

15. **Bibliography** of at least 10 articles you referenced in your literature review.

16. **Appended materials** such as (you MUST have at least one collection instrument):
   a. draft survey instrument or
   b. interview script or
   c. letters to potential interviewees or …

Rule #1 of appendices: Add no appendix that is not referenced in the body of the proposal and label them in the order they are referenced.

### 4.1.1.4 Research Prospectus Example

This prospectus is designed to be an example of the sort of work that you will hand in for your own project in IIST 608. It is an example of an action research project. *(double space real one!)*

**Research Problem:** The University at Albany Library would like to be able to distribute electronically journal articles to science faculty members of its campus, eliminating print journals from the university library. Issues of copyright have been cleared with the various publishers. The librarians are concerned about how this new policy will be received by science faculty members. They are asking for grant monies in order to create, administer, and analyze a survey.

**Research Hypothesis/Question:** To what extent would the science faculty members at the University at Albany be receptive to the idea of electronic journal article dissemination? *(Alternately, this could be a research hypothesis that they will be receptive—depends upon how much previous research has been done.)*

**Previous Research:** There has been a trend over the last decade that would indicate that science faculty members not only have access to equipment that would make electronic dissemination possible but also that they are engaging in research and communications that already make use of electronic technologies. As of 1992, all science faculty at the University at Albany reported access to or ownership of personal computers and communications software (Jones, 1993). Furthermore, science faculty around the world have been reported to engage in scholarly debate and exchange of preprints over the Internet (Martin & Martin, 1994).

**Proposed Population:** In order to meet the needs of the University Library, the population for this research will be the science faculty members in the chemistry, physics, biology, and astronomy departments at the University at Albany. The research will be limited to full time faculty members (no part-time, adjunct or emeritus).
Possible Variables: The research will study (1) access to or ownership of personal computers and communications software, (2) present ownership of pertinent journals in individuals’ fields, (3) library use of appropriate scientific journals, and (4) willingness to receive articles electronically rather than in print format (including barriers to electronic delivery).

Proposed Methodology: A survey will be developed to measure access, ownership, use and willingness. Fifty percent of the faculty will be included in a representative random sample and be surveyed. Descriptive statistics will be reported for the study. (Note that you could decide to do a census and survey everyone—probably a good idea when the population is small and you cannot expect a 100 percent response rate.)

Hypothesized Findings: The researcher believes that scientists at the University at Albany will be receptive to electronic delivery of pertinent journal articles, paving the way for savings for the libraries and the university as a whole.

References

4.1.1.5 Writing Grant Proposals
We will be going over various aspects of proposal writing in class. Try doing a search of the topic “grant writing” on the web. There are an enormous number of sites including materials on writing cover letters.

4.1.2 Problem Sets for IIST 608
NOTE: Read the following carefully for all five assignments (problem sets).

- See the class course schedule for due dates for each assignment.
- Problem sets are due at the beginning of class. Assignments will not be accepted late.
- Please make a copy of the assignment for discussion and for your records.
- Calculations can be done with a calculator, but do not use spreadsheets or statistical packages for calculations unless the instructor asks you to do so.
- Handwritten graphs and equations in pencil are fine. Do not take the time to try to word process equations.
- Make sure to label axes, equations, graphs and tables.
- When you are asked to write text, please use word processing, double-spaced with at least point 12 type.
- When doing calculations, include all your work so that the grader can locate problems. Finally, when solving mathematical problems, please highlight your answers and put a line between problems. Five points off on the problem set if this is NOT done.

Problem Set 1 (Chapters 1 to 3)
A. Variable Assignment: Select one of the articles that you will use in your final paper/project and have cited in your prospectus. Identify the major variable that the researchers were measuring and then describe how they measured that variable. Write out the citation for the article as well as the variable and its operationalization. You do not need to attach a copy of the article.

B. Statistics Assignment: (6 problems)
   Chapter 1 (B&B): Page 11, question 10
   Page 30, question 4
   Chapter 2 (B&B): Page 68, question 8
   Chapter 3 (B&B): Page 84, question 8
   Page 97, question 10
   Page 114, question 10

[Check to make sure you did the variable assignment above!]
Problem Set 2 (Chapter 4; skipping chapter 5 totally)

A. Variable Assignment: Identify the major variable from your grant proposal (final project/paper). (1) Give it a name. (2) Write a definition of the variable in one or two sentences. (3) Describe how you might measure this variable. (4) Create three survey questions that would measure the variable using three different types of survey techniques or questions/items. If you are proposing qualitative research, then select a quantifiable variable related to your work and do the assignment.

B. Statistics Assignment: (7 problems)
   - Chapter 4 (B&B): Page 132, question 12
   - Page 147, questions 7
   - Page 148, question 18
   - Page 160, question 8
   - Page 161, question 22
   - Page 161, question 24
   - Page 164, question 8

Problem Set 3 (Chapters 6; skip control charts section and section 6.4)

A. Variable and Spreadsheet Assignment:
   Make a list of the variables that you think will appear in your final project/proposal. Do this using a spreadsheet program and format it landscape. Give each one [1] a name and then write a one or two sentence [2] definition for each one. Finally, based upon the research method(s) you plan on using, [3] describe how you will operationalize each variable. Note here that you are doing a section of your final paper. These could be qualitative or quantitative variables depending upon your research and data collection method. For example:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
<th>Measurement method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance traveled</td>
<td>Number of miles and tenths from driveway to Draper parking lot</td>
<td>Ask each respondent to clock and record miles on his or her car’s odometer</td>
</tr>
</tbody>
</table>

B. Statistics Assignment: (13 problems; 9 fairly short)
   - Chapter 6 (B&B): Page 245, question 8
   - Page 257, question 8
   - Page 258, questions 12, 14, 16, 18, 20, 22, 24, 26, 28
   - Page 282, question 16
   - Page 284, question 22

Problem Set 4 (Chapter 7 sections 7.1 and 7.2 and Chapter 8 sections 8.1 and 8.2)

A. Spreadsheet Assignment: NO Variable Assignment
   Create a spreadsheet that reflects the budget for your final project/ paper for this course. Include items for personnel and supplies as discussed in class. This spreadsheet will appear in your final project/paper in the budget section. For this assignment only (not for the final paper), write in two spreadsheet formulas, in pencil, that you used to complete totals for the budget. (Of the form =c6+c7+c8 or = sum(c6:c8) with an arrow from the formula to the cell where it was used.)

B. Statistics Assignment: (6 problems. NOTE: do not take the time to verify statistics that B&B already gives you.)
   - Chapter 7 (B&B): Page 308, question 16
     Page 321, question 2
   - Chapter 8 (B&B): Page 341, question 20
     Page 342, question 21
     Page 351, question 16
     Page 388, question 8
Problem Set 5 (Chapter 9, sections 9.1 through 9.4; and Chapter 10)

A. Variable Assignment

Consider your final project/proposal for this course and the variables that you have defined. First, decide which variable could be considered a response (dependent) variable. Then select one variable that might be a predictor (independent) variable in a bivariate regression, and positively correlated with your response (dependent) variable. In a short paragraph discuss these two variables, why you have selected them, and what you believe the regression line would look like (create an equation in words and draw a rough graph).

Second, find another predictor (independent) variable that you believe could help predict your response (dependent) variable above and is also positively correlated. In a second short paragraph describe the relationship you believe this variable has to your response (dependent) variable. Which of the two predictor (independent) variables do you believe has a greater influence on the response (dependent) variable?

Third, identify and discuss a variable that you believe would be negatively correlated with your response (dependent) variable (even if you don’t have one in your final project/proposal and have to make one up). Again draw a rough graph as part of your answer.

Again, if your research proposal is qualitative, create some variables that would be related to your topic if it were quantitative and do this assignment.

B. Statistics Assignment: (10 problems)

Chapter 9 (B&B): Page 411, question 2
Page 414, question 12
Page 427, questions 10, 12, and 14
Page 450, question 9
Page 480, question 15 (small sample)

Chapter 10 (B&B): Page 505, questions 12 and 14
Page 522, number 12; be sure to read the directions for parts a through e on page 521 and do these also.

4.2 Examples of Quiz Questions

<table>
<thead>
<tr>
<th>Descriptive Statistics</th>
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<tbody>
<tr>
<td><strong>Measures of Center</strong></td>
</tr>
<tr>
<td>1. List the three measures of center that we have gone over in class.</td>
</tr>
<tr>
<td>a. ____________________</td>
</tr>
<tr>
<td>b. ____________________</td>
</tr>
<tr>
<td>c. ____________________</td>
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</tbody>
</table>
| d. Which measure of center is most sensitive to outliers (data points that fall far away from the center of the distribution)?
| e. If all three measures are numerically the same, what does this probably say about the shape of the distribution? |

<table>
<thead>
<tr>
<th><strong>Measures of Spread</strong></th>
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<tr>
<td>2. We have looked at standard deviation, variance, range, interquartile range, and min/max all as measures of the spread of a distribution. Answer these questions either with words or with a formula if you find that easier or more intuitive.</td>
</tr>
<tr>
<td>a. What is the relationship between standard deviation and variance?</td>
</tr>
<tr>
<td>b. What is the relationship between range and min/max?</td>
</tr>
<tr>
<td>c. What is the relationship between range and interquartile range?</td>
</tr>
<tr>
<td>d. Give a one sentence definition for standard deviation? Give a second sentence or two to explain how you could use standard deviations from two different data sets to compare these sets. What would you be comparing in the two sets?</td>
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</table>
Exploratory Data Analysis

3. Greensmith College Study Groups
   a. Use the following data set to construct a stem-and-leaf display.

The following data points were collected at Greensmith College. They concern the number of hours that pairs of undergraduate students spent doing group projects in the campus library over the course of the last two months of the semester.

| Hours | 63 | 10 | 26 | 45 | 45 | 59 | 50 | 51 | 12 | 29 | 32 | 44 | 47 | 58 | 59 | 51 | 51 | 14 | 19 | 41 | 42 | 15 | 15 | 52 | 17 | 20 | 22 | 24 | 29 | 52 | 54 | 44 | 36 | 23 | 37 | 23 | 49 | 45 | 23 | 38 |

b. Create a box-and-whiskers plot for the Greensmith College data set.
c. What informational differences are there between the stem-and-leaf and box-and-whiskers? What do you gain and lose between the two models? (Four or five sentences)
d. Write a paragraph (5 or 6 sentences) describing the center, spread and shape of the data set. Be as numeric as you can, given the information that you have. (Do not compute variance or standard deviation for this problem.)

Probability

Probability Matrix A displays data from the reading preferences assessment of four groups of adult readers (A, B, C, D). Individuals were asked to state their preference in type of reading materials by genre. Thus, 20 people in group A preferred novels, 4 preferred mysteries, and 1 preferred poetry. Use the matrix to answer questions a through e. Show your work for partial credit. Do not express fractions as decimals. Unanswered fractions are sufficient.

a. Compute marginals (column & row totals) and n.

<table>
<thead>
<tr>
<th></th>
<th>Novel</th>
<th>Mystery</th>
<th>Poetry</th>
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<tbody>
<tr>
<td>A</td>
<td>20</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>16</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>C</td>
<td>8</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>D</td>
<td>11</td>
<td>0</td>
<td>14</td>
</tr>
</tbody>
</table>

b. \( P(\text{novel, given A}) = \)___________
\( P(\text{mystery, given C}) = \)__________
\( P(\text{poetry, given B or D}) = \)__________
\( P(\text{not novel, given A or C}) = \)__________

c. \( P(\text{not novel and D}) = \)__________
\( P(\text{not C and mystery}) = \)____________
\( P(\text{A, given novel}) = \)__________
\( P(\text{D, given mystery or poetry}) = \)__________

d. Compute \( P(\text{mystery or novel}) \) using the addition rule \( P(\text{A or B}) = P(A) + P(B) - P(\text{A and B}) \)
e. Compute \( P(\text{mystery and novel}) \) using the multiplication rule \( P(\text{A and B}) = P(B) \cdot P(\text{A, given B}) \)

Normal Distributions

For each of the following problems (1) draw a graph, (2) compute \( Z \) score(s), and (3) find the indicated probability under the curve using the table provided. For all problems (a through f) \( \mu = 25 \) and \( \sigma = 2.5 \)

\[ Z = \frac{X - \mu}{\sigma} \]
\[ Z_x = \frac{x - \mu}{\sigma / \sqrt{n}} \]

a. \( P(x < 30) \)
b. \( P(30 < x < 35) \)
c. \( P(23 < x < 24) \)
d. \( P(23 < \bar{x} < 24) \) where \( n = 9 \)
e. In two or three sentences explain why the probabilities in parts c and d are not the same.
### Estimation

A group of graduate students has been asked to estimate the population parameter (\( \mu \)) for number of hours that professors spend counseling students about their schedules. The students randomly polled 100 faculty members and found out that they had an average (\( \bar{x} \)) of 8.5 hours per week and a standard deviation (s) of 4 hours (sample statistic) among them.

1. Using the data above create an 80% confidence interval for the true population parameter (mean) for the number of hours that faculty members spend counseling. Remember that a confidence interval is defined as the range from sample statistic minus the maximal margin of error (E) through the sample statistic plus the margin of error. E in this case is defined as

\[
E = t_{0.80} \frac{s}{\sqrt{n}}
\]

and \( t_{0.80} \) is 1.292 for an 80 percent confidence level (d.f.=99).

2. Compute the range of the confidence interval (max minus min): _______________________

3. Now compute a 99% confidence interval for the population mean for the same data. \( t_{0.99} \) is 3.499 (d.f.=99) for a 99 percent confidence level.

4. Compute the range of the confidence interval (max minus min): _______________________

5. Explain in mathematical terms why the answers in #2 and #4 are not the same. What is the difference between an 80% and a 99% confidence interval in terms of the percentage that you wish to be WRONG?

### Hypothesis Testing

Based upon a survey of special libraries in North America, the average budget was 67,000 dollars a year, with a standard deviation of 3,600 dollars. A sample of 52 libraries in Massachusetts was examined which had an average budget of 59,000 dollars. Conduct hypothesis tests to see if the Massachusetts budgets were significantly less than the national average.

1. State the null hypothesis:

2. State the research/alternate hypothesis:

3. Compute the test statistic for \( \bar{x} \) where

\[
z_{\bar{x}} = \frac{\bar{x} - \mu}{\sigma / \sqrt{n}}
\]

4. Find/estimate the p-value for the test statistic you calculated in #3 above ______________

5. Would you reject or fail to reject your null hypothesis at an alpha of .01? ______________

6. Would you reject or fail to reject your null hypothesis at an alpha of .05? ______________

7. In two or three sentences explain in plain English what your findings mean.

### Bivariate Regression

Answer the following questions about bivariate regression.

1. Identify the specified elements in the following bivariate regression equation.

\[ Y = 3.6 - .5X \]

a. Slope ______________________

b. Sign of the slope ______________

c. Y intercept ____________________

d. Independent variable _____________

e. Dependent variable ______________

f. For \( x = 2 \), predict \( y \). \( Y = \) __________

g. If the \( r \) for this equation were calculated at .96, how much of the correlation between the two variables is explained by the equation? ______________

h. How much of the variability between the two variables is NOT explained?

i. In the space below, draw an x/y axis and graph the line for this linear regression. Identify the two points with (x, y) coordinates. Make one of the points the y intercept.

### Correlation and Regression short answers

One sentence answers, please.

1. What is the difference between correlation and regression?

2. What is the difference between bivariate and multivariate regression?
3. Why might you decide to eliminate one variable from a multivariate regression research project? (There are many answers to this; give at least one reason)

4. Draw a picture of a positive correlation on an x/y axis. Label the axes and the y intercept. (You can do this without any numbers; just draw the line and an arrow to the intercept.)

**A correlation matrix**

Study the following correlation matrix and then answer the questions that follow.

<table>
<thead>
<tr>
<th></th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
</tr>
</thead>
<tbody>
<tr>
<td>C2</td>
<td>-.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C3</td>
<td>-.96</td>
<td>.22</td>
<td></td>
</tr>
<tr>
<td>C4</td>
<td>-.33</td>
<td>.65</td>
<td>.72</td>
</tr>
</tbody>
</table>

1. The strongest correlation is between which two variables in the matrix? _____ and ________
2. The weakest correlation is between which two variables in the matrix? _____ and ________
3. Identify the correlation in the matrix that has an $R^2$ of approximately 50%. _____ and ________
4. Examining the matrix you note that variable C1 is negatively correlated with all the other variables. In two or three sentences explain what this means. You can give an example if you wish.
5. If you were to run a bivariate regression on any two variables in the matrix and you were looking for the greatest predictive power, which two variables would you use? Why?

**4.3 Efforts Expected**

This class meets for approximately three class contact hours each week. Students can expect to work 3 to 4 hours per week for each credit hour. This means students may spend about 9 to 12 hours a week in the classroom and/or on readings, assignments, studying for quizzes and final exam, and other activities (3 hours in class and 6 to 9 hours outside of class). The instructor and TA want students to succeed and we are available to help. Students who are having problems or find themselves spending substantially more than 12 hours on average per week or falling behind are strongly urged to contact the instructor as soon as possible.

**4.4 Style Manuals & Guidelines**

In written reports, students are required to cite sources according to the format rules in either the APA or Turabian style manual (not both):


Style manuals are available in the reference sections of many mainstream bookstores and the reference or reserve sections of the University at Albany Libraries.

**4.5 Online Participation and Communication**

Each student is expected to have an email account for this class. Blackboard mail is the best (and preferably the only) method for communicating with the instructor and TA concerning assignments, questions, and readings. Each student must also subscribe to IST-L, the Information Studies listserv (http://www.albany.edu/informationstudies/ist_listservs.php).

Students are required to use Blackboard to read course materials including assignments and submit assignments electronically (except the five problem sets). They are also expected to visit the course’s Blackboard site at least once every other day to respond to communications from the instructor, TA, or other students. For all assignment deadlines, see the course’s schedule.
5. Student Performance Evaluation (Grading)

5.1 Grading

Grades are determined on a 10-point scale. An A signifies superior work beyond basic requirements of the course, B signifies adequate work that meets most requirements, and C or lower signifies inadequate work that does not meet the requirements.

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>A</th>
<th>A-</th>
<th>B+</th>
<th>B</th>
<th>B-</th>
<th>C+</th>
<th>C</th>
<th>C-</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale</td>
<td>95-100</td>
<td>90-94</td>
<td>86-89</td>
<td>83-85</td>
<td>79-82</td>
<td>75-78</td>
<td>71-74</td>
<td>68-70</td>
<td>60-67</td>
<td>0-59</td>
</tr>
</tbody>
</table>

The following shows the weights of the various assignments.

<table>
<thead>
<tr>
<th>Assignment/Project/Task</th>
<th>Percentage of Total Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem sets (5 at 4% each)</td>
<td>20%</td>
</tr>
<tr>
<td>Final project including prospectus, draft and final proposal/paper</td>
<td>30%</td>
</tr>
<tr>
<td>Quizzes (2 at 13% each)</td>
<td>26%</td>
</tr>
<tr>
<td>Final examination</td>
<td>20%</td>
</tr>
<tr>
<td>Participation in class &amp; in Blackboard, and Blackboard exercises <a href="http://www.citiprogram.org/">http://www.citiprogram.org/</a></td>
<td>4%</td>
</tr>
<tr>
<td>Extra credit for completing IRB core training <a href="http://www.citiprogram.org/">http://www.citiprogram.org/</a></td>
<td>3%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Participation scores are tallied throughout the semester and posted in Blackboard as a single score at the end of the semester. Keep in mind that attendance is a factor in assigning participation scores (see attendance statement below).

5.2 Grading criteria

**Deadlines:** To facilitate timely grading, all assignments must be submitted by 11:59PM (beginning of class for problem sets) on the due date. **Half a grade (5 points) will be deducted for each day an assignment is late.** An exception can be made if the student absolutely cannot meet the deadline and notifies the instructor in advance. Without this notification and an extension by the instructor, **any assignment submitted more than one full week (7 days) late will not be reviewed or graded.** Students may also lose points for incomplete submissions and failure to follow instructions. If you do not understand the assignment and instructions, you should contact the instructor -- **prior to assignment deadlines.**

**Helping speed up grading:** Please acquire a yellow highlight marker. Use it to highlight the answers to problems in the problem sets that have obvious numeric answers. This makes grading go much more quickly. You can also use this method on quizzes. Please work on problems in the order they appear in the textbook and put a solid line between problems on problem sets. This will also help with the grading.

**Writing Expectations:** One of the goals of the course is to help you learn the tools for effective research and writing at the graduate level. As such, your papers are expected to be well researched, well organized and well written. Quality academic writing carries the reader along in a logical progression, is well organized, is clear, adheres to the format prescribed by the assignment, does not use the first person (e.g. I or we), avoids colloquialisms, uses correct grammar/punctuation/spelling, and supports statements with cited references. A good general reference for research writing is available at: https://owl.english.purdue.edu/owl/. A useful free Open Source computer tool for helping organize your thoughts and topics is FreeMind. It is available at: http://sourceforge.net/projects/freemind/

**Participation:** In order to benefit from the course, each student needs a high level of participation during class discussions and activities. All students are expected to login to the course’s Blackboard site daily and to reply to email within 24 hours. Exceptions are weekends and holidays unless an assignment is due. Participation in class & Blackboard (plus completion of the Blackboard exercises in the warm-up module) carries 4% of the course grade.
5.3 Grade options
Extra credit: Human Subjects Review Course (online from Miami) - <http://www.citiprogram.org/>

All 608 students are required to sign up for the Miami course and to take the first 4 modules for discussion in class during Week 8 (10/13/2014). The rest of the course is optional and will give you up to 3 points of extra credit for the course.

Extra credit option: In order to receive extra credit for this work, please take the modules required for University at Albany, and any other modules that look interesting to you. If you are in school media you will probably want to take modules that concern children as subjects of research.

After completing the Miami course and taking the quizzes, save your certificate of completion as a PDF file and write up a one page, double-spaced evaluation that addresses the following points:

- you did the course
- the additional modules you covered
- what was most helpful
- what was least helpful
- your recommendation for having future students do this training
- ease of reading
- interest level of materials
- likelihood that the materials could more effectively be treated through class discussion
- importance to your understanding of materials covered in 608

You may turn in this work (the one page evaluation together with your certificate of completion) any time before the due date but it must be submitted via the appropriate assignment drop box. A link is available to a drop box in Week 9 module in Blackboard.

Withdrawal: Please see the University at Albany’s policy on withdrawal (http://www.albany.edu/graduatebulletin/requirements_degree.htm) and the semester schedule for deadlines. Please note that a student who simply stops participating and does not file for withdrawal per University at Albany procedures may receive a grade of “E”.

Incomplete: No incompletes will be given in this class without the express permission of the instructor in advance of the end of the semester. Quizzes and examinations will only be given on the announced days. Students who do not attend class during Quiz #1 or #2 will have their averages computed with a quiz grade of 0. Students who do not turn in their final proposals/papers on time should expect their grades will be averaged with a final proposal/paper grade of 0. Late papers lose 5 points (for each day an assignment is late) at the discretion of the instructor.

A tentative grade of “I” is given only when the student has nearly completed the course but due to circumstances beyond the student’s control the work is not completed on schedule. The student is responsible for contacting the instructor to request an incomplete and discuss the work required for completing the course in advance of the end of the semester. The date for the completion of the work is specified by the instructor. The date stipulated will not be later than one month before the end of the session following that in which the Incomplete is received. The grade “I” is automatically changed to “E” unless work is completed as agreed between the student and the instructor.

6. Readings
Additional readings in Blackboard with numbers indicated under “Read for class” in the course schedule.

- BLS #1. Finding the Objects to Study
- BLS #2. Protection of Human Research Subjects and Other Ethical Issues
- BLS #3. Step Four: Asking Descriptive Questions
- BLS #4. Survey Research
- BLS #5. Writing the Research Proposal
- BLS #6. Qualitative Analysis of Content
Methodology Articles: This is a very small set of examples of research articles. Read these to get a sense of how researchers in information science report their results and use different methodologies to explore their research questions.


Connaway & Powell chapter key for second, third, fourth, and fifth editions

<table>
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<tr>
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<th>2nd</th>
<th>3rd</th>
<th>4th</th>
<th>5th</th>
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<td>12</td>
<td>11</td>
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</tbody>
</table>

The 608 syllabus uses Connaway & Powell’s 5th edition numbers. Use the chart above depending upon which edition you own. Read “Qualitative research” particularly if your proposal for 608 is based on analyzing text rather than numbers.

7. Course Policies

7.1 Class Attendance

This is an intensive class in statistics and research methods. Attendance is taken each week. You are asked to notify the instructor in advance if you cannot attend class, must arrive late or leave early, expect to submit work late, or intend to withdraw from the course. In the unavoidable event of an absence, students should check the course’s Blackboard site or make arrangements with other students to pick up class notes and assignments. Time will be given during the first meeting of class for students to find study partners.

Students who miss more than 2 classes will have their final average dropped by two points per each additional absence. This course depends heavily upon student participation and you need to attend class to get full benefit from the course.

7.2 Class conduct

Availability: The instructor and TA are available for student consultation after class, during office hours, by appointment, and online in Blackboard. We would like to cordially ask you not to come to our offices during our preparation time immediately prior to class or at the beginning of class breaks. Students are expected to check Blackboard mail daily to see whether the instructor or TA is trying to reach them. Students should not assume that instructors and TAs are online 24 hours a day, 7 days a week, to answer your questions immediately (even though we will try to do so as much as possible).

Courtesy: In class discussions and group assignments, both face-to-face and online, the instructor, TA, and students are expected to demonstrate professional behavior. This means cooperating and interacting in a courteous, supportive, and tactful manner based on mutual respect for each other’s ideas.
Food, Phones, and Comfort: Please feel free to bring a snack to class. Please avoid peanuts (allergies) and really aromatic foods. Please turn off your cell phone. If absolutely necessary leave it on, but exit the room as quietly as possible (hard to do with the phone ringing somewhere in your backpack!) If you have any condition that would make different presentation of materials (e.g., size of type), placement in the room, special seating, or different teaching style (where possible) beneficial to you, please see the instructor. Some students have chosen to tape record lectures for future reference. That is fine with me.

7.3 Plagiarism and Academic Dishonesty/Misconduct

Due to the intensive nature of this course, students are encouraged to form study groups and to work together on assignments. Learn by interacting with one another—support and help one another. However, quizzes and the final examination will clearly be expected to reflect individual effort—you are expected to neither give nor receive assistance from anyone.

The instructor of this course has a zero tolerance policy for academic dishonesty, plagiarism (http://library.albany.edu/usered/plagiarism/), and cheating. As a policy for this course, plagiarism, self-plagiarism or cheating will result in a failing grade for the course. In addition, the instructor will pursue further disciplinary action at the University level including reporting to the Office of Conflict Resolution & Civic Responsibility (http://www.albany.edu/judicial_affairs/) according to the policies set forth in the current University at Albany Undergraduate Bulletin or University at Albany Graduate Bulletin, whichever is applicable to the student. The instructor abides by and enforces all relevant University at Albany policies.

Academic misconduct includes cheating, plagiarism and other unethical and illegal activities. Students are encouraged to form study groups and to talk about and read each other's assignments. Learn by interacting with one another—support and help one another. Nonetheless, students are expected to give credit where credit is due by citing the work and ideas of others in papers that they write. If you are not sure about what constitutes academic dishonesty, ask the instructor or err on the side of citing more than you think necessary.

The Department of Information Studies takes academic dishonesty very seriously. Before taking classes within the Department of Information Studies, you should familiarize yourself with the Department’s academic dishonesty policy, available in both the Department’s graduate handbook and online at http://www.albany.edu/content_images/Academic_Dishonesty.pdf. Professors reserve the right to add to the Department’s policy as they see appropriate.

7.4 Students with disabilities

Reasonable accommodations will be provided for students with documented physical, sensory, systemic, cognitive, learning and psychiatric disabilities. If you believe you have a disability requiring accommodation in this class, please notify the Director of Disabled Student Services (Campus Center 137, 442-5490, http://www.albany.edu/disability/index.shtml).
8. Course Schedule as of 8/25/2014 (subject to revision)

**Weekly Course Schedule:** Submit the prospectus, draft and final proposals as word-processed files to their corresponding assignment drop boxes in Blackboard before 11:59PM (Eastern Standard Time) on the due dates. This schedule will be updated regularly. Please check back for any updates or changes.

<table>
<thead>
<tr>
<th>#</th>
<th>Date</th>
<th>Topics</th>
<th>Read for Class</th>
<th>Turn in/Quiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8/25</td>
<td>Introduction; Center and Spread</td>
<td>B&amp;B: Preface, Chapters 1, 2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>9/1</td>
<td>No Class – Labor Day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>9/8</td>
<td>Center and Spread again; Grant Proposals; Spreadsheets Day 1</td>
<td>B&amp;B: Chapters 2, 3; C&amp;P, Chapters 1, 10—BLS #1, #5</td>
<td>Blackboard Exercises</td>
</tr>
<tr>
<td>4</td>
<td>9/15</td>
<td>Probability; Research Studies</td>
<td>B&amp;B: Chapter 4; C&amp;P, Chapters 2, 3</td>
<td>Quiz #1 and P.S. 1*</td>
</tr>
<tr>
<td>5</td>
<td>9/22</td>
<td>Probability again; Surveys</td>
<td>B&amp;B: Chapter 4; C&amp;P: Chapters 4, 5; BLS #1, #4.</td>
<td>Prospectus</td>
</tr>
<tr>
<td>6</td>
<td>9/29</td>
<td>Normal Distributions; Data Collection</td>
<td>B&amp;B: Chapter 6; C&amp;P: Chapter 5</td>
<td>P.S. 2*</td>
</tr>
<tr>
<td>7</td>
<td>10/6</td>
<td>Normal Distributions again; Experiments</td>
<td>B&amp;B: Chapter 6; Practice area under a normal curve; C&amp;P: Chapter 6</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>10/13</td>
<td>Ethics, human subjects and institutional review</td>
<td>BLS #2; discussion of Miami course first 4 modules required</td>
<td>Quiz #2 and P.S. 3*</td>
</tr>
<tr>
<td>9</td>
<td>10/20</td>
<td>Sampling Distributions; Historical Research</td>
<td>B&amp;B: Chapter 7; C&amp;P: Chapters 7, 8; BLS #3</td>
<td>HSR extra credit due</td>
</tr>
<tr>
<td>10</td>
<td>10/27</td>
<td>Estimation; Analysis of Data; Spreadsheets Day 2</td>
<td>B&amp;B: Chapter 8; C&amp;P: Chapter 9; BLS #6</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>11/3</td>
<td>No Class – Work on draft proposal</td>
<td></td>
<td></td>
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<tr>
<td>12</td>
<td>11/10</td>
<td>Hypothesis testing; Proposals</td>
<td>B&amp;B: Chapter 9; C&amp;P: Chapter 10—BLS #5</td>
<td>P.S. 4*; Draft proposal due</td>
</tr>
<tr>
<td>13</td>
<td>11/17</td>
<td>Correlation/Regression; Research reports</td>
<td>B&amp;B: Chapter 10; C&amp;P: Chapter 11</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>11/24</td>
<td>Chi square; wrap up</td>
<td>B&amp;B: Chapter 11 (selected)</td>
<td>P.S. 5*; Final proposal due</td>
</tr>
<tr>
<td>15</td>
<td>12/1</td>
<td>No Class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>12/8</td>
<td>Final Examination</td>
<td>B&amp;B: Chapters 7-11</td>
<td>Final Examination</td>
</tr>
</tbody>
</table>

*Solution sets will be posted, in Blackboard, for problem sets within 24 hours after they are handed in.*