

E370 Statistical Analysis for Business and Economics

Information and Policies Manual

Fall Semester, 2009-10

Sections 2363 & 2372

**Indiana University, Bloomington
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Course Description

E370 is the first course in statistics for Business and Economics majors. Statistics plays a vital role in many aspects of science, the economy, governance, and even entertainment. The course is intended to enable you to develop a set of statistical tools which you will be able to apply ethically and responsibly to data encountered in your future classes or on the job.

Prerequisite Knowledge

M118 is a prerequisite for this course. You are expected to know probability concepts including simple or marginal probability, joint probability, conditional probability, and sums and products of probabilities. You are also expected to understand combinations and permutations, and random variable concepts including PDF'S, expected values, standard deviations, the Bernoulli, and the Binomial. It is a good idea to get out your M118 text and review. **If you have managed to register for this course and M118 or its equivalent, you will summarily be dropped from the class roster.**

E201 is also a prerequisite for this course. You are expected to have learned basic language and concepts in E201 including but not limited to: surplus, shortage, complement, substitute, cost, production, average, marginal, ceteris paribus, Demand, Supply, exogenous and endogenous.

E202 and M119 are recommended in addition to the pre-requisites. E202 considers topics on which statistical analysis is frequently used and would provide a broader background for appreciating applications. Calculus is not used in E370 but M119 provides an introduction to the mathematics of continuity and infinity and how they differ from the mathematics of the finite and discrete.

Microsoft Excel is the computer package used for **all calculations** in this course. While you are not expected to know the statistical techniques, you are expected to know basic Excel operations and how to navigate a spreadsheet. Ask your lab coach for a starter workbook if you are unsure of your Excel abilities.

Course Goals

My Goal is for you to be successful learning statistics. To that end, this manual contains information on such topics as how to study, how to prepare for class, suggestions from former students, and suggested supplemental textbooks.

Your Goals are specifically to:

1. enhance your knowledge of quantitative concepts and skills, and the basic probability and statistics learned in M118.
2. develop an understanding of key statistical concepts used in economics and business.
3. learn basic methods of sampling and data collection.
4. learn the ethics of sampling, data collection, analysis and reporting.
5. learn basic statistical methods of data analysis, founded in probability theory.
6. apply basic statistical methods to data with the help of the statistical applications found in *Microsoft Excel*.
7. draw statistical inferences using the results obtained by the application of basic statistical methods.
8. learn to make predictions using basic linear methods.
9. learn to evaluate statistical techniques reported in the popular press.
10. develop the ability to think rationally which enables analysis, assessment, differentiation, and independent construction of opinions, ideas, and arguments.

Course Web Site

The course web site is at <http://www.indiana.edu/~econstat/>. Check the site frequently for assignments and answers, office hours, additional readings, supplemental materials, and important general announcements.

Semester Calendar Information:

- Last day to drop a course or to withdraw from all courses with an automatic grade of W: **Wednesday, October 28, 2009**, by 4:00 PM.
- **Required Evening Exams** are Mondays, October 5 and November 9, 2009, 7:30-9:00 p.m.
- **Thanksgiving recess** begins after last class Tuesday, November 24, 2009. Classes resume at 8 a.m. Monday, November 30, 2009.
- **The Final Exam** for this course is scheduled for 2:45-4:45 p.m., Monday, December 14, 2009.

Emergency Preparedness Plans:

Any alarms, drills or violent weather warnings take precedence over any planned class activity. In the event of a fire drill, alarm or other act of God occurring during a class session, stop work immediately and collect your personal items only.

- **In case of a fire drill or alarm**, vacate the room and building by the nearest exit and look for your lab coach who will be in the authorized safe area. Your coach will tell you if the class will re-group and you should linger, or if you are free to proceed to your next appointment. An announcement will be posted on the course web site and Oncourse detailing how access to any lost time and information will be made up.
- **In case of a severe weather warning or earthquake**, follow your coach to the designated shelter area. Follow instructions given by authorized personnel. When the danger has passed, your coach will tell you if the class will re-group, or if you are free to proceed to your next appointment. An announcement will be posted on the course web site and Oncourse detailing how access to any lost time and information will be made up.
- In case of **an interruption of an exam, leave all exam materials on your desk**, and follow the appropriate directions above. The exam will be rescheduled for some time in the following seven days, at which time a different exam will be given.

In addition to these relatively rare occurrences, it is important to know plans for how class work will continue despite student absence, instructor absence or the closing of the university due to **Pandemic Disease**. The H1N1 (swine) flu is expected to have a greater effect on University well-ness levels in the upcoming flu season than it did last Spring.

- **How do you prepare?**
 - » Bookmark the IUB Emergency Preparedness website: <http://www.iub.edu/~prepare> so that you will be able to access information in the event of any emergency.
 - » Sign up for emergency notifications through IU Notify. You may sign up or review your IU Notify contact information for accuracy by logging into OneStart (<http://onestart.iu.edu>). There are numerous methods for immediate notification of emergencies.
 - » If you suspect you have the flu or have flu-like symptoms, **email me and your lab coach**, then stay out of the public way, stay at home and miss class until you have recovered. Public and university health officials will be urging people with flu-like symptoms to stay away from school and work until they have been completely asymptomatic (without symptoms) for a full day. For severe symptoms, seek the advice of your physician.
- **What preparations have been made for class?**
 - » **In the case of a local H1N1 flu outbreak** as designated by IUB's Emergency Preparedness website, all rules requiring proof of illness in order to receive credit are suspended. Do NOT go to the health center to get documentation of flu, **but just email me (mcamp@indiana.edu)**. We will work out an alternate method of submitting any assignment.
 - » Should **I be ill and cancel class OR should the university close**, check your email, check Class Announcements on the course web site or look for an announcement on Oncourse with instructions about how we will continue to work through the syllabus as planned.
 - » In the event of **any cancelled classes**, all students will receive one Quiz Bowl point for every E370 class day when the university is closed or class is cancelled.
 - » Should the **university be closed at the time of a scheduled exam**, an alternate evaluative technique will be used, (most likely using the Original Test and Survey tool on Oncourse, with which you will be familiar from WarmUps) for which directions will be sent via email and posted on the course web site and Oncourse.
 - » Should a **flu outbreak occur at the time of a team project due date**, alternative means (an Oncourse chat room) will be established to facilitate relatively easy non-contact communication between team members. Additionally, provision will be made for you to post your final version of the particular project part due on Oncourse so that your lab coach may access and grade it without physical contact.
 - » We will have a final exam. Its form will be determined based on the state of the university at that time.

Required Resources: Texts

Please note: Either of these texts may not be available until the second week of class.

Applied Statistics in Business and Economics, 2d edition Doane and Seward, McGraw-Hill, 2008, **Custom Version with CD**. This book is available at the bookstores. The title on the cover will be *Statistical Analysis for Business and Economics--E370*

Pocket Dictionary of Statistics, Sahai & Khurshid, McGraw-Hill, 2002, reprinted by ClassPak Publishing.

Required Resources: Workbooks

E370 Introduction to Statistics for Economics and Business 2009-2010--Course Workbook, Mary Elizabeth Camp, Hayden-McNeil Publishing, 2009.

E370 Introduction to Statistics for Economics and Business 2009-2010-- Laboratory Manual, Mary Elizabeth Camp, ed., Hayden-McNeil Publishing, 2009.

Required Software:

Microsoft Excel 2007. This program is available through the Windows menu in any of the UITS clusters. Statistical applications of EXCEL will be used in this class. Knowledge of these EXCEL applications will be required for exams, lab tests and home work assignments. **Note that Office 2007 is available for free via IUWare. Go to the IUB web site and click on computers and go from there.**

All University computer labs have been updated with Office 2007. If you have Office 2003, it is important to note that the Office 2007 version of Excel uses new document formats which cannot be read by earlier versions of Office. To solve this problem, please install the file compatibility patch which allows earlier versions of Office to use the new format. This patch can be accessed at: <http://office.microsoft.com/en-us/downloads/default.aspx>.

Recommended Textbooks

The Cartoon Guide to Statistics, Larry Gonick & Wolcott Smith, HarperCollins, 1993. A “serious” statistics text which focuses on intuition and meaning of concepts.

Requests for Accommodation

Disability: If you desire classroom or testing accommodations for a disability, contact both Professor Camp **and** your Lab Coach outside of class to present the written supporting memorandum of accommodation from the Office of Disability Services for Students (www.indiana.edu/~iubdss). Please also submit a **Request for Accommodation form** which can be found on the course web site under “Special Forms.” Requests for accommodations for disability must be received and authorized by Professor Camp **and** your coach in written form **no less than two weeks in advance of need**, in order to allow adequate time to review and make appropriate arrangements. No accommodation should be assumed until authorized by Professor Camp. **This means that accommodation requests must be submitted by 5:00 PM Friday, September 18, 2009, which is two weeks in advance of the first exam.**

Religious Observances: The University sanctioned form for use by students requesting accommodation for religious observances can be accessed from the course web site under “Special Forms.” **A separate form must be completed for EVERY request throughout the semester.** Thus, since all lectures and labs are point bearing, you must be sure to request accommodation for **ALL possible missed classes**. ALL forms for the entire semester must be submitted to Professor Camp by **5:00 PM, Friday September 18, 2009.**

Sports Participation: Any student who is a member of a sports team must file a form asking for accommodation for any class activities that will be missed as the result of a game or travel associated with a game. The “Sports Absence Form” is found on

the web site under “Special Forms.” This form must be submitted to Professor Camp by **5:00 PM, Friday, September 18, 2009**. All anticipated absences for the entire semester must be included on the form.

University Sanctioned Activities: The University has requested that faculty make reasonable accommodation for participation in University sanctioned activities. Any student who participates in such activities must file a form asking for accommodation for any class activities that will be missed as the result of a specific activity or travel associated with the activity. The “University Sanctioned Activities Absence Form” is found on the web site under “Special Forms.” This form must be submitted to Professor Camp by **5:00 PM, Friday, September 18, 2009**. All anticipated absences for the entire semester must be included on the form. For those events of which the student is unaware prior to September 18, the student must file the accommodation request form with all due haste, **but not less than 2 weeks** prior to the activity.

How will this class work?

Course Organization: You will meet twice a week for 50 minutes each in BH013 for clarifying lecture, discussion and activities designed to help you grapple with the course concepts and to prepare you for home work and exams. Once a week you will meet in a computer lab for 50 minutes where you will practice using Excel to perform the techniques discussed in class and relating the concepts to the technicalities of the course.

Teams: You will be assigned to a team in one of your early lab meetings. You must sit with your team in lectures and in lab. Team members are also an excellent resource for assistance with home work. Specifically teams will:

1. be assigned a seating area in lecture and will sit together in that area. During class teams will work together on in-class activities and collaborate on problems.
2. sit in team “computer clusters” (each team member sits at a computer at one corner of a box; the aisle bisects the box) in lab and help one another with the assigned activities.
3. engage in Collaborative Learning.
4. produce all stages of the Team Project.

Why You Will Work in Teams:

1. The “synergy” produced by the interaction of team members all actively working on the same problem has been shown to enhance and deepen learning.
2. Research demonstrates discomfort with math-like subjects is reduced by the social interaction of group work.
3. Groups are safe places to practice solving problems before you try them on your own and to practice the language of statistics we will be learning.
4. Learning to work in small groups has become an essential real-world survival skill.
5. Explaining materials to others is the best way to come to understand it yourself.
6. Team work produces redundancy (that is, repeats) in presentation of course material and the more often material is heard, the more learning occurs.
7. Different learning styles require a variety of approaches to the material.
8. Collectively your team may produce ways of explaining the material to each other that are clearer to you than the resources provided.
9. It is easier for us to provide more feedback to teams.

Preparing for Class

1. **Turn to the appropriate page in the course workbook.** The Course Workbook is designed to prepare you for each class. One lesson is assigned for each class and begins with a list of specific goals for that lesson.
2. **Read the assigned pages from the text and the supplemental notes, answering the embedded review questions.** The goals are followed by the pages in the accompanying text and supplemental notes you need to read before you come to class. There are review questions embedded in the supplemental notes to help you focus and get ready for class. You should answer them in writing in the space provided. You should also write down any questions that come to mind as you are reading that you would like to have answered in class.
3. **Fill out the tables of vocabulary and symbols.** Additionally, there are tables of new statistical vocabulary and symbols to fill out when appropriate. Between the text assignment and the supplemental notes you should be able to define all the terms in the vocabulary list and decode all the symbols.

4. **Go to Oncourse and submit responses to WarmUps activities.** After you have completed these activities, you will go to Oncourse and answer questions related to current assignments. (See page 10 for more details about these activities.) You will be asked to specify what ideas you did not understand or found particularly difficult in the lesson. There will also be a standard question asking you to list any goal you think was not addressed and any problem you found exceptionally difficult (meaning you couldn't solve it) in the previous lesson.
5. **Attend and participate in class.** It is critical to be prepared for class. Class will consist of brief snippets of lecture intended to clarify what students found unclear, followed by activities and practice questions. The activities and questions are designed to provide a deeper understanding of and to give you practice using the concepts and ideas you have studied before class.

A Typical Week in the Life of an E370 Student (Written for a Friday Lab Student)	
Sunday:	Prepare for tomorrow's class by reading the assigned pages in the text and the supplemental notes in the work book. Respond to embedded questions in the supplemental notes and define the listed symbols and vocabulary terms. Do the WarmUps exercises online by 9:00 PM today.
Monday:	Attend class and earn Quiz Bowl Points. As soon as possible, review class activities and notes and respond to the questions in the Concepts section of the work book. Complete the remainder of the activities in the work book (summary, Tool Cards, additional problems) at your leisure but absolutely before the next class.
Tuesday:	Prepare for tomorrow's class by reading the assigned pages in the text and the supplemental notes in the work book. Respond to embedded questions in the supplemental notes and define the listed symbols and vocabulary terms. Do the WarmUps exercises online by 9:00 PM today. Check Important Announcements on the web site.
Wednesday:	Attend class and earn Quiz Bowl Points. As soon as possible, review class activities and notes and respond to the questions in the Concepts section of the work book. Complete the remainder of the activities in the work book (summary, Tool Cards, additional problems) at your leisure but absolutely before the next class.
Thursday:	Work through the assigned chapter in the lab manual and complete the pre-lab quiz. Check Important Announcements.
Friday:	Attend lab, turn in pre-lab quiz and take end-of-lab quiz.
Saturday:	Using your Tool Cards organize the week's information and put it in your concept map you have been keeping all semester. Glance through the WarmUps questions for the next class to help direct your reading.

Preparing for Lab

1. **Turn to the appropriate chapter in the lab manual.** The lab manual is designed to prepare you for lab. One chapter corresponds to a lab meeting, with three lab meetings reserved for exams and project presentations. Each chapter is set up the same way, beginning with a list of objectives and the specific workbook lessons that are related.
2. **Read the brief review of background theory and summary of important formulas.** Work your way through the examples, *using Excel as you do so*, to be sure you get the same answers. It is critically important that you work through the chapter **BEFORE** lab. Your lab coach will perform a very brief review at the beginning of the session, but you will be expected to be familiar with the chapter content.
3. **Do the pre-lab quiz assigned for the week.** The pre-lab quiz has been designed to allow you to gauge your readiness for lab. The questions are the clearest statement of exactly what you are expected to come to class able to do.
4. **Attend and participate in lab.** Turn in your pre-lab quiz at the beginning of the lab session. Lab will consist of a brief review of workbook and lecture material followed by problem sets that you will work with at the same time as the other members of your team. **YOU SHOULD EACH WORK AT YOUR OWN COMPUTER**, consulting and

checking with one another as you work. Periodically your lab coach will call the class back together to discuss the results and focus on accurate interpretation.

Learning

It is your responsibility to do the learning in this class. To that end, you are responsible for:

1. all material presented in lectures, labs and in assigned readings,
2. attending all classes,
3. being on time to all classes,
4. being ready to start class on time,
5. participating in all class activities,
6. staying in class until it is dismissed,
7. staying awake in class,
8. behaving according to stated rules in class,
9. doing assigned problems,
10. turning in assignments on time,
11. picking up assignments after they are graded and checking them,
12. following up a conversation with a teaching team member with an e-mail,
13. preparing for class,
14. preparing for exams,
15. taking exams,
16. staying informed of assignments, meeting locations, and any changes to the syllabus announced during class time.

About this Different Format

This is undoubtedly a different format for class than many of you are accustomed to and it requires you to take a central role in your learning. The ultimate goal of the class is to turn out practicing statisticians, students who are able to function at the synthesis and evaluation levels of Bloom's Taxonomy.¹ The latest research has confirmed that it is most important to use our valuable class time to do the hard stuff—practice, clarify, think deeply and evaluate. This is only possible if *you* do the relatively low-level stuff—familiarize yourself with information and work to comprehend it—on your own before class.

This format requires you to expend intellectual effort over the course of the entire semester, rather than in short bursts of intense work (that is, cramming for exams.) You will find that preparation for class exams is easier and takes less time than you would anticipate or have experienced in the past. You will also find that you will retain a much larger percentage of the content for a significantly longer time. You will remember enough so that you can practice statistics in your next semester's class or I-Core.

Thoughts about Course Difficulty and Studying Techniques

Students tend to find this subject difficult and I have gained some insight about why this is the case. What I have found as the primary problem is that it requires one to use *inductive* reasoning, drawing a general conclusion from specifics. Studies have shown that the vast majority of the population easily reasons *deductively*, from the general to the specific, but a relatively small minority easily reasons inductively. Everyone has the ability to reason inductively but in most people it is like a muscle that hasn't been exercised much and it tends to resist being stretched.

It is perfectly normal for a student to attempt to approach this subject with the skills that enabled success in previous courses. Unfortunately, most of those skills center around memorization as the primary activity. In the same way that you cannot simply memorize the correct technique for a muscle-building exercise and expect to build muscles, you cannot memorize definitions and formulas and expect to be able to think statistically. This skill must be warmed up, stretched and exercised—with all of the anticipated discomfort—in order for you to be successful at statistics. Perhaps if you think about the activities you are asked to do as muscle-building exercises you will understand why you are asked to do them.

¹ I refer you to a brief introduction to the six levels of Blooms which refer to an increasing level of understanding; for example, knowledge (the lowest level) is recalling definitions, whereas evaluation (the highest level) requires selecting the best definition and giving reasons for the choice. This introduction is linked on the web site.

Professional Code of Conduct and Student Responsibilities

“[The] Code of Student Rights, Responsibilities, and Conduct is intended to identify the basic rights, responsibilities, and expectations of all students and student groups to serve as a guide for the overall student experience at Indiana University. Every Indiana University student is responsible for reading and understanding this Statement, as well as other expectations identified by individual schools or organizations relevant to an academic major, professional field, or on-campus residence.

“The purposes of Indiana University include the advancement of knowledge, the pursuit of truth, the development of students, and the promotion of the general well-being of society. As a community, we share a dedication to maintaining an environment that supports trust, respect, honesty, civility, free inquiry, creativity, and an open exchange of ideas. By accepting membership in this community, an individual neither surrenders rights nor escapes fundamental responsibilities as a citizen, but acquires additional rights as well as responsibilities to the entire university community.

“Individual rights are best protected by a collective commitment to mutual respect. A student who accepts admission to Indiana University agrees to:

- be ethical in his or her participation in the academic community,
- take responsibility for what he or she says and does,
- behave in a manner that is respectful of the dignity of others, treating others with civility and understanding,
- use university resources and facilities in appropriate ways consistent with their purpose and in accordance with applicable policies.” The Code of Student Rights, Responsibilities, and Conduct. Copyright 2005 The Trustees of Indiana University

Specific E370 Expectations: Students are expected to behave in a professional manner while participating in the course. This includes any time when the student is engaged with a member of the E370 teaching team or other current E370 students. Violations of professionalism include, but are not limited to:

- accessing e-mail during lab class
- surfing the web during lab class
- reading the newspaper during class
- sleeping during class
- ignoring requests for quiet and attention
- arriving for class late
- packing up and/or leaving class early
- being absent for more than 25% of the class sessions without providing documentation with a legitimate reason for being absent
- working on material for another course during class
- exhibiting disrespect for the instructor or classmates
- disruptive behavior in class—e.g. carrying on conversations or being excessively noisy
- engaging in any activity that prevents any student from fully participating in class.

Two Additional Rules:

- **No laptop computers may be used for any purpose during lecture class.**
- **A Student will display his or her official Student ID at the request of any member of the teaching team.**

Penalties: Excessive violations of professionalism will result in a reduction of up to 10% of your total percent for the course, which will lower your letter grade. You will receive two warnings, the second of which will require a face-to-face meeting with me outside of class. The third violation will result in your dismissal from the classroom and a charge of personal misconduct placed at the Office of Student Ethics.

Academic Integrity

E370 students are expected to uphold the highest standards of Academic Integrity. Specifically, students will refrain from all cheating and lying, a form of cheating. Violations of Academic Integrity are different than violations of professionalism and carry different penalties.

Cheating: “Dishonesty of any kind with respect to examinations, course assignments, alteration of records, or illegal possession of examinations shall be considered cheating. Offering the work of someone else as one’s own is plagiarism. **It is the responsibility of the student not only to abstain from cheating but, in addition, to avoid the appearance of cheating and to guard against making it possible for others to cheat.**” (Student Academic Handbook)

Lying: Lying to a member of the teaching team about the behavior of another member of the teaching team is dishonest. Lying to a member of the teaching team about another student’s behavior is dishonest. Lying to a member of the teaching team about information purportedly received from another member of the teaching team is dishonest. Lying to a member of the teaching team about your physical or emotional condition and how it affects your class participation is dishonest. Lying to a member of the teaching team about an “act of God” which purportedly affects your class participation is dishonest.

Some Specific Examples of Dishonesty:

1. False claim that Oncourse was down “all night” and you could not complete a WarmUps.
2. False claim that you suffered an unanticipated catastrophic event (surgery, accident or illness requiring hospitalization, family or significant other death) which prevented you from completing an assignment.
3. False claim that a member of the teaching team did not give you the allotted time to complete an exam.

All such claims will be investigated.

Penalties: Any student guilty of cheating, plagiarism or lying about or on any exam, home work or course related activity will receive an F as a **final grade for the course**. Additional penalties may be invoked. Students in this course are asked to take a pledge of academic integrity, in particular to swear that they have not given or received help of any kind on exams, and that they will not discuss exams with anyone until given permission to do so.

Guidelines for Other Situations

Between Classes: Before, during and in-between lecture sections I am focused on the class or trying to get to my next room. Because of this focus, any conversations I might have are almost **immediately forgotten**. While I am happy to answer your content related questions **PLEASE**

1) **NEVER** ask me to do something for you at these times. 2) **NEVER EVER** give me something to give to someone else at these times. Any administrative issues ***of any kind*** must be addressed by e-mail. My e-mail address is mcamp@indiana.edu.

Office Hours: A student may seek assistance from any member of the teaching team during his or her stated office hours. Please adhere to the following guidelines when attending office hours with any member of the teaching team.

- Introduce yourself every time you go to anyone’s office hours.
- Bring your Course Workbook with you whenever you attend office hours. If you don’t bring your Course Workbook, we won’t be able to see what you have done and ***we will be unable to help you.***
- Bring a list of questions you would like to have answered.
- Spend a maximum of 15 minutes at any one time in office hours. Other students are usually waiting. The teaching team member may ask you to leave after 15 minutes.
- Do not ask the teaching team member to grade or correct your point valued work before the due date.
- Do not ask the teaching team member for the answers to the point valued work before the due date.

University E-mail Policy: Note the official University policy regarding e-mail: “The University reserves the right to send official communications to students by e-mail with the full expectation that students will receive e-mail and read these e-mails in a timely fashion. Official university e-mail accounts are available for all registered students. Official university communications will be sent to students’ official university e-mail addresses. For IU-Bloomington, this is the @indiana.edu address.

- “Students are expected to check their e-mail on a frequent and consistent basis in order to stay current with university related communications. . . .

- “Students who choose to have their e-mail forwarded from their official university e-mail address to another address do so at their own risk. The University is not responsible for any difficulties that may occur in the proper or timely transmission or access to e-mail forwarded to any other address, and any such problems will not absolve students of their responsibility to know and comply with the content of official communications sent to their official IU e-mail addresses. Instructions on setting up or cancelling the forwarding of e-mail may be found by visiting <http://itaccounts.iu.edu>.”

E370 E-mail Usage: Please be aware of the limitations of e-mail and adhere to the following guidelines when sending e-mail to any member of the teaching team. Unfortunately, because of past experience, the guidelines now include those e-mail behaviors to which no response will be given.

- Include a greeting and salutation in all your e-mails.
- Please include the name you prefer to be called **AND YOUR TEAM NUMBER.**
- **Retain all related e-mails at the bottom of any response you send and place your response at the top.** I will not search through previous e-mails to attempt to discover the topic of our e-mail exchange, nor will I search through a message for new information.
- Content questions that require in-depth or visual explanation are inappropriate for e-mail and you will receive a response asking you to come to office hours to have the question answered.
- Note that the times of the day that members of the teaching team read and respond to e-mail are listed on the web site under “E370 Teaching Team”.
- Direct your e-mail to only ONE member of the teaching team, with the option of copying one other member. For example, you may send a message to your coach and choose to copy your grader on that message. **Do not, however, send your message to every member of the teaching team.** You will most likely not receive a response.
- Do not use e-mail in emergency situations.

No-Response E-mails:

- Any e-mail which contains hostile or accusatory language will remain unanswered and the sender will be reported to the appropriate authorities.
- Any e-mail sent requesting a change of grade for any reason other than an error in calculation or recording of points will remain unanswered.
- Any e-mail sent which contains student opinions about the “fairness” of the course or exams will remain unanswered.

Activities

Overview: All activities are point-valued toward the final grade, and, as such, are graded. Guidelines and descriptions of activities are found on the page noted in parentheses after the name of each activity in the following table. Grades are calculated as a percentage of 1000 possible points, broken into the following categories. On the following page you will find a listing of extra credit opportunities.

Activity	Number of assignments and value	Total Points Possible
WarmUps (10):	27 offered @ 8 points to a maximum of 200	==> 200
Quiz Bowl Points (11):	Unlimited number offered @ 1 point, a minimum of 30 points required, the remainder are extra credit.	==> 30
End-of-Lab Quizzes (11):	10 end-of-lab quizzes offered @ 4 points to a maximum of 40.	==> 40
Team Project (11):	3 parts totaling 180 possible points.	==>180
Saturday Exams (12):	2 @ 100 points	==>200
Lab Exams (12):	2 @ 75 points	==>150
Comprehensive Final (12):	1 @ 200 points	==>200
Total Points Possible		==>1000

Extra Credit Opportunities:

Pre-Lab Quizzes (11)	11 @ 3 points each to a maximum of 30 points.
Conduct Points (13)	Awarded by lab coaches using a distribution with a maximum of 20, centered at 10.
Quiz Bowl Points (10, 13)	Any points over 30; see page 9, above.

Class WarmUps: Twenty percent of course points will be awarded for participation in Class WarmUps activities. (That is equivalent to the **Final Exam!**) These are questions linked to *lecture* only and posted on Oncourse, to which you submit answers by a specified time. WarmUps are the **ONLY** homework assigned for the course and are scheduled to help you to stay current with the material in the course. **There are lots of advantages to staying current with course assignments.** Some of them are:

- Your study sessions will be shorter.
- You will not have to cram for exams.
- You will find it easier to prepare for exams because you will be reviewing material rather than seeing it for the first time.
- You will find class more understandable and will get more out of it when you are up to date with assignments. (You will actually learn more, but don't tell anyone!)

WarmUps are “instant” messages all of you send to me. Your submissions are summarized and analyzed in order to check your understanding and detect specific problem areas with concepts. That way I can make any necessary adjustments for the coming class and will know about problems when I can do something about them, rather than after an exam. Your lab coach will be monitoring your submissions also and will be able to make suggestions to help you with your understanding and your study.

Because **WarmUps will be your ONLY homework**, you should expect the questions to be anything from computations to analysis. You may be asked to paraphrase definitions of common statistical terms; you may be asked to summarize the information from a data set after applying specific statistical methods to it; you may be asked to list the steps you would take to perform a particular task; you may be asked to describe a graph you have created or manipulated. You can reasonably expect to see a combination of review questions as well as questions about new material. For example, the WarmUps for one Wednesday's class will likely have questions about what we did on the previous Monday as well as the concepts we will be addressing on Wednesday. You should expect the review questions to be more challenging than the questions about the new material.

WarmUps will be scored. The criteria used for determining your daily score will include accuracy of your response (for review questions) as well as the particular grader's determination of the perceived expended effort (for all questions). Specifically, graders will be looking for original (no quoting text or copying friends), thoughtful (you actually tried to answer the question that was asked) and sincere (your response was not gibberish or in any other way not in good faith) responses to all questions.

This course, by virtue of the nature of the subject, **is cumulative**; think of it as a marathon. WarmUps are your regular training sessions that will help you finish the marathon at the front of the pack. They will improve your long-term performance in the course and your score on the final exam. **THEY CAN ONLY HELP YOU IF YOU DO THEM THOUGHTFULLY AND REGULARLY.** Don't reduce your chance to excel in this course by blowing WarmUps off.

WarmUps Details:

- The first WarmUp will be due by **9:00 PM Sunday, September 6, 2009.** It will be accessible at **6:00 PM, Wednesday, September 2.** The only dates for which no WarmUp must be submitted are August 31st, September 2nd and November 25th.
- WarmUps are available for just over four days (99 hours) before the deadline. Thus, WarmUps for Monday lectures are available beginning at 6:00 PM the preceding Wednesday; WarmUps for Wednesday lectures are available beginning at 6:00 PM the preceding Friday.

- WarmUps must be submitted by 9:00 PM the day prior to lecture days. *The reason for this is to allow the teaching team to summarize and analyze your responses in time to adjust the next day's lesson.*
- WarmUps are graded activities. Students may attempt WarmUps as many times as they wish and have an unlimited amount of time on which to work on them, within the 99 hour constraint. Please note that Oncourse does not allow you to edit an already submitted response; your best bet is to copy and paste previous submissions into your final submission. **Graders will score the most complete submission.**
- Twenty-seven WarmUps will be posted, valued at a maximum of 8 points each.
- A maximum of 200 points can be earned from WarmUps out of a possible 216.
- No makeups will be given for WarmUps activities for any reason. *ONLY in cases such as those described below* will an effort will be made to find a mutually agreeable method to provide you an opportunity to recover lost points.
 - » If you know of a reason that you will be unable to access the activities during their posted time, you must email me (mcamp@indiana.edu) *at least 48 hours prior* to the opening of the activity.
 - » Notes from the health center or a doctor are of value *ONLY* if they specifically state that you were prevented from accessing the activities for the entire 99 hours they were available.
 - » In the event of a catastrophic occurrence such as a family death or an accident which incapacitates you, you must notify me as soon as is practically possible. You will be asked to provide evidence of the occurrence (newspaper clipping, specific note from the doctor, memorial leaflet, etc.)
 - » Any claims of "system failure" must be accompanied by evidence of the failure. UITS can help you obtain such evidence.
 - » The 24-hour flu, colds and travel plans, unless related to a university-sanctioned event, are examples of insufficient reasons for an opportunity to recover points. Even a sudden onset of flu occurring at the end of the submission period is insufficient.

Quiz Bowl Points: Three percent of course points will be awarded for participation in classes. During every lecture or lab session student teams are asked to work on problems or questions following which they will be randomly selected to present the team's thinking to the class as part of the followup discussion. Quiz Bowl Certificates equal to one point will be distributed to teams for "best" answers, most thoughtful answers, correct answers and the like. Only those team members in attendance will receive points from team activities. After 30 points have been received by any person or team, additional points earned are considered extra credit and will be counted as such. Extra credit can only help you!

End-of-Lab Quizzes: Four percent of course points will be awarded for participation in End-of-Lab quizzes. A brief quiz will be given at the end of the period for the ten lab meetings which are not scheduled for lab exams or project presentations. Each quiz is worth a maximum of 4 points for a total possible 40 points.

Pre-Lab Quizzes: A total of eleven pre-lab quizzes are assigned to lab meetings over the course of the semester. All points earned on these quizzes are counted as **extra credit**. It should not be perceived, however, that the quizzes are optional. The quizzes have been carefully written to question specific material you are expected to know **PRIOR** to coming to lab. Your lab coach will assume that you are conversant with the material tested. These quizzes are found in your lab manual at the end of every chapter beginning with Chapter Two. They are to be completed **BEFORE** lab begins and will be collected by your coach at the beginning of lab. Each quiz is valued at a maximum of 3 points to a maximum pre-lab quiz total of 30 points. Pre-Lab Quiz due dates are in the table to the right.

Team Project: Eighteen percent of course points will be earned from a semester-long team project. The project asks you to use all techniques learned in class and, thus, forms a significant part of your final course grade. The project will be submitted in parts at three times over the course of the semester.

- **Part I, Project Proposal**, must be turned in for penalty-free feedback from your coach in your lab either October 1st or 2nd. The final version of the project proposal is valued at 30 points and is due in your lab October 8th or 9th.
- **Part II, Project Descriptives**, is due in your lab November 5th or 6th and is valued at 50 points.
- **Part III, Oral Presentation** worth 20 points and **Part IV, Inference**, worth 80 points, are due in your final lab of the semester, on December 10th or 11th, 2009.

Pre-Lab Quiz Due Dates	
Chapter	Due Date
Ch. 2	9/10-11
Ch. 3	9/17-18
Ch. 4	9/24-25
Ch. 5	10/1-2
Ch. 6	10/08-09
Ch. 7	10/22-23
Ch. 8	10/29-30
Ch. 9	11/05-06
Ch. 10	11/12-13
Ch. 11	12/03-04
Ch. 12	12/07

- Specific instructions for all parts of the project are found on the course web site under “Team Project”.
- Each individual’s total points from the team project will be determined by total team points weighted by average team evaluations for each team member. See “Team Evaluations” below.

Team Evaluations: Because eighteen percent of your final course grade is derived from your team project, it is important to appropriately assign credit for that which has been produced by a team. At the time the final version of the Team Project is submitted, each team member must submit a team evaluation form in which each team member will be scored on a number of criteria. The Team Evaluation Form is found on the web site under “Special Forms.” The scores for each student will be collated and a mean score calculated. The total points earned by the team on the Team Project will be individually weighted by the mean score for each team member. Only then will any points be awarded to individual students. For example, suppose a team earned a total of 140 points out of 180 for the Team Project. A team member had a mean participation score of 85%. That team member would receive 85% of 140 points, or 119 points for the Team Project.

WTS: The team project parts will be graded based in part on your ability to communicate clearly and effectively. For assistance with this, please check out **WTS**--Writing Tutorial Services, **Appointments:** Ballantine Hall 206, 855-6738; **Walk-ins** at the Herman B Wells Library, third floor, West Tower (M-R from 11am to 2pm and 2:30 to 5:30pm) and at the ASCs—Academic Support Centers at Briscoe, Forest and Teter—(S, M, T, W, and R from 7 to 11pm.) For more information see <http://www.indiana.edu/~wts/>

Exams: Fifty-five percent of your final grade is earned by taking exams in this course. There will be two exams held on Saturdays during the semester, two exams held during your lab time during the semester, and a final exam during Finals Week.

Saturday Exams: Two exams each worth 100 points for a total of 20% of your grade will be given during the semester. Contrary to what was published in the schedule of classes, exams originally scheduled for Monday evenings will instead be given on the Saturday preceding those dates published in the schedule of classes. The first exam will be Saturday, **October 3, 2009** from 9:30 to 11:00 AM; the second exam will be Saturday **November 7, 2009** from 9:30 to 11:00 AM.

Lab Exams: Two in-lab written exams will be given over the course of the semester each worth 75 points for a total of fifteen percent of your grade. You will take the exams at your regularly scheduled lab time, in your regularly scheduled lab. The lab exams are scheduled for **October 15th or 16th, 2009** and **November 19th or 20th, 2009**.

Final Exam: The final exam for this course is scheduled for 2:45 to 4:45 PM, Monday, December 14, 2009. When you registered for this course, you committed to taking the final exam at this time. The examination time was announced in the *Schedule of Classes*, and it is your responsibility to avoid final exam conflicts at the time of registration. **If you are registered in Mathematics A 118, D 116, D 117 or M118 AND E370, you will be summarily dropped from the roster. See page 1 “Prerequisite Knowledge.”** Failure to take the final results in “F” as a final grade. Only in the case of some documented catastrophic occurrence is an “I” awarded on an *ad hoc* basis.

Catastrophic Interruption in Exam: Interruptions in the exam-taking process have been known to happen. Should such an interruption occur (fire alarm, severe weather alarm, etc.) **immediately stop taking the exam.** Leave all exam materials at your desk or work station. Take only your personal belongings, follow the exam proctor’s instructions and exit the building or go to the designated place of safety as quickly as possible. In such an event, the exam will be rescheduled for some time in the following seven days, at which time a different exam will be given.

Missing an Exam: If a catastrophic emergency befalls you that prevents you from taking an exam, you must notify me in writing of the situation and that you will be missing the exam. E-mail is fine for immediate notice. However, as soon as possible after the exam and at most within seven calendar days after the exam, a "Missed Exam Form" must be submitted with evidence of the emergency that necessitated missing the exam. This form can be found on the web site under "Special Forms." If a lab exam is involved, notification should go to your lab coach **as well**.

No makeup exams will be given. The value of one and only one missed exam will be added to the Final Exam, increasing its value to 275 or 300 points depending on which type of exam is missed. Additional missed exams will receive zero points. There are no options for missing the Final Exam, with the exception of an Incomplete in special circumstances, determined on an *ad hoc* basis **prior** to the date of the Final Exam.

Exam Room Rules: Adhering to the following guidelines will make the examination process as comfortable as possible for all during all exams.

- You may not enter the exam room until asked to by a member of the teaching team.
- You must have a valid picture ID or you will not be allowed into the exam room.
- If you bring any books, papers, backpacks, etc. into the exam room, you will be asked to deposit them against a designated wall. Please note that students have lost personal property either inadvertently or by stealth from exam rooms.
- The only items allowed within your reach during an EVENING exam are calculators, the exam paper, pencils, erasers, and any of your Tool Cards, from either the workbook, lab manual or both.
- The only items allowed within your reach during a LAB exam are the exam paper, pencils, erasers and any of your Tool Cards from the **Lab Manual Only**.
- Only those Tool Card pages which have been divided into the card size will be allowed into the exams. If a proctor observes tool cards still in page form, the proctor will assist you in dividing the cards into the correct size. Any exam time lost will be forfeited.
- Tool Cards must be free of any printed or photocopied material other than what is already printed in order to be used on exams. Hand written notes are completely acceptable. Tool Cards not meeting this criterion will be confiscated and the student will be unable to use them on the exam.
- ANY talking between students once the exam has begun will be interpreted as cheating and all parties will receive a zero for the exam and fail the course.
- Absolutely NO cell phones, beepers or electronic messaging equipment will be allowed **into the exam room**. Any such equipment found will be interpreted as cheating and the student will receive a zero for the exam and fail the course.
- Once a student has left the exam room for ANY reason, that student may not re-enter the exam room.
- Students must remain seated during lab exams except to turn in their exam. Once the student stands, the exam must be turned in.
- When you have finished an exam, you may leave your seat and turn in your exam **ONLY IF YOU CAN DO SO WITHOUT DISTURBING YOUR CLASSMATES**.

Extra Credit Points

Students frequently ask for extra credit work. There is plenty of regular credit work built into the course and no special assignments of any kind will be given to “boost” any particular student’s grade. However, there are on-going opportunities for extra credit points during class.

Conduct Points: Each lab coach is allotted a maximum of twenty Conduct Points per student, all or part of which will be distributed to the student at the end of the semester based on that student's participation record **in both lecture and lab**. The distribution of the points will be centered at 10. Coaches will be determining the number of points allotted based on the student’s record of tardiness, absence and level of appropriate in-class behavior.

Quiz Bowl Points: During class, both lab and lecture, at the whim of the instructor, extra credit points will be distributed to individual students or teams for participation. A certificate will be awarded to the student or team which must be filled out **THAT DAY** and handed back to the student’s Lab Coach by the end of the class.

Office Hours and Study Assistance

Many opportunities are offered for assistance outside of class. Students are encouraged to take advantage of as many of these resources as necessary to perform successfully in this course. Suggested guidelines for seeking assistance will be found on the pages in parentheses.

Office Hours: (See page 8 for suggestions for office hour use.) Each member of the E370 Teaching Team has scheduled office hours set aside specifically to answer student questions. The team consists of Lab Coaches (AIs) Graders and Undergraduate Interns, all of whom have office hours. A student may seek assistance from any member of the teaching team during his or her stated office hours. The office hours for the entire team are posted on the web site under **Teaching Team**. Office hours are held in WY305 or at our Library Site, found on the fourth floor of the West Tower. Take the elevator up and look for the E370 flag at the desk with the team member.

Email Checking Times: The time of day when your lab coach or I will check our email for messages is posted on the web site under **Teaching Team**.

Private Tutors: Many students feel they can benefit from a private tutor. Many of the best students from previous semesters are willing to tutor. Some of their names and contact information are listed on the course web site under "Private Tutors". This information is provided for your convenience only and any arrangements you make are strictly between you and the tutor.

Immediate Problem Assistance: When stuck on a problem, check with (in the following order:) 1) the textbook, course work book or lab manual, 2) a team member, 3) an alternate textbook, 4) a peer tutor, 5) a UGI, 6) a coach, and 7) your professor.

Grading Matters

Grading Scale: Grades are assigned based on the percentage of total points earned out of 1000, according to the scale on the right. There is no "curve" in this class, however, you can see the grading scale is adjusted for the level of difficulty of the class. Note that normal rounding rules are followed when determining a grade. That is, anything ending in 0.5 or greater rounds up, and anything less than 0.5 rounds down.

Grade Posting: All scores for all activities and final grades are posted on Post'Em accessible via Oncourse. Grade books will be updated weekly.

Grading Errors: If you believe that there is a grading **error** on your exam, you have one calendar week from the time the exam score was **posted** to ask for clarification or regrading. Failure to pick up exams forfeits your right to regrading. See below for specific instructions about how to request that grades be corrected.

Grade Freezes: Posted scores will be frozen on **Monday, October 19th, 2009 at 8:00AM and again on Monday, November 23rd, 2009 at 8:00 AM**. There will no longer be any possible adjustment to the posted scores after these dates. Thus, all claims of grading errors or "missing" scores **from the beginning of the semester through Exam One, October 5th** must be resolved by October 19th. Likewise, all claims of grading errors or "missing" scores **from WarmUps on October 7th through Exam Three on November 9th** must be resolved by November 23rd. It is imperative that students are fully informed of their standing in the class, and this policy is to ensure that students pay attention to their recorded scores.

Grading: We need to make a distinction between "grading" and "recording grades". Some of the grading for the course is done electronically, such as all multiple choice exams which are graded by machine. For the pieces of work that require manual grading, your Coach is assigned a Grader who grades Pre-Lab Quizzes for your section using a universal key. All graders share the grading of the written lab exam. Your coach will personally grade all parts of the Team Project. Graders read and score WarmUps submissions.

Recording and Posting Scores: The Grader is also responsible for keeping a record of all your scores and for submitting scores for posting. All questions about grading and recording of scores or points must be directed to the Grader assigned to your coach. You will find information about who your grader is and how to contact him or her on the web site under **"Teaching Team Email and Office Hours."** Specific office hours have been set aside for the purpose of meeting with your grader. You will find graders' office hours in this same spot on the web site.

Final Grade Break Points in Percent		
Grade	Upper Limit	Lower Limit
A	100	90
A-	89	88
B+	87	86
B	85	78
B-	77	76
C+	75	74
C	73	66
C-	65	64
D+	63	62
D	61	54
D-	53	52
F	<52	no final

Grade Corrections: Print the Post 'Em screen that includes the points you dispute. Photocopy the evidence you have that supports your dispute. Take both items to WY105 and ask that they be put in your Grader's box **within one week of the day the exam or an assignment grade was posted. E-mail requests will not be honored.** Remember:

- You will need to know your grader's name in order to turn in such requests.
- While correction requests submitted by e-mail will not be honored, it is ALWAYS a good idea to send an e-mail to the grader saying that you have submitted a request for correction at the time you turned in the paper work to WY105. Keep a copy of the e-mail until the points dispute is resolved.
- If you don't pick up your assignments and exams, you will not be allowed to ask for corrections.
- Check your grades regularly so that you won't be sorry at the end of the semester **when you will be unable to do anything about it.**
- Remember the dates of the grade freezes. (See above.)
- **Do NOT bring your score corrections to me.**

Study Suggestions

Math Skills: Students in this course are frequently concerned about their level of mathematical skill. There are lots of good math review books available at every book store in town. In particular, if you look for the *Schaum's Outline Series* display at your favorite book store you will find several paperback workbooks that can give you a good basic math review. Another book I used when I went back to school was a workbook called *Forgotten Algebra: A Self-Teaching Refresher Course* by Barbara Lee Beau. I found it very helpful. It is still being published. Actually, the computer does most of the math. **YOU** need to be a good problem solver.

Problem Solving Skills: An excellent book that discusses problem solving techniques is *How to Solve It, 2nd ed.*, G. Polya, Princeton University Press, 1957/1985. Polya presents four steps to follow to a problem's solution. They are: 1) Understand the problem, 2) Devise a plan, 3) Carry out the plan, 4) Check the result. You will find these steps explained in detail on pages *xvi* and *xvii* of his book. Additionally, a web search will locate several sites with lists of problem solving "methods."

Note Taking Skill: To master statistics you must practice and organize, organize and practice. One important helpful skill is note taking. Most students, however, are not efficient note takers. I strongly recommend a visit to the following web sites:

<http://www.sas.calpoly.edu/asc/ssl/notetaking.systems.html>

<http://www.ucc.vt.edu/stdysk/cornell.html>

<http://www.dartmouth.edu/~acskills/success/notes.html>

Excel Skills: If you feel uncomfortable about the level of your Excel skills, get the recommended text *Succeeding in Statistics*, R.E. Schiffler & A. J. Adams, Duxbury, 1999. It contains information and exercises to help you get around in Excel. While this little book was written for an earlier version of Excel, it still has enough basic information to be of help. I have several copies if you would like to borrow one.

Study Skills: Students who are successful at Statistics regularly engage in many of the following study behaviors.

1. Attend class.
2. Organize notes into study guides, that is, create sheets of formulas, definitions, concepts, things to remember.
3. Do problems.
4. "Play" with their Tool Cards, that is, shuffle them and organize them in different ways, look for the links that exist between concepts.
5. Make concept maps, using a big sheet of paper and brightly colored Post It notes.
6. Go through their notes and write questions in the margin next to the answer.
7. Study in groups.
8. Compare notes with class mates.
9. Create sample exams and take them.
10. Outline notes, articles and important sections of chapters.
11. Read the text assignments and write questions in the margins next to the answer.
12. Study out loud.
13. Study regularly, not at the last minute.
14. Study sufficiently. Students report that the more time spent working on problems and talking about statistics, the more they understand and the better the grade.

15. Visit the instructor during office hours.

Statistics Pitfalls: Some common misconceptions students have can get them into trouble grade-wise in this course.

1. Statistics is all math—I can't do math!
2. I'm a little behind, but it is the beginning of the semester. I have plenty of time to catch up.
3. Since I will have the formulas, I don't have to practice problems.
4. Since I will be doing calculations only on the computer, I don't need to know how to write the commands.
5. The first exam was a piece of cake—I don't need to study for this class!
6. Statistics is pointless. The computer does all the work, anyway.

Student Suggestions

“Do as many problems as you can, using the computer.” R. P.

“Use your team. My grade went up by one full letter when I started using my team well.” M. K.

“I figured out by the middle of the semester that I understood lecture more when I read the book first and I learned more when I did all the problems. I wish I had started at the beginning of the semester.” K. V.

“I type my notes into the computer after every class. It really helps me cement the ideas and tells me what I don't really understand so I am ready for the next class with questions.” L. L.

“Nothing is as good as drawing those dumb pictures! It's a pain in the ass but it sure saved me from making mistakes on tests.” K. W.

“The workbook was great! I could see the big picture because I answered all the questions. It made everything fit together.” S. K.

“This class is about solving problems. I solved a lot of problems until I was good at it.” F. R.

Additional Resources

Video Help: A three tape video series can be found at the library. It is entitled “The High Stakes World of Statistics” by the Standard Deviants. We will likely see some clips from it in class. You may find that viewing portions of it will help you understand the scope of statistics. It must be viewed in the Media/Reserve section of the library, which is where you will find it. **Note:** the statistics taught in the video are not always identical to those we will learn, however it is excellent for concepts.

Other Texts: The big problem with the readability of statistics texts is that *YOU* don't know any statistics! **To be successful in statistics**, students should have at least two texts, one that serves as a reference guide and main text and one that can clear away any fog which might arise from the first. The books listed below can all be found in the main library. The list is a small fragment of all the options available. The books range from non-technical “intuitive” books to dictionaries of terms and formulas. Some classics from the world of statistics are included. You may find an alternate text among these. If you can't find one that works for you, come and see me about other suggestions.

CARTOON GUIDE TO STATISTICS

Author: GONICK, LARRY.

DICTIONARY OF STATISTICAL TERMS.

Author: MARRIOTT, F. H. C.

DICTIONARY/OUTLINE OF BASIC STATISTICS

Author: FREUND, JOHN E.

ENVISIONING INFORMATION

Author: TUFTE, EDWARD R.

HOW TO LIE WITH STATISTICS

Author: HUFF, DARRELL.

INTRODUCTION TO THE PRACTICE OF STATISTICS

Author: MOORE, DAVID S.

MAKING SENSE OF STATISTICS : A CONCEPTUAL OVERVIEW

Author: PYRCZAK, FRED.

MISUSED STATISTICS : STRAIGHT TALK FOR TWISTED NUMBERS

Author: JAFFE, ABRAM J.

STATISTICAL REASONING

Author: SMITH, GARY

STATISTICS : A SPECTATOR SPORT

Author: JAEGER, RICHARD M.

STATISTICS : AN INTUITIVE APPROACH

Author: WEINBERG, GEORGE H

STATISTICS WITH A SENSE OF HUMOR : A HUMOROUS WORKBOOK AND GUIDE

Author: PYRCZAK, FRED.

STATISTICS : CONCEPTS AND CONTROVERSIES

Author: MOORE, DAVID S.

STATISTICS BY EXAMPLE

Author: SINCICH, TERRY.

STATISTICS WITHOUT TEARS : A PRIMER FOR NON-MATHEMATICIANS

Author: ROWNTREE, DEREK.

STATISTICS YOU CAN'T TRUST : A FRIENDLY GUIDE TO CLEAR THINKING

Author: CAMPBELL, STEPHEN K.

VISUAL DISPLAY OF QUANTITATIVE INFORMATION

Author: TUFTE, EDWARD R.