Course Information

Date Submitted: 11/27/2012

Current Prefix and Number: STA - Statistics , STA 381 - INTRO TO ENGR STA

Other Course:

Proposed Prefix and Number: STA 381

What type of change is being proposed?

Major Change

Should this course be a UK Core Course? Yes

Statistical Inferential Reasoning

1. General Information

a. Submitted by the College of: College of Arts &Sciences

b. Department/Division: Statistics

c. Is there a change in 'ownership' of the course? No

If YES, what college/department will offer the course instead: Select...

e. Contact Person

Name: Dr. Mark Gebert

Email: mark.gebert@uky.edu

Phone: 7-6903

Responsible Faculty ID (if different from Contact)

Name:

Email:

Phone:

f. Requested Effective Date

Semester Following Approval: No OR Effective Semester: Spring/2013

2. Designation and Description of Proposed Course

a. Current Distance Learning (DL) Status: N/A

b. Full Title: INTRODUCTION TO ENGINEERING STATISTICS

Proposed Title: Engineering Statistics—A Conceptual Approach

c. Current Transcript Title: INTRO TO ENGR STA

Proposed Transcript Title: Engr Stats—A Conceptual Approach

d. Current Cross-listing: none

Proposed – ADD Cross-listing :

Proposed – REMOVE Cross-listing:

e. Current Meeting Patterns

LECTURE: 3

Proposed Meeting Patterns

LECTURE: 3

f. Current Grading System: ABC Letter Grade Scale

Proposed Grading System: PropGradingSys

g. Current number of credit hours: 3

Proposed number of credit hours: 3

h. Currently, is this course repeatable for additional credit? No

Proposed to be repeatable for additional credit? No

If Yes: Maximum number of credit hours:

If Yes: Will this course allow multiple registrations during the same semester? No

2i. Current Course Description for Bulletin: Probability; population and sample distributions; sampling; hypothesis testing; regression on one variable; quality control.

Proposed Course Description for Bulletin: Data collection, description, and factor “association” versus causal relationship; “Confidence”—statistical versus practical; and Hypothesis testing—All of these covered in a conceptual approach while relying heavily on the mathematical language of probability (e.g., population and sample distributions; sampling; regression on one variable) and use of simulated and real data.

2j. Current Prerequisites, if any: Prereq: MA 213.

Proposed Prerequisites, if any: MA 213

2k. Current Supplementary Teaching Component:

Proposed Supplementary Teaching Component:

3. Currently, is this course taught off campus? No

Proposed to be taught off campus? No

If YES, enter the off campus address:

4. Are significant changes in content/student learning outcomes of the course being proposed? Yes

If YES, explain and offer brief rational: Content/teaching objectives are being altered to reflect the new role of this course as a UK Core SIR (statistical inferential reasoning) course. Content and teaching objectives that reflected the former goals of a mechanical nature have been replaced by those of a more mature, conceptual statistical sort Please refer to the syllabus for specifics

5a. Are there other depts. and/or pgms that could be affected by the proposed change? Yes

If YES, identify the depts. and/or pgms: College of Engineering

5b. Will modifying this course result in a new requirement of ANY program? No

If YES, list the program(s) here:

6. Check box if changed to 400G or 500: No

Distance Learning Form

Instructor Name:

Instructor Email:

Internet/Web-based: No

Interactive Video: No

Hybrid: No

1.How does this course provide for timely and appropriate interaction between students and faculty and among students? Does the course syllabus conform to University Senate Syllabus Guidelines, specifically the Distance Learning Considerations?

2.How do you ensure that the experience for a DL student is comparable to that of a classroom-based student's experience? Aspects to explore: textbooks, course goals, assessment of student learning outcomes, etc.

3.How is the integrity of student work ensured? Please speak to aspects such as password-protected course portals, proctors for exams at interactive video sites; academic offense policy; etc.

4.Will offering this course via DL result in at least 25% or at least 50% (based on total credit hours required for completion) of a degree program being offered via any form of DL, as defined above?

If yes, which percentage, and which program(s)?

5.How are students taking the course via DL assured of equivalent access to student services, similar to that of a student taking the class in a traditional classroom setting?

6.How do course requirements ensure that students make appropriate use of learning resources?

7.Please explain specifically how access is provided to laboratories, facilities, and equipment appropriate to the course or program.

8.How are students informed of procedures for resolving technical complaints? Does the syllabus list the entities available to offer technical help with the delivery and/or receipt of the course, such as the Information Technology Customer Service Center (http://www.uky.edu/UKIT/)?

9.Will the course be delivered via services available through the Distance Learning Program (DLP) and the Academic Technology Group (ATL)? NO

If no, explain how student enrolled in DL courses are able to use the technology employed, as well as how students will be provided with assistance in using said technology.

10.Does the syllabus contain all the required components? NO

11.I, the instructor of record, have read and understood all of the university-level statements regarding DL.

Instructor Name:

Course Review Form
Statistical Inferential Reasoning

Reviewer Recommendation
Accept ☐ Revisions Needed ☐

Course: STA 381 (revised)

Using the course syllabus as a reference, identify when and how the following learning outcomes are addressed in the course. Since learning outcomes will likely be addressed multiple ways within the same syllabus, please identify a representative example (or examples) for each outcome.

☐ Evidence of course activities that will enable students to evaluate common claims arising from the formal statistical inference conveyed through margins of error and confidence intervals; and to articulate the sense in which margins of error and confidence intervals address and quantify risks that are of practical interest.

Date(s)/location(s) on syllabus or assignment:
Module II: Confidence, Statistical versus Practical

Brief Description:
Explore formal inferential claims involving margins of error and confidence intervals, expressing the variability that these encompass and do not; expressing the nature of the "significance" conveyed by these and that which is not

☐ Evidence of course activities that will enable students to evaluate common claims arising from the formal statistical inference conveyed through null hypothesis testing within statistically designed experiments, and to articulate the sense in which null hypothesis testing addresses and quantifies risks that are of practical interest.

Date(s)/location(s) on syllabus or assignment:
Module III: Statistical Hypothesis Testing

Brief Description:
Connect the ideas of sensitivity and specificity with the more complex notions of probability and sampling distributions to make more concrete the concepts and language of hypothesis testing and facilitate a discussion of the related statistical issues.

☐ Evidence of course activities that will enable students to evaluate common claims that arise from statistical constructs, like charts and graphs, tables and numerical summaries, through the informal act of human inference; and to articulate some of the associated challenges (e.g. with conditional reasoning, hidden variables, confounding, association versus correlation, not having the right information, misinterpreting randomness).

Date(s)/location(s) on syllabus or assignment:
Module I: Data Collection, Data Description, and Factor "Association" versus Causal Relationship

Brief Description:
Highlighting the importance of appropriate data collection and description in the human inference process of absorbing statistical information

☐ Topic distribution includes estimation (at least 25%), statistical testing (at least 25%), describing data (at least 20%), and information literacy (at least 5%).

Date(s)/location(s) on syllabus or assignment:

In all three modules, as indicated in the "Brief Description" field below.

Brief Description:

The mixture (estimation, at least 25%; testing, at least 25%; describing data, at least 20%) is shown in the time division stated in the syllabus (at least 5 weeks for Module I, at least 4 weeks for Module II, and at least 4 weeks for module III). The "at least 5% for information literacy" is shown in the various points in the learning outcomes in the individual modules:

In module I:

8. Present examples relevant to each of Outcomes 5., 6., and 7.

In module II:

2. Identify a poll from a source with an agenda related to the subject of the poll and explain the reasons such a poll is likely not a source of useful information

5. Identify a margin of error that is in the news, but not discussed in class, form the associated confidence interval and use the language of the module to explain the sort confidence that is being offered, and the type of risk that is being quantified

In module III:

2. Read about a statistical decision process that is in the student's field, not discussed in class, and explain the roles for sensitivity and specificity in assessing the integrity of that process

5. Read about a test of significance associated with an experiment that is in the news, but not discussed in class, and use the language of the module to explain and evaluate the nature of the evidence that is presented

☐ Assessable artifact(s) are identified and focused on demonstrating that the use and worth of statistical inference is for making everyday decisions. The artifact(s) should be conceptually focused and not primarily focused on computations and derivations.

Date(s)/location(s) on syllabus or assignment:
3 Module Reports, one each for Module I, II, and III

Brief Description:
Module summary reports, submitted online, comprising students' responses to queries over questions designed to assay their level of understanding on the learning outcomes listed in this syllabus—constitutes 20% of the course percentage.

☐ Sufficient evidence to suggest that the course is not confined to, or even largely focused on computation, but rather is designed to provide a conceptual understanding of statistical inferential reasoning (increasing student skill with computations is a perfectly acceptable by-product of the course). **This box must be checked by the reviewer for the submission to move forward**.

Date(s)/location(s) on syllabus or assignment:
Throughout

Brief Description:
The learning outcomes listed document this thoroughly--any point of concern may stem from the extensive reference to the standard statistical textbook; however, any and all computational instruction would be paired with/focused on a statistical concept that would be the goal for that period/week/module.

Reviewer Comments:

STA 381
Engineering Statistics—A Conceptual Approach

Instructor: Dr. Mark A. Gebert
Office Address: 347 Multidisciplinary Science Building
Email: mark.gebert@uky.edu
Office Phone: 257-6903
Office hours: By appointment

Course Description:

Data collection, description, and factor "association" versus causal relationship; "Confidence"—statistical versus practical; and Hypothesis testing—All of these covered in a conceptual approach while relying heavily on the mathematical language of probability (e.g., population and sample distributions; sampling; regression on one variable) and use of simulated and real data.

Prerequisites:
MA 213

Required Materials:
Textbook: Mendenhall, William, and Terry Sincich, *Statistics for Engineering and the Sciences*, 5th Ed., ISBN: 0‐13‐187706‐2.
Calculator: a graphing calculator is recommended.extbooks, lab materials, other things the student needs to acquire should be listed here.

Student Learning Outcomes:

Module I: Data Collection, Data Description, and Factor "Association" versus Causal Relationship

Goal: Highlight the importance of appropriate data collection and description in the human inference process of absorbing statistical information

Academic Flexibility
The faculty instructor has complete freedom with respect to the topics and resources that are used to address the learning outcomes. A resource list is attached but only as a suggestion. What is required is the following. First, that the core instruction include material of the sort found in the ***MS*** 1; 2.1 - .5, .8; 10.1 - .3; 12.1; 13.1 - .3; 14.1, .2. Second, that each student produce a portfolio that contains real examples from the student's field (of engineering or study), where incorrect human inferences have been made from simple statistical constructs. For each entry in this portfolio students should explain the error in the example and correct it.

Learning Outcomes
Students who successfully complete this module should be able to:

1. Identify categorically good or bad statistical summaries, charts and graphs and explain the reasons they are so categorized;

2. Identify categorically good or bad statistical arguments based on statistical summaries, charts, and graphs, and explain the reasons they are so categorized;

3. Distinguish the concepts of association/correlation and causation and explain how they offer different types of evidence;

4. Identify hidden or confounding variables in studies reported by the engineering or professional literature;

5. Explain if and how hidden or confounding variables can or did affect the associated common-sense inferences;

6. Explain how a misinterpretation of randomness leads to poor human inferences;

7. Explain how not having enough or the right information leads to poor human inferences;

8. Present examples relevant to each of Outcomes 5., 6., and 7.

Duration: minimum of 5 weeks.

Module II: Confidence, Statistical versus Practical

Goal: Explore formal inferential claims involving margins of error and confidence intervals, expressing the variability that these encompass and do not; expressing the nature of the "significance" conveyed by these and that which is not.

Academic Flexibility
The faculty instructor has complete freedom with respect to the topics that are used to address the learning outcomes. A resource list is attached but only as a suggestion. What is required: first, that the classroom pedagogy revolves around at least one detailed encounter with a survey that students actually take (e.g. work-hours survey) and discuss. Next, (as in Module I,) that the core instruction include material of the sort found in the ***MS*** 3.1, .2, .9, .10; 5.1 - .3, .5, .6; 6.7 - .11; 7.3 - .12.

Learning Outcomes
Students who successfully complete this module should be able to:

1. Identify categorically good or bad surveys and explain the reasons they are so categorized;

2. Identify a poll from a source with an agenda related to the subject of the poll and explain the reasons such a poll is likely not a source of useful information;

3. Explain the difference between sampling variability and non-sampling variability;

4. Identify strategies for understanding non-sampling variability;

5. Identify a margin of error that is in the news, but not discussed in class, form the associated confidence interval and use the language of the module to explain the sort confidence that is being offered, and the type of risk that is being quantified;

6. Define sampling variability and explain the role it plays in the construction of a confidence interval;

7. Define sampling distribution and demonstrate the Central Limit Theorem by simulation-based repeated sampling;

8. Produce a confidence interval for a proportion or mean for varying confidence levels, based on data from a simple random sample; explain what happens to a confidence interval as the confidence level changes and/or the sample size changes.

Duration: minimum of 4 weeks

Module III: Statistical Hypothesis Testing

Goal: Connect the ideas of sensitivity and specificity with the more complex notions of probability and sampling distributions to make more concrete the concepts and language of hypothesis testing and facilitate a discussion of the related statistical issues.

Academic Flexibility
The faculty instructor has complete freedom with respect to the topics that are used to address the learning outcomes. A resource list is attached but only as a suggestion. What is required: first, that the classroom pedagogy revolve around at least one detailed encounter with a go/no-go testing situation (involving data collection, formal declaration of hypotheses, selection of model, etc.). Next, that the core instruction include material of the sort found in the ***MS*** 4.1, .5, .6; 8.1, .2,

.4 - .8, .13; 15.1, .2.

Learning Outcomes

Students who successfully complete this module should be able to:

1. Define sensitivity and specificity;

2. Read about a statistical decision process that is in the student's field, not discussed in class, and explain the roles for sensitivity and specificity in assessing the integrity of that process;

3. Identify the structure of a test of hypothesis and explain the purpose of the null and the alternative, and the way in which the evidence that is gathered is used;

4. Define significance and power, and explain the roles each play in assessing the integrity of the dichotomous significance test;

5. Read about a test of significance associated with an experiment that is in the news, but not discussed in class, and use the language of the module to explain and evaluate the nature of the evidence that is presented;

6. Explain the role of modeled error in a simple test of hypothesis for a simple experimental design.

7. Define the Base Rate Fallacy;

8. Explain the importance of the Base Rate Fallacy in interpreting specificity and sensitivity;

9. Explain the importance of the Base Rate Fallacy in describing the results of null hypothesis testing;

Duration: minimum of 4 weeks

Description of Course Activities and Assignments

Required assignments for the course grade:

3 Exams at 100 points each, 1 on the material from each module
12 graded homeworks, collected weekly—lowest homework dropped
3 Module summary reports at 100 points each, 1 on the material from each module

Course grade is composed of 3 components:

1. Module summary reports, submitted online, comprising students' responses to queries over questions designed to assay their level of understanding on the learning outcomes listed in this syllabus—constitutes 20% of the course percentage.

2. Exams, testing *more* practical aspects of the statistical methodologies presented in pursuit of the concepts covered in the learning outcomes, but by no means exclusive of them—constitutes (20% each, for a total of) 60% of the course percentage.
3. Homework, which will comprise both conceptual (literature review in search of examples, such as those offered at the end of this syllabus, for illustration of particular points in each module and across modules) and practical (exercises from the text to work on the mechanics of a particular statistical methodology) portions—constitutes 20% of the course percentage.

Course Grading

90 – 100% = A
80 – <90% = B
70 – <80% = C
60 – <70% = D
<60% = E

Final Exam Information

In the regular classroom on the date/time announced in the Schedule of Classes.

Mid-term Grade

Mid-term grades will be posted in myUK by the deadline established in the Academic Calendar (http://www.uky.edu/Registrar/AcademicCalendar.htm)

Course Policies:

Submission of Assignments:
Describe expectations for assignment submissions. Paper vs online. Late penalty: no assignment may be submitted late, no exceptions, other than due to university-excused absences, and then only within the time frame defined in the rules section cited below in "Excused Abesences".

Attendance Policy.
While attendance is not taken *per se*, it should be noted that (because of the nature of the in-class work) absences can be tracked and those deemed excessive will be reported to the respective student's dean as part of the University of Kentucky's Academic Alert system.

Students are expected to withdraw from the class if more than 20% of the classes scheduled for the semester are missed (excused or unexcused) per university policy.

Excused Absences:
Students need to notify the professor of absences prior to class when possible. S.R. 5.2.4.2 defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, and (e) other circumstances found to fit "reasonable cause for

nonattendance" by the professor.

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. Information regarding dates of major religious holidays may be obtained through the religious liaison, Mr. Jake Karnes (859-257-2754).

Verification of Absences
Students may be asked to verify their absences in order for them to be considered excused. Senate Rule 5.2.4.2 states that faculty have the right to request "appropriate verification" when students claim an excused absence because of illness or death in the family. Appropriate notification of absences due to university-related trips is required prior to the absence.

Academic Integrity:
Per university policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the university may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the Code of Student Rights and Responsibilities. Complete information can be found at the following website: http://www.uky.edu/Ombud. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

Part II of *Student Rights and Responsibilities* (available online http://www.uky.edu/StudentAffairs/Code/part2.html) states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about the question of plagiarism involving their own work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgement of the fact, the students are guilty of plagiarism. Plagiarism includes reproducing someone else's work, whether it be a published

article, chapter of a book, a paper from a friend or some file, or something similar to this. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be.

Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone. When a student's assignment involves research in outside sources of information, the student must carefully acknowledge exactly what, where and how he/she employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas which are so generally and freely circulated as to be a part of the public domain (Section 6.3.1).

Please note: Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

Accommodations due to disability:
If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, email address: jkarnes@email.uky.edu) for coordination of campus disability services available to students with disabilities.

Classroom Behavior Policies
Please no cellphones.

Tentative Course Schedule

Module I: Data Collection, Data Description, and Factor "Association" versus Causal Relationship (at least 5 weeks)

Introduction
Types/Collection of Data
Experimental Design, Model Building, and Non-Parametrics
Statistics and Critical Thinking
Description of Data—incl. scatterplots
Probability—incl. Bayes Theorem

Module II: Confidence, Statistical versus Practical (approx. 4 weeks)

Probability—notion of random variables, distributions
Normal Probability Distribution and the Central Limit Theorem
Interval Estimation of Population Parameters

Module III: Statistical Hypothesis Testing (approx. 4 weeks)

Discrete random variables, especially the Bernoulli, Binomial
Classical Hypothesis Testing
Hypothesis Testing using Bootstrapping, other Non-Parametric Methods

Course Materials

Primary, referred to as ***MS*** throughout the syllabus:
Mendenhall, William, and Terry Sincich, *Statistics for Engineering and the Sciences*, 5th Ed., ISBN: 0 - 13 - 187706 - 2.

The following were borrowed, with permission, from Dr. William Rayens's excellent STA 210 resource list.

Module I

1. From current engineering literature—Liu G., van de Ven M., Wu S., Molenaar A., *Study on the Intrinsic Viscosity of Bitumen Containing Organo Montmorillonite Nanoclay*, **Journal of Testing and Evaluation** (JTE), Volume 40, Issue 5 (September 2012)—good example of model overfitting resulting in high correlations; although this article was selected, even in this single issue there were many similar examples.

2. Psychological Perspective on frailty of human inference:

· http://www.amazon.com/Human - Inference - Richard - E - Nisbett/dp/0134451309

· http://www.amazon.com/How - Know - What - Isnt - Fallibility/dp/0029117062

3. Joel Best books on real examples of misinterpretation of simple statistical data presentations:

· http://www.amazon.com/Stat - Spotting - Field - Guide - Identifying - Dubious/dp/0520257464/ref=ntt_at_ep_dpt_2

· http://www.amazon.com/Damned - Lies - Statistics - Untangling - Politicians/dp/0520219783/ref=ntt_at_ep_dpt_1

· http://www.amazon.com/More - Damned - Lies - Statistics - Numbers/dp/0520238303/ref=ntt_at_ep_dpt_3

4. Brief on - line resource: http://www.statisticalmisconceptions.com/MiscAndInvite01d.html

5. An excellent listing: http://www.cut - the - knot.org/do_you_know/misuse.shtml

6. Miscellaneous:

• http://www.eric.ed.gov/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=EJ796731&ERICExtSearch_SearchType_0=no&accno=EJ796731

• http://www.springerlink.com/content/g36h732914231721/

Module II

1. From current engineering literature— Casey Hodges and William Johansen, *Cone DP Meter Calibration Issues,* **Pipeline and Gas Journal**, Volume 239, Number 7 (July 2012)—good example of confidence interval (check scatterplots in article—could also be used in Module I for violation of linearity)

2. Survey Monkey for constructing free, simple surveys with up to 10 questions http://www.surveymonkey.com/

3. Private, on - campus utility for survey construction, developed by a colleague in the College of Education (ask Professor Rayens in Statistics for details)

4. General site with some interesting on - line surveys that can be assigned. Some are socially challenging. http://www.student.com/tests/

5. Same site as above, but a link to some rather steamy sex - related questions. The on - line survey is no long available but the questions are all still visible and the answers from the class could be compared to those who answered the on - line survey. Great opportunity to talk about voluntary response http://www.student.com/tests/sexresults

6. Surveys and/or survey results about "hooking up" from a variety of sources, biased and not

- http://www.studlife.com/news/students - survey - hooking - up - 1.907502
- http://smu.edu/univhonors/hilltopics/issues/volume3/3 - 21.pdf
- http://www.americanvalues.org/html/a - pr_hooking_up.html
- http://www.questia.com/googleScholar.qst;jsessionid=KJybhJmKyvB5ynY6wr1NwMJq0n1RpGSky7pcrJ9f h27Qqn0pQ1Tp!497993468!627277496?docId=5001963386
- http://s70766.gridserver.com/news/2008/11/19/hooking - up - patterns - vary - among - juniors - seniors/
- http://www.chs.fsu.edu/~ffincham/papers/ASB%20Owen%20et%20al.pdf

7. Surveys and/or survey results about plagiarism acts and causes:

- http://www.questionpro.com/akira/showSurveyLibrary.do?surveyID=332806
- http://wrt - howard.syr.edu/Bibs/PlagIncidence.htm
- http://www.varsity.co.uk/news/1058/2/
- http://www.jiscpas.ac.uk/documents/surveys/TutorSurvey.pdf

8. Resources related to push polls
- http://www.cbsnews.com/stories/2000/02/14/politics/main160398.shtml
- http://www.huffingtonpost.com/2008/09/11/nasty - anti - obama - push - pol_n_125607.html
- http://www.ncpp.org/?q=node/41
- http://article.nationalreview.com/?q=Y2ZkMWNkZDkzOTk1YTM0NTNkNmJlZThmYjJmM2ZmOGE=
- http://voices.washingtonpost.com/thefix/parsing - the - polls/parsing - the - polls - unmasking - th.html

9. A host of sex and relationship polls. Could use either to construct your own hardcopy poll or to debate voluntary response or totake online: http://www.womansavers.com/relationship - polls.asp

10. A very interesting study (a little old) on working in college, with lots of references cited. http://www.brockport.edu/career01/upromise.htm

Module III

1. Countering Indifference Using Counter - Intuitive Examples, by Larry Lesser. http://ts.rsscse.org.uk/gtb/lesser.pdf

2. Field Sobriety Tests: How Basic Science Proves They Have Little Power to Tell Impaired From Sober, by Dr. Greg Kane. http://fieldsobrietytest.info/KanePDF/KaneFSTTwo.pdf

3. National Association of Criminal Defense Lawyers. http://www.nacdl.org/public.nsf/PrinterFriendly/A0305p48?openDocument

4. Statistical Evaluation of Standardized Field Sobriety Tests, by Michael P. Hlastala, et al. http://www.mphlastala.com/JFSSFST.pdf

5. Home Pregnancy Tests May Be Less Sensitive Than Claims Suggest. http://cme.medscape.com/viewarticle/469226

6. Diagnostic Efficiency of Home Pregnancy Test Kits. http://archfami.ama -

assn.org/cgi/content/full/7/5/465

7. Relevant links regarding the Prosecutor's Fallacy:

- http://www.conceptstew.co.uk/PAGES/prosecutors_fallacy.html
- http://www.jeremymiles.co.uk/learningstats/2005/11/prosecutors‐fallacy.html
- http://www.colchsfc.ac.uk/maths/dna/discuss.htm
- http://buchanan.blogs.nytimes.com/2007/05/16/the‐prosecutors‐fallacy/
- http://en.wikipedia.org/wiki/Prosecutor%27s_fallacy
- http://www.rss.org.uk/PDF/RSS%20Statement%20regarding%20statistical%20issues%20in%20the%20Sally%20Clark%20case,%20October%2023rd%202001.pdf (JRSS response to famous Sally Clark case)

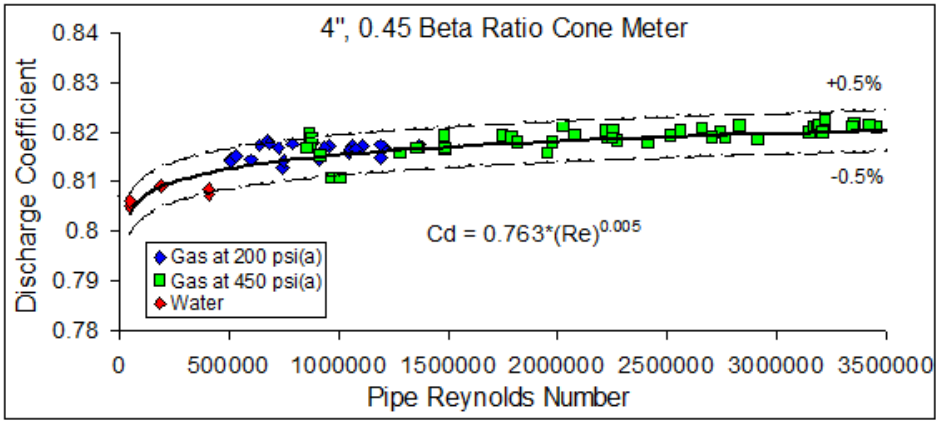
8. Relevant links regarding experimentation:

- Decaffeinated coffee and blood pressure http://hyper.ahajournals.org/cgi/reprint/14/5/563; http://www.pubmedcentral.nih.gov/picrender.fcgi?artid=2625695&blobtype=pdf
- HPT's http://linkinghub.elsevier.com/retrieve/pii/S0002937803011359; http://pediatrics.aappublications.org/cgi/reprint/113/3/581

"Statistical" (?) Confidence Assessment Example

Taking the literature example from the syllabus, the students would be asked to critique the statements from the article pertaining to "confidence":

> *This meter was previously calibrated with water at lower Reynolds numbers at the manufacturer's facility. Figure 3 shows the results. A data fit has been found to represent the actual discharge coefficients across this range to within ±0.5 % at 95% confidence.*



What sorts of variability are accounted for in this statement?

Does it appear that the author is using "95% confidence" in the statistical sense (keep in mind, in a *calibration* context, we have the unusual situation where we *know* our parameter, and are seeing if our statistic, or in this case the model based on the statistic, comes within a certain distance of it)?

Does it appear that the desired level of confidence was achieved? What evidence do we have (based on the scatterplot)?