Lower Division University Course Form

For help filling out the form press F1 or look at the bottom at the screen. For additional instructions, see Course Form Instructions.	
Type of Action	**Lower Division University Course - Request to offer a lower academic division course from a four-year state supported college or university.** See Rules of the Senate (Section III 2.5).
Notification to University	**According to Rules of the Senate (Section III, 2.5), the college will document notification to the appropriate university department of its intent to offer the course.** **Provide documentation of "notification to the appropriate university department of its intent to offer the course."** **Documentation is attached?** ☒ **Yes** ☐ **No**
General Education Status:	**Any university course or combination of university courses that can be used to satisfy the university requirements for a general education category will also satisfy the KCTCS requirements for that general education category.** **Does this course satisfy university requirements for general education status at the offering university?** ☒ **Yes** ☐ **No** **Documentation attached?** ☒ **Yes** ☐ **No** **If yes, what attribute (category) has been assigned? Quantitative Reasoning**

1. Name of institution and state that originally offers the course.

   University of Kentucky

2. Course Prefix and Number: **STA 210**

3. Course Title: **Making Sense of Uncertainty: An Introduction to Statistical Reasoning**

4. Submitting Entity: Curriculum Committee:

   College: **Bluegrass Community and Technical College**

5. Justification for Course:

    The University of Kentucky had changed its general education statistics course from STA 200 Statistics: A Force in Human Judgment to STA 210 Making Sense of Uncertainty: An Introduction to Statistical Reasoning. The Council on Postsecondary Education Report of First-Time Transfers from KCTCS to Four-Year Public and Independent Institutions for 2006-2007 (latest available on CPE website) shows that more BCTC students transfer to UK than to any other institution. STA 210 is also required in a number of majors at UK including Agricultural Biotechnology, Career and Technical Education, Communication, Early Elementary Education, Equine Science and Management, Family Sciences, Food Science, Forestry, Health Promotion, Horticulture, Plant and Soil Sciences, Hospitality Management and Tourism, Human Nutrition, Integrated Strategic Communications, Interdisciplinary Early Childhood Education, Journalism, Kinesiology, Landscape Architecture, Materials Engineering, Media Arts and Studies, Merchandising, Apparel and Textiles, Natural Resources and Environmental Science, Nursing, Secondary STEM Education, and Social Work. To meet the needs of our UK transfer students, BCTC will replace our current STA 200 sections with sections of STA 210 Making Sense of Uncertainty: An Introduction to Statistical Reasoning.

6. Will this course be a part of approved curriculum/curricula? ☒ Yes ☐ No

    If yes, which curriculum/curricula?

    Associate in Arts, Associate in Science, Associate in Fine Arts, Associate in Applied Science

7. Person(s) Primarily Responsible for Proposal **(Verify that members are still current and active prior to submission.)**:

Name	Teaching Area	College
Will Bradley	**Statistics**	**Bluegrass**
Robin Davis	**Statistics**	**Bluegrass**
Barbara Elzey	**Mathematics & Statistics**	**Bluegrass**
Peggy Saunier	**Mathematics & Statistics**	**Bluegrass**
Ruth Simms	**Mathematics**	**Bluegrass**

8. Involvement of Others (Designate Individuals):

    a. System Office Staff:

    b. Others:

9. **PROPOSED EFFECTIVE DATE:** **Fall 2013**

10. Proposed Course Designations:

    Credit / Contact Hours: 10a. Credit Hours: **3**   Minimum   Maximum

    10b. Contact Hours: **45**   If lab, etc., ratio of contact hours to credit hours. (See contact/ credit hour ratio chart)

    10c. Requisites:
    Pre-requisites: ☐ Yes ☐ No   If yes, list:

Co-requisites: ☐ Yes ☐ No   If yes, list:

11.   11a. Grading Basis : ☒ Letter Grades   ☐ Pass/Fail   ☐ Letter Grades/NO GPA

11b. Repeat for additional credit: ☐ Yes   ☒ No

If yes, how many times: Indicate total credit earned in course:

12.   Course Components (check all that require scheduling)

☒ Lecture   ☐ Lab   ☐ Clinical   ☐ Practicum   ☐ On-line Course

13.   Description:

The goal of this course is to help students develop or refine their statistical literacy skills. Both the informal activity of human inference arising from statistical constructs, as well as the more formal perspectives on statistical inference found in confidence intervals and hypothesis tests are studied. Throughout, the emphasis is on understanding what distinguishes good and bad inferential reasoning in the practical world around us.

14.   Course Competencies (**Begin statement with a capital letter and end with a period.**):

Upon completion of this course, the student can:

1. **Begin to absorb common statistical information appropriately and form associated human inferences carefully.**

2. **Develop an evolved sense of what statistical confidence means and doesn't mean by involving students in real surveys they will enjoy discussing.**

3. **Juxtapose the concepts and language of hypothesis testing with the more easily accessible ideas of sensitivity and specificity in an effort to demystify these more difficult ideas and facilitate a discussion of the related statistical issues.**

15.   Course outline (Two-level outline required):

I. **Begin to absorb common statistical information appropriately and form associated human inferences carefully.**

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

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

C. **Distinguish the concepts of correlation and causation and explain how they offer different types of evidence.**

D. **Identify hidden or confounding variables in studies reported by the media or in the literature.**

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

F. **Define what is meant by Simpson's Paradox.**

G. **Explain how a misinterpretation of randomness leads to poor human inferences.**

H. **Explain how not having enough or the right information leads to poor human**

inference.

I. Present examples relative to each of parts E, F, G, and H.

J. Identify and present at least one argument from psychology or neuroscience that supports the contention that poor human inferences are common.

II. Develop an evolved sense of what statistical confidence means and doesn't mean by involving students in real surveys they will enjoy discussing.

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

B. Identify a push poll from the news and explain the reasons such a poll is likely not a source of useful information.

C. Explain the difference between sampling variability and non-sampling variability.

D. Identify strategies for understanding non-sampling variability.

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

F. Compare and contrast the information contained in a Cosmopolitan on-line poll, a CBS Evening News call-in poll, a Gallup random-dialing poll, and a door-to-door political campaign poll.

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

H. Define sampling distribution and demonstrate the Central Limit Theorem by hands-on repeated sampling.

I. Produce a non-95% confidence interval for a proportion or mean, based on data from a simple random sample.

J. Explain what happens to a confidence interval as the confidence level changes and/or the sample size changes.

III. Juxtapose the concepts and language of hypothesis testing with the more easily accessible ideas of sensitivity and specificity in an effort to demystify these more difficult ideas and facilitate a discussion of the related statistical issues.

A. Define sensitivity and specificity.

B. Read about a dichotomous decision process that is in the news, not discussed in class, and explain the roles for sensitivity and specificity in assessing the integrity of that process.

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

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

E. 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 statistics to explain and evaluate the nature of the evidence that is presented.

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

G. Define the Prosecutor's Fallacy.

H. Explain the importance of the Prosecutor's Fallacy to interpreting specificity and

sensitivity.

I.   **Explain the importance of the Prosecutor's Fallacy to describing the results of null hypothesis testing.**

J.   **Read a news story and identify and demonstrate the difference between various conditional events and unconditional events discussed in that story.**

16.   List of experiments/activities (If laboratory or clinic is involved):

    1.

17.   Indicate suggested Learning Resources

SUGGESTED LEARNING RESOURCES FOR THIS COURSE

Best, Joel (2008). *Stat-Spotting: A Field Guide to Identifying Dubious Data***. University of California Press. ISBN-10: 0520257464 ISBN-13: 978-0520257467**

Submit form, documentation of notification to the appropriate university department of its intent to offer the course, and signature page or minutes of local CRC meeting to Mary Kleber at Mary.Kleber@kctcs.edu.