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| For Academic Affairs and Research Use Only | |
| CIP Code: |  |
| Degree Code: |  |

**New Course Proposal Form**

**[X] Undergraduate Curriculum Council**

**[ ] Graduate Council**

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| **[X] New Course or [ ]Experimental Course (1-time offering) (Check one box)** |

Signed paper copies of proposals submitted for consideration are no longer required. Please type approver name and enter date of approval.

Email completed proposals to [curriculum@astate.edu](mailto:curriculum@astate.edu) for inclusion in curriculum committee agenda.

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| Hong Zhou 10/23/2019 **Department Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **COPE Chair (if applicable)** |
| Amanda Lambertus 10/23/2019 **Department Chair:** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Head of Unit (If applicable)** |
| John Hershberger 10/25/2019 **College Curriculum Committee Chair** |  |
| Lynn Boyd 10/25/2019 Enter date… **College Dean** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Graduate Curriculum Committee Chair** |
| |  |  | | --- | --- | | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Enter date |   **General Education Committee Chair (If applicable)** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Vice Chancellor for Academic Affairs** |

1. Contact Person (Name, Email Address, Phone Number)

Latia Carraway

[lcarraway@astate.edu](mailto:lcarraway@astate.edu)

8709723090

2. Proposed Starting Term and Bulletin Year

Fall 2020

3. Proposed Course Prefix and Number (Confirm that number chosen has not been used before. For variable credit courses, indicate variable range. *Proposed number for experimental course is 9*. )

STAT 3133

4. Course Title – if title is more than 30 characters (including spaces), provide short title to be used on transcripts. Title cannot have any symbols (e.g. slash, colon, semi-colon, apostrophe, dash, and parenthesis). Please indicate if this course will have variable titles (e.g. independent study, thesis, special topics).

Applied Categorical Data Analysis

Short Title: Applied Categorical Analysis

5. Brief course description (40 words or fewer) as it should appear in the bulletin.

Descriptive statistics for quantitative and qualitative data, normal distribution, correlation, linear regression, contingency tables and association, Chi-Square test, observational studies and designed experiments, confidence interval and hypothesis testing, McNemar’s, Mann-Whitney, Spearman’s Correlation.

6. Prerequisites and major restrictions. (Indicate all prerequisites. If this course is restricted to a specific major, which major. If a student does not have the prerequisites or does not have the appropriate major, the student will not be allowed to register).

1. Are there any prerequisites? Yes
   1. If yes, which ones?

MATH 1023 – College Algebra **or** MATH 1043 – Quantitative Reasoning

* 1. Why or why not?

Students should possess the requisite math skills gained through college algebra or quantitative reasoning in order to grasp data analysis. Students should be able to use formulas and perform basic computations.

1. Is this course restricted to a specific major? No
   1. If yes, which major? Enter text...

7. Course frequency(e.g. Fall, Spring, Summer). *Not applicable to Graduate courses.*

Fall, Spring

8. Will this course be lecture only, lab only, lecture and lab, activity, dissertation, experiential learning, independent study, internship, performance, practicum, recitation, seminar, special problems, special topics, studio, student exchange, occupational learning credit, or course for fee purpose only (e.g. an exam)? Please choose one.

Lecture

9. What is the grade type (i.e. standard letter, credit/no credit, pass/fail, no grade, developmental, or other [please elaborate])

Standard Letter

10. Is this course dual listed (undergraduate/graduate)? No

11. Is this course cross listed? No

**11.1** – If yes, please list the prefix and course number of cross listed course.

Enter text...

**11.2** – **Yes / No** Are these courses offered for equivalent credit?

Please explain. Enter text...

12. Is this course in support of a new program? Yes

a. If yes, what program?

Undergraduate Certificate in Statistics

13. Does this course replace a course being deleted? No

a. If yes, what course?

Enter text...

14. Will this course be equivalent to a deleted course? No

a. If yes, which course?

Enter text...

15. Has it been confirmed that this course number is available for use? Yes

16. Does this course affect another program? No

If yes, provide confirmation of acceptance/approval of changes from the Dean, Department Head, and/or Program Director whose area this affects.

Enter text...

**Course Details**

17. Outline (The course outline should be topical by weeks and should be sufficient in detail to allow for judgment of the content of the course.)

1. Data (Week 1 and 2)

Introduction, Designed Experiments and Observational Studies, Sampling, Bias and Error

2. Organize and Display Data both Qualitative and Quantitative (Week 2 and 3)

Frequency and Relative Frequency Distributions, Graphs, Misrepresentations of Data

3. Descriptive Statistics and Regression (Week 4 and 5)

Measures of Central Tendency and Dispersion, Scatterplots and Correlation, Regression, diagnostics on Regression Line

4. Contingency Tables (Week 6)

Association, Marginal Distribution, Conditional Distribution, Simpson’s Paradox

5. Probability (Week 7 and 8)

Rules (with addition, compliment, independence), Conditional Probability

6. Discrete Probability Distributions (Week 9 and 10)

Discrete Random variable, Binomial Distribution, Poisson distribution

7. Hypothesis Testing (Week 11 and 12)

Language, Chi-Squared Distribution, Goodness of Fit, Chi-Square Test for Homogeneity of Proportions,

8. Inference for two population proportions (Week 13 and 14)

Independent vs Dependent samples, McNemar’s Test, Mann-Whitney for ordinal data

9. More Testing (Week 15)

Spearman’s Rank – Correlation Test

10. Review and Final (Week 16)

18. Special features (e.g. labs, exhibits, site visitations, etc.)

19. Department staffing and classroom/lab resources

Enter text...

1. Will this require additional faculty, supplies, etc.?

No

20. Does this course require course fees? No

**Course Justification**

21. Justification for course being included in program. Must include:

a. Academic rationale and goals for the course (skills or level of knowledge students can be expected to attain)

Categorical data analysis is encountered in many different disciplines. This course would address techniques for qualitative data. This new course would allow students to use Quantitative Reasoning as a prerequisite, so students could take QR and Categorical Data Analysis and possibly be able to satisfy their math and stat requirement. This would bring relief to high enrollment in College Algebra and Applied Stat I 3233 (STAT 3233). In addition, it would give more exposure with qualitative data since STAT 3233 focuses on quantitative data. This course is in support of an undergraduate certificate in Statistics. With the addition of this course, the undergraduate certificate in Statistics would be more accessible to many majors on campus.

b. How does the course fit with the mission established by the department for the curriculum? If course is mandated by an accrediting or certifying agency, include the directive.

This course enhances the mission of the Department of Mathematics to “prepare students for a variety of future endeavors and careers in business, industry, government, research, and academia.” This course will require students to

* Employ statistical terminology and notation accurately.
* Communicate statistics effectively.
* Read and interpret written material in statistics effectively.
* Possess the skills to read, interpret, and analyze applied statistical problems.
* Employ appropriate techniques, methods, and procedures in solving applied statistical problems.

c. Student population served.

Undergraduate: Juniors/Seniors

d. Rationale for the level of the course (lower, upper, or graduate).

Generally, students spend their first two years of college meeting the general education requirements. As juniors, they transition into the curriculum where they gain the knowledge and skills necessary to meet future credentials.

**Assessment**

**Relationship with Current Program-Level Assessment Process**

22. What is/are the intended program-level learning outcome/s for students enrolled in this course? Where will this course fit into an already existing program assessment process?

This course will serves a junior/senior elective option as well as a required course for the Undergraduate Certificate in Statistics.

23. Considering the indicated program-level learning outcome/s (from question #23), please fill out the following table to show how and where this course fits into the program’s continuous improvement assessment process.

*For further assistance, please see the ‘Expanded Instructions’ document available on the UCC - Forms website for guidance, or contact the Office of Assessment at 870-972-2989.*

**Course-Level Outcomes**

24. What are the course-level outcomes for students enrolled in this course and the associated assessment measures?

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| **Outcome 1** | Students will be able to identify and collect different types of data, recognize bias and error with sampling. |
| Which learning activities are responsible for this outcome? | Assigned readings, lecture, lab assignments, and activities with data sets, examples |
| Assessment Measure | Graded assignments and exams |

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| **Outcome 2** | Students will be able to use software to analyze the quantitative and qualitative data. |
| Which learning activities are responsible for this outcome? | Assigned readings, lecture, software practice with data sets, examples |
| Assessment Measure | Graded assignments and exams |

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| **Outcome 3** | Student will be able to draw appropriate conclusions utilizing formal inference procedures: confidence interval and hypothesis testing. |
| Which learning activities are responsible for this outcome? | Assigned readings, lecture, software practice with data sets, examples |
| Assessment Measure | Graded assignments and exams |

**Bulletin Changes**

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| **Instructions** |
| **Please visit** [**http://www.astate.edu/a/registrar/students/bulletins/index.dot**](http://www.astate.edu/a/registrar/students/bulletins/index.dot) **and select the most recent version of the bulletin. Copy and paste all bulletin pages this proposal affects below. Follow the following guidelines for indicating necessary changes.**  **\*Please note: Courses are often listed in multiple sections of the bulletin. To ensure that all affected sections have been located, please search the bulletin (ctrl+F) for the appropriate courses before submission of this form.**  - Deleted courses/credit hours should be marked with a red strike-through (~~red strikethrough~~)  - New credit hours and text changes should be listed in blue using enlarged font (blue using enlarged font).  - Any new courses should be listed in blue bold italics using enlarged font (***blue bold italics using enlarged font***)  *You can easily apply any of these changes by selecting the example text in the instructions above, double-clicking the ‘format painter’ icon 🡪 , and selecting the text you would like to apply the change to.*  *Please visit* [*https://youtu.be/yjdL2n4lZm4*](https://youtu.be/yjdL2n4lZm4) *for more detailed instructions.* |

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Statistics (STAT)

**STAT 3033. Statistics for the Health Professions** Introduction to data manipulation, analysis, and interpretation for health care professionals. Topics include Evidenced Based Practice, variables, scales of measurement, descriptive statistics, regression, statistical and clinical significance, confidence intervals, hypothesis testing, and inferential statistics including ANOVA. Restricted to College of Nursing and Health Professions majors. Prerequisite, MATH 1023 or equivalent. Fall, Spring, Summer

***STAT 3133. Applied Categorical Data Analysis Descriptive statistics for quantitative and qualitative data, normal distribution, correlation, linear regression, contingency tables and association, Chi-Square test, observational studies and designed experiments, confidence interval and hypothesis testing, McNemar’s, Mann-Whitney, Spearman’s Correlation. Prerequisite, MATH 1023 or MATH 1043. Fall, Spring.***

**STAT 3233. Applied Statistics** I For students in a variety of disciplines including the sciences, allied health fields, and education. Descriptive statistics for quantitative and qualitative data, normal distributions, correlation, linear regression, sample surveys, randomized comparative experiments, sampling distributions, estimation and hypothesis testing for means and proportions. Prerequisite, MATH 1023 or equivalent. Fall, Spring, Summer.

**STAT 4453. Probability and Statistics I** Set theory, random variables, probability laws and distributions, independence, conditioning, moment generating functions and the Central Limit Theorem. Prerequisite, MATH 3254 Fall.