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

**Letter of Notifications**

**[X] Undergraduate Curriculum Council**

**[ ] Graduate Council**

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 for inclusion in curriculum committee agenda.

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|  Hong Zhou | 10/23/2019 |

**Department Curriculum Committee Chair** |

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**COPE Chair (if applicable)** |
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| Amanda Lambertus | 10/23/2019 |

**Department Chair:**  |

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**Head of Unit (If applicable)**   |
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| John Hershberger | 10/25/2019 |

**College Curriculum Committee Chair** |

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**Undergraduate Curriculum Council Chair** |
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| Lynn Boyd | 10/25/2019 |

**College Dean** |

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**Graduate Curriculum Committee Chair** |
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**General Education Committee Chair (If applicable)**   |

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**Vice Chancellor for Academic Affairs** |

**If you require to fill out a Letter of Notification, please email** **curriculum@astate.edu** **or contact Academic Affairs and Research at (870) 972-2030 for guidance PRIOR TO submitting these through the curricular process.**

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

Amanda Lambertus: alambertus@astate.edu, 870-680-8136

Hong Zhou; hzhou@astate.edu; 870-680-8120

**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.* |

Add the following table on page 409 in 2019-20 Undergraduate Bulletin:

**Certificate in Statistics**

|  |  |
| --- | --- |
| **Required Courses:** | Sem. Hrs. |
| STAT 3233, Applied Statistics I ANDSTAT 4473, Applied Statistics II | 6 |
| **Select one of the following courses:**STAT 3133, Applied Categorical Data Analysis STAT 3243, Regression Analysis and Analysis of VarianceSTAT 4483, Statistical Methods Using R | 3 |
| Approved electives in related area  | 3 |
| **Total Required Hours:** | **12** |

**LETTER OF NOTIFICATION – 8**

**UNDERGRADUATE CERTIFICATE PROGRAM**

(6-21 SEMESTER CREDIT HOURS)

1. Institution submitting request: Arkansas State University
2. Contact person/title: Dr. Amanda Lambertus, Chair of Mathematics and Statistics Department
3. Phone number/e-mail address: 870-680-8136, alambertus@astate.edu
4. Proposed effective date: Fall 2020
5. Name of proposed Undergraduate Certificate Program (Program must consist of 6-21 semester credit hours):

 Undergraduate Certificate in Statistics

1. Proposed CIP Code: 27.0501
2. Reason for proposed program implementation:

There is a growing need for the qualified “statistician/statistical analyst” due to the increasing amounts of data collected in business, industry, and government. The Undergraduate Certificates in Statistics program is designed to give students a strong background in statistical methodology and data analysis in preparation for opportunities in the work force or for graduate studies.

The Bureau of Labor Statistics projects that jobs for “statisticians/ statistical analysts” will grow by 30% between 2018 and

2028, much faster than the average for all occupations. The corporations, non-profit organizations, governmental agencies,

educational and research institutes, health care, etc. will need these workers to analyze the increasing volume of digital and

electronic data.

 <https://www.bls.gov/ooh/math/mathematicians-and-statisticians.htm>

In fact, many “statisticians/statistical analysts” work under the titles as data scientist, quantitative analyst, business analyst, statistical researcher, financial analyst, economist, actuarial analyst, biostatistician, etc.

1. Provide the following:
	1. Curriculum outline - List of courses in new program – Underline required courses

|  |  |
| --- | --- |
| **Required Courses:** | Sem. Hrs. |
| STAT 3233, Applied Statistics I ANDSTAT 4473, Applied Statistics II | 6 |
| **Select one of the following courses:**STAT 3133, Categorical Data Analysis STAT 3243, Regression Analysis and ANOVASTAT 4483, Statistical Methods Using R | 3 |
| Approved electives in related area  | 3 |
| **Total Required Hours:** | **12** |

* 1. Total semester credit hours required for proposed program (Program range: 6-21 semester credit hours)

12 hours.

* 1. New courses and new course descriptions

**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 3243, Regression Analysis and ANOVA.** Theory and practice of regression analysis and ANOVA. Introduction of simple and multiple linear regression, inferences about model parameters, regression diagnostics, variable selection, and model adequacy checking and regression approaches to analysis of variance (ANOVA). Prerequisites, STAT 3233 Applied Statistics. Spring.

* 1. Program goals and objectives

The goal of the proposed program is to give undergraduate students majoring in science, engineering, business, and the social sciences more experiences in applied statistics to meet increasing demands for data analysis in the work force. The certificate program is much more application driven than theory driven and focuses on real-world applications and exposes students to different types of popular statistical software.

* 1. Expected student learning outcomes
		+ Students will learn basic statistical theory and methodologies needed to enter into the work force.
		+ Students will formulate real problems and solve them using appropriate statistical methodologies.
		+ Students will apply a variety of the statistical software to conduct data analysis.
		+ Students will communicate statistical concepts and interpret results with clarity and effective exposition to non-statisticians.
	2. Documentation that program meets employer needs

According the 2001-2017 Workforce Analysis report recently conducted by Arkansas Department of Higher Education, the professional- and knowledge-intensive industries offered the most pay and career growth, such as the qualified statisticians/statistical analysts working in finance and insurance, health care and assistance, professional, scientific and technical services, information, etc. For example, some statisticians/statistical analysts working as “Economists” are among the highest earners.

<https://static.ark.org/eeuploads/adhe/Workforce-Analysis.pdf>

* 1. Student demand (projected enrollment) for proposed program 30 per year
	2. Program approval letter from licensure/certification entity, if required N/A
	3. Name of institutions offering similar programs and the institution(s) used as model to develop proposed program

 University of Colorado, Denver

 Virginia Commonwealth University

* 1. Scheduled program review date (within 10 years of program implementation) Academic year 2028-29
1. Institutional curriculum committee review/approval date:
2. Will this program be offered on-campus, off-campus, or via distance delivery? If yes, indicate mode of distance delivery. Mark \*distance technology courses.

 On-campus

1. Identify off-campus location. Provide a copy of email notification to other institutions in the area of the proposed off-campus program offering. N/A
2. Provide additional program information if requested by ADHE staff.

President/Chancellor Approval Date:

Board of Trustees Notification Date:

Chief Academic Officer: Date: