Curriculum Action Request (CAR) Form

COURSE (New Course, Course Modification, Five Year Review)

University of Hawai'i Maui College

Curriculum Proposal # _____

(for CURCOM use only)

1. Curriculum Action

☐ New Course ☑ Course Modification ☐ Five Year Review

2. Proposer

Donna Harbin

3. Department

☐ Allied Health ☐ Business & Hospitality ☐ Career & Tech Education

☐ English ☐ Humanities ☐ Social Science

☑ Science/Tech/Eng/Math

4. Course Alpha

MATH

5. Course Number

115

6. Course Title

Introduction to Statistics and Probability

7. If this is a course modification or a five year review, please check the curriculum items being modified.

☐ 1. Course Alpha ☐ 2. Course Number ☐ 3. Course Title

☐ 4. Credits ☐ 5. Contact Hours ☐ 6. Course Description

☑ 7. Prerequisites ☐ 8. Corequisites ☐ 9. Rec Prep

☐ 10. Cross-list w other course ☐ 13. Grading Method ☐ 14. Repeatable for credit?

☐ 15. SLOs ☐ 16. Course Competencies ☐ 17. Content & Timeline

☐ 18. PLOs ☐ 19. CASLOs ☐ 21. Method of Delivery

☐ 22. Text and Materials ☐ 23. Maximum Enrollment ☐ 29. Course Designation

☑ 31. Catalog Modification

☐ Other

8. Proposed Semester

Fall 2015

9. Effective Semester (1 Year from Proposed Semester)

Fall 2016

University of Hawaii Maui College
MATH 115 - Introduction to Statistics and Probability/ Intro to Stats and Prob (***BANNER system agreement)

1. **Course Alpha.**

   MATH

2. **Course Number.**

   115

3. **Course Title/Catalog Title.**

   Introduction to Statistics and Probability/ Intro to Stats and Prob (***BANNER system agreement)

4. **Number of Credits.**

   3

5. **Contact Hours/Type.**

   - Hour lecture (3)

6. **Course Description.**

   Utilizes basic statistical topics including measures of central tendency and dispersion, classification of variables, sampling techniques, elementary probability, normal and binomial probability distributions, tests of hypothesis, linear regression and correlation in order to solve problems.

7. **Pre-Requisites.**

   MATH 75 with grade C or better, or placement at least MATH 82, and ENG 100 with grade C or better (or concurrent), or consent.

8. **Co-requisites.**

   None

9. **Recommended Preparation.**

   None

10. **Is this a cross-listed course?**

    NO

11. **Reason for Proposal. Why is this course being proposed or modified? This question requires specific information as part of the explanation.**

    Change prerequisite to include MATH 75 (currently proposed) or MATH 22 as well as placement at MATH 82.

12. **Effective Semester and Year.**

Fall 2016

13. Grading Method. What grading methods may be used for this course?

- Standard (Letter,Cr/NCr,Audit) (0)

14. Is this course repeatable for credit? How often can this course be counted toward a degree or certificate?

NO

15. Course Student Learning Outcomes (SLOs).

Competency/Course SLO	Choose appropriate symbolic mathematical techniques and employ them to solve and interpret statistical application.	Demonstrate effective use of technology in solving such problems.	Communicate the solution of such problems using Standard English and numeric, graphic, or symbolic representation.
Define, calculate, and interpret various descriptive and inferential statistical processes.	☑	☑	☑
Solve normal distribution application problems.	☑	☑	☑
Create a linear regression model equation from data points, interpret the correlation coefficient, and use the model to make predications.	☑	☑	☑
Define, calculate, and interpret various probability concepts and application problems.	☑	☑	☑
Apply and interpret appropriate concepts such as random sampling and confidence intervals in statistical analysis.	☑	☑	☑
Discuss and interpret statistical inference, confidence intervals, hypothesis testing, z test, research and null hypothesis, sample statistics, and population parameters.	☑		☑
Explain the concepts of statistical confidence, power, and the impact of type I and type II errors.	☑		☑
Differentiate between the concepts of levels of confidence, interval estimate, confidence interval, and significance level.	☑		☑
Conduct a single sample, independent samples, and correlated/dependent pair t-tests.	☑	☑	☑
Calculate a confidence interval for the proportion of a population, the mean of a population, matched paired data, and the difference between two means.	☑	☑	☑

Course SLO/PSLO	Demonstrate an understanding of theories, practices, histories, and key issues of a field of study using essential terminology and concepts of the discipline.	Use theories, concepts, and practices of a field of study to analyze evidence, artifacts, and/or texts and produce interpretations, hypotheses, evaluations, or conclusions.	Apply theories and/or methods of a field of study to perform practical, scholarly, and/or creative tasks that respond to social, cultural, environmental, or economic issues.
Choose appropriate symbolic mathematical techniques and employ them to solve and interpret statistical application.	☑	☑	☑
Demonstrate effective use of technology in solving such problems.		☑	
Communicate the solution of such problems using Standard English and numeric, graphic, or symbolic representation.	☑	☑	☑

16. Course Competencies.

Competency
Define, calculate, and interpret various descriptive and inferential statistical processes.
Solve normal distribution application problems.
Create a linear regression model equation from data points, interpret the correlation coefficient, and use the model to make predications.
Define, calculate, and interpret various probability concepts and application problems.
Apply and interpret appropriate concepts such as random sampling and confidence intervals in statistical analysis.
Discuss and interpret statistical inference, confidence intervals, hypothesis testing, z test, research and null hypothesis, sample statistics, and population parameters.
Explain the concepts of statistical confidence, power, and the impact of type I and type II errors.
Differentiate between the concepts of levels of confidence, interval estimate, confidence interval, and significance level.
Conduct a single sample, independent samples, and correlated/dependent pair t-tests.
Calculate a confidence interval for the proportion of a population, the mean of a population, matched paired data, and the difference between two means.

17. Recommended Course Content and Timeline. The course content facilitates the course competencies. Course content may be organized by weeks, units, topics or the like.

Content
Weeks 1-5: Descriptive statistics Weeks 6 - 10: Elementary probability Weeks 11-16: Inferential statistics

18. Program Learning Outcomes.

Program SLO
Demonstrate an understanding of theories, practices, histories, and key issues of a field of study using essential terminology and concepts of the discipline.
Use theories, concepts, and practices of a field of study to analyze evidence, artifacts, and/or texts and produce interpretations, hypotheses, evaluations, or conclusions.
Apply theories and/or methods of a field of study to perform practical, scholarly, and/or creative tasks that respond to social, cultural, environmental, or economic issues.

19. College-wide Academic Student Learning Outcomes (CASLOs).

	Creativity - Able to express originality through a variety of forms.
☑	**Critical Thinking** - Apply critical thinking skills to effectively address the challenges and solve problems. ☑ Preparatory Level
	Information Retrieval and Technology - Access, evaluate, and utilize information effectively, ethically, and responsibly.
	Oral Communication - Practice ethical and responsible oral communications appropriately to a variety of audiences and purposes.
☑	**Quantitative Reasoning** - Synthesize and articulate information using appropriate mathematical methods to solve problems of quantative reasoning accurately and appropriately. ☑ Preparatory Level
	Written Communication - Write effectively to convey ideas that meet the needs of specific audiences and purposes.

20. Linking.

21. Method(s) of delivery appropriate for this course.

- Cable TV (0)
- Classroom/Lab (0)
- HITS/Interactive TV (0)
- Hybrid (0)
- Online (0)

22. Text and Materials, Reference Materials, and Auxiliary Materials.

Texts such as:

Larson, R. and Farber, B. (2011 Elementary Statistics, 5th Edition Pearson Publishing

23. Maximum enrollment.

35

24. Particular room type requirement. Is this course restricted to particular room type?

NO

25. Special scheduling considerations. Are there special scheduling considerations for this course?

NO

26. Are special or additional resources needed for this course?

No

27. Does this course require special fees to be paid for by students?

NO

28. Does this course change the number of required credit hours in a degree or certificate?

No

29. Course designation(s) for the Liberal Arts A.A. degree and/or for the college's other associate degrees.

Degree	Program	Category
Associate in Arts:	Liberal Arts	FS - Symbolic Reasoning LE - Elective
AS:	ANY	QR - Quantitative Reasoning
AAS:	ANY	QR - Quantitative Reasoning
BAS:	ABIT	QR - Quantitative Reasoning
Developmental/Remedial:	N/A	

also : AA in Hawaiian Studies

30. Course designation(s) for other colleges in the UH system.

FS in UH System

31. Indicate the year and page # of UHMC catalog referred to. For new or modified courses, please indicate

the catalog pages that need to be modified and provide a sheet outlining those changes.

UHMC General Catalog 2015-2016; Pages 131 and 132

32. College-wide Academic Student Learner Outcomes (CASLOs).

Standard 1 - Written Communication Write effectively to convey ideas that meet the needs of specific audiences and purposes.	
Outcome 1.1 - Use writing to discover and articulate ideas.	1
Outcome 1.2 - Identify and analyze the audience and purpose for any intended communication.	1
Outcome 1.3 - Choose language, style, and organization appropriate to particular purposes and audiences.	1
Outcome 1.4 - Gather information and document sources appropriately.	1
Outcome 1.5 - Express a main idea as a thesis, hypothesis, or other appropriate statement.	2
Outcome 1.6 - Develop a main idea clearly and concisely with appropriate content.	1
Outcome 1.7 - Demonstrate a mastery of the conventions of writing, including grammar, spelling, and mechanics.	0
Outcome 1.8 - Demonstrate proficiency in revision and editing.	0
Outcome 1.9 - Develop a personal voice in written communication.	0
Standard 2 - Quantitative Reasoning Synthesize and articulate information using appropriate mathematical methods to solve problems of quantative reasoning accurately and appropriately.	
Outcome 2.1 - Apply numeric, graphic, and symbolic skills and other forms of quantitative reasoning accurately and appropriately.	3
Outcome 2.2 - Demonstrate mastery of mathematical concepts, skills, and applications, using technology when appropriate.	3
Outcome 2.3 - Communicate clearly and concisely the methods and results of quantitative problem solving.	2
Outcome 2.4 - Formulate and test hypotheses using numerical experimentation.	3
Outcome 2.5 - Define quantitative issues and problems, gather relevant information, analyze that information, and present results.	2
Outcome 2.6 - Assess the validity of statistical conclusions.	3
Standard 3 - Information Retrieval and Technology. Access, evaluate, and utilize information effectively, ethically, and responsibly.	
Outcome 3.1 - Use print and electronic information technology ethically and responsibly.	1
Outcome 3.2 - Demonstrate knowledge of basic vocabulary, concepts, and operations of information retrieval and technology.	0
Outcome 3.3 - Recognize, identify, and define an information need.	0
Outcome 3.4 - Access and retrieve information through print and electronic media, evaluating the accuracy and authenticity of that information.	1
Outcome 3.5 - Create, manage, organize, and communicate information through electronic media.	1
Outcome 3.6 - Recognize changing technologies and make informed choices about their appropriateness and use.	0
Standard 4 - Oral Communication Practice ethical and responsible oral communications appropriately to a variety of audiences and purposes.	
Outcome 4.1 - Identify and analyze the audience and purpose of any intended communication.	0
Outcome 4.2 - Gather, evaluate, select, and organize information for the communication.	1
Outcome 4.3 - Use language, techniques, and strategies appropriate to the audience and occasion.	0
Outcome 4.4 - Speak clearly and confidently, using the voice, volume, tone, and articulation appropriate to the audience and occasion.	0
Outcome 4.5 - Summarize, analyze, and evaluate oral communications and ask coherent questions as needed.	1
Outcome 4.6 - Use competent oral expression to initiate and sustain discussions.	1
Standard 5 - Critical Thinking Apply critical thinking skills to effectively address the challenges and solve problems.	
Outcome 5.1 - Identify and state problems, issues, arguments, and questions contained in a body of information.	3

Outcome 5.2 - Identify and analyze assumptions and underlying points of view relating to an issue or problem.	2
Outcome 5.3 - Formulate research questions that require descriptive and explanatory analyses.	3
Outcome 5.4 - Recognize and understand multiple modes of inquiry, including investigative methods based on observation and analysis.	3
Outcome 5.5 - Evaluate a problem, distinguishing between relevant and irrelevant facts, opinions, assumptions, issues, values, and biases through the use of appropriate evidence.	2
Outcome 5.6 - Apply problem-solving techniques and skills, including the rules of logic and logical sequence.	1
Outcome 5.7 - Synthesize information from various sources, drawing appropriate conclusions.	2
Outcome 5.8 - Communicate clearly and concisely the methods and results of logical reasoning.	1
Outcome 5.9 - Reflect upon and evaluate their thought processes, value system, and world views in comparison to those of others.	1
Standard 6 - Creativity Able to express originality through a variety of forms.	
Outcome 6.1: Generate responses to problems and challenges through intuition and non-linear thinking.	1
Outcome 6.2: Explore diverse approaches to solving a problem or addressing a challenge.	2
Outcome 6.3: Sustain engagement in activities without a preconceived purpose.	0
Outcome 6.4: Apply creative principles to discover and express new ideas.	0
Outcome 6.5: Demonstrate the ability to trust and follow one's instincts in the absence of external direction	1
Outcome 6.6: Build upon or adapt the ideas of others to create novel expressions or new solutions.	1

33. Additional Information