UNIVERSITY OF HAWAII MAUI COLLEGE
ASSOCIATE IN ARTS DEGREE
REVIEW OF COURSES FOR AA CATEGORY INCLUSION

SUBJECT ALPHA: OCN **COURSE NUMBER: 250**

If the course is cross-listed, please provide the cross-listing: Subject _____ Course # _____

COURSE TITLE: Statistical Applications in Marine Science

CATEGORY: I – FOUNDATIONS/SKILLS II

SUB-CATEGORY: Numeracy

HALLMARKS:

To satisfy the Numeracy requirement, a course will:

a) Introduce students to current technology for performing numerical computation and solving problems through numerical methods.
b) Provide students with guided practice in collecting, organizing, and summarizing data to test hypotheses and make predictions.
c) Require students to graphically display and interpret information.
d) Require students to use the full diversity of real numbers from the small to the very large in their various forms (fractions, decimals, percents, scientific notation) for computation and evaluation of formulas.

Is the course outline, on file with the UHMC Curriculum Committee, consistent with the Hallmarks stated above? X Yes _____ No

If "No" and you wish to submit changes to correspond with the Hallmarks, attach a University of Hawaii Maui College Curriculum Action Request (CAR) (Form 4-93) with new course outline.

OR

Recommend course be changed to another sub-category: _____

OR

Recommend course be used only as general elective

Ann Coopersmith
Instructor's Printed Name

ACoopersmith 20 Oct 2011
Instructor's Signature Date

View Outline

View: Compressed | Expanded **Statistical Applications in Marine Science** Print friendly

1. **Course Alpha. See HELP for information.**

   OCN

2. **Course Number. See HELP for information.**

   250

3. **Course Title/Catalog Title. See HELP for information.**

   Statistical Applications in Marine Science

4. **Number of Credits. See HELP for information.**

   3

5. **Contact Hours/Type. See HELP for information.**

   - Hour lab (2)
   - Hour lecture (2)

6. **Course Description. See HELP for information.**

   Introduces design of field experiments including collection and analysis of ecological data. Uses computer software for statistical analysis. Requires completion of a project using data collected in the field followed by both written and oral reports.

7. **Pre-Requisites. Please click on HELP icon for style sheet.**

   either
   OCN 201 or ZOOL 200 with grade C or better; or consent.

8. **Co-requisites**

9. **Recommended Preparation.**

   Computer competence.

10. **Is this a cross-listed course? See help for information.**

    NO

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

    Hour lab

    Course is a required prerequisite for most of the courses included in the collaborative BA and BS degrees in Marine Science to be offered at UHMC by UH-Hilo through the UHMC University Center. It will also be required for courses included in the the proposed UHMC BAS degree in Ocean Studies.

12. **Effective Semester and Year. For new or modified courses, the effective year is one year from the semester proposed. For example, if proposed in Spring 2012, the effective semester is Spring 2013. See help for more information.**

    Fall 2012

13. **Grading Method. What grading methods may be used for this course? See help for information.**

    - 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? See help for information.**

    NO

15. **DO NOT ENTER TEXT IN THE TEXT BOX BELOW. Click on the yellow button "COURSE LEARNING OUTCOMES" and enter in that screen. Course Student Learning Outcomes (Course SLOs). These need to be added before the connections are made in question 20. See help for information.**

Course SLO/Competency	develop a strategy to sample a population relative to a specific question and including relevant controls.	use descriptive statistics and graphics to summarize a set of sample data,	use basic inferential statistical analyses to test hypotheses and interpret results, and	present and explain results of statistical analysis and interpret other published statistical results.
Use statistical techniques to answer questions and determine the validity of hypotheses,	☑	☑	☑	☑

Interpret the results of statistical graphs and calculations.	☑	☑	☑	☑

Course SLO/GESLO	Critical Thinking - Apply critical thinking skills to effectively address the challenges and solve problems.	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	Written Communication - Write effectively to convey ideas that meet the needs of specific audiences and purposes.
Use statistical techniques to answer questions and determine the validity of hypotheses.	☑	☑	☑	☑	☑
Interpret the results of statistical graphs and calculations.	☑	☑	☑	☑	☑

Course SLO/PSLO	Students should be able to synthesize and articulate information using appropriate mathematical methods to solve problems and logically address real-life situations.
Use statistical techniques to answer questions and determine the validity of hypotheses.	☑
Interpret the results of statistical graphs and calculations.	☑

16. DO NOT ENTER TEXT IN THE TEXT BOX BELOW. Click on the yellow button "COURSE COMPETENCIES/ISSUES/SKILLS" and enter text in that screen.
Competencies/Concepts/Issues/Skills

Competency/Content	Week 1: Introduction, scientific method, populations and sampling; Lab: Minitab tutorial	Week 2: Frequency distributions, statistics of location, statistics of dispersion; Lab: Introduction to Minitab	Week 3: Quartiles and boxplots; Lab: Graphing & descriptive statistics	Week 4: Probability distributions, introduction to hypothesis testing, one sample t-tests; Lab: One sample T-tests, normality	Week 5: Test for normality, statistical power; Lab: Exam	Week 6: Two sample tests of means and variance; Lab: Collect field data	Week 7: Nonparametric two-sample tests of means, experimental design; Lab: Two sample tests	Week 8: Experimental design questions, analysis of variance; Lab: ANOVA	Week 9: ANOVA, Kruskal Wallis test; Lab: ANOVA, Kruskal-Wallis	Week 10: Multiple comparisons, nonparametric multiple comparisons; Lab: Exam	Week 11: Two-factor ANOVA; Lab: Two-factor ANOVA	Week 12: Randomized block ANOVAs, nested ANOVA; Lab: Two factor ANOVAs	Weeks 13-14: ANOVA transformations, linear correlation, linear regression, data transformation; Lab: Correlation	Week 15: Goodness of fit tests; Lab: Chi square analysis
develop a strategy to sample a population relative to a specific question and including relevant controls.	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
use descriptive statistics and graphics to summarize a set of sample data.		☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
use basic inferential statistical analyses to test hypotheses and interpret results, and		☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
present and explain results of statistical analysis and interpret other published statistical results.		☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑

17. DO NOT ENTER TEXT IN THE TEXT BOX BELOW. Click on the yellow button "RECOMMENDED COURSE CONTENT..." and enter text in that screen. Recommended Course Content and Timeline. See HELP for information.

Content
Week 1: Introduction, scientific method, populations and sampling; Lab: Minitab tutorial
Week 2: Frequency distributions, statistics of location, statistics of dispersion; Lab: Introduction to Minitab
Week 3: Quartiles and boxplots; Lab: Graphing & descriptive statistics
Week 4: Probability distributions, introduction to hypothesis testing, one sample t-tests; Lab: One sample T-tests, normality
Week 5: Test for normality, statistical power; Lab: Exam
Week 6: Two sample tests of means and variance; Lab: Collect field data
Week 7: Nonparametric two-sample tests of means, experimental design; Lab: Two sample tests
Week 8: Experimental design questions, analysis of variance; Lab: ANOVA

Week 9: ANOVA, Kruskal Wallis test; Lab: ANOVA, Kruskal-Wallis
Week 10: Multiple comparisons, nonparametric multiple comparisons; Lab: Exam
Week 11: Two-factor ANOVA; Lab: Two-factor ANOVA
Week 12: Randomized block ANOVAs, nested ANOVA; Lab: Two factor ANOVAs
Weeks 13-14: ANOVA transformations, linear correlation, linear regression, data transformation; Lab: Correlation
Week 15: Goodness of fit tests; Lab: Chi square analysis

18. Recommended Evaluation and Assessment Methods. See help for information.

- Includes, but is not limited to: group discussions, group projects, group presentations, group exercises, group/team work in- and out-side of the classroom; appropriate rubrics. (0)
- Includes, but is not limited to: assignments done outside of class in any discipline, such as math problems, reading and questions, chapter questions, critical thinking questions, class preparation; appropriate rubrics. (0)
- Includes, but is not limited to: attendance, participation, readings, art projects, media reviews, reactions to speakers, critical thinking exercises, or reflective exercises; appropriate rubrics. (0)
- Includes, but is not limited to: reading logs, reflective journals, mentoring logs, tutoring logs, personal growth journals, professional logs, service learning logs; appropriate rubrics. (0)
- Includes, but is not limited to: lab assignments, lab projects, field assignments, field projects, student teaching, skill-building work, or hands-on projects; appropriate rubrics. (0)
- Includes, but is not limited to: speeches, class talks, drama presentations, oral readings, interviewing, capstone or other class presentations, oral presentations using technology, oral presentations given via technology; appropriate rubrics. (0)
- Other, not included in above (0)
- Includes, but is not limited to: research, art, observation, interview, or service learning projects, portfolio development; appropriate rubrics. (0)
- Includes, but is not limited to: essay tests, objective tests, mid-term and final exams, unit exams, quizzes of all types, tests may be written, oral, computerized, in-class, take-home, at testing sites; appropriate rubrics. (0)
- Includes, but is not limited to: term papers, essays, creative writings, reports, or reaction papers; appropriate rubrics. (0)

Method of Evaluation	Includes, but is not limited to: assignments done outside of class in any discipline, such as math problems, reading and questions, chapter questions, critical thinking questions, class preparation; appropriate rubrics.	Includes, but is not limited to: attendance, participation, readings, art projects, media reviews, reactions to speakers, critical thinking exercises, or reflective exercises; appropriate rubrics.	Includes, but is not limited to: essay tests, objective tests, mid-term and final exams, unit exams, quizzes of all types, tests may be written, oral, computerized, in-class, take-home, at testing sites; appropriate rubrics.	Includes, but is not limited to: group discussions, group projects, group presentations, group exercises, group/team work in- and out-side of the classroom; appropriate rubrics.	Includes, but is not limited to: lab assignments, lab projects, field assignments, field projects, student teaching, skill-building work, or hands-on projects; appropriate rubrics.	Includes, but is not limited to: reading logs, reflective journals, mentoring logs, tutoring logs, personal growth journals, professional logs, service learning logs; appropriate rubrics.	Includes, but is not limited to: research, art, observation, interview, or service learning projects, portfolio development; appropriate rubrics.	Includes, but is not limited to: speeches, class talks, drama presentations, oral readings, interviewing, capstone or other class presentations, oral presentations using technology, oral presentations given via technology; appropriate rubrics.	Includes, but is not limited to: term papers, essays, creative writings, reports, or reaction papers; appropriate rubrics.	Other, not included in above
Course SLOs										
Use statistical techniques to answer questions and determine the validity of hypotheses.										
Interpret the results of statistical graphs and calculations.										
Course Competencies										
develop a strategy to sample a population relative to a specific question and including relevant controls.										
use descriptive statistics and graphics to summarize a set of sample data.										
use basic inferential statistical analyses to test hypotheses and interpret results, and										
present and explain results of statistical analysis and interpret other published statistical results.										

Method of Evaluation
Includes, but is not limited to: assignments done outside of class in any discipline, such as math problems, reading and questions, chapter questions, critical thinking questions, class preparation; appropriate rubrics.
Includes, but is not limited to: attendance, participation, readings, art projects, media reviews, reactions to speakers, critical thinking exercises, or reflective exercises; appropriate rubrics.
Includes, but is not limited to: essay tests, objective tests, mid-term and final exams, unit exams, quizzes of all types, tests may be written, oral, computerized, in-class, take-home, at testing sites; appropriate rubrics

Includes, but is not limited to: group discussions, group projects, group presentations, group exercises, group/team work in- and out-side of the classroom; appropriate rubrics.
Includes, but is not limited to: lab assignments, lab projects, field assignments, field projects, student teaching, skill-building work, or hands-on projects; appropriate rubrics.
Includes, but is not limited to: reading logs, reflective journals, mentoring logs, tutoring logs, personal growth journals, professional logs, service learning logs; appropriate rubrics.
Includes, but is not limited to: research, art, observation, interview, or service learning projects, portfolio development; appropriate rubrics.
Includes, but is not limited to: speeches, class talks, drama presentations, oral readings, interviewing, capstone or other class presentations, oral presentations using technology, oral presentations given via technology; appropriate rubrics.
Includes, but is not limited to: term papers, essays, creative writings, reports, or reaction papers; appropriate rubrics.
Other, not included in above

Other: Computer applications - Includes statistics (Mini Tab), word processing (Word), spreadsheet (Excel)

19. DO NOT ENTER TEXT IN THE TEXT BOX BELOW. Click on the yellow button "PLOs" and enter text in that screen. Program Student Learning Outcomes (PLOs) supported by this course. If you are not a "program" use the Liberal Arts PLOs, view them by clicking on the HELP icon.

AA in Liberal Arts PLO, Quantitative Reasoning

Students should be able to synthesize and articulate information using appropriate mathematical methods to solve problems and logically address real-life situations.

Program SLO
Students should be able to synthesize and articulate information using appropriate mathematical methods to solve problems and logically address real-life situations.

20. General Education Student Learner Outcomes (CASLOs). FIRST, fill out the CASLO grid located in the UHMC tab above. Click on the HELP icon for tips on determining support for the CASLOs and indicate your choices below by clicking on the box in front of each supported CASLO. NOTE: Our campus does not use the Preparatory Level, Level 1 and Level 2 designations in the chart below.

	Creativity - Able to express originality through a variety of forms.
☑	**Critical Thinking** - Apply critical thinking skills to effectively address the challenges and solve problems. ☑ Level 1
☑	**Information Retrieval and Technology** - Access, evaluate, and utilize information effectively, ethically, and responsibly. ☑ Level 1
☑	**Oral Communication** - Practice ethical and responsible oral communications appropriately to a variety of audiences and purposes. ☑ Preparatory Level
☑	**Quantitative Reasoning** - Synthesize and articulate information using appropriate mathematical methods to solve problems of quantative reasoning accurately and appropriately. ☑ Level 2
☑	**Written Communication** - Write effectively to convey ideas that meet the needs of specific audiences and purposes. ☑ Preparatory Level

	Creativity	Critical Thinking	Information Retrieval and Technology	Oral Communication	Quantitative Reasoning	Written Communication
Includes, but is not limited to: assignments done outside of class in any discipline, such as math problems, reading and questions, chapter questions, critical thinking questions, class preparation; appropriate rubrics.		☑	☑	☑	☑	☑
Includes, but is not limited to: attendance, participation, readings, art projects, media reviews, reactions to speakers, critical thinking exercises, or reflective exercises; appropriate rubrics.		☑	☑	☑	☑	☑
Includes, but is not limited to: essay tests, objective tests, mid-term and final exams, unit exams, quizzes of all types, tests may be written, oral, computerized, in-class, take-home, at testing sites; appropriate rubrics.		☑	☑	☑	☑	☑
Includes, but is not limited to: group discussions, group projects, group presentations, group exercises, group/team work in- and out-side of the classroom; appropriate rubrics.		☑	☑		☑	
Includes, but is not limited to: lab assignments, lab projects, field assignments, field projects, student teaching, skill-building work, or hands-on projects; appropriate rubrics.		☑	☑	☑	☑	☑
Includes, but is not limited to: reading logs, reflective journals, mentoring logs, tutoring logs, personal growth journals, professional logs, service learning logs; appropriate rubrics.		☑	☑	☑	☑	☑
Includes, but is not limited to: research, art,						

observation, interview, or service learning projects, portfolio development; appropriate rubrics.		☑	☑	☑	☑	☑
Includes, but is not limited to: speeches, class talks, drama presentations, oral readings, interviewing, capstone or other class presentations, oral presentations using technology, oral presentations given via technology; appropriate rubrics.		☑	☑	☑	☑	☑
Includes, but is not limited to: term papers, essays, creative writings, reports, or reaction papers; appropriate rubrics.		☑	☑	☑	☑	☑
Other, not included in above						

GenED SLO
Critical Thinking - Apply critical thinking skills to effectively address the challenges and solve problems.
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.
Written Communication - Write effectively to convey ideas that meet the needs of specific audiences and purposes.

21. Linking Items in Course Outline. CLICK ON CHAIN LINK ICON IN UPPER RIGHT HAND CORNER TO BEGIN LINKING. See HELP for more information on Linking.

22. Method(s) of delivery appropriate for this course. See Help for information.

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

23. Text and Materials, Reference Materials, and Auxiliary Materials. See Help for information.

Glover, T. & Mitchell, K. 2008. *An Introduction to Biostatistics*, 2nd ed. Waveland Press, Inc.

MiniTab computer software

24. Maximum enrollment. See Help for information.

Depends on number of computer lab stations with software licenses; 24 maximum

25. Particular room type requirement. Is this course restricted to particular room type? See Help for information.

YES

Computer lab

26. Special scheduling considerations. Are there special scheduling considerations for this course? See Help for information.

NO

27. Are special or additional resources needed for this course? See Help for information.

NO

28. Does this course require special fees to be paid for by students? See Help for information.

NO

29. Does this course change the number of required credit hours in a degree or certificate? See help for information.

NO

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

Degree	Program	Category
AA Liberal Arts:	AA	LE - Elective
AS:	ANY	PE - Program Elective
AAS:	ANY	PE - Program Elective
BAS:	ANY	Other

Developmental/ Remedial:	N/A	

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

32. 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 to reflect the new or modified course and provide sheet outlining catalog changes.

2011-2012, page 138

33. General Education Student Learner Outcomes (CASLOs). Please click on the HELP icon for more information.

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.		1
Outcome 1.8 - Demonstrate proficiency in revision and editing.		1
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.		3
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.		2
Outcome 3.2 - Demonstrate knowledge of basic vocabulary, concepts, and operations of information retrieval and technology.		2
Outcome 3.3 - Recognize, identify, and define an information need.		1
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.		1
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.		1
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.		1
Outcome 4.4 - Speak clearly and confidently, using the voice, volume, tone, and articulation appropriate to the audience and occasion.		1
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.		0
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.		1
Outcome 5.2 - Identify and analyze assumptions and underlying points of view relating to an issue or problem.		1
Outcome 5.3 - Formulate research questions that require descriptive and explanatory analyses.		2
Outcome 5.4 - Recognize and understand multiple modes of inquiry, including investigative methods based on observation and analysis.		2
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.		2
Outcome 5.7 - Synthesize information from various sources, drawing appropriate conclusions.		1
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.		0
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.		0
Outcome 6.2: Explore diverse approaches to solving a problem or addressing a challenge.		1
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		0
Outcome 6.6: Build upon or adapt the ideas of others to create novel expressions or new solutions.		1

34. Additional Information

Outline Information

Proposer: ANN COOPERSMITH
Progress: APPROVAL
Modify Date: 01/08/2012 7:18 PM
Approved Date:

approval history (2) | Print friendly