

LSC Use Only Proposal No:

LSC Action-Date: AP-3/29/12

UWUCC Use Only Proposal No: 11-135

UWUCC Action-Date: AP-4/24/12

Senate Action Date: App-5/01/12

Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

Contact Person(s) Francisco Alarcon	Email Address falarcon@iup
Proposing Department/Unit Mathematics	Phone 724-357-2608

Check all appropriate lines and complete all information. Use a separate cover sheet for each course proposal and/or program proposal.

1. Course Proposals (check all that apply)

- | | | |
|---|--|---|
| ☐ New Course | ☐ Course Prefix Change | ☐ Course Deletion |
| ☒ Course Revision | ☐ Course Number and/or Title Change | ☐ Catalog Description Change |

Current course prefix, number and full title: MATH 217 Probability & Statistics

Proposed course prefix, number and full title, if changing:

2. Liberal Studies Course Designations, as appropriate

This course is also proposed as a Liberal Studies Course (please mark the appropriate categories below)

- | | | | |
|--|--|---|---|
| ☐ Learning Skills | ☒ Knowledge Area | ☐ Global and Multicultural Awareness | ☐ Writing Across the Curriculum (W Course) |
| ☐ Liberal Studies Elective (please mark the designation(s) that applies – must meet at least one) | | | |
| ☐ Global Citizenship | ☐ Information Literacy | ☐ Oral Communication | |
| ☐ Quantitative Reasoning | ☐ Scientific Literacy | ☐ Technological Literacy | |

3. Other Designations, as appropriate

- | | |
|--|---|
| ☐ Honors College Course | ☐ Other: (e.g. Women's Studies, Pan African) |
|--|---|

4. Program Proposals

- | | | | |
|---|--|---|------------------------------------|
| ☐ Catalog Description Change | ☐ Program Revision | ☐ Program Title Change | ☐ New Track |
| ☐ New Degree Program | ☐ New Minor Program | ☒ Liberal Studies Requirement Changes | ☐ Other |

Current program name:

Proposed program name, if changing:

5. Approvals	Signature	Date
Department Curriculum Committee Chair(s)		02/19/2012
Department Chairperson(s)		2/20/12
College Curriculum Committee Chair		3/22/12
College Dean		3/22/12
Director of Liberal Studies (as needed)		4/19/12
Director of Honors College (as needed)		
Provost (as needed)		
Additional signature (with title) as appropriate		
UWUCC Co-Chairs	 Received	4/24/12

JUN 25 2012

APR 19 2012

Liberal Studies

Liberal Studies

Received

MAR 23 2012

Liberal Studies

Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

Processing Department/Unit	Mathematics	Phone	154-387-3808
Contact Person(s)	Francisco Alarcon	Email Address	faralcon@uio

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☐ New Course ☒ Course Revision ☐ Course Number and/or Title Change ☐ Course Description Change ☐ Course Definition	☐ Course Title Change ☐ Course Number and/or Title Change	☐ Course Title Change ☐ Course Description Change ☐ Course Definition
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ola: luf baw yednaw xistc ezunoo mawun

Ignazio il più bel bambino della scuola

☐ Learning Skills	☒ Knowledge Area	☐ Global and Multicultural Awareness	☐ Writing Across the Curriculum (WAC)
☐ Quantitative Reasoning	☐ Scientific Literacy	☐ Technological Literacy	
☐ Global Citizenship	☐ Information Literacy	☐ Oral Communication	

☐ Liberal Studies Elective (please mark the designation(s) that apply – must meet at least one)

using the following formula:

☐ New Degree Program ☐ Catalog Description Change ☐ Program Revision ☒ New Minor Program	☐ Other (e.g. Women's Studies, Pan African) ☐
--	--

2025 RELEASE UNDER E.O. 14176

...photo is great esp. on background

[illegible]

SECRET

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Liberal Studies

REVISED

102 P. J. V.

Scientific introduction

Part II.

1. New Syllabus of Record

I. CATALOG DESCRIPTION

MATH 217 Probability and Statistics

3c-0l-3cr

Prerequisite: For non-math majors

Frequency distributions, measures of central tendency and variation, elementary probability, sampling, estimation, testing hypotheses, correlation and regression. Emphasis will be placed on applications in the social sciences using appropriate technology, as opposed to theoretical development of topics.

II. COURSE OUTCOMES

Objective 1:

Create and interpret the basic graphical representations of data.

Expected Learning Outcomes 1 and 2:

Informed and Empowered Learners

Rationale:

Assignments will require students to have a level of knowledge of graphical representations of data that will enable them to describe and summarize a set of data. Assignments will also require students to critically analyze, interpret, and use graphical representations of data from experiments and observations in order to draw inference to phenomena from the natural, social, and or technical world.

Objective 2:

Calculate and interpret basic numerical descriptions of data.

Expected Learning Outcomes 1 and 2:

Informed and Empowered Learners

Rationale:

Assignments will require students to have a level of knowledge of numerical descriptions of data that will enable them to describe and summarize a set of data. Assignments will also require students to critically analyze, interpret, and use numerical descriptions of data from experiments and observations in order to draw inference to phenomena from the natural, social, and or technical world.

Objective 3:

Understand the basic concepts of probability and how to apply them.

Expected Learning Outcomes 1 and 2:

Informed and Empowered Learners

Rationale:

Assignments will require students to have a level of knowledge of probability that will enable them to understand the concepts, properties, and rules of probability. Assignments will also require students to interpret and use the concepts of probability in drawing

inferences about probabilistic events from the natural, social, and or technical world.

Objective 4:

Estimate population parameters using confidence intervals.

Expected Learning Outcomes 1 and 2:

Informed and Empowered Learners

Rationale:

Assignments will require students to have a level of knowledge of confidence intervals that will enable them to estimate unknown characteristics of a population. Assignments will also require students to construct and interpret confidence intervals to draw inference to unknown characteristics of populations found in the natural, social, and or technical world.

Objective 5:

Evaluate statements about a population using tests of significance.

Expected Learning Outcomes 1 and 2:

Informed and Empowered Learners

Rationale:

Assignments will require students to have a level of knowledge of tests of significance that will enable them to evaluate statements about unknown characteristics of a population. Assignments will also require students to perform and interpret tests of significance to answer research questions about phenomena in the natural, social, and or technical world.

III. COURSE OUTLINE / TIME SCHEDULE

- | | |
|--|------------|
| 1. Basic Sampling Designs, Observational Studies and Experiments | (3 hours) |
| 2. Graphically Summarizing Qualitative and Quantitative Data | (2 hours) |
| 3. Numerically Summarizing Quantitative Data | (3 hours) |
| 4. Scatterplots, Correlation and Regression | (6 hours) |
| 5. Basic Probability | (3 hours) |
| 6. The Normal Probability Distribution | (3 hours) |
| 7. Sampling Distributions for the Mean and Proportions | (2 hours) |
| 8. Confidence Intervals for the Mean and Proportions | (4 hours) |
| 9. Hypothesis Testing for the Mean and Proportions | (4 hours) |
| 10. Inference on Two Samples | (4 hours) |
| 11. Contingency Tables and the Chi-Square Test for Independence | (optional) |

This syllabus leaves an additional 8 hours for tests, other optional topics, etc. The final or culminating activity is an additional 2 academic hours.

IV. EVALUATION METHODS

- 60% Three Tests (20% for each test) – Test will be given during the regular semester
20% Final Examination. The final examination will be comprehensive.
20% Homework, Quizzes, and Projects. These will cover textbook assignments and applications.

V. EXAMPLE GRADING SCALE

90 - 100%	A
80 - 89%	B
70-79%	C
60 - 69%	D
Below 60%	F

VI. UNDERGRADUATE COURSE ATTENDANCE POLICY

Although there is no formal attendance policy for this class, student learning is enhanced by regular attendance and participation in class discussions. The University expects all students to attend class.

[Note: It is recommended that an attendance policy be developed by individual faculty and included in student syllabi. (See undergraduate catalog for Undergraduate Course Attendance Policy.)]

VII. REQUIRED TEXTBOOKS, SUPPLEMENTAL BOOKS AND READINGS

Sullivan, M. (2012). *Statistics: Informed Decisions Using Data* (4th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

VIII. SPECIAL RESOURCE REQUIREMENTS

Most instructors require students to purchase a scientific or graphing calculator.

IX. BIBLIOGRAPHY

Consortium for the Advancement of Undergraduate Statistics Education.
(<http://www.causeweb.org/>).

Journal of Statistics Education Data Archive.
(http://www.amstat.org/publications/jse/jse_data_archive.htm).

Moore, D. (2011). *The Basic Practice of Statistics* (6th ed.). New York, NY : W. H. Freeman and Co.

Tufte, E. (1983). *The visual display of quantitative information*. Cheshire, Ct: Graphics Press.

Watkins, D., Schaeffer, R., Cobb G. (2010). *Statistics: From Data to Decision* (2nd ed.). Hoboken, N.J. : Wiley.

Part II.

2. Overview of changes from original syllabus of record

1. The course description was reworded although the content is the same.
2. Objectives: The course objectives were aligned with the Expected Undergraduate Student Learning Outcomes.
3. The textbook section was changed.
4. The special resource requirements section was changed.
5. The Bibliography section was changed.

Part II.

3. Justification/Rationale for the revision.

The course is a currently approved Liberal Studies Mathematics course and is being revised to meet the new curriculum criteria for this category.

Part II.

4. Old Syllabus of Record

I. Catalog Description

MATH 217 Probability and Statistics

3c-0l-3cr

Prerequisites: none

(For students in the social sciences) Frequency distributions, measures of central tendency and variation, elementary probability, sampling, estimation, testing hypotheses, correlation and regression. Emphasis will be on applications in the social sciences using appropriate technology, as opposed to theoretical development of topics.

II. Course Outcomes

Upon successful completion of this course, students will be able to:

1. create and interpret the basic graphical representations of data;
2. calculate and interpret basic numerical descriptions of data;
3. understand the basic concepts of probability and how to apply them;
4. estimate population parameters using confidence intervals;
5. evaluate statements about a population using tests of significance.

III. Course Outline

12. Basic Sampling Designs, Observational Studies and Experiments	(3 hours)
13. Graphically Summarizing Qualitative and Quantitative Data	(2 hours)
14. Numerically Summarizing Quantitative Data	(3 hours)
15. Scatterplots, Correlation and Regression	(6 hours)
16. Basic Probability	(3 hours)
17. The Normal Probability Distribution	(3 hours)
18. Sampling Distributions for the Mean and Proportions	(2 hours)
19. Confidence Intervals for the Mean and Proportions	(4 hours)

- 20. Hypothesis Testing for the Mean and Proportions (4 hours)
- 21. Inference on Two Samples (4 hours)
- 22. Contingency Tables and the Chi-Square Test for Independence (optional)

This syllabus leaves 8 hours for tests, other optional topics, etc.

IV. Evaluation Methods

The final grade for the course will be determined by elements such as tests, quizzes, projects, and homework assignments. A substantial proportion of the course grade will be determined by tests.

V. Example Grading Scale

90% - 100%	A
80% - 89%	B
70%-79%	C
60% - 69%	D
Below 60%	F

VI. Undergraduate Course Attendance Policy

Although there is no formal attendance policy for this class, student learning is enhanced by regular attendance and participation in class discussions. The University expects all students to attend class.

[Note: It is recommended that an attendance policy be developed by individual faculty and included in student syllabi. (See undergraduate catalog for Undergraduate Course Attendance Policy.)]

VII. Required Textbooks, Supplemental Books and Readings

None

VIII. Special Resources and Requirements

None

IX. Bibliography

Sullivan, M. (2007), *Statistics: Informed Decisions Using Data* (2nd ed.), Upper Saddle River, NJ: Pearson Prentice Hall

Sample Assignment and Rubric

Name: _____

Census Bureau Activity: Best Estimates for Proportions

Directions:

- Go the website: _____ . At the bottom of the webpage, you will find links to an alphabetized list of 253 cities and towns in Pennsylvania, organized into five columns of 50 of three cities/towns and one column of three cities/towns.
- Using the random number feature on your calculator, randint(1,253) select a random sample of 12 towns/cities. You may get duplicate id numbers so continue getting random numbers until you have 12 unique ID numbers. Locate the corresponding city/town. ID numbers for the first column are 1-50, for the second column 51-100, etc.
- Click on the links for your twelve randomly selected towns/cities and record both the 2010 population estimate and the percentage of persons in that city/town who were under 18 years in 2010.
- Fill in the following summary table with the information from parts 1.-3.

#	Random ID Number	Name of Town/City	2010 Population Estimate	Percentage of people under the age of 18	Number of People Under the Age of 18
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

- Generate a histogram of the 2010 population estimates and a histogram of the percentage of people under the age of 18. Discuss shapes of the distributions and identify any values that appear to be outliers.
- Find the mean of the twelve percentages. This is the first estimate of the percentage of people in Pennsylvania who are under the age of 18.
- Find the sum of the twelve population estimates and the sum of the numbers of people under the age of 18. Use these two statistics to find a second estimate of the percentage of people in Pennsylvania who are under the age of 18.
- Discuss the differences in the estimates in 6. and 7. Which do you think is the better estimate of the percentage of people in Pennsylvania who are under the age of 18? Why?

**Census Bureau Activity: Best Estimates for Proportions
Grading Rubric**

Item	Points	Points Earned	Comments
Summary Table	10		
Histogram of the Population Estimates	5		
Histogram of the Percentages of People under the age of 18	5		
Overall Percentages and Discussion	5		
Total	25		

Additional Comments:

Please attach this page to your assignment.

Answers to Liberal Studies Questions

- A. Most faculty who teach this course are members of the Statistics Curriculum Committee, that meets on a regular basis to talk about issues related to this and the other handful of Statistics-based courses in the department. In addition, most textbooks for this course are fairly uniform in the order and content that they present.
- B. Whenever appropriate, information will be introduced into the classroom discussion which will reflect the contributions made to the development of the fields of probability and statistics by women and minorities.
- C. This course is designed to develop higher level quantitative skills, and as such, the content does not include substantial literary works.
- D. This course is intended for majors outside the college of Natural Sciences and Mathematics. This course puts more of the emphasis on concepts and applications to the students' fields of studies and less of the emphasis on formulas and theory than does the introductory course (MATH 216) for math and science majors. This emphasis is clear in the objectives for the course.

Subject: FW: MATH 217 Course Title
From: "Gail Sechrist" <gailsech@iup.edu>
Date: Sat, 23 Jun 2012 12:15:25 -0400
To: "'Sharon Aikins'" <saikins@iup.edu>

The change in title for MATH 217 was an error so we need to correct our records (both docket, the proposal itself, and minutes) it was proposal 135.

Gail

From: Francisco E. Alarcón [mailto:falarcon@iup.edu]
Sent: Saturday, June 23, 2012 12:10 PM
To: 'Gail Sechrist'
Cc: 'Mary Lou Metz'; 'Sharon Aikins'; pararaim@iup.edu
Subject: RE: MATH 217 Course Title

That was just an error, there was no intention to change the title.

Francisco E. Alarcón, Ph. D.
Chairperson and Professor
Department of Mathematics
233 Stright Hall
Indiana University of PA
Phone: 724-357-2608
www.ma.iup.edu/people/falarcon.html

From: Gail Sechrist [mailto:gailsech@iup.edu]
Sent: Thursday, June 21, 2012 4:19 PM
To: Francisco Alarcon
Cc: 'Mary Lou Metz'; 'Sharon Aikins'
Subject: MATH 217 Course Title

Francisco & Mary Lou,

On April 24th the UWUCC approved a course revision for MATH 217 the course title was listed on the cover sheet and inside the proposal as Introduction to Probability and Statistics, but the box for a Course title change was not checked. Did you intend to change the title of the course or was this just an error?

Gail

Subject: Re: FW: MATH 217

From: "Christoph Maier" <cmaier@iup.edu>

Date: Wed, 11 Apr 2012 18:22:16 -0400

To: "David H. Pistole" <dpistole@iup.edu>

Let's remove the (for non-MATH majors) .

Christoph

On Mon, 09 Apr 2012 13:37:55 -0400

"David H. Pistole" <dpistole@iup.edu> wrote:

Christoph, I need a bit more help from you on the catalog description. The catalog description of MATH 217 in the current catalog does not have any pre-requisites and at the beginning of the description says (for non-MATH majors). You now have "For non-math majors" as a pre-requisite and then at the beginning of the description (for students in the social sciences). Please let me know what you'd like since those tend to be contradictory. Thanks, David

David H. Pistole
Director of Liberal Studies
Professor of Biology
103 Stabley
724-357-5715

On 4/9/2012 11:40 AM, Christoph Maier wrote:

Hi David.

Find attached the updated Math 217 syllabus.

Christoph

--- the forwarded message follows ---

Part II.

4. Old Syllabus of Record

I. Catalog Description

MATH 217 Introduction to Probability and Statistics

3c-0l-3cr

Prerequisites: none

(For students in the social sciences) Frequency distributions, measures of central tendency and variation, elementary probability, sampling, estimation, testing hypotheses, correlation and regression. Emphasis will be on applications in the social sciences using appropriate technology, as opposed to theoretical development of topics.

II. Course Outcomes

Upon successful completion of this course, students will be able to:

1. create and interpret the basic graphical representations of data;
2. calculate and interpret basic numerical descriptions of data;
3. understand the basic concepts of probability and how to apply them;
4. estimate population parameters using confidence intervals;
5. evaluate statements about a population using tests of significance.

III. Course Outline

12. Basic Sampling Designs, Observational Studies and Experiments	(3 hours)
13. Graphically Summarizing Qualitative and Quantitative Data	(2 hours)
14. Numerically Summarizing Quantitative Data	(3 hours)
15. Scatterplots, Correlation and Regression	(6 hours)
16. Basic Probability	(3 hours)
17. The Normal Probability Distribution	(3 hours)
18. Sampling Distributions for the Mean and Proportions	(2 hours)
19. Confidence Intervals for the Mean and Proportions	(4 hours)

Part II.

1. New Syllabus of Record

I. CATALOG DESCRIPTION

MATH 217 Introduction to Probability and Statistics

3c-0l-3cr

Prerequisite: For non-math majors

(For students in the social sciences) Frequency distributions, measures of central tendency and variation, elementary probability, sampling, estimation, testing hypotheses, correlation and regression. Emphasis will be on applications in the social sciences using appropriate technology, as opposed to theoretical development of topics.

II. COURSE OUTCOMES

Objective 1:

Create and interpret the basic graphical representations of data.

Expected Learning Outcomes 1 and 2:

Informed and Empowered Learners

Rationale:

Assignments will require students to have a level of knowledge of graphical representations of data that will enable them to describe and summarize a set of data. Assignments will also require students to critically analyze, interpret, and use graphical representations of data from experiments and observations in order to draw inference to phenomena from the natural, social, and or technical world.

Objective 2:

Calculate and interpret basic numerical descriptions of data.

Expected Learning Outcomes 1 and 2:

Informed and Empowered Learners

Rationale:

Assignments will require students to have a level of knowledge of numerical descriptions of data that will enable them to describe and summarize a set of data. Assignments will also require students to critically analyze, interpret, and use numerical descriptions of data from experiments and observations in order to draw inference to phenomena from the natural, social, and or technical world.

Objective 3:

Understand the basic concepts of probability and how to apply them.

Expected Learning Outcomes 1 and 2:

Informed and Empowered Learners

Rationale:

Assignments will require students to have a level of knowledge of probability that will enable them to understand the concepts, properties, and rules of probability. Assignments will also require students to interpret and use the concepts of probability in drawing