MATH115 : Probability and Statistics

General Information

Author:	• Maria Coulson
Course Code (CB01) :	MATH115
Course Title (CB02) :	Probability and Statistics
Department:	Mathematics
Proposal Start:	Fall 2023 Credit/Noncredit
TOP Code (CB03) :	(1701.00) Mathematics, General
SAM Code (CB09) :	Non-occupational
Distance Education Approved:	Yes
Course Control Number (CB00) :	CCC000348401
Curriculum Committee Approval Date:	07/19/2022
Board of Trustees Approval Date:	07/19/2022
External Review Approval Date:	07/19/2022
Course Description:	(Prerequisite: Completion of Intermediate Algebra or the equivalent. Or, placement based on AB705 mandates. Credit awarded for either Math 115 or STAT 115, but not both courses.) An in-depth introduction to probability and statistics appropriate for students in the math and life/earth science disciplines. Descriptive statistics, introduction to probability theory, probability distributions, data sampling, estimation, correlation, hypothesis testing. (CSU/UC) AA/AS Area E, CSU Area B-4, IGETC Area 2, C-ID: MATH 110
Submission Rationale:	No value
Author:	No value

Faculty Requirements

Master Discipline Preferred:	No value
Alternate Master Discipline Preferred:	No value
Bachelors or Associates Discipline Preferred:	No value
Additional Bachelors or Associates Discipline Preferred:	No value

Course Development Options

Basic Skill Status (CB08)

Course is not a basic skills course.

☐ Allow Students to Gain Credit by Exam/Challenge

Rationale For Credit By Exam/Challenge

No value

Course Special Class Status (CB13)

Course is not a special class.

Allowed Number of Retakes

0

Retake Policy Description

No value

Grade Options

No value

Course Prior To College Level (CB21)

Not applicable.

☐ Allow Students To Audit Course

Associated Programs

☑ Course is part of a program (CB24)

Associated Program	Award Type	Active
AA-T Anthropology	A.A. Degree for Transfer	Summer 2019 Credit/Noncredit to Spring 2020 Credit/Noncredit
AA-T Economics	A.A. Degree for Transfer	Spring 2020 Credit/Noncredit to Fall 2020 Credit/Noncredit
AS-T Business Administration	A.S. Degree for Transfer	Fall 2018 Credit/Noncredit to Fall 2020 Credit/Noncredit
AS-COM Business, General	A.S. Degree Major	Spring 2020 Credit/Noncredit to Fall 2020 Credit/Noncredit
AS-T in Hospitality Management	A.S. Degree for Transfer	Fall 2019 Credit/Noncredit to Spring 2020 Credit/Noncredit
Certificate of Achievement, Early Childhood Education (In Development)	Certificate	Fall 2021 Credit/Noncredit
A.S. in Computer Science	A.S. Degree Major	Spring 2020 Credit/Noncredit to Fall 2020 Credit/Noncredit
AA-T Sociology	A.A. Degree for Transfer	Fall 2018 Credit/Noncredit to Spring 2020 Credit/Noncredit
AS-T Business Administration 2.0	A.S. Degree for Transfer	Fall 2022 Credit/Noncredit
AA-T Political Science	A.A. Degree for Transfer	Summer 2020 Credit/Noncredit
AS-COM Computer Science	A.S. Degree Major	Fall 2018 Credit/Noncredit to Spring 2020 Credit/Noncredit
AA-T Anthropology	A.A. Degree for Transfer	Fall 2020 Credit/Noncredit
AA-COM Liberal Arts: Social & Behavioral Science Emphasis	A.A. Degree Major	Fall 2018 Credit/Noncredit to Spring 2020 Credit/Noncredit

AA-T Economics	A.A. Degree for Transfer	Fall 2020 Credit/Noncredit
AS-T Hospitality Management	A.S. Degree for Transfer	Fall 2020 Credit/Noncredit
A.S. in Computer Science	A.S. Degree Major	Fall 2020 Credit/Noncredit
AA-T Political Science (In Development)	A.A. Degree for Transfer	Fall 2020 Credit/Noncredit
AS-T Administration of Justice	A.S. Degree for Transfer	Fall 2020 Credit/Noncredit
AA-T Sociology	A.A. Degree for Transfer	Spring 2020 Credit/Noncredit to Fall 2020 Credit/Noncredit
AS-T in Hospitality Management	A.S. Degree for Transfer	Spring 2020 Credit/Noncredit to Summer 2020 Credit/Noncredit
Certificate o Achievement in Business, General	Certificate	Fall 2020 Credit/Noncredit
AS-T Business Administration (In Development)	A.S. Degree for Transfer	Summer 2022 Credit/Noncredit
Certificate of Achievement, Early Childhood Education (In Development)	Certificate	Fall 2021 Credit/Noncredit
AS-T in Mathematics	A.S. Degree for Transfer	Fall 2020 Credit/Noncredit
AS-COM Business, General	A.S. Degree Major	Fall 2018 Credit/Noncredit to Spring 2020 Credit/Noncredit
Certificate of Achievement, Early Childhood Education	Certificate	Spring 2021 Credit/Noncredit
AS-T Administration of Justice	A.S. Degree for Transfer	Fall 2018 Credit/Noncredit to Spring 2020 Credit/Noncredit
AS-T Administration of Justice	A.S. Degree for Transfer	Spring 2020 Credit/Noncredit to Fall 2020 Credit/Noncredit

A.A. in Liberal Arts: Social & Behavioral Science Emphasis	A.A. Degree Major	Spring 2020 Credit/Noncredit
A.A. in Liberal Arts: Natural Science Emphasis	A.A. Degree Major	Spring 2020 Credit/Noncredit
Certificate of Achievement, Early Childhood Education	Certificate	Spring 2021 Credit/Noncredit
AS-T in Mathematics	A.S. Degree for Transfer	Fall 2019 Credit/Noncredit to Fall 2020 Credit/Noncredit
AS-T Business Administration	A.S. Degree for Transfer	Fall 2020 Credit/Noncredit
CERT Business, General	Certificate	Fall 2019 Credit/Noncredit to Fall 2020 Credit/Noncredit
AA-COM Liberal Arts: Natural Science Emphasis	A.A. Degree Major	Fall 2018 Credit/Noncredit to Spring 2020 Credit/Noncredit
A.A. in Liberal Arts: Social and Behavioral Science Emphasis (In Development)	A.A. Degree Major	Fall 2021 Credit/Noncredit
AA-T Anthropology	A.A. Degree for Transfer	Spring 2020 Credit/Noncredit to Fall 2020 Credit/Noncredit
A.S. in Business, General	A.S. Degree Major	Fall 2020 Credit/Noncredit
AA-T Kinesiology	A.A. Degree for Transfer	Fall 2018 Credit/Noncredit to Fall 2020 Credit/Noncredit
AA-T Psychology	A.A. Degree for Transfer	Fall 2020 Credit/Noncredit
AA-T Sociology	A.A. Degree for Transfer	Spring 2021 Credit/Noncredit
AA-T Kinesiology	A.A. Degree for Transfer	Fall 2020 Credit/Noncredit to Fall 2022 Credit/Noncredit
AS-T Hospitality Management	A.S. Degree for Transfer	Summer 2020 Credit/Noncredit to Fall 2020 Credit/Noncredit

AA-T Kinesiology	A.A. Degree for Transfer	Fall 2022 Credit/Noncredit
AA-T Economics	A.A. Degree for Transfer	Fall 2018 Credit/Noncredit to Spring 2020 Credit/Noncredit
AS-COM Business, General	A.S. Degree Major	Fall 2018 Credit/Noncredit to Spring 2020 Credit/Noncredit
AA-T Psychology	A.A. Degree for Transfer	Fall 2018 Credit/Noncredit to Fall 2020 Credit/Noncredit
AA-T Political Science	A.A. Degree for Transfer	Fall 2018 Credit/Noncredit to Summer 2020 Credit/Noncredit
AA-T Sociology	A.A. Degree for Transfer	Fall 2020 Credit/Noncredit to Spring 2021 Credit/Noncredit

Transferability & Gen. Ed. Options

Transferability (CB05)

Transferable to both UC and CSU

Transferability Status

Approved

C-ID	Categories	Status	Approval Date	Comparable Course
C-ID Descriptor	Descriptor Number	Approved	No value	MATH 110

College of Marin General Education Pattern	Categories	Status	Approval Date	Comparable Course
Area E. Communication and Analytical Thinking	Communication and Analytical Thinking	Approved	No value	No Comparable Course defined.

CSU GE-Breadth - California University System General Education Pattern	Categories	Status	Approval Date	Comparable Course
Area B-4 Mathematics/Quantitative Reasoning	Mathematics/Quantitative Reasoning	Approved	No value	No Comparable Course defined.

IGETC - University of California General Education Pattern	Categories	Status	Approval Date	Comparable Course
Area 2 - Mathematical Concepts and Quantitative Reasoning	Mathematical Concepts and Quantitative Reasoning	Approved	No value	No Comparable Course defined.

Units and Hours

Summary

Minimum Credit Units (CB07)	4
Maximum Credit Units (CB06)	4
Total Course In-Class (Contact) Hours	70
Total Course Out-of-Class Hours	140
Total Student Learning Hours	210
Faculty Load	4

Credit / Non-Credit Options

Course Credit Status (CB04)

Credit - Degree Applicable

Course Non Credit Category (CB22)

Credit Course.

Non-Credit Characteristic

No Value

Course Classification Code (CB11)

Credit Course.

☐ Variable Credit Course

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	4	8
Laboratory Hours	0	0
Activity Hours	0	0

Course Student Hours

Course Duration (Weeks)	17.5
Hours per unit divisor	52.5
Course In-Class (Contact) Hours	
Lecture	70
Laboratory	0
Activity	0
Total	70
Course Out-of-Class Hours	
Lecture	140
Laboratory	0
Activity	0
Total	140

Time Commitment Notes for Students

No value

Faculty Load

Extra Duties: 0

Faculty Load: 4

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Pre-requisites, Co-requisites, Anti-requisites and Advisories

Anti-Requisite

STAT115 - Introduction to Statistics for Business

Prerequisite

Completion of Intermediate Algebra or the equivalent. Or, placement based on AB705 mandates

Outcomes
- 1. Translate both ways between English sentences and algebraic sentences.
- 2. Engage in mathematical discourse, with proper notation and logic when solving an equation or transforming an expression.
- 3. Identify and solve a variety of linear and nonlinear equations and inequalities.
- 4. Use functions, equations, or system of equations or inequalities as models for solving applications.

Entrance Skills

Entrance Skills	Description
No value	No value

Limitations on Enrollment

Limitations on Enrollment	Description
No value	No value

Specifications

Methods of Instruction

Methods of Instruction	Lecture
Rationale	Case studies and other examples will be presented to generate discussion by students. Lecture, lecture/discussion

Assignments

Sample Problems:

1. A brand of flashlight battery has normally distributed lifetimes with a mean life of 30 hours and a standard deviation of 5 hours. A supermarket purchases 500 of these batteries from the manufacturer. What is the probability that at least 80% of them last longer than 30 hours?

2.Suppose that 70% of college students graduate with debt over $5000. In a random sample of 10 recent graduates, a) what is the probability that more than half have debt? b) What is the probability that at least one has debt?

3. You are interested in determining the percent of students on your campus who are interested in the college offering students a chance to rent a calculator for $15/month You survey an SRS of 100 students and find that 67 of them would like to see that happen. Construct a 95% confidence interval for the true population percentage of students who would like the rental program and prepare a brief presentation for the College President.

Project:
Use data from the Statistical Abstract of the United States Motor vehicle accidents, fatalities and DWI arrests to examine the numbers of registered drivers and the rate of motor vehicle accidents, fatalities, and driving while under the influence arrests in the United States. The data is given for all drivers and then broken down by gender and by different age groups. The data is to be examined for several different years to see if there were any trends.

Methods of Evaluation	Rationale
Tests	Problem sets from the text, quizzes, exams and a cumulative final test or project.
	Problems will involve data description using measures of central tendency; calculation of probability of events; construction of probability distributions and finding the mean, variance, and standard deviation; hypothesis testing and finding confidence intervals; testing the difference among means, variance, and proportions.
Projects	Sample project: Use data from the Statistical Abstract of the United States Motor vehicle accidents, fatalities and DWI arrests to examine the numbers of registered drivers and the rate of motor vehicle accidents, fatalities, and driving while under the influence arrests in the United States. The data is given for all drivers and then broken down by gender and by different age groups. The data is to be examined for several different years to see if there were any trends.
Quizzes	A researcher wants to check the claim that convicted burglars spend an average of 18.7 months in jail. She takes a random sample of 11 such cases from court files and finds a sample mean of 20.2 months and standard deviation of 8 months. Test the claim that the mean jail time of convicted burglars is equal to 18.7 months, against the alternative that this mean is not 18.7 months, at the 0.05 significance level. Assume that the sample has been randomly selected from a population with a normal distribution.

Equipment

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
Weiss, Neil A.	INTRODUCTORY STATISTICS 9th edition	Pearson	2014	
Weiss, Neil A.	INTRODUCTORY STATISTICS, 10th ed.	Pearson	2015	
Robert Gould, Colleen Ryan	Introductory Statistics: Exploring the World Through Data	Pearson	2019	

Other Instructional Materials

No Value

Learning Outcomes and Objectives

Course Objectives

1. Calculate measures of central tendency and variation for a data set, discrete random variable or sampling distribution.

2. Identify the standard methods of obtaining qualitative and quantitative data and identify advantages and disadvantages of each.

3. Calculate probabilities using counting techniques, law of large number and normal and t-distributions.

4. Construct and interpret confidence intervals for one and two means and one and two proportions.

5. Conduct hypotheses tests including formulating hypotheses, interpreting sample data, calculating the p-value, making appropriate conclusions, and considering Type I and Type II errors.

6. Analyze related data sets including determining if a linear relationship is feasible. If appropriate, calculate the least-squares-regression line and use it to make predictions.

7. Interpret the output of a technology-based statistical analysis.

8. Use appropriate statistical techniques to analyze and interpret applications based on data from disciplines including business, social sciences, psychology, life science, health science, and education.

CSLOs

Organize, display, and summarize a data set using appropriate graphical and numerical methods.

Expected SLO Performance: 70.0

Business AS-T Business Administration	4. Use statistical and mathematical expressions to make general statements about populations of customers and make numeric business decisions.
	Demonstrate the ability to apply theory, critical thinking, and analytical skills to practical issues and problems that decision makers in the field of business are likely to face.
Business CERT Business, General	Analyze practical business problems and utilize research and critical thinking to evaluate and recommend alternative solutions.
	Students will demonstrate appropriate use of business terms and concepts across a standard breadth of business functions (e.g. Management, Marketing, Accounting, Finance, Entrepreneurship).
Economics AA-T Economics	Apply critical thinking and analytical methods to evaluate the credibility of economic theories, concepts, research, and models.
Physics AS-COM Computer Science	Apply knowledge of programming, mathematics, science, and engineering to real world problems.

	Develop an interdisciplinary vision with a strong foundation in mathematics and physics.
Sociology AA-T Sociology	Apply scientific methods of sociological research and analysis to describe social customs and interactions within specific groups.
Psychology AA-T Psychology	Apply the scientific method and critical thinking skills to formulate and evaluate valid hypotheses in the field.
Hospitality AS-T in Hospitality Management	Demonstrate a variety of problem-solving and critical thinking skills as related to the hospitality industry.
Mathematics AS-T in Mathematics	Demonstrate the ability to discern and describe relevant factors, and do appropriate observations, data collection, and analysis.
Counseling AA-COM Liberal Arts: Social & Behavioral Science Emphasis	Demonstrate through written and oral work an understanding of methodological approaches used by the social and behavioral sciences to investigate and analyze human behavior.
ISLOs Core ISLOs	Effectively and critically understand and communicate visually, in writing, and/or orally using traditional and/or modern information resources and supporting technology.
	Locate, identify, collect, and organize data in order to then analyze, interpret or evaluate it using mathematical skills and/or the scientific method.
Business AS-COM Business, General	Students will demonstrate appropriate use of analytical frameworks, methods, and skills in response to business questions, cases, and projects.

Determine the likelihood of events via enumeration methods and known distributions.

Expected SLO Performance: 70.0

Business AS-T Business Administration	4. Use statistical and mathematical expressions to make general statements about populations of customers and make numeric business decisions.
	Demonstrate the ability to apply theory, critical thinking, and analytical skills to practical issues and problems that decision makers in the field of business are likely to face.
Physics AS-COM Computer Science	Apply knowledge of programming, mathematics, science, and engineering to real world problems.
	Develop an interdisciplinary vision with a strong foundation in mathematics and physics.
Sociology AA-T Sociology	Apply scientific methods of sociological research and analysis to describe social customs and interactions within specific groups.
Psychology AA-T Psychology	Apply the scientific method and critical thinking skills to formulate and evaluate valid hypotheses in the field.
Mathematics AS-T in Mathematics	Demonstrate the ability to discern and describe relevant factors, and do appropriate observations, data collection, and analysis.
Counseling AA-COM Liberal Arts: Social & Behavioral Science Emphasis	Demonstrate through written and oral work an understanding of methodological approaches used by the social and behavioral sciences to investigate and analyze human behavior.
ISLOs Core ISLOs	Differentiate between facts, influences, opinions, and assumptions to reach reasoned and supportable conclusions. Recognize and identify the components of a problem or issue, look at it from multiple perspectives, and investigate ways to resolve it.
	Effectively and critically understand and communicate visually, in writing, and/or orally using traditional and/or modern information resources and supporting technology.
	Formulate strategies to locate, evaluate, and apply information from a variety of sources — print and/or electronic.
	Locate, identify, collect, and organize data in order to then analyze, interpret or evaluate it using mathematical skills and/or the scientific method.

Make a qualitative or quantitative inference about a population based on a sample.

Expected SLO Performance: 70.0

Business AS-T Business Administration	4. Use statistical and mathematical expressions to make general statements about populations of customers and make numeric business decisions.

	Demonstrate the ability to apply theory, critical thinking, and analytical skills to practical issues and problems that decision makers in the field of business are likely to face.	
Political Science AA-T Political Science	Analyze systems and draw conclusions about their relative effectiveness in meeting the needs of the nation and its people.	
	Relate theories concerning the purpose of government, the relationship between government and people, and the justification for the acquisition and exercise of power.	
Economics AA-T Economics	Apply critical thinking and analytical methods to evaluate the credibility of economic theories, concepts, research, and models.	
Physics AS-COM Computer Science	Apply knowledge of programming, mathematics, science, and engineering to real world problems.	
	Develop an interdisciplinary vision with a strong foundation in mathematics and physics.	
Counseling AA-COM Liberal Arts: Natural Science Emphasis	Apply mathematical and quantitative reasoning skills to questions in the natural sciences, including the fields of biology, geology, geography, astronomy, physics and/or anthropology.	
Sociology AA-T Sociology	Apply scientific methods of sociological research and analysis to describe social customs and interactions within specific groups.	
	Formulate critical questions around issues facing our global society today.	
Psychology AA-T Psychology	Apply the scientific method and critical thinking skills to formulate and evaluate valid hypotheses in the field.	
Hospitality AS-T in Hospitality Management	Demonstrate a variety of problem-solving and critical thinking skills as related to the hospitality industry.	
Mathematics AS-T in Mathematics	Demonstrate the ability to explicitly support the evidence or line of thinking that led to a particular outcome.	
Counseling AA-COM Liberal Arts: Social & Behavioral Science Emphasis	Demonstrate through written and oral work an understanding of methodological approaches used by the social and behavioral sciences to investigate and analyze human behavior.	
ISLOs Core ISLOs	Differentiate between facts, influences, opinions, and assumptions to reach reasoned and supportable conclusions. Recognize and identify the components of a problem or issue, look at it from multiple perspectives, and investigate ways to resolve it.	
	Effectively and critically understand and communicate visually, in writing, and/or orally using traditional and/or modern information resources and supporting technology.	
	Formulate strategies to locate, evaluate, and apply information from a variety of sources — print and/or electronic.	
	Locate, identify, collect, and organize data in order to then analyze, interpret or evaluate it using mathematical skills and/or the scientific method.	
Business AS-COM Business, General	Students will demonstrate appropriate use of analytical frameworks, methods, and skills in response to business questions, cases, and projects.	
Business CERT Business, General	Students will demonstrate appropriate use of business terms and concepts across a standard breadth of business functions (e.g. Management, Marketing, Accounting, Finance, Entrepreneurship).	

Outline

Course Outline

1. The nature of statistics
a. Simple Random Sampling
b. Experimental Designs
2. Descriptive statistics: relative position and levels/scales of measurement;
a. Graphs and Charts
b. Measures of Center
c. Measures of Variation
3. Probability theory

a. Events
b. Conditional Probability
c. Independence
d. The Mean and Standard Deviation of a Discrete Random Variable
e. The Binomial Distribution
f. The Normal Distribution
g. Sampling distributions
4. Inferential statistics
a.Confidence intervals (means, proportions)
b.Hypothesis testing (means, proportions)
c. Chi square procedures (goodness of fit and independence)
5. Regression, correlation
a. Least Squares Regression Line
b. Correlation coefficient.
c. prediction
6. Applications using data from disciplines including business, social sciences, psychology, life science, health science, and education
7. Statistical analysis using technology such EXCEL, Minitab, or graphing calculators.

Workflow Step for Additional Course Information/Goals

Maximum Enrollment: Answer with a number. If changing the maximum, provide a rationale.

No Value

What is the justification for the new/revised course?

No Value

What is the primary course goal?

No Value

What is the justification for the Service Unit(s)? (e.g. lecture, lab, activity, etc.)

No Value

Does this new or revised course represent Substantive Change? Answer YES or NO.

No Value

What are the Critical Thinking expectations? Answer this question for UC transferable courses.

Students must be able to analyze a problem; choose appropriate concepts and methods to be used in its solution; then apply these tools skillfully to solve the problem. "Evaluate", "synthesize", and "differentiate" are all terms applicable to the use of probability and statistics in problem solving.

What is the level of Information Competency expected by this course?

No Value

Is this a Stand Alone Course?

No Value

What is the course start date?

No Value

Accessibility: Are all course materials, including videos, webcasts, podcasts, audio, and visual, accessible to students (per The Americans with Disabilities Act of 1990, section 508 of the Rehabilitation Act of 1973, and California Government Code section 11135)? Answer YES or NO.

No Value

For Approvers ONLY: Do you certify that the following requirements have been met? Answer YES or NO to each. o Accessibility (Title 5, section 55200): Course content and delivery is accessible to all students. o Course Quality: The course meets a "3" on the OEI rubric (Accomplished). o Evidence of instructor contact: Regular and effective contact is demonstrated between the instructor and students and students with other students.

No Value

Workflow step for Library Resources/Textbooks

Does this course include online library resources? Y or N

No Value

Does this course include periodicals as library resources? Y or N

No Value

Does this course include reference books as library resources? Y or N

No Value

Does this course include data base(s) as library resources? Y or N

No Value

Are there assigned textbooks for this course? (If so, list full reference.)

No Value

Workflow Step for Special Materials

Are any Special Materials required?

No Value

Materials Fee Effective Term?

No Value

What is the justification for the Materials Fee?

No Value

Workflow Step for Distance Education Course (if applicable)

Have you reviewed the current policy on Distance Education courses? http://policies.marin.edu/sites/policies/files/AP4105-DistanceEducation.pdf Respond YES or NO.

No Value

Delivery Mode: Is this course is Hybrid (a minimum of one mandatory face-to-face meeting) OR Online (no face-to-face meetings required)? Choose either HYBRID or ONLINE.

No Value

What type of HYBRID contact (if applicable) will be incorporated into this course? Examples include: o Orientation sessions o In-person group meetings o In-person review sessions o In-person exams o Other (please describe):

No Value

How will course objectives and student learning outcomes be adapted to an online or hybrid format? Please describe activities, enhanced lecture materials, discussions, forums, etc.

No Value

Please provide a description of activities in this course that demonstrate instructor-to-student contact and student-to-student contact. Examples of activities: o Announcements o Course materials o Modules o Customized and personalized audio and video content o Online videos that are annotated and contextualized o Internet resources o Library and database resources o Webcasts o Web Conferencing o Podcasts o Discussion forms o Listserv o Other (please describe):

No Value

How will regular and effective instructor-to-student contact and student-to-student contact be demonstrated in this course? o Messages via the LMS o Telephone and office hours o Regular announcements in LMS o Chat rooms o Video messages o Timely feedback and return of student work in LMS o Discussion forums that are facilitated and engage students in regular dialogue o Roster management to ensure that every enrolled students is fully participating in course o E portfolios, blogs, etc. o Orientation and review sessions o Field trips o Library workshops o Webcasts o Podcasts o Other (please describe):

No Value

Please specify the expected course hours for students: this includes content delivery, instructor-student interaction, student-student interaction, and out-of-class hours. Ratio: 1 Lecture unit = 1 hour weekly of class time + 2 hours out-of-class time weekly. 1 Laboratory unit = 3 hours weekly of class time. 1 Activity unit = 3 hours weekly of class time + 1.5 hour out-of-class weekly. Please also specify the students activities that take place to fulfill in-class time. Activities may include reading modules, quizzes, exams, participation in discussion forums, etc. In-class activities do not include homework that may include reading the textbook and preparing and studying for exams.

No Value