CT STATE
COMMUNITY COLLEGE

COVER SHEET FOR ALL CURRICULUM PROPOSALS

Check all Campuses making this proposal.		ALL Proposals	New Programs/Courses		
		PC Signature	CEO Signature *(CEO signature needed for all new programs and any new courses that have new facility/resource costs associated with the course)*	New Program Approval Supplement B *("Budget" included for each campus)*	New Program Approval Section 6 *("Cost Effectiveness and Resources" included for each campus)*
	ACC				
	CCC				
X	GWCC				
X	HCC				
	MCC				
	MxCC				
	NVCC				
	NWCC				
	NCC				
	QVCC				
	TRCC				
	TxCC				

Type of Proposal.

	NEW Program (*degree*)
	NEW Certificate
	NEW Course
	MODIFICATION of an Aligned Program (*degree*)
	MODIFICATION of an Aligned Certificate
X	**MODIFICATION** of an Aligned Course
	DISCONTINUATION of a Program (*degree*)
	DISCONTINUATION of a Certificate
	DISCONTINUATION of a Course
	OTHER (*please describe*):

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Modification of an Existing Aligned Course

This template should be used by the faculty discipline and program workgroups to modify an official record of a course for inclusion in the CT State Community College catalog. All original information as approved should be included, with revisions highlighted within the document and summarized in the "Summary of Changes." Please use the form below, or the original approved template with revisions highlights can be copied here, with a summary of changes and effective date included and all changes highlighted within the document.

Directions: *Please provide the date, name of originator, title, and campus below.*
Date: 11/10/23
Name of Originator: Marina Philips
Title of Originator: Professor of Mathematics
Primary Campus of Originator: Housatonic

COURSE INFORMATION (Aligned)   ## COURSE INFORMATION (Modified)

COURSE TITLE:	Statistics I with Computer Applications	COURSE TITLE:	
COURSE CODE: (3-4-letter subject code and number)	MATH 1201 (formerly MAT* 165)	**COURSE CODE:** (3-4-letter subject code and number)	
SUMMARY OF CHANGES:		**SUMMARY OF CHANGES:**	The only change is a prerequisite change. Without formal prerequisites programmed in banner and Degree Works, overrides must be used for subsequent course registrations, which has many consequences, including exempting students from grade sweeps.
EFFECT DATE OF CHANGES:		**EFFECT DATE OF CHANGES:**	Fall 2024

CREDIT HOURS:	4	CREDIT HOURS:	
CONTACT HOURS:	Lecture: 4	CONTACT HOURS:	
PREREQUISITES: Student must have earned an acceptable grade in all prerequisites before enrolling	None	PREREQUISITES: Student must have earned an acceptable grade in all prerequisites before enrolling	Placement using multiple measures OR a grade of D- or higher in MATH 1010/1011 OR a grade of C- or higher in MATH 0988/0989.
COREQUISITES: Student must be enrolled in this course during the same term.	MAT 0902 Statistics I Support (unless student places out)	COREQUISITES: Student must be enrolled in this course during the same term.	
COURSE DESCRIPTORS: For example: General Education course, Clinical, Lab, Studio, Distance Learning, Seminar, Practicum. Use designated codes: (once developed)	General Education - Math/Quantitative Reasoning	COURSE DESCRIPTORS: For example: General Education course, Clinical, Lab, Studio, Distance Learning, Seminar, Practicum. Use designated codes: (once developed)	

CATALOG COURSE DESCRIPTION:	This course covers fundamental concepts in descriptive and inferential statistics, probability, and probability distributions. Descriptive statistics topics include: the concept of population versus sample, frequency distributions, measures of central tendency, measures of variation, measures of position, and correlation and linear regression. Inferential statistics topics include confidence intervals and hypothesis testing. Use of software for data analysis and data exploration is an integral part of the course. This course requires the use of computer-based statistical software. Students may not receive credit for both MATH 1200 and MATH 1201.	CATALOG COURSE DESCRIPTION:	
STUDENT LEARNING OUTCOMES:	Upon success completion of this course the student will: 1) Apply the statistical problem-solving process (formulate a problem that involves the collection of data, collect data, perform statistical analysis, and interpret the results) 2) Describe data types, methods of data collection, and how the analysis and interpretation of data depends on the type of data and how data are collected 3) Apply descriptive statistics techniques to describe characteristics of data (e.g., measures of center, measures of variability, and measures of position, outliers) and create and interpret graphical displays of data 4) Apply probability concepts and	STUDENT LEARNING OUTCOMES:	Upon success completion of this course the student will:

	probability distributions to model real-world situations and solve problems		
	5) Perform statistical inference via confidence intervals and hypothesis tests and explain the role of randomness in the inference process		
	6) Use technology to investigate and analyze data and solve statistical problems; and interpret and draw conclusions from the output of statistical software		
TOPICS OUTLINE:	List Instructional units:	**TOPICS OUTLINE:**	List Instructional units:
	1) Introduction to Data & Statistics a) Types of data b) Levels of measurement c) Population vs. sample d) Parameter vs. statistic e) Experiments vs. observational studies f) Sampling techniques g) Types of conclusions based on type of statistical study h) Ethical issues in surveys and experiments i) Critical examination of newspaper, magazine, journal, and internet research reports 2) Describing Quantitative and Categorical Data a) Frequency distributions, relative frequencies, cumulative frequencies b) Graphs of single variable and multi-variable data – line plots, stem plots, histograms, box plots, bar charts, pie charts, multi-variable graphs c) Measures of center (mean, median, mode) d) Measures of spread (range, variance, standard deviation, IQR)		

| | e) Measures of relative position (z-scores, quartiles, percentiles)
f) Empirical Rule

3) Correlation & Linear Regression
a) Scatterplots
b) Correlation coefficient
c) Least squares regression line
d) Prediction, extrapolation

4) Probability & Probability Rules
a) Classical probability
b) Empirical probability
c) Addition and multiplication rules
d) Two-way tables
e) Conditional probability
f) Counting problems

5) Discrete Random Variables
a) Discrete probability distribution
b) Mean, expected value, variance, standard deviation
c) Binomial random variables

6) Continuous Random Variables
a) Standard normal distribution
b) Any normal distribution, cutoff values
c) Central Limit Theorem
d) Normal approximation of binomial distribution

7) Confidence Intervals
a) Point estimate vs. interval estimate
b) Critical values & margin of error
c) Estimating a population mean (sigma known, sigma unknown)
d) T-distributions
e) Estimating a population proportion

8) Hypothesis Testing
a) Hypothesis tests for a population mean (sigma known, sigma unknown) | | |

	b) Hypothesis tests for a population proportion c) Determining hypotheses from claims or research questions d) Calculating and interpreting test statistics e) Calculating and interpreting P-values and/or critical values f) Making decisions g) Type 1 & Type II errors h) Statistical significance 9) Optional Topics a) Hypothesis tests for differences in population means (independent and dependent samples) b) Confidence intervals for the difference in population means (independent and dependent samples) c) Hypothesis tests for differences in population proportions d) Confidence intervals for the difference in population proportions e) Hypothesis test for the population correlation coefficient or slope of the regression line f) Confidence intervals using bootstrap samples g) Hypothesis tests using randomizations		
ADDITIONAL INFORMATION (OPTIONAL): Note any special instructions, recommended texts, or materials (e.g., open-source materials)	Requirement for student use of computer-based statistical software: • Students are required to spend one contact hour per week completing computer-based activities. Activities can be completed individually or in groups and must count towards students' overall course grade. Required learning objectives for computer-based activities: • Import data from different file types (e.g., csv, excel files) into statistical software for analysis • Compute summary statistics and construct	**ADDITIONAL INFORMATION (OPTIONAL):** Note any special instructions, recommended texts, or materials (e.g., open-source materials)	

graphs of distributions of quantitative data and use the statistics and graphs to describe the distributions' characteristics
• Compare multiple distributions of quantitative data using summary statistics and graphs
• Construct and interpret multi-variable graphs that display relationships between qualitative and quantitative variables (e.g., stacked dotplots, stacked boxplots, overlapped histograms, scatterplots with grouping by color, etc.)
• Examine how outliers affect statistics (e.g., how outliers in a univariate distribution impact measures of center, variation and position; how outliers in a bivariate distribution impact the correlation coefficient and least-squares regression line)
• Use statistical software to plot discrete and continuous probability distributions, compare binomial distributions to normal distributions, and use probability distributions to solve problems
• Create simulations of distributions of sample statistics (e.g., distributions of sample means and distributions of sample proportions) to explore the Central Limit Theorem
 • Use statistical software to assess normality, construct confidence intervals, and perform hypothesis tests
• Filter observations in a dataset according to specific criteria to obtain subgroups of data; and compute statistics and construct visualizations on the subgroups of data
• Given a real-world dataset with multiple quantitative and qualitative variables, generate a set of research questions that can be posed and answered involving the data and perform the appropriate statistical analysis on the data to answer the research questions
• (Optional) Use statistical software to recreate data visualizations

CLASSROOM REQUIREMENTS	Computer Access (via a personal computer, computer lab, or laptop cart) Students must have access to a computer during class to complete computer-based activities. Students must spend a minimum of 1-hour per week completing computer-based activities.	CLASSROOM REQUIREMENTS ***Note: If modified classroom requirements result in increased demand for Budget, Facilities, Equipment, and/or Personnel, the campus CEO must approve this proposal.**	
(e.g., Computer lab, Kitchen, Science Lab, Studio, Lecture)		(e.g., Computer lab, Kitchen, Science Lab, Studio, Lecture)	

Resource needs have been discussed with Library Services and Information Technology Operations. (*Complete if applicable*.)

Name and Title	Signature of Originator	Date
Marina Philips, Professor of Mathematics		11/10/23

☐ **No Library Services needed.**

☐ **No Technology Services needed.**

GOVERNANCE BODY	SIGNATURES	DATE
Statewide Discipline Council		
School Area Curriculum Council		
Curriculum Congress		
School Area Academic Dean		
CT State Provost		
*Campus CEO (if applicable)		
*CT State President (if applicable)		