KINGSBOROUGH COMMUNITY COLLEGE
The City University of New York

CURRICULUM TRANSMITTAL COVER PAGE

Department: Department of Mathematics & Computer Science **Date:** 02/04/2022

Title Of Course/Degree/Concentration/Certificate: Integrated Statistics (MAT 2010)

Change(s) Initiated: (Please check)

- ☐ Closing of Degree
- ☐ Closing of Certificate
- ☐ New Certificate Proposal
- ☐ New Degree Proposal
- ☒ New Course
- ☐ New 82 Course (Pilot Course)
- ☐ Deletion of Course(s)
- ☐ Change in Degree or Certificate
- ☐ Change in Degree: Adding Concentration
- ☐ Change in Degree: Deleting Concentration
- ☐ Change in Prerequisite, Corequisite, and/or Pre/Co-requisite
- ☐ Change in Course Designation
- ☐ Change in Course Description
- ☐ Change in Course Title, Number, Credits and/or Hours
- ☐ Change in Academic Policy
- ☐ Pathways Submission:
  - ☐ Life and Physical Science
  - ☐ Math and Quantitative Reasoning
  - ☐ A. World Cultures and Global Issues
  - ☐ B. U.S. Experience in its Diversity
  - ☐ C. Creative Expression
  - ☐ D. Individual and Society
  - ☐ E. Scientific World
- ☐ Change in Program Learning Outcomes
- ☐ Other (please describe):______

PLEASE ATTACH MATERIAL TO ILLUSTRATE AND EXPLAIN ALL CHANGES

DEPARTMENTAL ACTION

Action by Department and/or Departmental Committee, if required:

Date Approved:______ **Signature, Committee Chairperson:**______

If submitted Curriculum Action affects another Department, signature of the affected Department(s) is required:

Date Approved:______ **Signature, Department Chairperson:**______

Date Approved:______ **Signature, Department Chairperson:**______

I have reviewed the attached material/proposal

Signature, Department Chairperson: Rina Yarmish

Revised/Augl.2018/AK

KINGSBOROUGH COMMUNITY COLLEGE
★ DREAMS BEGIN HERE ★

TO:	Spring 2022 Curriculum Committee
FROM:	Department of Mathematics & Computer
DATE:	Science 02/04/2022
RE:	New Course: Integrated Statistics (MAT 2010)

The Department of Mathematics & Computer Science is proposing to add a new course, in the following manner:

ADD:
MAT 2010 - Integrated Statistics

Rationale for Change:

The proposed course represents a new pedagogical approach to Elementary Statistics with more supported interaction for preparing students who have not achieved CUNY mathematics proficiency, and who want a first course in statistics.

Students will work in a laboratory setting with an instructor and will be provided hands-on, personalized guidance in the development and fine-tuning of algebraic skills needed for mastery of statistical concepts. This approach will facilitate success for students who would not otherwise succeed in Statistics.

Additionally, this course aligns with the upcoming CUNY transition, effective Fall 2022, to remove courses that follow Elementary Algebra (at Kingsborough MAT R300 – Elementary Algebra II) but precede the first-level Pathways MQR course. At Kingsborough, the current lowest-level 3 credit pathways Statistics courses are MAT 19A0 and MAT 2000, with prerequisite knowledge required as follows: (1) math proficiency followed by (2) MAT R300 as prerequisites.

The proposed 6-hour, 3-credit MAT 2010 will replace the 3-semester sequence MAT M200; MAT R300; MAT 2000, comprising 12 semester-hours.

MAT 2010

Once the course is in place, the department plans to conduct an analysis of student success, including such factors as grade distribution and particularly final exam performance in MAT 2010 as compared/contrasted with those achieved via the MAT M200-MAT R300-MAT 2000 sequence. Assessment of both global and particular essential skills needed for specific student majors is expected.

The department is hopeful that this new approach will provide much-enhanced student success for Kingsborough students who have not achieved CUNY mathematics proficiency, and who want a first course in statistics.

New Course Proposal Form*

*This form is **NOT** intended for Internships or Field Work

1. Complete the requested course information in the table below. Indicate "**NONE**" where applicable. *For Assignment of New Course Number, contact **Academic Scheduling**.

Department:	Department of Mathematics & Computer Science
Course Designation/Prefix:	MAT
***Course Number:**	2010
Course Title:	Integrated Statistics
Course Description: **(Note: Description should include language similar to Course Learning Outcomes.)**	Introduction to statistics, with integrated pre-algebra and algebra. Main statistics topics are descriptive measures, probability theory, the normal distribution, hypothesis testing, and regression analysis. This course is intended for students who have not achieved CUNY mathematics proficiency, and who want a first course in statistics. **Students who have completed MAT 19A0, or MAT 2000, or MAT/BA 2200, or MAT/BIO 9100 will not receive credit for this course.**
Prerequisite(s):	For students who are eligible for a corequisite course per CUNY Math placement guidelines and are in need of developmental support.
Corequisite(s):	
Pre-/Co-requisite(s):	
Open ONLY to Select students (Specify Population):	
Frequency course is to be offered (Select All that Apply)	☑ Fall ☑ Winter ☑ Spring ☑ Summer
Suggested Class Limit:	25
Indicate if a special space, such as a lab, and/or special equipment will be required:	

2. Credits and Hours based on MSCHE Guidelines for *College Credits Assigned for Instructional Hours* -***Hours are based on hours per week in a typical 12-week semester** (Please check **ONE** box based on credits):

1-credit:	☐ 1 hour lecture ☐ 2 hours lab/field/gym

2-credits:	☐ 2 hours lecture ☐ 1 hour lecture, 2 hours lab/field ☐ 4 hours lab/field

3-credits:	☐ 3 hours lecture ☐ 2 hours lecture, 2 hours lab/field ☐ 1 hour lecture, 4 hours lab/field ☑ 6 hours lab/field

4-credits:	☐ 4 hours lecture ☐ 3 hours lecture, 2 hours lab/field ☐ 2 hours lecture, 4 hours lab/field ☐ 1 hour lecture, 6 hours lab/field ☐ 8 hours lab/field

More than 4-credits: ☐ Number of credits: ____ (explain mix lecture/lab below) ___ Lecture ____Lab Explanation:____

3. **Where** does this course fit? Select from the following:

☐ Degree Program(s)/Certificate(s)*	**List Degree Program(s)/Certificate(s):** 1. 2.
☑ General Education/Pathways	**Select ONE of the following:** ☐ Life and Physical Science (LPS) ☑ Math and Quantitative Reasoning (MQR) ☐ World Cultures and Global Issues (Group A) ☐ U.S. Experience in its Diversity (Group B) ☐ Creative Expression (Group C) ☐ Individual and Society (Group D) ☐ Scientific World (Group E)
☐ **82XX** Pilot/Experimental Course	**If proposed as a "real" course, where will this course fit?** Select from the following: **List Degree Program(s)/Certificate(s):** 1. 2. **Select ONE of the following:**

	☐ Life and Physical Science (LPS) ☐ Math and Quantitative Reasoning (MQR) ☐ World Cultures and Global Issues (Group A) ☐ U.S. Experience in its Diversity (Group B) ☐ Creative Expression (Group C) ☐ Individual and Society (Group D) ☐ Scientific World (Group E)

***If Degree Program/Certificate is Selected:**

- Include an updated **Curricular** Map (Program Learning Outcomes) for each Degree Program/Certificate listed above.
- Include an updated Degree Map (semester-by-semester course sequence) for each Degree Program/Certificate listed above. For Degree Map template, contact Amanda Kalin, ext. 4611, Amanda.Kalin@kbcc.cuny.edu

The Following NYSED Guidelines must be adhered to for **ALL** Degree Programs:

45 credits of Liberal Arts (General Education) course work for an Associate of Arts Degree (AA)
30 credits of Liberal Arts (General Education) course work for an Associate of Science Degree (AS)
20 credits of Liberal Arts (General Education) course work for an Applied Associate of Science (AAS)

Additional Separate Submissions Required:
1. Curriculum Transmittal Cover Page indicating a "Change in Degree or Certificate"
2. Memo with rationale for inclusion of the course within the curriculum
3. "Current" Degree with all proposed deletions (strikeouts) and additions (bolded) clearly indicated
4. "Proposed" Degree, which displays the degree as it will appear in the *College Catalog*

For a copy of the most up-to-date Degree/Certificate requirements contact Amanda Kalin, ext. 4611, Amanda.Kalin@kbcc.cuny.edu

If General Education/Pathways is Selected:

- Please refer to NYSED Guidelines for courses that are considered Liberal Arts (General Education).
- Pilot/Experimental/82XX courses CANNOT be submitted for Pathways until they are submitted as a "**real**" course.

Additional Separate Submissions Required:
1. Curriculum Transmittal Cover Page indicating BOTH "New Course" and "Pathways"
2. CUNY Common Core Pathways Submission Form

4. **List the Course Learning Outcomes** – Course Learning Outcomes are measureable/demonstrable, containing "**action verbs**" (Blooms Taxonomy). If proposed to PATHWAYS, the Course Learning Outcomes should significantly align with the Pathways Learning Outcomes (refer to the Pathways Common Core Submission Form for Pathways Learning Outcomes). If proposed for a Degree program, the course should align with the Program Learning Outcomes (PLOs). **REMINDER** – Course Learning Outcomes are consistent for **ALL sections** of the same course and **MUST** be included on the syllabus.

Course Learning Outcomes
1. Interpret Data (Descriptive Measures / Probability Theory) Interpretation of descriptive data along with elucidation of arithmetic and basic algebraic skills needed for these analyses. These include arithmetic skills including interpretation of graphs.
2. Communicate Quantitative Analysis (Normal Distribution) Understanding of the concept of distribution of aggregate data and differences between distribution patterns. The normal distribution will be considered along with concepts of standard deviation and variance. Arithmetic skills needed to understand and compute the standard deviation and variance as well as other related measures will be introduced at appropriate points in the presentation.
3. Evaluate Solutions (Linear Systems / Regression Analysis) Evaluation of solutions to linear systems will be accompanied by insertion of explanatory algebraic constructs. The concept of linear regression will be explained and illustrated using real-world examples and illustrations. Relevant algebraic skills and constructs will be introduced.
4. Apply Mathematical Methods (Hypothesis Testing) Hypothesis testing as a practical tool for data analysis will be introduced along with relevant examples. Projects relevant to individual students' major areas of study will be assigned. Of particular importance is the understanding of application of theory of risk analysis and potential pitfalls thereof.

5. **Assessment of Course Learning Outcomes**: The Course Learning Outcomes are measurable/demonstrable through the below listed sample assignments/activities. Include percentage breakdown for grading. **REMINDER** - Assessment of Course Learning Outcomes are based on a **Common Syllabu**s – to allow for **any** qualified instructor to teach the course.

Course Learning Outcome	Percentage of Grade	Measurement of Learning Outcome (Artifact/Assignment/Activity)
1. Homework/projects/assignments	20	Projects involving hypothesis testing, individualized per student's area of study.
2. In-class exams	50	Exams will be based on learning outcomes as described. Minimum of 2 class exams during the 12-week meeting period.
3. Final Examination	30	Departmental final examination to assure consistency of coverage in disparate sections.

6. **Who** is expected to enroll in this course? Please provide details for the student population(s), degree program(s)/certificate(s), and applicable concentration(s), this course is expected to include.

For students who are eligible for a corequisite course per CUNY Math placement guidelines and are in need of developmental support.

7. Explain **why** this course is a necessary addition to the curriculum. **REMINDER** – Explain the course's role within the selected Pathways Group or Degree program – How does this course meet the Program Learning Outcomes (PLOs)? Was the course a recommendation from a recent Annual Program Review (APR), Advisory Board, Accrediting Body, etc.? How might this course help students seeking to transfer to a 4-yr college or transition into a career after KCC?

CUNY now requires that students be eligible, upon admission to a degree program, for a credit-bearing course that satisfies the MQR pathways requirement for their major. In the case of students entering without certification of Math competency, a corequisite course will help satisfy this requirement. The proposed class will be categorized as a co-requisite class for this purpose and will grant 3 credits as satisfaction of the MQR requirement for students who prefer to take a Statistics class because of a major requirement or as a prerequisite for entry into a transfer program -- as is, for example, the case for many majors/programs in nursing and in the allied health areas.

8. Upon transfer, does this course meet a specified requirement for a degree at a 4-year institution? If so, please include the institution and degree program. It is recommended you review your current Articulation Agreements.

Preliminary indications are that students will receive transfer credit for:

LaGuardia Community College: MAT 119 - Statistics with Elementary Algebra (3 credits, 7 hours (5 lecture, 2 lab))

BMCC: MAT 150.5 – Statistics with Algebra (4 credits, 6 hours)

Other CUNY Colleges: Potential CUNY Pathways course fulfilling the Required Core: Mathematical and Quantitative Reasoning requirement.

9. Will adding the course potentially **conflict** with other courses – in content or subject matter – offered in either your Department or in *another* Department? If it will, please explain **how** and indicate **why** the course is still necessary.

N/A

10. Proposed textbook(s) and/or other required instructional material(s), including open educational resources (OER)– Please include any supplemental/recommended materials/texts to allow for **any** qualified instructor to teach the course:

OER Resource: OpenAlgebra.com (Free Algebra Guide with Videos) Textbook: Introductory Statistics, MyLab Revision, 10^{th} edition, by Weiss (Pearson Education)

11. **Attach a Common Syllabus** that includes the Topical Course Outline for the 12-week semester. This should be specific and explicit regarding the topics covered and should contain the detailed sample assignments/activities being used to measure the Course Learning Outcomes. **REMINDER** – be mindful to focus on the Course Learning Outcomes, Course Content, and Assessment.

Lab Hours	Topics	Sections (OpenAlgebra)	Sections (Weiss book)
1	Real Numbers and The Number Line	1.1	
1	Adding and Subtracting Integers	1.2	
1	Multiplying and Dividing Integers	1.3	
1	Fractions	1.4	
1	Decimals and Percents	1.5	
1	Exponents and Square Roots	1.6	
1	Order of Operations	1.7	
1	Review		
1	Test		
1	Measures of Center and Measures of Variation		3.1 – 3.2
1	The Five-Number Summary; Boxplots		3.4
1	Descriptive Measures for Population; Use of Samples		3.5

1	Probability Basics		4.1-4.3
1	Contingency Tables; Joint and Marginal Probabilities		4.4
1	Conditional Probability		4.5
1	The Multiplication Rule; Independence		4.6
1	Counting Rules		4.8
1	Discrete Random Variables and Probability Distributions		5.1
1	The Mean and Standard Deviation of a Discrete Variable		5.2
1	The Binomial Distribution		5.3
1	Review		
1	Test		
1	Introduction to Algebra	2.1	
1	Simplifying Algebraic Expressions	2.2	
1	Linear Equations: Part I	2.3	
1	Linear Equations: Part II	2.4	
1	Applications of Linear Equations	2.5	
1	Ratio and Proportion Applications	2.6	
1	Introduction to Inequalities and Interval Notation	2.7	
1	Linear Inequalities	2.8	
1	Rules of Exponents	5.1	
1	Introduction to Polynomials and Evaluating	5.2	
1	Adding and Subtracting Polynomials	5.3	
1	Multiplying Polynomials and Special Products	5.4	
1	Dividing Polynomials	5.5	
1	Negative Exponents and Scientific Notation	5.6	
1	Review		
1	Test		
1	Introducing Normally Distributed Variables		6.1
1	Areas under the Standard Normal Curve		6.2
1	Working with Normally Distributed Populations		6.3
1	Normal Approximation to the Binomial Distribution		6.5
1	Sampling Error		7.1

1	The Mean and Standard Deviation of the Sample Mean		7.2
1	The Sampling Distribution of the Sample Mean		7.3
1	Estimating a Population Mean		8.1
1	Confidence Intervals for Mean: Standard Deviation Known		8.2
1	Confidence Intervals for Mean: Standard Deviation Unknown		8.3
1	The Nature of Hypothesis Testing		9.1
1	Critical-Value Approach to Hypothesis Testing		9.2
1	P-Value Approach to Hypothesis Testing		9.3
1	Hypothesis Tests for Mean: Standard Deviation Known		9.4
1	Hypothesis Tests for Mean: Standard Deviation Unknown		9.5
1	Confidence Intervals for One Population Proportion		12.1
1	Hypothesis Tests for One Population Proportion		12.2
1	Review		
1	Test		
1	Rectangular Coordinate System	3.1	
1	Graph by Plotting Points 70	3.2	
1	Graph using Intercepts	3.3	
1	Graph using the y-intercept and Slope	3.4	
1	Finding Linear Equations	3.5	
1	Parallel and Perpendicular Lines	3.6	
1	Solving Linear Systems by Graphing	4.1	
1	Solving Linear Systems by Substitution	4.2	
1	Solving Linear Systems by Elimination	4.3	
1	Applications of Linear Systems	4.4	
1	The Regression Equation		14.2
1	The Coefficient of Determination		14.3
1	Linear Correlation		14.4
1	Review		
1	Test		

12. Selected Bibliography and Source materials:

1. Bennett and Briggs, ***Using & Understanding Mathematics: A Quantitative Reasoning Approach***, 7th edition, Pearson, 2019

2. Black, ***Business Statistics: For Contemporary Decision Making***, 9th edition, Wiley, 2016

3. Blitzer, ***Introductory Algebra for College Students***, 8th edition, Pearson, 2021

4. Blitzer, ***Thinking Mathematically***, 6th edition, Pearson, 2015

5. Larson and Farber, ***Elementary Statistics: Picturing the World with Integrated Review***, 7th edition, Pearson, 2019

6. Majewicz, ***College Algebra: A Narrative Approach***, 3rd edition, Pearson, 2016

7. McClave and Sincich, ***Statistics***, 13th edition, Pearson, 2021

8. Sturm-Beiss and Yarmish, ***Essential College Pre-Algebra***, Kendall Hunt, 2015

9. Sturm-Beiss and Yarmish, Math Prep ***Elementary Algebra Exam***, Kendall Hunt, 2017

10. Sullivan, ***Statistics: Informed Decisions Using Data Plus Integrated Review***, 2nd edition, Pearson, 2017

11. Triola, ***Biostatistics for the Biological & Health Sciences***, 2nd edition, Pearson, 2018

12. Triola, ***Elementary Statistics with Integrated Review***, 13th edition, Pearson, 2018