KENT STATE UNIVERSITY

Name: Lorna G Herdina
Organization: Dean Arts & Sciences
Submission Date: 12/5/2018

Course Catalog Update

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Course Catalog Update Information: STU0004

Reference Number: CCU013951 **Date:** 22-OCT-18

Level: 3.00 of 3.00 **Currently On The Worklist Of:** Alison Smith, alisonjs

Owner: Office of Curriculum Services, 330-672-8558 or 330-672-8559, curriculum@kent.edu

Basic Course Data

Change type: Establish

Faculty member submitting this proposal: Xiaoyu Zheng

Requested Effective Term: 201980

Campus: Kent

College: AS-Arts and Sciences

Department: MATH-Mathematical Sciences

Course Subject: MATH-Mathematics

Course Number: 10050

Course Title: Quantitative Reasoning Plus

Title Abbreviation: Quantitative Reasoning Plus

Slash Course and Cross-list Information:

Credit Hours

Minimum Credit/Maximum Credit: 5 to 5

Contact Hours: Lecture - Minimum Hours/Maximum Hours: 5 to 5

Contact Hours: Lab - Minimum Hours/Maximum Hours:

Contact Hours: Other - Minimum Hours/Maximum Hours:

Attributes

Is this course part of the LER, WIC or Diversity requirements: Yes

If yes, course attributes: 1. LMCR-LER-Mathematics and Critical Reasoning 2. 3.

Can this course be repeated for credit: No Repeat	**Course Limit:**	**OR Maximum Hours:**
Course Level: Undergraduate	**Grade Rule:** B-Standard letter	

Rationale for an IP grade request for this course (if applicable):

Schedule Type(s): 1. LEC-Lecture 2. 3.

Credit by Exam: N-Credit by exam-not approved

Prerequisites & Descriptions

Current Prerequisite/Corequisite/Catalog Description:

Catalog Description (edited): (Learning Outcome Equivalent to MATH 10051) In the broadest sense mathematics should provide students the needed quantitative tools, logical reasoning and problem-solving skills, and a sense that quantitative modeling can be used to describe and understand developments in many areas of daily living. Since critical thinking is the primary objective and outcome for our course, in each area of concentration (numeracy, mathematical modeling, and probability and statistics) students will need to read and glean information from the problem situation, convert the information into a usable form, perform any needed routine calculations, make or draw a conclusion, and then communicate the result via explanation using quantitative reasoning by writing coherent statements and paragraphs. This course also provides just-in-time remediation to help students achieve the same learning outcomes as MATH 10051. No credit earned for this course if a student already earned credit for MATH 10051.

Prerequisites (edited): ALEKS Math score between 25 and 34; or minimum C grade in MATH 00021.

Corequisites (edited):

Registration is by special approval only: No

Content Information

Content Outline:

Content Hours per Course Topic	Topic Description

25	Numeracy
22	Mathematical Modeling
18	Basic Probability and Statistics
10	Reviews and Exams

Display/Hide Delimited Course Outline

Total Contact Hours: 75

Textbook(s) used in this course: Quantway College Co-Requisite, a program of the Carnegie Foundation for the Advancement of Teaching, Carnegie Math Pathways project.

Writing Expectations: On a daily basis students will be completing activities where they must communicate their ideas orally then in writing for submission to be graded. There will also be longer writing assignments such as a term paper or three short papers.

Instructor(s) expected to teach: All Math faculty

Instructor(s) contributing to content: Ellen Mulqueeny

Proposal Summary

Explain the purpose for this proposal:

To allow some students who placed into remedial coursework, and still need MATH 10051, to complete the equivalent course in one semester instead of two semesters. Math department currently offers a pilot version of this course in the form of Corequisite model, some students who placed into MATH 00022, are registered in two separate courses: MATH 10051 (4 hours) and a linked MATH 00095 (1-hour special topics). This proposal is to permanently combine of these two courses into one 5-credit hour course.

Explain how this proposal affects program requirements and students in your unit:

No effect.

Explain how this proposal affects courses, program requirements and student in other units:

Students needing MATH 10051 that would have been placed in MATH 00022 will take this course, MATH 10050, instead of MATH 00022 and MATH 10051, which are taken over two semesters. Students will progress faster to degree completion.

Explain how this proposal affects enrollment and staffing:

Enrollments will increase at the same rate as decreased remedial enrollment. No effect on staffing.

Units consulted (other departments, programs or campuses affected by the proposal):

Regional Campuses.

Curriculum Services Information:

Approved by EPC:	**Curriculum Bulletin:**
Cross-list Banner Code:	**OBR Course Level:**
OBR Program Code:	**OBR Subsidy Code:**
CIP Code:	**Term Start:**
	Term End:

Comments (500 Character Maximum):

NOTE: Please do not use the following restricted characters: (~ * / \ --)

Comments:

Date	User	Comment
11/6/2018	Xiaoyu Zheng	
11/1/2018	Mary Ann Haley	Returning per your request.

History:

Date	User	Status
12/5/2018	Mary Ann Haley	Approved

11/6/2018	Andrew M. Tonge	Approved
11/6/2018	Xiaoyu Zheng	Submitted
11/1/2018	Mary Ann Haley	Returned For Edit
10/30/2018	Andrew M. Tonge	Approved
10/30/2018	Xiaoyu Zheng	Submitted

Kent Core Course Proposal Questionnaire

Please review the Kent Core Policy Statement before completing and submitting the questionnaire to the University Requirements Curriculum Committee accompanied by a Course Catalog Update workflow and typical course syllabus.

Date: November 6, 2018

Department/School: Mathematics

Course ID: Math 10050 **Credit Hours:** 5

Course Title: Quantitative Reasoning Plus

Prerequisite(s): ALEKS Math score between 25 and 34; or minimum C grade in Math 00021.

Select Kent Core Category:

☐ **Composition**	☐ **Humanities and Fine Arts**	☐ **Social Sciences**
x **Mathematics and Critical Reasoning**	☐ **Humanities**	☐ **Basic Sciences**
	☐ **Fine Arts**	☐ **Additional**

1. **Explain how the course addresses (a) concepts central to the subject area and (b) the specific Kent Core learning goals listed in the *University Catalog* (www.kent.edu/catalog/kent-core)**

   a. **Acquire critical thinking and problem-solving skills.**

   In this course students will be asked to examine current issues such as medical testing, students will then have to make decisions on whether or not to pursue further testing based on the information reported.

   b. **Apply principles of effective written and oral communications.**

   On a daily basis students will be completing activities where they must communicate their ideas orally then in writing for submission to be graded.

   c. **Broaden their imagination and develop their creativity.**

   Students will be investigating topics currently in the news such as global warming. Through class discussions students will have opportunities to think of creative ways in which they can impact the environment and reasons why their actions can be significant.

   d. **Cultivate their natural curiosity and begin a lifelong pursuit of knowledge.**

   Students will be investigating topics currently in the news such as the garbage problem in the Pacific Ocean a as a result of the Tsunami in Thailand in 2004. This will engage students to think about topics they may have not considered as containing any mathematical importance.

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e. **Develop competencies and values vital to responsible uses of information and technology.**

Students will create many different types of graphs with technology and explain the differences and strengths of each different representation.

f. **Engage in independent thinking, develop their own voice and vision and become informed, responsible citizens.**

The materials used for this course were developed using topics from current events, such as social, health, or environmental issues where students explore/read through an article and are asked to evaluate and critique using numerical reasoning, not just stating an opinion.

g. **Improve their understanding of issues and behaviors concerning inclusion, community and tolerance.**

Since students will be working in randomly assigned groups giving them opportunities to interact with students with differing backgrounds and interests.

h. **Increase their awareness of ethical implications of their own and others' actions.**

Through class discussion and working together in small groups students will be gain insight as to how their reactions or lack of can impact others.

i. **Integrate their major studies into the broader context of a liberal education.**

Students will on a weekly basis bring in articles of interest to them and discuss the relevant quantitative information contained in the news clipping or graphic display.

j. **Strengthen quantitative reasoning skills.**

A major goal of this course is to develop the intellectual skills needed to deal with quantitative information as a citizen and in the workplace. On a daily basis students will interact with the course materials beyond the typical skill and drill typically encountered in a lower level mathematics course making decisions that can be supported with numerical reasoning.

k. **Understand basic concepts of the academic disciplines.**

Students will have the opportunity to use a variety of mathematical strategies, breaking difficult questions into component parts, and looking at questions from various viewpoints in diverse settings

2. **If this course is being proposed for the Composition category or the Mathematics and Critical Reasoning category, indicate the essential skills that the course is intended to teach, sharpen or strengthen. (Skip this question if the proposed course is intended for other categories.)**

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Engage students in a meaningful intellectual experience, increase students' quantitative and logical reasoning abilities, improve students' ability to communicate quantitative ideas, and strengthen mathematical abilities that students need in other disciplines.

3. **State how the course is representative of a field that has attained maturity and substance with critical mass of its own scholarly literature, methodology, community of specialists and conceptual framework.**

   This course will reflect the Mathematical Association of America's Undergraduate Programs and Courses in the Mathematical Sciences: CUPM Curriculum Guide 2004. An updated version of the CUPM Curriculum Guide was released in 2015. In this document six core Quantitative Reasoning outcomes were referenced. The State of Ohio has included these outcomes in TMM011.

4. **Are adequate resources available for this course (e.g., faculty, classroom space, equipment, library holdings)? If yes, explain.**

   Yes. Reallocation of new classrooms developed in the redesigned space of the former Math Emporium in the second floor of the library, replacing some Basic Algebra sections by MATH 10050 sections. The Students will access to computers and be sitting at round tables to promote collaborative learning.

5. **Has this course been offered previously?**

   Yes, as a pilot. Currently being offered as MATH 10051+ MATH 00095

6. **Given the available Kent Core course options, why is it important that this course be added as an option for students in fulfilling their Kent Core?**

   MATH 10050 builds from a lower pre-requisite level but achieves the same ultimate learning outcomes as MATH 10051, Quantitative Reasoning, which fulfills the Kent Core. Creation of MATH 10050 aligns with the Ohio Math Initiative's Math Pathways focus on establishing co-requisite courses offering variable entry points for math gateway courses. Co-requisite courses are designed to increase student success and accelerate student progress toward graduation by moving students out of math remediation as much as possible. Instead taking an extra semester of math remediation, students are placed directly into college level "co-requisite" courses incorporating extra support. This approach provides students with a shortened one or two semester pathway to completion of their mathematics requirement, aligned to the needs of their majors. Institutions in many states have deployed co-requisite courses and have achieved very significant gains in student success in their math courses, in completion of math gateway courses, and in acceleration toward graduation. MATH 10050 is a co-requisite course achieving the same learning outcomes as MATH 10051, but open to many more students who are not adequately prepared for MATH 10051. MATH 10050 provides additional background and extra time to help such students be successful. Students may not receive credit for this course if they already earned credit for MATH 10051.

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7. Please complete and attach the Kent Core Learning Outcomes Assessment Plan, and attach a sample syllabus.

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Kent Core Learning Outcomes Assessment Plan

Course number, title (credit hours): MATH 10051 Quantitative Reasoning (4) and MATH 10050 Quantitative Reasoning Plus (5)

Department/School: Mathematical Sciences

Proposed Kent Core Category: ☐ Composition ☐ Humanities and Fine Arts ☐ Social Sciences

(please check appropriate box) X Mathematics and Critical Reasoning ☐ Humanities ☐ Fine Arts ☐ Basic Sciences ☐ Additional

A sample syllabus must accompany the plan.

I. Kent Core learning objectives	II. Ohio Transfer Module learning objectives III. What corresponding learning outcomes are included in this course?	IV. What method(s) will be used to assess student learning?	V. What evidence of this assessment will be presented annually for the five-year Kent Core review of this course?
Acquire critical thinking and problem-solving skills. Understand basic concepts of the academic discipline. Strengthen quantitative reasoning skills.	**1. Numeracy:** The successful Quantitative Reasoning student should be able to demonstrate these competencies: 1.1 Solve real-world problems requiring the use and interpretation of ratios in a variety of contexts: Parts to whole comparisons, converting decimals to percentages and vice versa, quantifying risks by calculating and interpreting probabilities, rates of change, and margins of error.	Assessments may include Preview Next Lesson (PNL) exercises, Out-of-class Exercises (OEC), quizzes, unit exams, writing assignments, daily class activities, and an end-of-term project	Overall student grades will be monitored to track student performance in the course. We will report percentages of students mastering course material in general, i.e. the overall percentage of students scoring 73% or higher on the exam. In addition, we will report mastery of individual learning outcomes based on final exam items. We will use the final exam to assess strengths and weakness in our students and analyze causes of the weakness and adjust course materials, delivery, or assignments as deemed appropriate.
Understand basic concepts of the academic discipline.	1.2 Solve real-world problems relating to rates of change, distinguishing between and utilizing models that describe absolute change and relative change including growth and decay.	Assessments may include Preview Next Lesson (PNL) exercises, Out-of-class Exercises (OEC), quizzes, unit exams, writing assignments, daily class activities, and an end-of-term project	
Acquire critical thinking and problem-solving skills.	1.3 Compare and contrast statements which are proportional and those that are not by applying proportional reasoning appropriately to real-	Assessments may include Preview Next Lesson (PNL) exercises, Out-of-class Exercises (OEC), quizzes,	

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Understand basic concepts of the academic discipline. Strengthen quantitative reasoning skills.	world situations such as scaling, dimensional analysis and modeling.	unit exams, writing assignments, daily class activities, and an end-of-term project	
Apply principles of effective written and oral communications. Engage in independent thinking, develop their own voice and become informed, responsible citizens	1.4 Demonstrate numerical reasoning orally and/or by writing coherent statements and paragraphs.	Assessments may include Preview Next Lesson (PNL) exercises, Out-of-class Exercises (OEC), quizzes, unit exams, writing assignments, daily class activities, and an end-of-term project	
Acquire critical thinking and problem-solving skills. Strengthen quantitative reasoning skills. Apply principles of effective written and oral communications. Broaden their imagination and develop their creativity.	**2. Mathematics Modeling:** The successful Quantitative Reasoning student should be able to demonstrate these competencies: 2.1 Create and use tables, graphs, and equations to model real-world situations including: using variables to represent quantities or attributes, estimating solutions to real-world problems using equations with variables, identifying pattern behavior, identifying how changing parameters can affect results, and identifying limitations in proposed models.	Assessments may include Preview Next Lesson (PNL) exercises, Out-of-class Exercises (OEC), quizzes, unit exams, writing assignments, daily class activities, and an end-of-term project	
Cultivate their natural curiosity and begin a lifelong pursuit of knowledge. Develop competencies and values vital to responsible uses of information and technology	2.2 Model financial applications such as credit card debt, installment savings, loans, etc. and calculate income taxes.	Assessments may include Preview Next Lesson (PNL) exercises, Out-of-class Exercises (OEC), quizzes, unit exams, writing assignments, daily class activities, and an end-of-term project	
Acquire critical thinking and problem-solving skills. Understand basic concepts of the academic discipline. Strengthen quantitative reasoning skills. Apply principles of effective written and oral communications.	2.3 Create basic linear and exponential models for real-world problems and be able to choose which one is most appropriate for a given context and describe the limitations of the proposed models.	Assessments may include Preview Next Lesson (PNL) exercises, Out-of-class Exercises (OEC), quizzes, unit exams, writing assignments, daily class activities, and an end-of-term project	
Acquire critical thinking and problem-solving skills. Understand basic concepts of the academic discipline.	2.4 Use basic logarithm properties to address questions (regarding time periods etc.) arising in real-world situations modeled exponentially.	Assessments may include Preview Next Lesson (PNL) exercises, Out-of-class Exercises (OEC), quizzes, unit exams, writing assignments, daily class activities, and an end-of-	

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		term project	
Acquire critical thinking and problem-solving skills. Apply principles of effective written and oral communications.	2.5 Explain and critique models orally and/or by writing coherent statements and paragraphs	Assessments may include Preview Next Lesson (PNL) exercises, Out-of-class Exercises (OEC), quizzes, unit exams, writing assignments, daily class activities, and an end-of-term project	
Acquire critical thinking and problem-solving skills. Strengthen quantitative reasoning skills. Cultivate their natural curiosity and begin a lifelong pursuit of knowledge. Increase their awareness of ethical implications of their own and others' actions	**3. Probability and Statistics:** The successful Quantitative Reasoning student should be able to demonstrate these competencies: 3.1 Critically evaluate statistics being presented in the media, journals, and other publications including evaluating the research methodology, critiquing how the author(s) came to their conclusions, identifying sources of bias, and identifying confounding variables. Students will be able to critically evaluate sampling strategy, the impact of sample size, correlation versus causation, and any inferences made.	Assessments may include Preview Next Lesson (PNL) exercises, Out-of-class Exercises (OEC), quizzes, unit exams, writing assignments, daily class activities, and an end-of-term project	
Acquire critical thinking and problem-solving skills. Apply principles of effective written and oral communications.	3.2 Summarize and interpret datasets with regard to shape, center, and spread. Use both graphical and numerical information. Use statistics appropriate to the shape. Students will be able to compare two or more datasets in light of this type of information.	Assessments may include Preview Next Lesson (PNL) exercises, Out-of-class Exercises (OEC), quizzes, unit exams, writing assignments, daily class activities, and an end-of-term project	
Develop competencies and values vital to responsible uses of information and technology	3.3 Create visual representations of real-world data sets such as charts, tables, and graphs and be able to describe their strengths, limitations, and deceptiveness.	Assessments may include Preview Next Lesson (PNL) exercises, Out-of-class Exercises (OEC), quizzes, unit exams, writing assignments, daily class activities, and an end-of-term project	
Understand basic concepts of the academic discipline. Acquire critical thinking and problem-solving skills.	3.4 Calculate probabilities and conditional probabilities in real-world settings, and employ them to draw conclusions.	Assessments may include Preview Next Lesson (PNL) exercises, Out-of-class Exercises (OEC), quizzes, unit exams, writing assignments, daily class activities, and an end-of-term project	
Apply principles of effective written and oral communications. Improve their understanding of issues and behaviors concerning inclusion, community and tolerance	3.5 Justify decisions based on basic statistical (probabilistic) modeling orally and/or by writing coherent statements and paragraphs.*	Assessments may include Preview Next Lesson (PNL) exercises, Out-of-class Exercises (OEC), quizzes, unit exams, writing assignments, daily class activities, and an end-of-term project	

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ASSURANCES:

By submitting this proposal, we assure that:

1. The faculty members who teach this course have agreed to the learning outcomes and assessment methods.
2. Assessment results will be reviewed annually by the faculty and submitted to the University Requirements Curriculum Committee.
3. Modifications to the course and/or assessment plan will be based on the annual review.

A M Tonge 11-13-18

Department Chair/School Director (or designee) Signature Date

SYLLABUS

MATH 10050– Quantitative Reasoning Plus (5 Credit Hours)

Catalog Information (Learning Outcomes equivalent to MATH 10051) In the broadest sense mathematics should provide students the needed quantitative tools, logical reasoning and problem-solving skills, and a sense that quantitative modeling can be used to describe and understand developments in many areas of daily living. Since critical thinking is the primary objective and outcome for our course, in each area of concentration (numeracy, mathematical modeling, and probability and statistics) students will need to read and glean information from the problem situation, convert the information into a usable form, perform any needed routine calculations, make or draw a conclusion, and then communicate the result via explanation using quantitative reasoning by writing coherent statements and paragraphs. This course also provides just-in-time remediation to help students achieve the same learning outcomes as Math 10051. No credit earned for this course if a student already earned credit for MATH 10051.

Prerequisite: ALEKS Math score between 25 and 34; or minimum C grade in Math 00021.

Course Materials: Quantway College Co-Requisite, a program of the Carnegie Foundation for the Advancement of Teaching, Carnegie Math Pathways project.

Numeracy (25 days)

- Interpret different uses of %, % of whole - % change
- Solve percentage problems
- Apply proportional (using ratios and proportions) reasoning skills to compare and contrast
- Understand the difference between absolute change and relative change
- Dimensional analysis
- Index numbers: use and calculate indexes to understand and compare data
- Understand budget basics
- Understand how the CPI is used to measure inflation

Mathematical Modeling (22 days)

General function knowledge

- Understand functional notation, domain, and range
- Construct and interpret graphs including piecewise functions
- Recognize linear and non-linear functions from formulas, graphs, and/or tables

Linear Functions

- Recognize when a linear function can be used for modeling real-world data and find the equation that represents this relationship.

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        - Find an equation for the regression curve and use this equation to predict values of the dependent variable for given values of the independent variable
    - Write linear function to model real-world situations
    - Apply and interpret linear models to make decisions

Exponential/log functions

- Understand the how to recognize the difference between linear and exponential growth or decay
- Determine when a data set is growing or decreasing at an exponential rate
- Understand the difference between rate of change and percent change
- Analyze relevant formulas to compute simple and compound interest
- Understand ordinary annuities and how to use the accumulated savings formula
- Apply loan payment formula to understand and analyze credit card debt and installment loans
- Find an equation for the regression curve and use this equation to predict values of the dependent variable for given values of the independent variable
- Write exponential function given:
    - Two solutions, parameters, or one parameter and one solution
    - Apply and interpret in application problems parameters and find specific solution given one variable
- Understand the inverse relationship between exponential on logarithmic functions and its usefulness and use this solve exponential equations
- Understand why Logarithms are used for handling very large/small numbers (pH, earthquake magnitudes, sound levels, etc.)

Basic Probability and Statistics (18 days)

- Distinguish between quantitative and qualitative data
- Draw bar graphs, circle graphs, histograms and be able to interpret them in the context of the data they represent
- Decide what or when each type of graphical display is appropriate for the type of data and describe their strength, limitations and possible deceptions
- Distinguish the difference between surveys, experiments, and case control studies
- Justify statistical decisions
- Compute and compare mean, median, mode and appropriate uses for each
- Compute and use the appropriate measure of center to analyze and compare data sets
    - 5 number summary: construct and interpret a box plot for contextual situations
    - Standard deviation: Use the 68-95-99.7 rule to interpret probabilities
- Calculate probabilities and conditional probabilities and use them to make informed decisions
- Interpret the accuracy of medical testing

EXAMS and Reviews (10 days)

MATH 10050 QUANTITATIVE REASONING PLUS

INSTRUCTOR: **OFFICE HOURS:**
E-MAIL:

This course may be used to satisfy a Kent Core Requirement. Kent Core courses are intended to broaden intellectual perspectives, foster ethical and humanitarian values, and prepare students for responsible citizenship and productive careers.

COURSE PREREQUISITE:

You are expected to have successfully completed (with a grade of C or better) MATH 00021 here at Kent or ALEKS Math score between 25 and 34. If you do not satisfy these prerequisites, the Registrar may de-register you from this course.

COURSE MATERIALS:

All students are required to purchase the textbook and the access code for the Quantway College Materials, this product is only available from the campus bookstore. Additionally, students will need at a minimum a scientific calculator. While not mandatory use of your own laptop in class is encouraged.

CLASS WEBSITE (*Blackboard*):

Through http://*flashline.kent.edu* (click on "Student Tools & Courses" tab, then the "Blackboard Single Sign On" link near top left.) OR click on the "Blackboard" Icon on the top right toolbar on the flashline homepage. From here you will be able to access Quantway and log into your pathways account.

COURSE DESCRIPTION:

In the broadest sense mathematics should provide students the needed quantitative tools, logical reasoning and problem-solving skills, and a sense that quantitative modeling can be used to describe and understand developments in many areas of daily living. Since critical thinking is the primary objective and outcome for our course, in each area of concentration (numeracy, mathematical modeling, and probability and statistics) students will need to read and glean information from the problem situation, convert the information into a usable form, perform any needed routine calculations, make or draw a conclusion, and then communicate the result via explanation using quantitative reasoning by writing coherent statements and paragraphs. This course also provides just-in-time remediation to help students achieve the same learning outcomes as Math 10051.

SUGGESTED INSTRUCTIONAL METHODS:

Multiple instructional methods will be used to **ACTIVELY** engage students in the learning process.

"FLIPPED PEDAGOGY." Flipping the classroom" is an active-learning technique in which students learn the basics of the course content by preparing for class. In this course, you are expected to complete assigned exercises BEFORE coming to each class. The students and instructor then spend class time interacting with and elaborating on that content, deepening learning and making it "stick". Much of our class time will be spent working on problems and engaging in activities either in a group or individually. This daily work will encourage students to think, reflect, discuss, and write about mathematical ideas and concepts in context. This course organization will help you **"learn by doing"** and develop a strong understanding of algebraic modeling and quantitative reasoning.

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LEARNING OUTCOMES:

- Use and interpret ratios in a variety of contexts; quantify risk by calculating and interpreting probabilities.
- Solve real world problems relating to rate of changes and differentiating when to use models that utilize absolute change and models that use relative change.
- Gain knowledge of mathematics as a practical tool in examining the world of finance through a realistic study of simple and compound interest and loans, credit cards, and budgeting.
- Interpret and make inferences from statistical graphs, tables, and chart regarding shape, center and spread.
- Understand how statistics are used in analyzing polls.
- Investigation of sampling methods and graphs with applications in scientific studies including the use of spreadsheet.
- Critically evaluate statistical studies and can describe the strengths, limitations, and deceptiveness.
- Understand the basics of probability.
- Investigation of linear modeling including piecewise models, linear systems, and regression.
- Estimating solutions to real world problems using equations with variables. And identifying how changing parameters can affect results
- Investigation of exponential modeling with applications in personal finance.
- Use basic logarithm properties to address the questions such as regarding times periods arising in real-world situations modeled exponentially.

TENATIVE CLASS SCHEDULE

DATE	SECTION – TOPIC	ACTIVITY
Week 1-2		
	CoReq N.1; Introduction to Quantitative Reasoning , N.1	Class introduction; Logging into the Carnegie hub; Forming groups (some type of ice breaker activity); Problem situation Vacation puzzle
	CoReg N.2, N.2; estimating with large numbers, recognize and compare proportional relationships,	Writing principle Syllabus activity; Millions, Billions, Or Trillions (social)
	(QLRA assessment), Coreq N.3	
LAST DAY TO ADD WEDNESDAY AUGUST 29th		
Week 3		
	N.3; interest rates, estimation skills recognize and compare proportional relationships, scaling factors, unit conversions.	A trillion dollars of student loans (finance)
	CoReq N.4	
	N.4; percentages, ratios, absolute and relative change, rates and probability	Computing and interpreting percentages (social, health, finance)
Week 4		

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	CoReq N.5	
	N.5; proportions, percentages, rates CPI, inflation; **Mid-module quiz (N.1 -N.4)**	The national debt: How big is it? (social, financial)
	CoReq N.7	
Week 5		
	N.7; relative change, growth indexes	An index for your salary (financial)
	CoReq N.8/N.9	Conditional probabiltiy
	N.8; specificity and sensitivity, screening tools, probability	Screening tools – How effective are they? (health and risk),
Week 6		
	N.9; conditional probability, two-way tables, specificity and sensitivity, screening tools	A closer look at screening tools (health and risk);
	Review; **"NEWS OF THE DAY"(or Project for Module N)**	
	Module N Assessment	
Week 7		
	CoReq M.1	
	M.1; use variables, introduction to models, construct and use equations, estimating solutions; CoReq M.2	Mathematical models: What's best? (social)
	M.2; linear models, slopes, intercepts, trendlines, tables, graphs, equations from a verbal description, spreadsheets, scatterplots 2	Linear models (social)
Week 8		
	CoReq M.3	
	Fall Break	
Week 9		
	M.3; linear models with real world data with fluctuations, spreadsheets, scatterplots, trendlines	Data is trendy (health, environment)
	CoReq M.4	
	M.4; piecewise models; CoReq M.5	Four equations.... Two models

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	Mid-Module Quiz (M.1 – M.4)	
Week 10		
	M.5: Developing mathematical modeling skills M.6; Exponential; equations and logarithmic operations; **Mid-Module Quiz (M.1 – M.4)**	Modeling a new type of growth (social); How long does that take? (finance)
	M.7 Exponential models and assumptions	A trust in social security (finance)
	CoReq M.8	
Week 11		
	M.8; multivariable models, formula, weighted averages	Multiple variables weighing on your mind? (social)
	Review; **"NEWS OF THE DAY"**	
	Module M Assessment	
LAST DAY TO WITHDRAW WEDNESDAY OCTOBER 31st @ MIDNIGHT		
Week 12		
	CoReq S.1	
	S.1; bar charts, pie charts, spreadsheets	Interpreting charts and graphs (finance)
	CoReq S.2	
Week 13		
	S.2; Evaluating and interpreting graphics, research questions, population and samples	Measuring success (social)
	S.3 observational versus experimental studies, bias, lurking variables, correlation versus cause	Statistical analysis process (health and risk)
	Finish lesson S.3; S.4; parameters versus statistics, margin of error, sample size, interval estimates	
Week 14		
	Finish lesson S.4; **Mid-Module Quiz (S.1-S.3)**	Sampling and error
	S.5; center, spread and standard deviation. Mean of grouped data	Exploring climate data (environmental)
	Finish Lesson S.5	
Week 15		
	S.6; shapes of distributions, normal distribution and z-scores	Exploring climate variability (environmental)
	Finish lesson S.6	

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	Review	
Week 16		
	Module S assessment	
	QLRA Assessment; Review for Final Exam	
Finals Week	**SEE FINAL EXAM SCHEDULE FOR THE DATE AND TIME OF YOUR FINAL EXAM**	

ATTENDANCE POLICY:

Excellence attendance is mandatory for your success in the course. A significant portion of your grade is based on your preparation for and participation in each class. **Failure to attend and participate in class can cause you to fail this course**. According to the university policy 3 – 01.2 "Administrative policy regarding class attendance and class absence, students may be excused from class for **PROPERLY DOCUEMENTED** "illness and injury, disability related concerns, military service, death in the immediate family, religious observance, academic field trips, participation in an approved concert or athletic event and direct participation in university disciplinary hearings."

STUDENTS IN THIS COURSE MUST

- Document absences in hard copy form, no phone or email excuses will be accepted.
- Submit excuses in a timely manner: All excuses for anticipated absences must be submitted before the anticipated absence, or in the case of an unanticipated absence, on the first day of the student's return to class.
- Assume all responsibility for getting assignments and submitting work. Even when the absence is excused it is t still your responsibility to catch up and submit the required work. Please note, the instructor is not your accountability "buddy", get the information from a trusted group member.

COURSE GRADES

Prep for Next Lesson; PNL exercises	**9%**
Daily class participation, completion of daily workbook activity (5% each module)	**15%**
Out of class exercises; OCE exercises	**15%**
News of the Day articles/presentations	**15%**
Module exams (3 @ 10% each)	**30%**
Final assessment	**16%**
QLRA assessment (BONUS, based on improvement from initial assessment)	**Up to 2%**

SUGGESTED DAILY PARTICIPATION POINTS:

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You will earn the full 5% for each module by satisfying the following requirements. Everyone will start each module with 100 participation points. Failure to complete any of the requirements below will result in a subtraction of points as indicated in parentheses below:

- coming to class each day (10 points, if unexcused)
- completing the PNL exercises in your workbook before each class (2 points)
- completing the daily lesson in your workbook during class (2 points)
- refraining from using your cell phone during class (2 points)
- submitting any take home assessments on time when collected in class (10 points)
- completing the "Making Connections" prompts in writing after each lesson and submitting when collected in class (2 points)
- participating in classroom discussions (2 points)

GRADING SCALE:

		A	93–100	A-	90–92
B+	87–89	B	83–86	B-	80–82
C+	77–79	C	73–76	C-	70–72
D+	67–69	D	60–66	F	0–59

SOCIAL MEDIA POLICY:

Being physically in the room while class is in session but being on your phone or social media is not being present in class, it is considered disruptive and as such you will forfeit the day's class points. When you are in class put your phone away, set it to silence, and close your social media. BE PRESENT!

LATE OR INCOMPLETE WORK:

Follow the course calendar however it is subject to changes. Any changes in due dates will be announced in class. Late work will NOT be counted for credit without an official accepted excusal form (see attendance policy).

MAKE-UP EXAMS:

Given only under **EXTRAORDINARY CIRCUMSTANCES** with written verification of a university-accepted excuse (documented illness, death in immediate family, university-sponsored event, see attendance policy). Please notify me IN ADVANCE, if possible, if an exam is to be missed.

CHEATING AND PLAGIARISM:

University policy 3342-3-01.8 deals with the problem of academic dishonesty, cheating, and plagiarism. None of these will be tolerated in this class. The sanctions provided in this policy will be used to deal with any violations. If you have any questions, please read the policy here or ask me.

STUDENTS WITH DISABILITIES:

University policy 3342-3-01.3 requires that students with disabilities be provided reasonable accommodations to ensure their equal access to course content. If you have a documented disability and require accommodations, please contact the instructor at the beginning of the semester to plan for

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necessary classroom adjustments. Please note, you must first verify your eligibility for these through Student Accessibility Services (contact 330-672-3391 or visit www.kent.edu/sas for more information on registration procedures).

REGISTRATION REQUIREMENT:

The last day to add a full-term class or change sections of a class is midnight on Sunday. The last day to drop any or all courses that meet the full semester before grade of "W" is assigned is midnight on Monday September 3rd . University policy requires all students to be officially registered in each class they are attending. Students who are not officially registered for a course by published deadlines should not be attending classes and will not receive credit or a grade for the course. Each student must confirm enrollment by checking his/her class schedule (using Student Tools in Flash Fast) prior to the deadline indicated. Registration errors must be corrected prior to the deadline.

WITHDRAWAL DEADLINE:

The official withdrawal deadline for this course is Wednesday October 31st at midnight.

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