

New Course Proposal Form

**Submitted on 02/01/2019 by William
Bray (WBray@MissouriState.edu).**

***All fields require input**

- New COURSE
- New REGULAR PERMANENT SECTION of an existing variable content course. If a new regular section of an existing variable topics course, enter the existing course number below

Existing Course:

MTH134 Algebraic Reasoning and Modeling

Course Code:

MTH

Course Number: (Check Availability)

134

Course Title:

Algebraic Reasoning and Modeling

Will this course become part of a program? No Yes (A corresponding program change form must be submitted)

Will this proposal need to be reviewed by CGEIP? No Yes

Will this proposal need to be reviewed by EPPC? No Yes

Prerequisite/Co-requisite or enter 'None':

Suitable score on the mathematics placement exam or a grade of C or better in MTH 101 or MTH 103. (1)

Catalog Course Description: (Include any Pass/Not Pass grading restrictions, repeatable limits, limitation on course applicability, UG/GR parallel course, etc.)

This course focuses on developing and applying concepts of algebra and statistics to real world data and problems. Reasoning skills will be developed as students analyze data sets with descriptive statistics and by creating and analyzing algebraic models to describe the data. The algebraic functions that will be used in modeling include linear, power, exponential and logarithmic. Technology options will be utilized in the analysis of data. Cannot count toward the mathematics major or minor. Cannot be taken Pass/No Pass.

Credit Hours:

3 ▼

Lecture Contact Hours:

3 ▼

Lab Contact Hours:

0 ▼

Note: If variable credit, enter the highest number and add to end of course description. (e.g. "Variable credit, may be taken 1-3 hours.")

Periodicity. Check all that apply.



Fall



Fall (even-numbered years only)



Fall (odd-numbered years only)



Spring



Spring (even-numbered years only)



Spring (odd-numbered years only)



Summer



On Demand only

Complete Catalog Description:

MTH 134 Algebraic Reasoning and Modeling

Prerequisite: Suitable score on the mathematics placement exam or a grade of C or better in MTH 101 or MTH 103.

This course focuses on developing and applying concepts of algebra and statistics to real world data and problems. Reasoning skills will be developed as students analyze data sets with descriptive statistics and by creating and analyzing algebraic models to describe the data. The algebraic functions that will be used in modeling include linear, power, exponential and logarithmic. Technology options will be utilized in the analysis of data. Cannot count toward the mathematics major or minor. Cannot be taken Pass/No Pass.

Credit hours: 3 Lecture contact hours: 3 Lab contact hours: 0

Typically offered: Fall, Spring, Summer

Include sample syllabus (list topics, course goals.) Use text box OR upload only file types of PDF, DOC or DOCX.

Attached 

Purpose of Course

MTH 134 Philosophy and Guiding Principles: This course is designed to provide students with experience in using technology, algebraic functions, statistics, and reasoning within the context of real world problems that include social science and business applications. With that philosophy in mind, it is imperative that this course

1. Develops mathematical concepts and skills within the context of real world problems.
2. Provides authentic experiences in reasoning and mathematical modeling to develop the logical skills needed to be an effective problem solver.
3. Makes connections among the multiple representations of functions and reinforces the value of functions in solving problems.
4. Emphasizes communication of questions, results, and logical processes.
5. Facilitates the use of technology.

Students can take this course to meet the Focus on Quantitative Literacy portion of the Foundations requirement in General Education. This course will meet Goal 5 of the MSU General Education Learning Goal.

Relationship to Other Departments

This is meant to replace MTH 135 College Algebra and as such will be an integral part of requirements for College of Business, Nursing, and many Social Sciences.

Is there a graduate/undergraduate parallel course to this one? No Yes

Enter parallel course number

null null null

How do these classes differ?

New Course Resource Information

Anticipated Average Enrollment per section:

40

Maximum Enrollment Limit per section:

44

Anticipated Average Enrollment per semester:

600

Maximum Enrollment Limit per semester:

700

Anticipated Average Enrollment per year:

950

Maximum Enrollment Limit per year:

950

Faculty Load Assignment (equated hours):

3

Is another course being deleted? No Yes

Select course number and title being deleted.

null null null

What will this course require in the way of:

Additional library Holdings

none

Additional computer resources

none

Additional or remodeled facilities

none

Additional equipment or supplies

none

Additional travel funds

none

Additional faculty; general vs specialized

none

Additional faculty; regular vs per-course

none

Other additional expenses

none

If additional faculty are not required, how will faculty be made available to teach this course?

They currently are teaching MTH 135; this course will ultimately replace MTH 135 in the curriculum.

List names of current faculty qualified and available to teach this course

Patti Blanton, Robert Brown, Roger Bunn, Sylvia Carr, Carolyn Shand-Hawkins, Harry Shea, Gary Stafford, Donna Sherrill, Linda Sun, Anna Tripi, Kimberly Van Ornum, Fan Zhou

What is the anticipated source of students for this course?

Business majors, Nursing majors, Social Science majors

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If from within the department, will students be taking this course in addition to or in place of other courses?

N/A

If from outside the department, which courses in other departments would most likely be affected?)

It is a requirement for students to be accepted into the Business major. It is intended as a General Education Quantitative Literacy course for Business, Nursing, and Social Science.

Other comments:

All sections of MTH 135 College Algebra were piloted with the suggested curriculum/syllabus for MTH 134 in Fall 2018. Primary students taking the course came from Business, Nursing, and Social Science. The success rate was 73% (old college algebra had a success rate of 55% (typically) for the same group of students). The course was designed with the above majors in mind and to meet the State requirements to carry MOTR#120. We survey the students regarding the content and nature of the course with very positive feedback from them (a report is available if requested).

What is the date that this new course was approved by departmental or program faculty?
(MM/DD/YYYY)

01/31/2019

Current Status:

College Council Review

Proposal Progress:

02/01/2019 - Submitted by Department Head (William Bray)

Review Comments:

02/01/2019 - Department Head Review - William Bray - Ready to go based on our pilot of the course in Fall 2018.

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MTH 134 Algebraic Reasoning and Modeling (Generic) Syllabus & Policy Statement

Instructor Name, Contact Information & Office Hours (mandatory on all syllabi and policy statements)

Type of Course: General Education—Foundations: Focus on Quantitative Literacy

Prerequisites: Suitable score on the mathematics placement exam or a grade of C or better in MTH 101 or MTH 103.

Description: This course focuses on developing and applying concepts of algebra and statistics to real world data and problems. Reasoning skills will be developed as students analyze data sets with descriptive statistics and by creating and analyzing algebraic models to describe the data. The algebraic functions that will be used in modeling include linear, power, exponential and logarithmic. Technology options will be utilized in the analysis of data. Cannot count toward the mathematics major or minor. Cannot be taken Pass/No Pass.

MTH 134 Philosophy and Guiding Principles: This course is designed to provide students with experience in using technology, algebraic functions, statistics, and reasoning within the context of real world problems that include social science and business applications. With that philosophy in mind, it is imperative that this course

1. Develops mathematical concepts and skills within the context of real world problems.
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4. Emphasizes communication of questions, results, and logical processes.
5. Facilitates the use of technology.

Purpose of the Course: Students can take this course to meet the Focus on Quantitative Literacy portion of the Foundations requirement in General Education. This course will meet Goal 5 of the MSU General Education Learning Goals:

General Goal (5): Students will be able to reason and solve quantitative problems from a wide array of contexts and everyday life situations; understand and create logical arguments supported by quantitative evidence; and clearly communicate those arguments in a variety of formats (e.g., words, tables, and mathematical equations) as appropriate.

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This is achieved through the following student learning outcomes (SLO):

SLO 5.1. Interpret and communicate information presented in mathematical forms (e.g., equations, functions, graphs, diagrams, tables, or words).

SLO 5.2. Convert relevant information into various mathematical forms (e.g., equations, functions, graphs, diagrams, tables, or words).

SLO 5.3. Calculate numerically and symbolically to solve a problem.

SLO 5.4. Analyze data quantitatively as the basis for competent, valid, and reliable inferences in order to draw reasonable and appropriate conclusions.

SLO 5.5. Use appropriate mathematical tools to explicitly describe assumptions, mathematical relationships, and conclusions.

SLO 5.6. Express evidence in support of an argument by employing an appropriate form of presentation (e.g., equations, functions, graphs, diagrams, tables, or words).

MTH 134 Content Learning Objectives: The following table shows the major learning objectives related to mathematical content and how these objectives meet the Missouri State General Education Student Learning Objectives, as well as the objectives of the Mathematical Reasoning and Modeling Pathway of the Missouri Department of Higher Education. (For the MDHE objectives, see: <https://dhe.mo.gov/AAU-Initiatives-MathPathways.php> where the bullets are sequentially lettered for ease of reference.)

Objective	MSU SLO	MDHE Pathway
Organize data in graphs and tables.	5.1, 5.5	II.A
Use descriptive statistics to interpret and analyze quantitative data.	5.1, 5.2, 5.5	II.B
Use probability to interpret and analyze quantitative data	5.3	II.C
Choose an appropriate technology tool to analyze two variable data.	5.4, 5.5	IV.
Draw valid conclusions from analysis of data and list possible limitations of conclusions.	5.4, 5.5	II.D
Communicate statistical findings or problem solving results effectively	5.4	II.D
Apply proportional reasoning to solve problems and draw conclusions.	5.3, 5.5	I.A
Provide appropriate units and convert units to explain, draw conclusions, or make decisions.	5.2, 5.3	I.B
Use appropriate function notation and investigate the behavior of algebraic functions, including linear, power, logarithmic and exponential.	5.1, 5.2, 5.5	IV.
Apply the concept of Average Rate of Change to real world problems.	5.3, 5.5	I.A

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Analyze data sets to determine if the behavior is linear or nonlinear and if the nonlinear sets can be better modeled by a power, logarithmic, or exponential function.	5.1, 5.2, 5.4, 5.5	II.A, III.B, III.C
Use knowledge of algebraic functions to create a possible model for data. Analyze the effectiveness of the model.	5.2, 5.3, 5.4, 5.5	III.B, III.C
Use the regression feature of technology tools to find an algebraic model and analyze its effectiveness.	5.4, 5.5	III.B, III.C
Use a model to make and interpret the meaning of predictions through interpolation and extrapolation.	5.3, 5.4, 5.5	III.B, III.C
Apply exponential function to growth and decay problems.	5.3, 5.5	IV.
Explore characteristics of data sets when they are plotted on a logarithmic scale versus a linear scale.	5.2, 5.3, 5.4, 5.5	III.B
Construct, graph and interpret a system of linear or nonlinear equations.	5.1, 5.2, 5.3, 5.5	III.C

Required Text: Access to **WileyPlus** online site for course materials; *Explorations in College Algebra*, by Kime, Clark, and Michael, 6th edition.

Additional Course Materials: Along with the required textbook and publisher website access, the instructor and students will use written and online sources, as well as data analysis software, to explore relevant and timely problems.

Assessment of Specific Learning Outcomes

Student success of the specific learning outcomes will be assessed through a variety of means. The assessment tools include, but are not limited to, homework, tests, and a common (across all sections of the class) written final exam.

The overall course grade will be weighted as follows: three in-class exams 45%; common final exam 25%; alternative assessments (quizzes, presentations, projects) 15%; class participation/homework 15%. The instructor will assign final course letter grades based on the overall weighted grade as follows: 90-100% A; 80-89% B; 70-79% C; 60-69% D; below 60% F. The plus/minus grading option is not used in this course.

Attendance. Due to the nature of this course, attendance to each class is critical and will be recorded. Students should make every effort to be in attendance at each session. In the event that a student must miss class, that student should contact the instructor for any items that were distributed during class. The student should also contact a classmate to get any missed notes. In the event that the absence occurred on the day of an exam,

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documentation must be provided to the instructor as soon as possible and the policy for possible make-up exams will be followed.

Other required policies as per the Provost's office will be put into all syllabi and policy statements including: Academic Integrity, Dropping the Class, Statement of Nondiscrimination, Statement on Disability Accommodation, Cell Phone Use Policy, and Emergency Response Statement.

Change Course Proposal Form

**Submitted on 02/01/2019 by William
Bray (WBray@MissouriState.edu).**

***All fields require input**

This proposal applies to:

- An existing COURSE
- An existing REGULAR (e.g. permanent) SECTION of a variable content course.

Existing Course:

MTH287 Computational Calculus with Analytic Geometry I

Will this proposal need to be reviewed by CGEIP? No Yes

Will this proposal need to be reviewed by EPPC? No Yes

Current online catalog description:

MTH 287 Computational Calculus with Analytic Geometry I

Prerequisite: "C" or better in MTH 135 or MTH 136 or MTH 138, or an approved score on a department placement test. General Education Course (Focus on Quantitative Literacy). Introduction to the concepts and methods of analytic geometry and differential and integral calculus with emphasis on applications in the natural sciences and technology. Cannot receive credit toward graduation for both MTH 287 and MTH 261. Cannot receive credit for both MTH 287 and MTH 285. A grade of "C" or better is required in this course in order to take MTH 288. Cannot be taken Pass/Not Pass. 3(3-0) F

Revise the current online catalog description as needed: (Strikethrough all deletions and insert/bold new information. Any content that is copied and pasted will lose existing formatting; please review prior to submission.)

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MTH 287 Computational Calculus with Analytic Geometry I

Prerequisite: "C" or better in ~~MTH 135~~ or MTH 136 or MTH 138, or an approved score on a department placement test. General Education Course (Focus on Quantitative Literacy). Introduction to the concepts and methods of analytic geometry and differential and integral calculus with emphasis on applications in the natural sciences and technology. Cannot receive credit toward graduation for both MTH 287 and MTH 261. Cannot receive credit for both MTH 287 and MTH 285. A grade of "C" or better is required in this course in order to take MTH 288. Cannot be taken Pass/Not Pass. 3(3-0) F

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What is changing? Check all boxes that apply.

- Course Code
- Course Number (Check Availability)
- Title
- Prerequisite
- Credit Hours/Contact Hours
- Periodicity
- Description

Reason for proposed change

The curriculum in MTH 135 is evolving into a form more appropriate for Business, Nursing, and Social Science majors and is no longer suitable for students intending to pursue Calculus.

Does this change affect course assessment (e.g. student learning evidence/outcomes)? No Yes

Explain.

[Empty text box for explanation]

How did you determine the need for this change? Check all boxes that apply or specify other.

- Routine or annual review/assessment of curriculum
- Faculty
- Student Input
- Accreditation/certification compliance
- Review of catalog information

Other (be specific):

[Empty text box for other reasons]

Check if this is a non-substantive change.

What is the date that this course change was approved by departmental or program faculty?
(MM/DD/YYYY)

01/31/2019

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Current Status:

College Council Review

Proposal Progress:

02/01/2019 - Submitted by Department Head (William Bray)

Review Comments:

02/01/2019 - Department Head Review - William Bray - The is natural given the change in MTH 135.

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MAKE YOUR

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