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**Bulletin / Banner Change Transmittal Form**

**[x] Undergraduate Curriculum Council**

**[ ] Graduate Council**

Signed paper copies of proposals submitted for consideration are no longer required. Please type approver name and enter date of approval.

Email completed proposals to curriculum@astate.edu for inclusion in curriculum committee agenda.

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| Suzanne Melescue | 10/21/2016 |

**Department Curriculum Committee Chair** |

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**COPE Chair (if applicable)** |
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| Jie Miao | 10/14/2016 |

**Department Chair:**  |

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**General Education Committee Chair (If applicable)**   |
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**College Curriculum Committee Chair** |

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**Undergraduate Curriculum Council Chair** |
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**College Dean** |

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**Graduate Curriculum Committee Chair** |
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**Vice Chancellor for Academic Affairs** |

**1.Contact Person** (Name, Email Address, Phone Number)

Jie Miao, jmiao@astate.edu, 680-8168

**2.Proposed Change**

Update course descriptions with prefixes MATH and STAT in the bulletin.

**3.Effective Date**

5/30/2017

**4.Justification –** *Please provide details as to why this change is necessary.*

Many of the course descriptions with prefixes MATH and STAT are outdated. Changes in the course descriptions are needed to reflect what are taught in those courses.

**Bulletin Changes**

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| **Instructions**  |
| **Please visit** [**http://www.astate.edu/a/registrar/students/bulletins/index.dot**](http://www.astate.edu/a/registrar/students/bulletins/index.dot) **and select the most recent version of the bulletin. Copy and paste all bulletin pages this proposal affects below. Follow the following guidelines for indicating necessary changes.** **\*Please note: Courses are often listed in multiple sections of the bulletin. To ensure that all affected sections have been located, please search the bulletin (ctrl+F) for the appropriate courses before submission of this form.** - Deleted courses/credit hours should be marked with a red strike-through (~~red strikethrough~~)- New credit hours and text changes should be listed in blue using enlarged font (blue using enlarged font). - Any new courses should be listed in blue bold italics using enlarged font (***blue bold italics using enlarged font***)*You can easily apply any of these changes by selecting the example text in the instructions above, double-clicking the ‘format painter’ icon 🡪 , and selecting the text you would like to apply the change to.**Please visit* [*https://youtu.be/yjdL2n4lZm4*](https://youtu.be/yjdL2n4lZm4) *for more detailed instructions.* |

DEPARTMENT OF MATHEMATICS AND STATISTICS

Methods and Materials Teaching Mathematics (EDMA)

EDMA 4563. Methods and Materials for Teaching Mathematics in the Secondary School Systematic

application of a variety of activities to facilitate the development of competent mathematics

teachers. Development and implementation of instructional strategies for teaching mathematics,

explicating types of knowledge and the ways they can be taught. Must be admitted to the Teacher

Education Program. Spring.

Mathematics (MATH)

MATH 0003. Introductory Algebra Credit not applicable toward a degree. Real numbers, inequalities,

linear equations, exponents, polynomials, and rational expressions. A grade of C or better

must be made in this course before enrolling in MATH 0013. Prerequisite, MATH ACT of 16. The

grade in this course will not be used to compute semester and cumulative grade point averages.

The course does not count toward any degree. Fall, Spring, Summer.

MATH 0013. Intermediate Algebra Credit not applicable toward a degree. Exponents, radicals,

polynomials, rational expressions, linear equations, functions, graphs, factoring, introduction to

quadratic equations, and related topics. A grade of C or better must be made in this course before

enrolling in MATH 1023, or MATH 1054. Prerequisite, High School Algebra I and Math ACT of 17 or

18, or a C or better in MATH 0003. The grade in this course will not be used to compute semester

and cumulative grade point averages. The course does not count toward any degree. Fall, Spring,

Summer.

MATH 1023. College Algebra Equations and inequalities, functions and graphs, polynomial and

rational functions, exponential and logarithmic functions, systems of equations and inequalities,

~~matrices,~~ and miscellaneous topics. No credit given if taken following MATH 1054. Prerequisite,

High School Algebra II and score of 21 or above on ACT Math or 530 or above on SAT Mathematics

or 47 or above on COMPASS Algebra or a grade of C or better in MATH 0013 or completion of 9

modules in UC 0173 and UC 022V. Fall, Spring, Summer. (ACTS#: MATH 1103)

MATH 1023. College Algebra Equations and inequalities, functions and graphs, polynomial and rational functions, exponential and logarithmic functions, systems of equations and inequalities, and miscellaneous topics. No credit given if taken following MATH 1054. Prerequisite, High School Algebra II and score of 21 or above on ACT Math or 530 or above on SAT Mathematics or 47 or above on COMPASS Algebra or a grade of C or better in MATH 0013 or completion of 9 modules in UC 0173 and UC 022V. Fall, Spring, Summer. (ACTS#: MATH 1103)

MATH 1033. Plane Trigonometry Right triangles and similar triangles, trigonometric ratios,

degrees, and radians, trigonometric functions, circular functions, trigonometric identities, inverse

trigonometric functions, trigonometric equations, Law of Sines, Law of Cosines, vectors, polar coordinates,

and complex numbers. No credit given if taken following MATH 1054. Prerequisite, High

School Algebra II and score of 21 or above on Math ACT or 530 or above on Math SAT, or a grade

of C or better in MATH 0013 or completion of 9 modules in UC 0173 or UC 022V or Corequisite,

MATH 1023. Fall, Spring, Summer. (ACTS#: MATH 1203)

MATH 1043. Quantitative Reasoning Quantitative reasoning as the approach to understanding

relationships using mathematical and algebraic methodologies. Contemporary topics will be used

to identify, analyze, generalize, and communicate quantitative relationships. Prerequisite, High

School Algebra II and score of 19 or above on ACT Math or ~~460~~ or above on SAT Mathematics or

36 or above on COMPASS Algebra or 42 or above on ASSET Algebra or a grade of C or better in

MATH 0013 or completion of 12 modules in UC 0173 and UC 022V. Fall, Spring, Summer. ~~Fall,~~

~~Spring, Summer.~~ (ACTS#: MATH 1003)

MATH 1043. Quantitative Reasoning Quantitative reasoning as the approach to understanding relationships using mathematical and algebraic methodologies. Contemporary topics will be used to identify, analyze, generalize, and communicate quantitative relationships. Prerequisite, High School Algebra II and score of 19 or above on ACT Math or 500 or above on SAT Mathematics or 36 or above on COMPASS Algebra or 42 or above on ASSET Algebra or a grade of C or better in MATH 0013 or completion of 12 modules in UC 0173 and UC 022V. Fall, Spring, Summer. (ACTS#: MATH 1003)

MATH 1054. Precalculus Mathematics Selected topics from algebra, trigonometry, and

analytic geometry. Prerequisite, High School Algebra II and score of 24 or above on Math ACT or

590 or above on Math SAT, or MATH 1023. Fall, Spring, Summer. (ACTS#: MATH 1305)

MATH 1093. Making Connections Mathematics Required course for first semester freshmen.

Core content includes transition to college, academic performance skills, problem solving, critical

thinking, self management, group building skills, and university policies. Content related to the

departmental majors is also included. Fall.

MATH 1143. Finite Mathematics Selected topics include linear systems, matrices, linear equalities,

linear programming simplex method, probability, combinatorics, statistics and finance application.

Prerequisites, MATH 1023. Demand.

MATH 2113. Mathematics for School Teachers I Sets, logic, and numbers with emphasis on

the axiomatic development of the real numbers. For elementary education majors only. Prerequisite,

with a C or better in MATH 1023. This course may not be used to satisfy general education

mathematics requirement. Fall, Spring, Summer.

MATH 2123. Mathematics for School Teachers II Mathematical systems, ~~elementary algebra,~~

~~probability and statistics, and geometry with applications.~~ Prerequisite, C or better in MATH 2113.

This course may not be used to satisfy general education mathematics requirement. Fall, Spring,

Summer.

MATH 2123. Mathematics for School Teachers II Mathematical systems, continued development of real numbers, specifically rational numbers, geometry, and measurement with applications. Prerequisite, C or better in MATH 2113. This course may not be used to satisfy general education mathematics requirement. Fall, Spring, Summer.

MATH 2143. Business Calculus ~~Exponential functions, mathematics of finance, systems of linear~~

~~equations, linear inequalities and linear programming, limits, derivatives, and integrals, business~~

~~calculus applications including marginal analysis, extrema and concavity of functions of one and~~

~~several variables.~~ Will not satisfy requirements for mathematics degrees. Prerequisite, MATH 1023

or MATH 1054 or a Math ACT score of 26 or a Math SAT score of 650. Fall, Spring, Summer.

MATH 2143. Business Calculus Exponential and logarithmic functions, mathematics of finance, limits, derivatives, optimization, and integrals, business calculus applications including marginal analysis, extrema and concavity of functions. Will not satisfy requirements for mathematics degrees. Prerequisite, MATH 1023 or MATH 1054 or a Math ACT score of 26 or a Math SAT score of 650. Fall, Spring, Summer.

MATH 2183. Discrete Structures ~~Topics include~~ ~~sets~~ and functions, partially ordered sets, trees

and graphs, algorithms, symbolic logic, Boolean algebra, combinatorics, and probability modeling.

Prerequisites, High School Algebra II and score of 22 or above on Math ACT or ~~630~~ or above on

SAT, or MATH 1054. Fall, Spring.

MATH 2183. Discrete Structures Sets and functions, partially ordered sets, trees and graphs, algorithms, symbolic logic, Boolean algebra, combinatorics, and probability modeling. Prerequisites, High School Algebra II and score of 22 or above on Math ACT or 560 or above on SAT, or MATH 1054. Fall, Spring.

MATH 2194. Survey of Calculus Survey of the basic concepts of calculus, including limits, derivatives,

exponential and logarithmic functions, integrals~~, and series and sequences~~. Credit will

not be given for both MATH 2194 and MATH 2204. Prerequisites, MATH 1023 or MATH 1054 or

a Math ACT score of 26 or a Math SAT score of 650. Fall, Spring. (ACTS#: MATH 2203)

MATH 2194. Survey of Calculus Survey of the basic concepts of calculus, including limits, derivatives, exponential and logarithmic functions, and integrals. Credit will not be given for both MATH 2194 and MATH 2204. Prerequisites, MATH 1023 or MATH 1054 or a Math ACT score of 26 or a Math SAT score of 650. Fall, Spring. (ACTS#: MATH 2203)

MATH 2204. Calculus I ~~Limits, derivatives, implicit differentiation, applications of the derivative,~~

~~indefinite integrals, definite integrals, substitution techniques for integrals and applications of the~~

~~integral.~~ Prerequisites, High School Trigonometry and score of 26 or above on math ACT or 650

or above on SAT, or MATH 1023 and MATH 1033 or MATH 1054. Fall, Spring, Summer. (ACTS#:

MATH 2405)

MATH 2204. Calculus I The calculus of functions of one real variable. Limits, derivatives, implicit differentiation, applications of the derivative (including L'Hospital's Rule), definite integrals, indefinite integrals, Fundamental Theorem of Calculus, substitution technique for integrals. Prerequisites, High School Trigonometry and score of 26 or above on math ACT or 650 or above on SAT, or MATH 1023 and MATH 1033 or MATH 1054. Fall, Spring, Summer. (ACTS#: MATH 2405)

MATH 2214. Calculus II ~~Inverse trigonometric functions, hyperbolic functions, integration by parts,~~

~~trigonometric substitution, partial fractions, integral tables, approximating definite integrals, Taylors~~

~~Theorem, L’Hospital’s Rule, improper integrals, sequences, series, power series, Taylor series,~~

~~parametric curves, arc length, surface area and polar coordinates~~. Prerequisite, MATH 2204 with

a grade of ~~“C”~~ or better. Fall, Spring, Summer. (ACTS#: MATH 2505)

MATH 2214. Calculus II Additional topics in the calculus of functions of one real variable. Techniques of integration (integration by parts, trigonometric substitution, partial fractions, integral tables), approximating definite integrals, improper integrals, applications of the integral, sequences, series, Taylor's Theorem, parametric curves, polar coordinates. Prerequisite, MATH 2204 with a grade of “C” or better. Fall, Spring, Summer. (ACTS#: MATH 2505)

MATH 3003. Geometry for Middle School Teachers Formal geometry in two and three dimensions,

measurement, symmetry, congruence and similarity, coordinate geometry, constructions,

conics. May not be used to satisfy the general education mathematics requirement. Prerequisites,

C or better in both MATH 2113 and MATH 2123. Spring.

MATH 3051. Try Out the Classroom Introductory classroom experience led by ASU STEM

faculty and area teachers. Topics include Arkansas science/math curriculum, classroom management,

laboratory safety, and basic teaching skills. Students will develop and present science/math

activities in area classrooms and campus outreach. Prerequisites, MATH 2204 and MATH 2214.

Fall.

MATH 3133. Math for School Teachers III Mathematical systems of computation, geometry,

algebra, probability and statistics with applications ~~for the Middle School Teacher~~. This course may

not be used to satisfy general education mathematics requirements. Prerequisites, C or better in

both MATH 2113 and MATH 2123. Fall.

MATH 3133. Math for School Teachers III Mathematical systems of computation, geometry, algebra, probability and statistics with applications. This course may not be used to satisfy general education mathematics requirements. Prerequisites, C or better in both MATH 2113 and MATH 2123. Fall.

MATH 3243. Linear Algebra ~~Introduction to vector spaces, with application to matrix theory.~~

Prerequisite, MATH 2214. Spring, Summer.

MATH 3243. Linear Algebra Matrix algebra, vector spaces, subspaces, the Rank-nullity theorem, eigen theory, and inner product spaces. Prerequisite, MATH 2214. Spring, Summer.

MATH 3254. Calculus III Vectors, lines, and planes in two and three dimensions, vector valued

functions, space curves, curvature and torsion, partial and directional derivatives, extrema of

functions of several variables, optimization problems, double and triple integrals with applications,

cylindrical and spherical coordinates, vector fields and line integrals, Greens Theorem and the

divergence theorem. Prerequisite, MATH 2214. Fall, Spring, Summer.

MATH 3273. Applied Complex Analysis ~~Survey of complex analysis with emphasis on developing~~

~~skills needed for applications.~~ Prerequisite, MATH 3254. ~~Demand.~~

MATH 3273. Applied Complex Analysis Survey of complex analysis with emphasis on developing skills needed for applications and understanding of derivatives and integrals of complex functions. Prerequisite, MATH 3254. Fall, even.

MATH 3303. Modern Algebra I ~~Introduction to the theory of groups, rings, modules, and vector~~

~~spaces, with emphasis on applications to the real number system.~~ Prerequisite, MATH 2214. Fall.

MATH 3303. Modern Algebra I Introduction to the theory of groups and rings, with emphasis on modular arithmetic proofs. Prerequisite, MATH 2214. Fall.

MATH 3323. Mathematical Modeling Construction of mathematical models for use with problems

in the mathematical sciences, operations research, engineering and the management and life sciences.

Prerequisite, MATH 2214. Spring.

MATH 3343. College Geometry ~~Geometric transformations and invariants.~~ Prerequisite, MATH

2214. Spring.

MATH 3343. College Geometry Origin and development of Euclidean and Transformational Geometry, explorations of spherical and hyperbolic geometries. Implementation of geometric software. Prerequisite, MATH 2214. Spring.

MATH 3353. History of Mathematics Origin and development of modern mathematical concepts.

Topics include systems of numeration, algebra, geometry, calculus, and the foundations of the real

number system. Prerequisite, MATH 2214. Fall, odd.

MATH 4403. Differential Equations ~~Topics in the elementary theory of differential equations,~~

~~including existence theorems.~~ Prerequisite, MATH 3254. Fall, Spring.

MATH 4403. Differential Equations Topics in the elementary theory of differential equations, including existence theorems and applications. Prerequisite, MATH 3254. Fall, Spring.

MATH 4423. Modern Algebra II Continuation of MATH 3303. Prerequisite, MATH 3303. Spring.

MATH 4513. Applied Mathematics ~~Topics from ordinary and partial differential equations, including~~

~~existence theorems.~~ Prerequisite, MATH 3254. ~~Fall, even.~~

MATH 4513. Applied Mathematics Asymptotics, summation techniques, approximation solutions to differential and difference equations. Prerequisite, MATH 3254. Fall.

MATH 4533. Numerical Methods ~~Algebraic, transcendental, ordinary and partial differential~~

~~equations, finite differences, and integral equations. Numerical integration, error analysis, and~~

~~other topics of numerical analysis utilizing high speed computer techniques.~~ Prerequisites, MATH

2214 and CS 2114. ~~Fall, odd.~~

MATH 4533. Numerical Methods Error analysis, numerical methods to solve nonlinear systems, numerical integration, ordinary and partial differential equations, and finite differences. Prerequisites, MATH 2214 and CS 2114. Spring, even.

MATH 4553. Advanced Calculus I ~~The calculus of one and of several variables. Limits, continuity,~~

~~sequences, differentiation, partial differentiation, integration, and infinite series.~~ Prerequisite,

MATH 3254. ~~Fall, Summer, even.~~

MATH 4553. Advanced Calculus I The theoretical treatment of calculus of one real variable. Limits, continuity, sequences, differentiation and integration. Prerequisite, MATH 3254. Fall.

MATH 4563. Advanced Calculus II Continuation of MATH 4553. Prerequisite, MATH 4553.

Spring.

MATH 4581. Mathematics Seminar Prerequisite, MATH 3303. ~~Demand~~.

MATH 4581. Mathematics Seminar Prerequisite, MATH 3303. Fall, Spring.

MATH 459V. Special Problems in Mathematics Prerequisite, MATH 3303. ~~Demand~~.

MATH 459V. Special Problems in Mathematics Prerequisite, MATH 3303. Fall, Spring.

Statistics (STAT)

STAT 3233. Applied Statistics I For students in a variety of disciplines including the sciences,

allied health fields, and education. Descriptive statistics for quantitative and qualitative data, normal

distributions, correlation, linear regression, sample surveys, randomized comparative experiments,

sampling distributions, estimation and hypothesis testing for means and proportions. Prerequisite,

MATH 1023 or equivalent. Fall, Spring, Summer.

STAT 4453. Probability and Statistics I ~~Probability spaces, random variables, probability distributions,~~

~~independence, conditioning, probability laws, sampling theory, and associated topics.~~  Prerequisite, MATH 3254. Fall.

STAT 4453. Probability and Statistics I Set theory, random variables, probability laws and distributions, independence, conditioning, moment generating functions and the Central Limit Theorem. Prerequisite, MATH 3254. Fall.

STAT 4463. Probability and Statistics II ~~Point and interval estimation, testing hypotheses,~~

~~standard statistical tests, correlation and regression, and nonparametric methods.~~ Prerequisite,

STAT 4453. Spring.

STAT 4463. Probability and Statistics II Point and interval estimation, hypothesis testing, ANOVA, correlation, regression, and nonparametric methods. Prerequisite, STAT 4453. Spring.

STAT 4473. Applied Statistics II A second course in applied statistics covering topics in statistical

inference for comparing population means and proportions, power, and sample size analyses,

analysis of variance, ANOVA, and multiple comparisons procedures, nonparametric statistical procedures,

chi square analyses, and inference for regression. Prerequisite, STAT 3233 or equivalent.

Spring.

Teaching Internship (TIMA)

TIMA 4825. Math Teaching Internship in the Secondary School Ten semester hours. Full

semester teaching internship. Fall, Spring.

TIMA 4826. Math Teaching Internship in the Secondary School Twelve semester hours. Full

semester of teaching internship. Fall, Spring