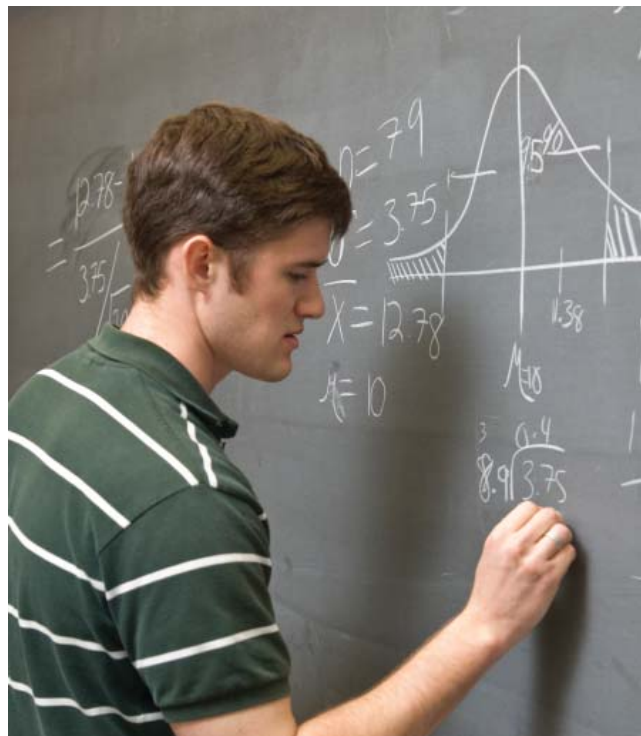


Department of

# Mathematics



Jackie Nygaard, Department Chair

Kent Bessey, David Brown, Greg Cameron, Larry Chilton, Paul Cox, Ryan Cromar, Brad Garner, Troy Goodsell, Shane Goodwin, Ann Marie Harmon, Daris Howard, Paul Johanson, Craig Johnson, Bonnie Moon, Jackie Nygaard, Susan Orme, Richard Pieper, Danae Romrell, Jason Rose, Garrett Saunders, Wayne Startin, David Stowell, Heidi Turner, Elaine Wagner, Ben Woodruff

Jennifer Gohr, Department Secretary (208) 496-7521  
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The Department of Mathematics offers two degree programs – a Bachelor of Science in Applied Mathematics and a Bachelor of Science in Mathematics Education.

## Applied Mathematics

Majoring in applied mathematics at BYU-Idaho will help you enhance your problem-solving skills, sharpen your ability to reason logically, apply mathematics to problems which have real world implications, and improve your ability to communicate difficult ideas. Corporations, government agencies, research labs, and other employers will value the traits you will gain as a mathematics major, and employees in the jobs are typically well compensated.

The demand for people with mathematics training is so great that many undergraduates are given extra funds (through the Smart Grant) to encourage them to complete their rigorous training. When you finish, your degree in applied mathematics could prepare you for a career as an educator, researcher, engineer, software developer, business manager, statistician, biostatistician, physicist, actuary, lawyer, etc. Government agencies such as the National Security Agency, Central Intelligence Agency, Treasury Department, and the Commerce Department hire mathematicians to do everything from break codes to detect who is cheating on their taxes.

## Mathematics Education

The Math Education major is designed to help students become qualified mathematics instructors in secondary education programs. Qualified mathematics instructors greatly influence our children's success in becoming informed and capable members of society. Consequently, such instructors are a vital part of every secondary education program. As technology continues to advance and influence our daily lives, the demand for quality mathematics instruction has increased. This high demand has caused a shortage of qualified instructors. Hence, graduates skilled in secondary mathematics instruction have little difficulty finding careers in education.

In order to provide students with the experiences necessary to become exceptional teachers, the Mathematics Education program focuses on the following areas: a rigorous understanding of mathematical concepts, applying the principles of the BYU-Idaho Learning model to mathematics instruction, implementing a variety of teaching pedagogies, using technology appropriately for instruction, learning to communicate mathematical concepts well, and developing professional behaviors. Emphasis on becoming true disciples of Jesus Christ permeates and enhances all of these student experiences. Students who fully participate in and master these objectives will leave BYU-Idaho able to deliver high quality mathematics instruction at public or private secondary institutions.

## Mission Statement

The Department of Mathematics fully supports the University's Mission Statement. The specific mission of the Department is to:

1. Prepare students to work confidently and competently with the quantitative elements of modern life.
2. Provide students studying Mathematics or related disciplines with the knowledge, skills, and experiences necessary to excel in their careers.
3. Foster a culture of personal and professional development among the department's faculty and staff.

To achieve this mission, the following outcomes will be measured:  
 All students will:

- Demonstrate knowledge of the mathematical principles underlying provident living practices.
- Use quantitative information to make logical decisions.
- Apply multiple tools to the solution of real world problems with quantitative elements.

Students majoring in disciplines related to Mathematics will:

- Appropriately apply mathematical concepts and techniques to problems in their discipline.

Students majoring in Mathematics will:

- Communicate technical information and ideas effectively.
- Solve real world problems by applying diverse problem solving approaches.

Prospective Mathematics teachers will:

- Conduct themselves professionally.
- Have a foundational understanding of the concepts they will teach.
- Use a variety of pedagogies and reflect on their application and effectiveness.
- Use a variety of technologies and reflect on their potential to improve learning.

Students majoring in Applied Mathematics will:

- Be prepared for professional opportunities or graduate studies.

## Mathematics

Brigham Young University-Idaho 2014-2015

### BS in Applied Mathematics (650)

Take required Foundations courses

#### Major Requirements

*Students must maintain a minimum grade of C- in their major courses*

<b>Introductory Applied Math Module</b> <i>Take these courses your first 2 semesters:</i> CS 124                    3 MATH 221B                3 MATH 113                 3 MATH 341                 3 <hr style="width: 50%; margin-left: 0;"/> 12  <b>Applied Math Module 1</b> <i>Take these courses:</i> MATH 214                 3 MATH 281                 3 MATH 301                 3 MATH 316                 4 <hr style="width: 50%; margin-left: 0;"/> 13	<b>Applied Math Module 2</b> <i>Take these courses:</i> MATH 411                 3 MATH 441                 3 MATH 461                 3 <hr style="width: 50%; margin-left: 0;"/> 9  <i>Take 1 course:</i> MATH 423                 3 MATH 463                 3 MATH 472                 3 MATH 495R                3 <hr style="width: 50%; margin-left: 0;"/> 3	<b>Applied Math Module 3</b> <i>Take 2 courses:</i> MATH 412                 3 MATH 442                 3 MATH 462                 3 <hr style="width: 50%; margin-left: 0;"/> 6  <i>Take 1 course:</i> MATH 412                 3 MATH 423                 3 MATH 425                 3 MATH 442                 3 MATH 462                 3 MATH 463                 3 MATH 472                 3 MATH 495R                3 <hr style="width: 50%; margin-left: 0;"/> 3	<b>Internship/Senior Project</b> <i>Take 3 credits:</i> MATH 498R                1-3 MATH 499R                1-3 <hr style="width: 50%; margin-left: 0;"/> 3	<b>Program Notes:</b>  No Double Counting of Major Courses.
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**Total Major Credits=49**

**Additional Elective Credits Required for Graduation=31**

This major is available on the following tracks:

Fall-Winter---- YES

Winter-Spring---- YES

Spring-Fall---- YES

### BS in Mathematics Education (850)

Take required Foundations courses

#### Major Requirements

*Students must maintain a minimum grade of C- in their major courses*

<b>Education Module:</b> <i>Take these courses:</i> ED 200                    2 ED 304                    3 ED 361                    3 ED 461                    3 ED 492                    10 SPED 360                 2 <hr style="width: 50%; margin-left: 0;"/> 23	<b>Introductory Math Education Module</b> <i>Take these courses during your first 2 semester:</i> FDMAT 112*                4 MATH 114                 4 MATH 205                 3 MATH 221B                3 <hr style="width: 50%; margin-left: 0;"/> 14	<b>Math Education Module 1</b> <i>Take these courses:</i> MATH 190                 1 MATH 206                 2 MATH 241                 2 MATH 242                 2 MATH 271                 2 MATH 340                 3 MATH 340L                1 <hr style="width: 50%; margin-left: 0;"/> 13	<b>Math Education Module 2</b> <i>Take these courses:</i> MATH 350                 3 MATH 440                 3 MATH 450                 2 MATH 490                 2 <hr style="width: 50%; margin-left: 0;"/> 10	<b>Program Notes:</b> *FDMAT 112 needs to be taken to satisfy a major requirement as well as partially satisfy the Foundations Quantitative Reasoning requirement. Full completion of Foundations will also require FDMAT 108T.
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**Total Major Credits=37**

**Education Core Credits=23**

**Education Majors Require an Education Minor for Graduation**

This major is available on the following tracks:

Fall-Winter---- YES

Winter-Spring---- YES

Spring-Fall---- YES



**Statistics Minor**  
**For Math/Science Majors (233)**

**Minor Requirements**

*No Double Counting of Minor Courses - Students must maintain a minimum grade of C- in their Minor Courses*

<b>Introductory Statistics Module</b> <i>Take 1 course:</i> MATH 221B      3 MATH 221C      3 <hr style="width: 20px; margin-left: 0;"/> 3	<i>Take 1 course:</i> MATH 214      3 MATH 215      4 <hr style="width: 20px; margin-left: 0;"/> 3	<i>Take these courses:</i> MATH 325      3 MATH 341      3 <hr style="width: 20px; margin-left: 0;"/> 6	<b>Statistics Module 2</b> <i>Take these courses:</i> MATH 326      3 MATH 327      3 MATH 423      3 MATH 425      3 <hr style="width: 20px; margin-left: 0;"/> 12	<b>Program Notes:</b>  
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**Total Minor Credits=24**

This minor is available on the following tracks:

Fall-Winter---- YES                                  Winter-Spring---- YES                                  Spring-Fall---- YES

**Actuarial Concentration (D 118)**

**Concentration Requirements**

*No Double Counting of Concentration Courses - Students must maintain a minimum grade of C- in their Concentration Courses*

<b>Introductory Actuarial Module</b> <i>Take these courses:</i> ACCTG 201      3 ECON 150      3 ECON 151      3 <hr style="width: 20px; margin-left: 0;"/> 9  <i>Take this course:</i> ECON 215      4 OR <i>Take these courses:</i> MATH 119      4 MATH 241      2 <hr style="width: 20px; margin-left: 0;"/> 4	<b>Actuarial Module 1</b> <i>Take these courses:</i> B 410      3 ECON 388      3 ECON 453      3 <hr style="width: 20px; margin-left: 0;"/> 9  <i>Take 1 course:</i> ECON 278      3 MATH 221A      3 <hr style="width: 20px; margin-left: 0;"/> 3	<b>Actuarial Module 2</b> <i>Take these courses:</i> ECON 455      3 MATH 423      3 <hr style="width: 20px; margin-left: 0;"/> 6  <b>Interdisciplinary Module</b> <i>Take these courses:</i> IDS 398R      1-3 IDS 499      2 <hr style="width: 20px; margin-left: 0;"/> 3	<b>Recommended Electives</b> These courses would be beneficial to students completing the Actuarial Concentration but are not required:  B 401      3 B 411      3	<b>Program Notes:</b>  
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**Total Concentration Credits=34**

This Concentration is available on the following tracks:

Fall-Winter---- YES                                  Winter-Spring---- YES                                  Spring-Fall---- YES

**Applied Math Concentration (D 119)**

**Concentration Requirements**

*No Double Counting of Concentration Courses - Students must maintain a minimum grade of C- in their Concentration Courses*

<b>Introductory Applied Math Module</b> <i>Take these courses:</i> FDMAT 112*      4 MATH 113      3 MATH 221B      3 MATH 341      3 <hr style="width: 20px; margin-left: 0;"/> 13	<b>Applied Math Module 1</b> <i>Take these courses:</i> MATH 214      3 MATH 301      3 MATH 316      4 <hr style="width: 20px; margin-left: 0;"/> 10	<b>Applied Math Module 2</b> <i>Take 3 courses:</i> MATH 411 or 412      3 MATH 423      3 MATH 441 or 442      3 MATH 461 or 462      3 MATH 463      3 MATH 472      3 <hr style="width: 20px; margin-left: 0;"/> 9  <b>Interdisciplinary Module</b> <i>Take these courses:</i> IDS 398R      1-3 IDS 499      2 <hr style="width: 20px; margin-left: 0;"/> 3	<b>Recommended Electives</b> These courses would be beneficial to students completing the Applied Math Concentration but are not required:  CS 124      3 CS 165      3	<b>Program Notes:</b>  <i>*Note to students: FDMAT 112 needs to be taken to satisfy a major requirement as well as partially satisfy the Foundations Quantitative Reasoning requirement. Full completion of Foundations will also require FDMAT 108T.</i>
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**Total Concentration Credits=35**

This Concentration is available on the following tracks:

Fall-Winter---- YES                                  Winter-Spring---- YES                                  Spring-Fall---- YES

## Mathematics

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### Statistics Concentration (D 133)

#### Concentration Requirements

*No Double Counting of Concentration Courses - Students must maintain a minimum grade of C- in their Concentration Courses*

Introductory Applied Math Module Choose either Option 1 or Option 2		Statistics Module 1 <i>Take these courses:</i>	Statistics Module 2 <i>Take these courses:</i>	<i>Program Notes:</i>
<b>Option 1</b> <i>Take 1 course:</i> MATH 221A           3 MATH 221B           3 MATH 221C           3 <u>3</u>  <i>Take these courses:</i> MATH 119           4 MATH 241           2 MATH 325           3 <u>9</u>	<b>Option 2</b> <i>Take 1 course:</i> MATH 221A           3 MATH 221B           3 MATH 221C           3 <u>3</u>  <i>Take these courses:</i> MATH 215           4 MATH 325           3 MATH 341           3 <u>10</u>	MATH 326           3 MATH 327           3 MATH 425           3 <u>9</u>  <i>Take 1 course:</i> BIO 377           3 BIO 379           3 CHILD 400       3 ECON 388       3 ESS 497         3 HS 391           2 MATH 423       3 PSYCH 302       3 SOC 400         3 <u>2</u>	MATH 461           3 MATH 462           3 <u>3</u> 6  OR  <i>Take these courses:</i> CS 124           3 CS 165           3 <u>3</u> 6  <b>Interdisciplinary Module</b> <i>Take these courses:</i> IDS 398R         1-3 IDS 499           2 <u>2</u> 3	

**Total Concentration Credits=32**

This Concentration is available on the following tracks:

Fall-Winter---- YES

Winter-Spring--- YES

Spring-Fall---- YES

#### Mathematics Pre-approved Cluster

<b>General Mathematics</b> <span style="float: right;">6200</span> <i>Take at least 12 credits from Mathematics courses numbered 112 or higher:</i>  <div style="text-align: right;"> <b>Total Credits</b>           <u>12</u> </div>	<b>Physical Science and Mathematics</b> <span style="float: right;">6800</span> <i>Take 12 credits from at least 2 of the following areas:</i> <b>Chemistry</b> Take any Chemistry class numbered 105 or higher   0-10 (Chem 150 and Chem 153 cannot be taken with Chem 351 and/or Chem 352)  <b>Physics</b> Take any Physics class numbered 105 or higher   0-10  <b>Geology</b> Take any Geology class numbered 111 and 111L or higher 0-10  <b>Mathematics</b> Take any Mathematics class numbered 111 or higher   0-10 <div style="text-align: right;"> <b>Total Credits</b>           <u>12</u> </div>
<b>Statistics</b> <span style="float: right;">6203</span> <i>Take 1 course:</i> MATH 221B   Biostatistics           3 MATH 221C   Social Science Statistics   3  <i>Take these courses:</i> MATH 325   Intermediate Statistics Methods   3 MATH 326   Experimental Design           3  <i>Take 3 credits:</i> BIO 377    Techniques in Biochemistry and Molecular Biology                               3 BIO 379    Ecological and Wildlife Tech       3 CHILD 400   Research and Evaluation           3 ECON 388   Introduction to Econometrics       3 ESS 497    Exercise Science Seminar          3 HS 391    Research Methods and Program Evaluation 2 MATH 327   Introduction to Bayesian Statistics   3 MATH 423   Probability and Statistics          3 MATH 425   Applied Linear Regression          3 PSYCH 302   Research Methods                   3 SOC 400    Sociological Analysis               3 <div style="text-align: right;"> <b>Total Credits</b>           <u>12</u> </div>	

# Mathematics

Brigham Young University–Idaho 2014-2015

## Course Descriptions

## Credits\*

### FDMAT 108 Math for the Real World

(3:3:0)

Prerequisites: Students must have an ACT Math score of at least 18, or an SAT Math score of at least 430, or an ALEKS score of at least 38, or MATH 100B with a B or higher, or MATH 101 with a B or higher, or MATH 100G with a B or higher.

This class prepares students to understand, analyze, and solve real-life problems that require quantitative reasoning. Topics include the meaning of probabilities, how to read, critique, and apply statistical information found in news reports, public policy debates, consumer reports, and other daily life and professional situations, the use of mathematical models in describing, understanding, and making predictions about real world phenomena, and the mathematics of loans and investments. Topics will be illustrated by examples and applications from current events, daily life, business, and natural phenomena. Mathematical Tools for the Real World is to inspire students to act wisely when faced with quantitative challenges in collegiate coursework, employment, and daily living.

(Winter, Spring, Fall)

### FDMAT 108T Test Out Option for FDMAT 108

(1:0:0)

Prerequisites: Take one of the following- ECON 215, FDMAT110, FDMAT112, FDMAT109, MATH 113, MATH 215, MATH 119

This pass/fail online-based course allows students who have already had a Foundations mathematics course, to explore the contemporary topics of finance math, linear and exponential modeling, probability, and statistical reasoning. It will satisfy the BYU-Idaho Foundations quantitative reasoning requirement and contains the most vital topics of the traditional 3.0-credit FDMAT 108. Completion of the course includes passing both financial mathematics exam and statistical reasoning exam along with a financial life-planning spreadsheet project. Students may take FDMAT 108T one time only. Failure of FDMAT 108T would require the students to take the traditional 3.0 credit FDMAT 108 course to complete the foundations quantitative reasoning requirement.

(Winter, Spring, Fall)

### FDMAT 110 College Algebra

(3:3:0)

Prerequisite: MATH 101

Course Requirement: Students must have an ACT Math score of at least 18 or an SAT Math score of 430 or an ALEKS score of 53 to register for this course.

Elementary analysis of functions having discrete or connected domains. Methods of solving equations. Systems of equations and matrices. Strong connections to real world applications of functions and matrices will be made. Students who will be going on to take Calculus are strongly encouraged to take Math 109 instead of Math 110.

(Winter, Spring, Fall)

### FDMAT 112 Calculus I

(4:4:1)

Prerequisites: (FDMAT 109 or MATH 109) or (FDMAT 110 and MATH 111)

Course Requirement: Students must have an ACT Math score of at least 18 or an SAT Math score of 430 or an ALEKS score of 85 to register for this course.

Limits, continuity, derivatives, integrals, and transcendental functions. Properties and applications of the above.

(Winter, Spring, Fall)

### MATH 100A Arithmetic

(1:0:3)

A study of arithmetic and applications using arithmetic. This course is only for those needing a review of elementary school arithmetic including signed numbers, fractions, decimals, and percent's.

(Winter, Spring, Fall)

### MATH 100B Beginning Algebra

(2:0:3)

The arithmetic of integers and rational numbers as well as an introduction to algebra. This course is recommended for those needing basic algebra before taking progressively higher math courses.

(Winter, Spring, Fall)

### MATH 100G Personal Finance

(3:3:0)

Part of the Pathway program, this course covers a review of arithmetic of decimals and fractions, introduction to variables, evaluating formulas, solving linear equations, graphing linear equations in two variables, exponent rules, and financial applications in spreadsheets. This is a pre-requisite for FDMAT 108.

(Winter, Spring, Fall)

### MATH 100L English Language and Personal Finance

(5:0:0)

Prerequisite: GS 120L

As part of the Pathway program for students that speak English as a second language, this course has English language development components related to arithmetic. This course content reviews of arithmetic of decimals and fractions, introduction to variables, evaluating formulas, solving linear equations, graphing linear equations in two variables, exponent rules, and financial applications in spreadsheets. This is a pre-requisite for FDMAT 108.

(Winter, Spring, Fall)

### MATH 101 Intermediate Algebra

(3:3:0)

Fundamental operations of algebra, properties of exponents, solving linear, fractional, radical and quadratic equations, graphing linear and quadratic functions. Math 101 may not be taken for credit if FDMAT 110 has been completed with a grade of "B" or higher.

(Winter, Spring, Fall)

### MATH 109 Precalculus

(5:5:0)

Prerequisite: MATH 101

Course Requirement: Students must have an ACT Math score of at least 18 or an SAT Math score of 430 or an ALEKS score of 55 to register for this course.

Combination of College Algebra and Trigonometry. Intended to prepare students for Calculus or other math and science courses. Elementary analysis of functions having discrete or connected domains. Methods of solving equations. Systems of equations and matrices. Triangle relationships, graphs of periodic functions, trigonometric identities, inverse trigonometric functions, and applications of trigonometry.

(Winter, Spring, Fall)

### MATH 111 Trigonometry

(2:2:0)

Prerequisites: MATH 101 or FDMAT 110

Course Requirement: Students must have an ACT Math score of at least 18 or an SAT Math score of 430 or an ALEKS score of 55 to register for this course.

Trigonometric functions, triangle relationships, graphs, identities, inverse trigonometric functions, complex numbers, and applications. Applications of trigonometry will be emphasized throughout the course.

(Winter, Spring, Fall)

### MATH 113 Calculus II

(3:3:1)

Prerequisites: FDMAT 112 or MATH 112

Techniques of integration, infinite sequences and series, polar coordinates, and parametric curves.

(Winter, Fall)

### MATH 114 Calculus II for Education Majors

(4:4:1)

Prerequisites: FDMAT 112 or MATH 112

Techniques of integration, infinite sequences and series, polar coordinates, parametric curves, introduction to multi-variable and vector calculus.

(Spring, Fall)

### MATH 119 Calculus for Business and Life Science

(4:4:1)

Prerequisites: Take either FDMAT 110, MATH 110, MATH 109, or FDMAT 109

A one-semester terminal course of single and multi-variable calculus designed primarily for students in biology, agriculture, and business. Topics include derivatives, integrals, and Applications.

(Winter, Spring, Fall)

### MATH 190 Tutoring Mathematics

(1:1:0)

Prerequisites: FDMAT 112 or MATH 112

This course gives math education majors a mid-level practicum experience working with secondary level students. We hope that participants will discover whether or not they really want to pursue a secondary education degree. During this practicum experience, participants will tutor junior high school students, discuss and use "best" practices in tutoring, and improve their presentation skills by completing a theater workshop.

(Winter, Spring, Fall)

### MATH 205 Fundamentals of Number Theory

(3:3:0)

Prerequisites: FDMAT 108 or FDMAT 108T

This course is for Secondary Education Mathematics Majors and Minors and Elementary Education majors. Systems of numeration, operations on whole numbers, integers and rational numbers, the real number system, and other topics from number theory are included.

(Winter, Spring, Fall)



## Mathematics

Brigham Young University–Idaho 2014-2015

<p><b>MATH 206 Elementary Geometry</b> (2:2:0)            Prerequisites: FDMAT 108 or FDMAT 108T            This course is for Secondary Education Mathematics majors and minors and Elementary Education majors. Concepts of geometry in two and three dimensions.            (Winter, Spring, Fall)</p>	<p><b>MATH 301 Introduction to Analysis</b> (3:3:0)            Prerequisites: (MATH 113, MATH 114 or MATH 215) and MATH 281 or Instructor Consent            Achieving maturity in mathematical communication. Topics include introduction to mathematical proof, analysis of proof, set theory, mathematical induction, logical reasoning, elementary number theory, and properties of relations and functions.            (Winter)</p>
<p><b>MATH 214 Multivariable/Vector Calculus</b> (3:3:1)            Prerequisite: MATH 113            Vectors, vector geometry, quadric surfaces, alternative coordinate systems, vector-valued functions, partial derivatives, gradient, optimization, multiple integration, vector fields, integral theorems of vector calculus, and applications. Math 214 and 215 cannot both be taken for credit.            (Winter, Fall)</p>	<p><b>MATH 316 Differential Equations with Linear Algebra</b> (4:4:1)            Prerequisites: MATH 214 or MATH 215            Matrices, determinants, eigen values and eigenvectors, first and second order ordinary differential equations, power series and Fourier series methods, Laplace transforms, systems of linear ordinary differential equations. Emphasis on methods and applications.            (Winter, Spring, Fall)</p>
<p><b>MATH 215 Multivariable Calculus</b> (4:4:1)            Prerequisites: FDMAT 112 or MATH 112            Polar coordinates, parametric curves, vectors, vector geometry, vector-valued functions, partial derivatives, gradient, optimization, multiple integration, vector fields, and operations on scalar and vector fields. Emphasis on methods and applications. Math 215 and Math 214 cannot both be taken for credit.            (Winter, Spring, Fall)</p>	<p><b>MATH 325 Intermediate Statistics</b> (3:3:0)            Prerequisites: Take either ECON 278, MATH 221A, MATH 221B, or MATH 221C            Various nonparametric procedures, ANOVA and ANCOVA with two or more factors, multiple near regression, modules to develop various skill sets: a) principles of experimental design, six-sigma, and quality control, b) odds ratio/relative risk, chi-square, and logistic regression analyses, c) basic time series and forecasting models.            (Winter, Spring, Fall)</p>
<p><b>MATH 221A Business Statistics</b> (3:3:0)            Prerequisites: FDMAT 108 or FDMAT 108T            Graphical representation of data, measure of center and spread, elementary probability, sampling distributions, correlation and regression, statistical inference involving means, proportions, and contingency tables.            (Winter, Spring, Fall)</p>	<p><b>MATH 326 Experimental Design</b> (3:3:0)            Prerequisites: Take either MATH 221A, MATH 221B, MATH 221C, or ECON 278            Designed to explore various experimental designs, to analyze data from these designs, and to consider optimal experimental designs. Students will design and conduct major-specific projects.            (Spring, Fall)</p>
<p><b>MATH 221B Biostatistics</b> (3:3:0)            Prerequisites: FDMAT 108 or FDMAT 108T            Graphical representations of data, measures of center and spread, elementary probability, sampling distributions, correlations and regression, statistical inference involving means, proportions, and contingency tables, odds ratio and relative risk.            (Winter, Spring, Fall)</p>	<p><b>MATH 327 Intro to Bayesian Statistics</b> (3:3:0)            Prerequisites: (FDMAT 112 or MATH 119) and (MATH 221A or MATH 221B or MATH 221C)            Topics include: the scientific method, conditional probability, Bayes' Theorem, multiple integrals, probability distributions, prior/posterior distributions, hypothesis testing, credible intervals, conjugate distributions (beta-binomial, Poisson-gamma, normal-normal), MCMC methods (i.e. Gibbs sampling), and comparison to frequentist methodologies.            (Spring, Fall)</p>
<p><b>MATH 221C Social Science Statistics</b> (3:3:0)            Prerequisites: FDMAT 108 or FDMAT 108T            Graphical representation of data, measures of center and spread, elementary probability, sampling distributions, correlation and regression, statistical inference involving means, proportions, and contingency tables.            (Winter, Spring, Fall)</p>	<p><b>MATH 330 Engineering Statistics</b> (3:3:0)            Prerequisite: FDMAT 112            Introduction to statistical methods for science and engineering. Review of basic statistical concepts of central tendency, dispersion of data, probability laws, hypothesis testing, and confidence intervals. Introduces statistical process control, design of experiments, statistical tolerance analysis, and concepts of six sigma quality.            (Winter, Spring, Fall)</p>
<p><b>MATH 241 Linear Algebra I</b> (2:2:0)            Prerequisites: FDMAT 112, MATH 119, or ECON 215            Introduces and explores some of the major concepts of matrix analysis through solving significant real world problems.            (Winter, Spring)</p>	<p><b>MATH 340 Discrete Mathematics</b> (3:3:0)            Prerequisites: MATH 114 and MATH 205            To be taken concurrently with MATH340L.            (Spring, Fall)</p>
<p><b>MATH 242 Linear Algebra II</b> (2:2:0)            Concurrent requisite: MATH 241            Introduces and explores some of the major concepts of vector spaces and linear transformations through solving significant real world problems.            (Winter, Spring)</p>	<p><b>MATH 340L Technical Writing Lab</b> (1:0:2)            Training in how to create and edit technical documents and how to typeset mathematics and mathematical figures using a computer. To be taken concurrently with MATH340.            (Spring, Fall)</p>
<p><b>MATH 271 Elementary Differential Equation</b> (2:2:0)            Prerequisites: MATH 113 or MATH 114            Introduces and explores some of the major concepts of differential equations and dynamical systems through solving significant real world problems.            (Spring, Fall)</p>	<p><b>MATH 341 Linear Algebra</b> (3:3:0)            Prerequisite: FDMAT112            Systems of linear equations, matrices, determinants, eigenvalues and eigenvectors, vectors, vector spaces, linear transformations, and applications.            (Winter, Spring, Fall)</p>
<p><b>MATH 281 Introduction to Applied Mathematics</b> (3:3:0)            Course Fees: \$20.00            Prerequisites: FDMAT 112 or MATH 119            Mathematical modeling concepts applied to areas such as biology, physics, chemistry, game theory, and economics. May include guest lecture, field trips, and interdisciplinary projects.            (Fall)</p>	<p><b>MATH 350 Geometry</b> (3:3:0)            Prerequisite: MATH 340            Axiomatic treatment of finite geometries, transformation geometry, Euclidean and non-Euclidean geometries with emphasis on the historical significance of the Parallel Postulate.            (Winter, Spring)</p>

# Mathematics

Brigham Young University–Idaho 2014-2015

<b>MATH 399R Mathematical Competitions</b> (1:0:1) Repeatable Course: may earn maximum of 4 credits Prerequisite: FDMAT 112 A hands-on problem solving course to prepare and practice for the Putnam Exam and other mathematical competitions. (Winter, Fall)	<b>MATH 462 Real Analysis II</b> (3:3:0) Prerequisite: MATH 461 Analysis in the context of metric spaces. Applications involving such tools as approximation, Fourier analysis, and multivariate optimization. (Winter- odd years)
<b>MATH 411 Numerical Analysis</b> (3:3:0) Prerequisites: CS 124 and MATH 316 Basic error analysis, complexity of algorithms, roots, interpolation, least squares approximation, curve fitting, numerical differentiation and integration, and systems of linear equations. (Fall)	<b>MATH 463 Complex Analysis</b> (3:3:0) Prerequisites: MATH 214 or MATH 215 Arithmetic, algebra and calculus operations and concepts applied to complex numbers and functions of a single complex variable. (Winter- odd years)
<b>MATH 412 Numerical Analysis II</b> (3:3:0) Prerequisites: MATH 411; (MATH 214 or MATH 215) Methods of solving complex problems using numerical analysis and computer simulation. A variety of computing tools will be employed to study significant problems of current interest. Topics may include graph theory, cryptography, random number generation, queuing theory, discrete optimization, parameter fitting, finite element analysis, numerical PDE methods, etc. (Winter- even years)	<b>MATH 472 Intro to Partial Diff Equations</b> (3:3:0) Prerequisite: MATH 316 Solving linear homogeneous and nonhomogeneous second-order partial differential equations with homogeneous and nonhomogeneous boundary conditions by separation of variables. Sturm-Liouville theory. Applications of partial differential equations to diffusion, wave, and other phenomena. Fourier series and their applications to solving partial differential equations. Solving first-order partial differential equations using the method of characteristics. Introduction to the finite-element and finite-difference methods. (Winter)
<b>MATH 423 Probability and Statistics</b> (3:3:0) Formerly MATH 324 Prerequisites: (MATH 221A or MATH 221B or MATH 221C) and (MATH 214 or Math 215) This course is intended for mathematics majors, economics majors, and statistics minors. This is an introduction to probability and mathematical statistics. Topics include: probability theory, random variables, multiple integration, discrete and continuous distributions, limit theorems, estimation, hypothesis testing, and power. (Winter)	<b>MATH 488R Statistical Consulting</b> (3:3:0) Repeatable Course: may take a maximum of 2 times Prerequisite: MATH 326 Co-requisite: MATH 425 This is a hands-on introduction to statistical consulting. Students will apply skills developed in other statistical courses to provide consulting services to researchers at BYU-Idaho. Students will continue to develop the written and oral communication skills needed to discuss technical statistical content with other researchers. Projects address needs at all stages of the research process. Student activity will be closely monitored by a statistician. This course provides a foundation upon which a student with interest in statistics can provide meaningful service and enhance their skills. (Winter, Spring, Fall)
<b>MATH 425 Applied Linear Regression</b> (3:3:0) Prerequisites: (MATH 241 or MATH 341) and (MATH 119 or MATH 214 or MATH 215) and MATH 325 Designed to explore fundamentals of regression, theory of regression models, residual and residual analysis, multiple regression, remediation, transformations, and ANOVA. Students will use SPSS for statistical analyses. (Winter)	<b>MATH 490 Secondary Education Mathematics Teaching Methods</b> (2:2:0) Co-requisites: (MATH 440 and MATH 450) and (MATH 302 or MATH 350) Math 490 must be taken the semester before student teaching. This course is designed to help preservice secondary mathematics teachers apply research-based teaching strategies that lead students to discover, create, appreciate, and utilize mathematics. Students will have many opportunities to teach, prepare lesson plans, learn how to organize and manage classrooms, and gain a knowledge of state and professional standards for secondary mathematics teachers. (Winter, Spring, Fall)
<b>MATH 440 Modern Algebra</b> (3:3:0) Prerequisites: Take either MATH 301, MATH 240, or MATH 340 This course is for secondary education majors and minors. Number theory, division algorithm, primes, GCD, LCM, proof, rings, integral domains, fields, polynomials, Fundamental Theorem of Algebra, groups, isomorphisms, and how these topics apply to the secondary school mathematics curriculum. (Spring, Fall)	<b>MATH 495R Topics in Mathematics</b> (3:3:0) Prerequisite: MATH 301 Repeatable Course: may earn maximum of 9 credits The content of this class will be determined by the department and the instructor, based on student need and interest. Possible subjects are Number Theory, Topology, Stochastic Processes, and Actuarial Science. (Fall)
<b>MATH 441 Abstract Algebra I</b> (3:3:0) Prerequisites: MATH 301 and MATH 341 Introduction to groups, rings, fields, vector spaces, and applications. (Fall)	<b>MATH 498R Internship</b> (1-3:0:0) Repeatable Course: may earn maximum of 3 credits Practical experience working in a math intensive industry. (Winter, Spring, Fall)
<b>MATH 442 Abstract Algebra II</b> (3:3:0) Prerequisite: MATH 441 Additional exposure to groups, rings, fields, vector spaces, and applications. (Winter- even years)	<b>MATH 499R Senior Project in Mathematics</b> (1-3:0:0) Repeatable Course: may earn maximum of 3 credits Content tailored to individual needs and interests of the students. Investigation and/or application of mathematical principles under the guidance of a faculty member. (Winter, Spring, Fall)
<b>MATH 450 History of Mathematics</b> (2:2:0) Prerequisite: MATH 350 Intended for those students majoring in Mathematics Education. Presents an overview of the development of mathematics and its interaction with society. (Spring, Fall)	
<b>MATH 461 Real Analysis I</b> (3:3:0) Prerequisites: (MATH 214 or MATH 215) and (MATH 316 or MATH 341) and MATH 301 Rigorous treatment of the calculus. Limits, continuity, differentiation, integration, and metric properties of Euclidean spaces. (Fall)	