4398 Senior Design. (2-2) This course deals with application of technical and non-technical skills and knowledge using a multidisciplinary team-based approach for solving real-world problems related to product and process development. The topics include systematic product development, development of business plans, project management, cost estimation, documentation and presentation, prototyping, fabrication and concurrent engineering. Prerequisites: TECH 4395 or TECH 4372 or EE 3400 or GEO 4313. (WI)

4399 Seminar in Technology. (3-0) The topics for this course will vary. The course will involve the identification of the topic, its nomenclature, its processes, tools, equipment or materials, and its application to technology. The topic may apply to either the certification program or technology program or to both. A final report summary or presentation will conclude each seminar. Repeatable for credit with different emphasis.

Department of Mathematics

Math/Computer Science Building 470
T: 512.245.2551 F: 512.245.3425
www.txstate.edu/math/welcome.html

Degree Programs Offered
Bachelor of Arts (BA), major in Mathematics
Bachelor of Science (BS), major in Applied Mathematics
Bachelor of Science (BS), major in Mathematics
Bachelor of Science (BS), major in Mathematics (Teacher Certification in Mathematics, Grades 7-12)

Minor Offered
Applied Mathematics
Mathematics

The study of mathematics is more than four thousand years old and comprises an enormous body of knowledge. Mathematics remains a very active area of research continually giving rise to new theories and questions. The knowledge accumulated and the questions being considered concern both mathematics itself and its many applications.

Mathematics is a fundamental skill required at some minimal level of all educated people, and required in depth in many professions. The teaching objective of our Department includes the development of reasoning and computations skills, and the preparation of students for careers requiring a significant mathematical background.

Centers for Excellence
The department houses two Centers for Excellence. Mathworks, a center for innovation in mathematics and math education, designs and hosts programs for students from kindergarten to high school, conducts research on math curriculum, and provides training for teacher education students as well as current teachers. Mathworks received the 2001 Star Award for Closing the Gaps from the Texas Higher Education Coordinating Board and the 2007 Siemens Founders Award.

The mission of the Center for Mathematics Readiness is to provide students with a fresh perspective, immersing them into the world of Mathematics through infrastructure planning, content and curriculum, technical support and evaluation. This will ensure that all students are afforded the opportunity to succeed, not just in college, but in life as well.

Majors
The department offers the Bachelor of Science with a major in Mathematics with or without teacher certification, the Bachelor of Science with a major in Applied Mathematics, and the Bachelor of Arts with a major in Mathematics. Any major consists of 20 required credit hours and 18 additional credit hours, which vary with the student's program. See the degree plans below.

For the BA or BS, a major in mathematics requires at least 38 semester hours, including MATH 2471, 2472, 3330, 3377, 3380, 4307 and 18 semester hours of advanced mathematics. The eighteen hours must follow one of two plans. The first consists of 3373, 4315, and 4330 plus any three of the following courses: 3305, 3323, 3325, 3348, 3375, 3398, 4305, 4306, 4336, or 4382. The second is the certification plan and consists of 3305, 3315, 4304 and 4311 plus any two of the following courses: 3323, 3325, 3373, 4305, 4315 or 4330. Notice that MATH 3315, 4302, 4303, 4304 and 4311 are not in the list of elective courses when taking the plan that includes MATH 3373. Even though MATH 2471 is the first required mathematics course, some students will need to take courses numbered below 2471. Credit examinations in MATH 1315, 2417, and 2471 are available.

For the BS, a major in applied mathematics requires at least 38 semester hours, including Math 2358, 2471, 2472, 3305, 3323, 3330, 3373, 3377, 3380 and 9 semester hours from Math 3348, 3375, 3398, 4305, 4306, 4307, 4315, 4336.

Teacher Certification

A student seeking certification to teach at the secondary level must take RDG 3323; EDST 4681; and CI 3325, 4332, 4343, and 4370. The student who has further questions should see the undergraduate advisor in Mathematics.

For students who are seeking teacher certification within their major and are not in the College of Science and Engineering, but would like a second teaching field in Mathematics (Texas Grades 7-12) the requirements are: MATH 2471, 2472, 3305, 3315, 3330, 3377, 3380, 4304, and 4307.

Bachelor of Science (BS)
Major in Applied Mathematics
Minimum required: 120 semester hours

General Requirements:
1. A minimum of 9 writing intensive hours and a total of 36 advanced hours are required to graduate. An advanced course is one that is numbered above 3000 and below 5000.
2. See the Academic Services section of this catalog for general education core curriculum requirements. PHYS 1430 is highly recommended as one of the 7-8 hours of natural science since it is a prerequisite for MATH 3375 in the advanced MATH electives.
3. If two years of the same foreign language were taken in high school, then no additional language hours required for the degree. In the absence of such high school language, two semesters of the same modern language must be taken at the college level.
4. Even though MATH 2471 is the first required mathematics course, some students will need to take courses numbered below 2471. Credit examinations in MATH 1315, 2417, and 2471 are available.
5. At least 38 hours are required in mathematics. and must include MATH 2358, 2471, 2472, 3305, 3323, 3330, 3373, 3377, 3380 and 9 semester hours of advanced mathematics from the following courses: MATH 3348, 3375, 3398, 4305, 4306, 4307, 4315 or 4336.
6. See the list of minors under the Degrees and Programs section of this catalog. Minor and electives should be chosen in consultation with the academic advisor.

Freshman Year - 1st Semester		Freshman Year - 2nd Semester		Sophomore Year - 1st Semester		Sophomore Year - 2nd Semester	
Course	Hr	Course	Hr	Course	Hr	Course	Hr
US 1100	1	MATH 2472	4	MATH 3373	3	MATH 3305	3
ENG 1310	3	ENG 1320	3	Minor (see gen. req. 6)	3	Minor (see gen. req. 6)	3
POSI 2310	3	HIST 1310	3	Life and Physical Sciences Component (see gen. req. 2)	4	CS 1428	4
COMM 1310	3	Life and Physical Sciences Component (see gen. req. 2)	3-4	MATH 2358	3	ENG Literature (see gen. req. 2)	3
MATH 2471	4	PHIL 1305 or 1320	3			MATH 3323	3
Social Science Component (see gen. req. 2)	3						
Total	17	Total	16-17	Total	13	Total	16

Junior Year - 1st Semester		Junior Year - 2nd Semester		Senior Year - 1st Semester		Senior Year - 2nd Semester	
Course	Hr	Course	Hr	Course	Hr	Course	Hr
ART, DAN, MU, or TH 2313	3	MATH 3377	3	MATH 3380	3	MATH Advanced Elective (see gen. req. 5)	3
MATH 3330	3	MATH Advanced Elective (see gen. req. 5)	3	Minor (see gen. req. 1 & 6)	3	MATH Advanced Elective (see gen. req. 5)	3
CS 2308	3	Minor (see gen. req. 1 & 6)	3	Electives (see gen. req. 1,3,4 & 6)	5-6	Minor (see gen. req. 1 & 6)	3
Minor (see gen. req. 1 & 6)	3	POSI 2320	3	ENG 3303	3	Electives (see gen. req. 1,3,4 & 6)	4
HIST 1320	3	Electives (see gen. req. 1,3,4 & 6)	3				
Total	15	Total	15	Total	14-15	Total	13

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Bachelor of Arts (BA)
Major in Mathematics
Minimum required: 120 semester hours

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General Requirements:
1. A minimum of 9 writing intensive hours and a total of 36 advanced hours are required to graduate. An advanced course is one that is numbered above 3000 and below 5000.
2. See the Academic Services section of this catalog for general education core curriculum requirements.
3. Even though MATH 2471 is the first required mathematics course, some students will need to take courses numbered below 2471. Credit examinations in MATH 1315, 2417 and 2471 are available.
4. At least 38 hours are required in mathematics, and must include MATH 2471, 2472, 3330, 3373, 3377 3380, 4307, 4315, and 4330; and nine hours of advanced mathematics from the following courses: MATH 3305, 3323, 3325, 3348, 3375, 3398, 4305, 4306, 4336, or 4382.
5. See the list of minors under the Degrees and Programs section of this catalog. Minor and electives should be chosen in consultation with the academic advisor.

Freshman Year - 1st Semester		Freshman Year - 2nd Semester		Sophomore Year - 1st Semester		Sophomore Year - 2nd Semester	
Course	Hr	Course	Hr	Course	Hr	Course	Hr
US 1100	1	MATH 2472	4	MATH 3373	3	ART, DAN, MU, or TH 2313	3
ENG 1310	3	ENG 1320	3	Minor (see gen. req. 6)	3	MATH Advanced Elective	3
POSI 2310	3	HIST 1310	3	Modern Language 1410	4	CS 1428	4
COMM 1310	3	Life and Physical Sciences		Life and Physical Sciences Component		Modern Language 1420	4
MATH 2471	4	Component (see gen. req. 2)	3	(see gen. req. 2)	4	ENG Literature (see gen. req. 2)	3
Social Science Component (see gen. req. 2)	3	PHIL 1305 or 1320	3				
Total	17	Total	16	Total	14	Total	17

Junior Year - 1st Semester		Junior Year - 2nd Semester		Senior Year - 1st Semester		Senior Year - 2nd Semester	
Course	Hr	Course	Hr	Course	Hr	Course	Hr
MATH 3377	3	MATH 3380	3	MATH 4330	3	MATH 4307	3
MATH 3330	3	MATH Advanced Elective (see gen. req. 4)	3	Minor (see gen. req. 1 & 5)	6	MATH 4315	3
Minor (see gen. req. 1 & 5)	3	Minor (see gen. req. 1 & 5)	3	Second ENG Literature (see gen. req. 2)	3	Minor (see gen. req. 1 & 5)	3
Modern Language 2310	3	Modern Language 2320	3	Elective	3	MATH Advanced Elective (see gen. req. 4)	3
HIST 1320	3	POSI 2320	3		2		
Total	15	Total	15	Total	14	Total	12

<div align="center">

Bachelor of Science (BS)
Major in Mathematics
Minimum required: 120 semester hours

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General Requirements:

1. A minimum of 9 writing intensive hours and a total of 36 advanced hours are required to graduate. An advanced course is one that is numbered above 3000 and below 5000.
2. See the Academic Services section of this catalog for general education core curriculum requirements.
3. If two years of the same foreign language were taken in high school, then no additional foreign language hours will be required for the degree. In the absence of such high school foreign language, two semesters of the same modern language must be taken at the college level.
4. Even though MATH 2471 is the first required mathematics course, some students will need to take courses numbered below 2471. Credit examinations in MATH 1315, 2417 and 2471 are available.
5. At least 38 hours are required in mathematics and must include MATH 2471, 2472, 3330, 3373, 3377, 3380, 4307, 4315, and 4330; and nine hours of advanced MATH from the following courses: MATH 3305, 3323, 3325, 3348, 3375, 3398, 4305, 4306, 4336, or 4382.
6. The fourth English course may be an additional sophomore level English Literature or ENG 3303, Technical Writing.
7. See the list of minors under the Degrees and Programs section of this catalog. Minor and electives should be chosen in consultation with the academic advisor.

Freshman Year - 1st Semester		Freshman Year - 2nd Semester		Sophomore Year - 1st Semester		Sophomore Year - 2nd Semester	
Course	Hr	Course	Hr	Course	Hr	Course	Hr
US 1100	1	MATH 2472	4	MATH 3373	3	MATH 3330	3
ENG 1310	3	ENG 1320	3	Minor (see gen. req. 7)	3	Minor (see gen. req. 7)	3
POSI 2310	3	HIST 1310	3	Life and Physical Sciences Component (see gen. req. 2)	4	CS 1428	4
COMM 1310	3	Life and Physical Sciences Component (see gen. req. 2)	3-4	Electives (see gen. req. 1,3, 4 & 7)	3	ENG Literature (see gen. req. 2)	3
MATH 2471	4	PHIL 1305 or 1320	3			MATH 3377	3
Social Science Component (see gen. req. 2)	3						
Total	17	Total	16-17	Total	13	Total	16

Junior Year - 1st Semester		Junior Year - 1st Semester		Senior Year - 1st Semester		Senior Year - 2nd Semester	
Course	Hr	Course	Hr	Course	Hr	Course	Hr
ART, DAN, MU, or TH 2313	3	MATH Advanced Elective (see gen. req. 6)	6	MATH 4330	3	MATH 4307	3
MATH 3380	3	Minor (see gen. req. 1 & 7)	3	MATH Adv Elective	3	MATH 4315	3
Minor (see gen. req. 1 & 7)	3	POSI 2320	3	Electives (see gen. req. 1,3,4 & 7)	4-5	Minor (see gen. req. 1 & 7)	6
HIST 1320	3	Electives (see gen. req. 1,3,4 & 7)	3	Fourth English course (see gen. req. 1, 2 & 6)	3	Elective	3
Electives (see gen. req. 1,3,4 & 7)	3						
Total	15	Total	15	Total	13-14	Total	15

Bachelor of Science (BS)
Major in Mathematics
(Teacher Certification in Mathematics, Grades 7-12)
Minimum required: 120 semester hours

General Requirements:

1. A minimum of 9 writing intensive hours and a total of 36 advanced hours are required to graduate. An advanced course is one that is numbered above 3000 and below 5000.
2. See the Academic Services section of this catalog for general education core curriculum requirements.
3. If two years of the same modern language were taken in high school, then no additional language hours will be required for the degree. In the absence of such high school language, two semesters of the same modern language must be taken at the college level.
4. Even though MATH 2471 is the first required mathematics course, some students will need to take courses numbered below 2471. Credit examinations in MATH 1315, 2417 and 2471 are available. Electives should be chosen in consultation with the academic advisor.
5. At least 38 hours are required in mathematics and must include MATH 2471, 2472, 3305, 3315, 3330, 3377, 3380, 4304, 4307 and 4311 and six hours from: MATH 3323, 3325, 3373, 4305, 4315, 4330.
6. The fourth English course may be sophomore level English Literature or ENG 3303 Technical Writing.
7. A minor in Secondary Education and admission into the Teacher Preparation Program is required. Visit the Office of Educator Preparation (OEP) website for more information, http://www.education.txstate.edu/oep/

Freshman Year - 1st Semester		Freshman Year - 2nd Semester		Sophomore Year - 1st Semester		Sophomore Year - 2nd Semester	
Course	Hr	Course	Hr	Course	Hr	Course	Hr
US 1100	1	MATH 2472	4	MATH 3330	3	MATH 3305	3
ENG 1310	3	CS 1428	4	MATH 3315	3	MATH 3377	3
POSI 2310	3	ENG 1320	3	Life and Physical Sciences Component (see gen. req. 2)	3-4	COMM 1310	3
MATH 2471	4	HIST 1310	3	Electives (see gen. req. 1,3 & 4)	4-5	Electives (see gen. req. 1,3 & 7)	3
Social Science Component (see gen. req. 2)	3	PHIL 1305 or 1320	3			Life and Physical Sciences Component (see gen. req. 2)	4
Total	14	Total	17	Total	13-15	Total	16

Sophomore Year - Summer I		Sophomore Year Summer II		Junior Year - 1st Semester		Junior Year - 2nd Semester	
Course	Hr	Course	Hr	Course	Hr	Course	Hr
HIST 1320	3	POSI 2320	3	MATH 3380	3	MATH 4307	3
ENG Literature (see gen. req. 2)	3			MATH 4311	3	MATH 4304	3
				CI 4332	3	CI 3325	3
				MATH Adv Elective (see gen. req. 5)	3	MATH Adv Elective (see gen. req. 5)	3
				ART, DAN, MU, or TH 2313	3	Fourth English course (see gen. req. 6)	3
Total	6	Total	3	Total	15	Total	15

Senior Year - 1st Semester		Senior Year - 2nd Semester	
Course	Hr	Course	Hr
CI 4370	3	EDST 4681	6
CI 4343	3		
RDG 3323	3		
Electives (see gen. req. 1,3 & 4)	6		
Total	15	Total	6

Minor in Applied Mathematics

A minor in Applied Mathematics requires at least 20 hours, including MATH 2471, 2472 and the remaining courses from this list: MATH 3305, 3323, 3348, 3373, 3375, 3377, 3398, 4306, PHYS 3320, CS 3378, or IE 3320.

Students can take only one of: PHYS 3320, CS 3378, or IE 3320 and students may not receive credit for both MATH 3305 and IE 3320.

Minor in Mathematics

A minor in Mathematics requires at least 20 hours, including MATH 2471, 2472 and the remaining courses from this list: MATH 3305, 3323, 3325, 3330, 3348, 3373, 3377, 3380, 3398, 4305, 4306, or 4307.

Courses in Mathematics (MATH)

1300 Elementary Algebra. (1-3) A course to remediate and review basic academic skills in mathematics, including number concepts, computation, elementary algebra, geometry and mathematical reasoning. Credit for this course will not count toward any baccalaureate degree offered by the University.

1311 Intermediate Algebra. (1-3) A preparatory course for college algebra. Topics include linear equations and inequalities, rational expressions, exponents and radicals, quadratics and word problems. This course is designed for students who have graduated from high school with no more than the minimum mathematics requirements or for students who have been away from mathematics for a number of years. Credit for this course will not count toward any baccalaureate degree offered by the University. Prerequisite: MATH 1300 with a grade of CR, ACT Mathematics score of 15 or more, SAT Mathematics score of 400 or more, Accuplacer Elementary Algebra score of 59 or more, Compass Algebra score of 35 or more.

1312 (MATH 1342) College Statistics and Algebra. (3-0) A course covering linear and quadratic equations, inequalities, functions and their graphs, logarithms, systems of equations, and applications of mathematics. Special emphasis on statistical concepts including linear and quadratic regression, distributions confidence intervals, & hypothesis testing. This course is not intended to substitute for MATH 1315 as a prerequisite. Prerequisite: College Readiness in Mathematics according to the TSI regulations.

1315 (MATH 1314) College Algebra. (3-0) A course covering linear and quadratic equations, inequalities, word problems, functions, logarithms, systems of equations and other college algebra topics as time permits. Prerequisite: College Readiness in Mathematics according to the TSI regulations.

1316 A Survey of Contemporary Mathematics. (3-0) A study of the uses of mathematics in society today. Emphasis is on concepts rather than technical details. May not be used as a prerequisite for any other mathematics course. Prerequisite: College Readiness in Mathematics according to the TSI regulations.

1317 (MATH 1316) Plane Trigonometry. (3-0) A course covering trigonometric functions, right triangles, radian measure, graphs of trigonometric functions, trigonometric identities, including multiple and half-angle identities, inverse trigonometric functions, trigonometric equations, oblique triangles, and complex numbers. Prerequisite: MATH 1315 with

a grade of C or higher, Accuplacer College Mathematics score of 86 or more, Compass College Algebra score of 46 or more.

1319 (MATH 1324) Mathematics for Business and Economics I. (3-0) Topics from college algebra and finite mathematics which apply to business and economics including applications of equations and inequalities, simple and compound interest and annuities. Prerequisite: College Readiness in Mathematics according to the TSI regulations.

1329 (MATH 1325) Mathematics for Business and Economics II. (3-0) Topics from finite mathematics and elementary differential calculus which apply to business and economics. Prerequisite: MATH 1315 or 1319 with a grade of C or higher, ACT Mathematics score of 27 or more, SAT Mathematics score of 580 or more, Accuplacer College Mathematics score of 86 or more, Compass College Algebra score of 46 or more.

2311 (MATH 1350) Principles of Mathematics I. (3-0) Logical deductive reasoning, number theory, a rational development of the real numbers with the associated number structures and algorithms for the fundamental operations, including historical, philosophical and cultural significance. Prerequisite: MATH 1315 with a grade of "C" or higher.

2312 (MATH 1351) Informal Geometry. (3-0) Geometric measuring. Euclidean Geometry, and topics associated with informal geometry, including historical, philosophical, and cultural significance. Prerequisite: MATH 2311 with a grade of "C" or higher. (MC).

2321 (MATH 2313) Calculus for Life Sciences I. (3-0) This course is designed to serve the needs of students in the life sciences. Topics will include: graphs, derivatives, exponents and logarithms, scientific notation, sequences, summation, and applications. Prerequisite: MATH 1315 with a grade of C or higher, ACT Mathematics score of 24 or more, SAT Mathematics score 520 or more, Accuplacer College Mathematics score of 86 or more, Compass College Algebra score of 46 or more.

2328 (MATH 2342) Elementary Statistics. (3-0) Algebra-based introduction to descriptive statistics, random sampling, design of experiments, probability and the Central Limit Theorem. Inferential statistics topics include the foundational concepts for confidence intervals and hypothesis testing for simple experiments. Prerequisites: MATH 1315 with a grade of "C" or higher, MATH 2321 with a grade of "D" or higher, MATH 2417 with a grade of "D" or higher, MATH 2471 with a grade of "D" or higher, ACT Mathematics score of 24 or more or SAT Mathematics score of 520 or more.

2331 Calculus for Life Science II. (3-0) Extension of MATH 2321. Topics will include: trigonometric functions, probability, integral calculus, differential equations, and applications. Prerequisites: MATH 2321 with a grade of "C" of higher, MATH 2471 with a grade of "D" of higher.

2358 (MATH 2305) Discrete Mathematics I. (3-0) A study of discrete mathematical structures that are commonly encountered in computing hardware and software. Prerequisites: MATH 1315 with a grade of "C" of higher, MATH 2417 with a grade of "D" of higher, MATH 2471 with a grade of "D" of higher.

2417 (MATH 2412) Pre-Calculus Mathematics. (3-2) A survey of functions, trigonometry and analytic geometry to prepare students for calculus. Prerequisite: MATH 1315 with a grade of C or higher, ACT Mathematics score of 24 or more, SAT Mathematics score of 520 or more, Accuplacer College Mathematics score of 86 or more, or Compass College Algebra score of 46 or more.

2471 (MATH 2413) Calculus I. (3-2) A first course in differential and integral calculus which stresses limits as well as the applications of calculus to the problems of science. Prerequisites: MATH 2417 with a grade of C or higher, ACT Mathematics score of 27 or more, SAT Mathematics score of 580 or more, Accuplacer College Mathematics score of 103 or more, Compass Trigonometry score of 46 or more.

2472 (MATH 2414) Calculus II. (3-2) A continuation of differential and integral calculus including methods of integration, sequences and series, and introduction to partial derivatives. Prerequisite: MATH 2471 with a grade of "C" or higher.

3305 Introduction to Probability and Statistics. (3-0) Basic probability models, generating functions and conditional probability, also discrete and continuous, univariate and bivariate distributions of random variables. Concepts of estimation, tests of hypothesis and statistical inference. Prerequisite: MATH 2472 with a grade of "C" or higher.

3315 Modern Geometry. (3-0) Modern geometry with an emphasis on the triangle, circle, plane and Euclidian geometry, an historical aspects will be integrated into the course. May not be applied toward a minor in mathematics. Prerequisites: MATH 2321 or 2471 with a grade of "C" or higher.

3323 Differential Equations. (3-0) A course covering solutions to the more common types of ordinary differential equations, especially those of first and second order, with emphasis on geometrical and physical interpretations. Prerequisite: MATH 2472 with a grade of "C" or higher.

3325 Number Systems. (3-0) Algebraic construction of the natural numbers. Covers the basic vocabulary and proof techniques of abstract algebra, and the structural properties of the natural numbers, integers, rational, real and complex number systems. Prerequisite or Co-requisite: MATH 2471.

3330 Introduction to Advanced Mathematics. (3-0) An introduction to the theory of sets, relations, functions, finite and infinite sets, and other selected topics. Algebraic structure and topological properties of Euclidean Space, and an introduction to metric spaces. Prerequisite: MATH2472 with a grade of C or higher.

3348 Deterministic Operations Research. (3-0) This course provides a broad overview of deterministic operations research techniques. Linear programming will be covered including the simplex method, duality and sensitivity analysis. Further selected topics are from integer programming, dynamic programming, scheduling models, game theory, and associated topics. Prerequisite: MATH 2472 with a grade of C or higher.

3373 Calculus III. (3-0) A course covering sequences and series, vectors, functions of several variables, partial derivatives, multiple integrals, line and surface integrals, and applications. Prerequisite: MATH 2472 with a grade of "C" or higher.

3375 Engineering Mechanics. (3-0) A course covering statics, using a vector approach to mechanics. The course is designed to satisfy the requirements of engineering Colleges. Prerequisite: PHYS 1430. Prerequisite or Co-requisite: MATH 2472.

3377 Linear Algebra. (3-0) An introductory course in linear algebra covering vector spaces, linear transformation, matrices, systems of linear equations, and inner product spaces. Prerequisite: MATH 2472 with a grade of "C" or higher.

3380 Analysis I. (3-0) A course covering the introduction to the theory of real functions. Topics include limits, continuity and derivatives and associated topics. Prerequisite: MATH 3330 with a grade of "C" or higher.

3398 Discrete Mathematics II. (3-0) A continuation of discrete Mathematics I. Prerequisite: MATH 2358 with a grade of "C" or higher.

4302 Principles of Mathematics II. (3-0) Algebraic reasoning and probability with selected topics from quantitative reasoning, measurement, statistics, and geometry are integrated with middle school pedagogical practices such as inquiry learning and use of technology. Appropriate correlated lessons, writing components, and culturally responsive teaching are incorporated. Prerequisite: MATH 2312 with a grade of "C" or higher. (WI)

4303 Capstone Mathematics for Middle School Teachers. (3-0) A rigorous, integrated, analytical perspective of mathematical topics; quantitative reasoning, geometry and measurement, probability and statistics, number theory and algebraic reasoning. May not be applied towards a mathematics minor. Must be taken before student teaching. Prerequisites: Math 2331 or 2472 and Math 3315 with grades of "C" or higher.

4304 Capstone Mathematics for Secondary Teachers (of Mathematics). (3-0) Basic concepts underlying algebra, geometry, trigonometry, and calculus taught from an advanced standpoint, including historical, philosophical, and cultural significance. May not be applied toward a minor in mathematics. Must be taken before student teaching. Prerequisite: MATH 3315 and 2331 or 2472 with grades of "C" or higher.

4305 Probability and Statistics. (3-0) A course covering sample spaces, probability of events, binomial and multinomial distributions, random variables, normal approximations, statistical inference, and applications. Prerequisite: MATH 3305 with a grade of "C" or higher.

4306 Fourier Series and Boundary Value Problems. (3-0) Advanced solution methods for differential equations; partial differential equations; series approximations, Fourier series; boundary value problems typical of scientific applications. Prerequisite: MATH 3323 with a grade of "C" or higher.

4307 Modern Algebra. (3-0) A course covering elementary set theory, structures, functions, and concepts of modern algebra. Prerequisites: MATH 3330 with a grade of "C" or higher and MATH 3325 or 3377 with a grade of "C" or higher.

4311 Introduction to the History of Mathematics. (3-0) A survey of the development of major mathematical topics, including geometry, algebra, calculus, and advanced mathematics. Philosophical and cultural aspects will be integrated with the structure, theorems, and applications of mathematics. May not be applied toward a minor in mathematics. Prerequisite: MATH 3315 with a grade of "C" or higher and MATH

2331 or 2472 with a grade of "C" or higher. (WI)

4315 Analysis II. (3-0) A continuation of MATH 3380. Topics include integration, series and sequences of functions and associated topics. Prerequisite: MATH 3380 with a grade of "C" or higher.

4330 General Topology. (3-0) Topics include introductory treatment of convergence, continuity, compactness, connectedness and fixed points in topological spaces with special emphasis on metric spaces. Prerequisite: MATH 3330 or 3380 with a grade of "C" or higher.

4336 Studies in Applied Mathematics. (3-0) Selected topics including Laplace transforms, complex variables, advanced calculus for applications, calculus of variations, integral equations, intermediate differential equations, vector analysis, etc. May be repeated once for credit with a different topic. Prerequisite: Consent of instructor.

4350 Introduction to Combinatorics (3-0) This course introduces fundamental concepts and results in combinatorics such as counting techniques, binomial coefficients, and recurrence relations; and applications in different fields such as complexity of algorithms and graph theory. Mathematical proofs are an essential part of this course. Prerequisite: Math 2472 with a grade of "C" or higher.

4382 The Literature and Modern History of Mathematics and Its Applications. (3-0) This course will focus on mathematical articles in recent journals. The articles will be re-written so that the proofs and comments are more easily understood by the casual reader. This embellishment of journal articles will take place in class with the class participating, in groups for outside work and as individual assignments. May not be applied toward a minor in mathematics. Prerequisites: A grade of "C" or higher in two of these three: MATH 3380, 4307, or 4330. (WI)

Department of Physics

Roy F. Mitte Building, Room 3240
T: 512.245.2131 F: 512.245.8233
www.physics.txstate.edu

DEGREE PROGRAMS OFFERED
Bachelor of Arts (BA), major in Physics
Bachelor of Science (BS), major in Physics

MINOR OFFERED
Physics

Physics, the study of matter and energy, is at the root of every field of natural science and underlies all physical phenomena. The problem-solving skills learned in the study of physics are valuable even if one's career is not in a physics-related field.

The BS with a major in Physics provides a rigorous background in physics as a preparation for graduate studies or a career in industry. The BA with a major in Physics is for students who want a background in physics but plan to pursue fields of interest other than physics as a life's work.

Career opportunities for a physics major exist in a wide variety of settings-from teaching in a classroom to basic research in an industrial or government laboratory, as a self-employed consultant, or as a member of a multidisciplinary research team.

Students who enter Texas State needing mathematics at a level below MATH 2417 are urged to attend a summer session to avoid any delay in starting their physics courses.

For more information contact the College of Science and Engineering Advising Center or the departmental advisor for the Department of Physics. For information on engineering technology, electrical engineering, industrial engineering, and manufacturing engineering see the Ingram School of Engineering and Department of Engineering Technology sections of this catalog.

Teacher Certification
Students interested in seeking a Physical Science (Texas Grades 6-12) or Physics/Mathematics (Texas Grades 8-12) certification should contact the Science Advisor for requirements. Initial or additional certification may also be acquired as a post-baccalaureate or graduate student. Students interested in certification are strongly encouraged to see the Science Advisor early in their undergraduate program or certification process.