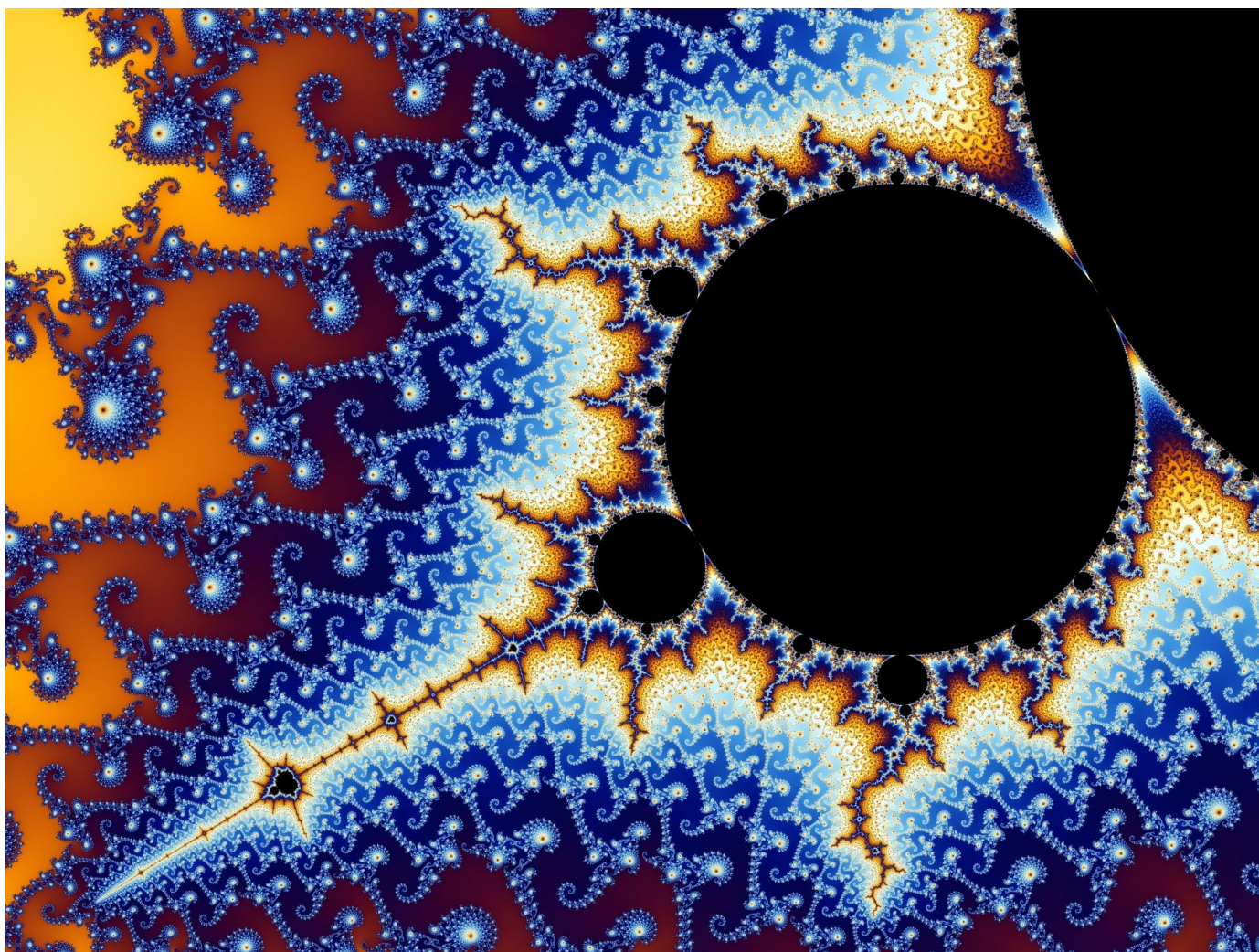


Texas A&M University
Department of Mathematics



Spring 2025

Undergraduate Handbook

OVERVIEW OF UNDERGRADUATE PROGRAM

The Undergraduate Program in the Department of Mathematics seeks to provide a high-quality education to our students, focusing both on depth and breadth in all fields of Mathematics. This may include, but is not limited to, algebra, analysis, topology, number theory, differential equations, geometry and numerical analysis. The Undergraduate Mathematics Program offers three degrees which allow our majors to choose a plan that is best suited to their academic and career objectives.

The curriculum in the **Bachelor of Arts (BA)** in Mathematics affords students to undertake a traditional liberal arts education in mathematics. The degree is well suited for students interested in pursuing mathematics and some other area, and a minor field of study is required for this degree. A student completing this program is prepared to enter the professional work force, or with appropriately chosen electives, to pursue professional degrees in various fields, including education, law, and medicine. Students in this degree can also pursue teaching certification programs.

Students following the **Bachelor of Science (BS)** degree program investigate a broad array of techniques in pure mathematics and pursue electives in science and related fields that demonstrate the crucial underpinnings of mathematics in our understanding of information, science, and technology. A student completing this program is prepared to enter employment with analytical and quantitative tools relevant to technological industries or modern financial markets. Furthermore, with the appropriate electives chosen, the student is prepared to enter quantitatively oriented graduate schools, including PhD programs in Mathematics.

While the study of mathematics in and of itself is its central focus, the **Applied Mathematics (APMT)** degree provides students an opportunity to explore applications of mathematics to various other fields (tracks), such as *Actuarial Science*, *Biological Science*, *Computational Science*, *Cryptography*, *Economics*, *Mathematics* and *Statistics*. Students in the program are prepared to pursue admission to graduate degree programs or employment in industry and business.

The comprehensive professional preparation provided by our programs benefits not only our students, but provides future employers and society in general with uniquely prepared professionals capable of effectively facing our rapidly developing world.

ADVISING PROCEDURES

Questions relating to this handbook or information regarding particular degrees can be directed to the advising team:

Jill Lyster, Academic Advisor IV
(979) 458-7609, Blocker 529E, math-advising@tamu.edu

Prof. Catherine Yan, Associate Head for Undergraduate Programs
(979) 458-1124, Blocker 332A, math-advising@tamu.edu

Prof. Heather Klein, Assistant Head for Undergraduate Programs
(979) 845-4299, Blocker 332B, math-advising@tamu.edu

Prof. Rob Rahm, Undergraduate Program Faculty Member
332C Blocker, math-advising@tamu.edu

Prof. Todd Schrader, Undergraduate Program Faculty Member
332D Blocker, math-advising@tamu.edu

All undergraduate mathematics majors are expected to consult with an advisor at least once per semester, prior to registering for courses. Failure to do so can result in taking courses that cannot be applied to your degree and the possibility of holds being placed on your account.

All Students: You are welcome to meet with any faculty advisor, but if you are in the actuarial science emphasis of APMT, be sure to meet with Prof. Todd Schrader or Prof. Heather Klein at least once to discuss the requirements of becoming an actuary. **All students are expected to meet with an advisor at least once per semester, even if an approved degree plan is on file.** Additionally, *graduating seniors MUST apply for graduation online in the HOWDY portal at the beginning of the semester in which they expect to graduate.* Failure to do so will result in delayed graduation or extra fees.

Honors Students: Please see your honors advisor, Prof. Frank Sottile. You will have the same advisor all the time you are in the math honors program.

All Students: Please schedule an appointment ahead of time by going to the NAVIGATE website or phone app. For instructions on how to make an appointment in Navigate, see this website:

<https://studentsuccess.tamu.edu/NAVIGATE/>

For questions during the semester, you can also email the math advising team and the Undergraduate Program Office at this email address:

math-advising@tamu.edu

ADDITIONAL IMPORTANT CAMPUS TELEPHONE NUMBERS AND EMAILS

Prof. Frank Sottile

sottile@tamu.edu

Director of Math Honors Program and Undergraduate Research

Math Advising Office	(979) 845-0061
Math Department (Main Office)	845-7554
Admissions	845-1031
Bus Operations	845-1971
Campus Bookstore	845-8681
Campus Information	845-3211
Career Center	845-5139
Cooperative Education Office	845-7725
Counseling and Psychological Services (CAPS)	845-4427
Data & Research Services (DARS)	845-0532
Degree Audit	845-1089
Evans Library	845-5741
Financial Aid	845-3236
Registrar's Office	845-7117
Statistics Department	845-3141
Student Fees Office	845-8127
Transfer Admissions	845-1098
University Honors Program Office	845-1957

WHY SHOULD YOU MAJOR IN MATH?

There are a number of important benefits associated with being a mathematics major at TAMU:

Flexible Degree Plans - Our degree plans offer more elective hours and flexibility than most other degree plans on campus. The requirements and options for each plan are listed in this handbook, and each plan requires 120 credit hours.

Honors Opportunities in Math - Honors majors are encouraged to take special courses, may be honors mentors, may earn an MS and BS in 5 years, and have extra opportunities to advance their career goals. Earning the Honors in Mathematics distinction makes a student more attractive to future employers and graduate schools.

Job Opportunities - Almost all of our majors have jobs prior to graduation. Currently, 60% of our majors plan to work in industry or teach, while 40% plan to attend graduate school.

Graduate School Opportunities - The variety of graduate school choices available to mathematics majors is perhaps the largest amongst all majors on campus.

Small Class Size - Typical mathematics courses have an enrollment of 40 or less during the freshman year, and 30 or less in subsequent years. The overall student to professor ratio in the Math Department is extremely small, offering small classroom settings to its undergraduate majors. This also results in ample opportunities for students interested in undergraduate research projects.

Study Lounge - The Math Department is very fortunate to have one of the few undergraduate student lounges on campus. The lounge is located in Blocker 339. Math majors have access to the lounge anytime the Blocker building is unlocked. On any given day, it is typical to find students working on assignments, collaborating on the white board, eating lunch, or simply hanging out between classes. This lounge provides a relaxed environment for our majors to study or escape from the stress of their day.

Friendly and Helpful Advisors and Faculty - The advisors and undergraduate program faculty make it a point to know each student. They are always willing to help with any questions you might have relating to your degree and classes.

CAREER OPPORTUNITIES

BA in Mathematics

The BA in Mathematics is designed primarily for students who are interested in teaching, pursuing a professional degree in medicine or law, and those students who are interested in both mathematics and some other area. The BA in Mathematics requires the fewest number of hours of mathematics and has 35 hours of general electives, but it does require that a 15 to 18-hour minor be taken in some focused area of study other than mathematics. Students planning to attend a professional school (medical, dental, law, etc.) may use the 35 hours of general electives for courses required for the school. Please see the Career Center's Professional School Advising for more details: <http://careercenter.tamu.edu>

Students interested in the liberal arts and who can write will find that this degree plan with a minor in English or Communications is greatly desired by employers. In particular, technical firms frequently need people who can produce a logical argument and then explain it to others. Financial institutions and industry are other places such graduates are valued.

BS in Mathematics

The BS in Mathematics is the "pure mathematics" degree. The mathematics courses required by this degree prepare students for graduate school in mathematics, physics, and engineering. Because this option requires a total of 26 hours of science courses, 10 hours more than the APMT degree, it is also a good degree for students who are interested in science as well as mathematics. If you are planning to attend a medical school, the BS MATH is a good option (although APMT-Biological Science is great, too.) Please see the Career Center's Professional School Advising for more details: <http://careercenter.tamu.edu>

For students not planning to pursue an advanced degree, the jobs open to graduates with a BS in Mathematics are similar to the job opportunities of APMT and BA MATH graduates. Technical companies that have hired recent graduates include Microsoft, Apple, Google, and CGG Veritas. These firms hire people to be software engineers and to design web pages. Software development firms can pay very well, but they expect prospective employees to be able to program. This degree plan only requires 4 hours of computer science, so it would be wise to take one or two more CSCE courses if you want a job with a high-tech firm.

In summary, there are many job opportunities available with this degree, but this degree will not train you for a specific profession. It would be best to start attending job fairs in your freshman year to get an idea of what sort of jobs interest you and what courses besides math courses will strengthen your resume.

BS in APMT

The BS degree in Applied Mathematics has seven emphases: Actuarial Science, Biological Science, Computational Science, Cryptography, Economics, Math, and Statistics. The APMT degree is the most flexible degree and prepares students for the widest possible number of careers.

Over half of the APMT graduates seeking employment directly after graduation look to business, in particular consulting firms, actuarial firms, and technical companies. All of these companies are looking for people with good problem-solving skills. Employers need to be able to train new employees to solve their particular technical problems. In the broadest possible terms, math graduates are hired to work as part of a problem-solving team. See the next page for career information on specific areas of emphasis within the APMT degree.

Actuarial Science Emphasis: Students pursuing an Applied Mathematics degree with the Actuarial Science Emphasis have chosen a degree that is suited to a career in business, particularly actuarial and financial consulting. An actuary is a mathematician who analyzes risk. Pension actuaries work with client firms to help them determine their retirement liability and funding status, while casualty actuaries work in insurance firms and run statistical models to determine proper insurance premiums. Actuarial and financial consulting firms that have hired recent graduates include AIG, Aon Hewitt, Cigna, EY, Fidelity, Forethought Financial, HCC Tokio Marine, Mercer, Traveler's, Willis Towers Watson, and USAA. A minor in business or economics pairs nicely with this degree plan. Some graduates with this degree go on to graduate school in finance, economics, or business, but if you are interested in a graduate-level mathematics or mathematical finance degree, you will need to take additional mathematics courses. Those who want to pursue this degree but are also interested in teacher certification should consider Post Bacc Certification or emergency certification.

Biological Science Emphasis: This emphasis was recently redesigned to be 100% compliant with medical school prerequisites, making this program an excellent choice for anyone planning to go to a medical professional school. This program also prepares students for a career in applications of mathematics to the life sciences. Mathematics makes important contributions to these areas: genomics, computational neuroscience, modeling human and animal physiology, epidemiology, ecology, and pharmacology. Breakthroughs in these fields will be made by interdisciplinary teams of scientists, statisticians, and mathematicians working in commercial (industrial) labs, governmental labs, research centers, and universities. Information on applied mathematics careers can be found at the Society for Mathematical Biology (<http://www.smb.org/>) and the Society of Industrial and Applied Mathematics (<http://www.siam.org/>). A minor in biology or some other area of the biological sciences pairs nicely with this degree plan. This degree plan will prepare you for graduate work in mathematics or statistics with an emphasis in applications to the biological sciences.

Computational Science Emphasis: Some graduates with this degree will go on to graduate school in Computer Science or seek employment with such companies as Apple, Google, and Microsoft, and government agencies such as NSA, NGA, and NASA. A Masters in Computer Science will greatly improve both pay and career options both at places listed for the BS and also at other types of firms needing advanced IT help.

Cryptography Emphasis: A student completing this program is prepared to enter employment with analytical and quantitative tools relevant to technological industries or government, especially in cybersecurity related fields. Cryptography and cybersecurity are of ever-increasing importance for our digital communication and financial transactions, and tech companies, such as Apple, Google, and Microsoft. Government agencies, such as the NSA, are continually looking for employees with expertise in these areas. Students are also prepared to enter quantitatively oriented Ph.D. programs in Applied Mathematics or Mathematics. A minor in computer science or cybersecurity pairs nicely with this program.

Economics Emphasis: Like the Actuarial Science Emphasis, graduates of this degree plan can be hired to be business analysts, financial analysts, and actuaries. A minor in business is well suited to this degree plan. Some graduates with this degree go on to graduate school in economics, finance, and business. A Master's degree will greatly improve the chance for a high paying job, as well as increase career options.

Math Emphasis: Students getting a BS in Applied Mathematics with the Math Emphasis have prepared themselves for graduate school in Mathematics and employment with high-tech firms, engineering firms, and consulting companies. The career opportunities with high-tech firms will depend in part on a student's programming ability and willingness to take a job which requires some programming. All these jobs require employees to be able to both program and do mathematics. There is a high demand for mathematicians with programming skills. However, the type of high-tech jobs that are available changes greatly from year to year. The best way to determine what is currently "hot" is to go to the Engineering Job Fair, the Sciences Career Fair, and the Career Center.

Statistics Emphasis: The CIA, NSA, FBI, NIST and Census Bureau need mathematically trained personnel. Some former students have been hired by the state transportation division. Many of the students who graduate with an APMT-Statistics degree go on to graduate school in statistics or data science. At present, there is a shortage of statisticians and data scientists. A Masters in Statistics or Data Science will greatly improve the chance for a high paying job, as well as increase career options. People with a masters degree have recently found positions with banks, INTEL, pharmaceutical firms, and biotech firms.

PROGRAM CURRICULA

The layout of our curricula utilizes the following courses.

- Mathematics Courses offered (for Math and Science Majors)**

Crs. No.	Crs. Name	Offered	Crs. No.	Crs. Name	Offered
150	Functions, Trig and Linear Systems	F, S	300	Foundations of Mathematics	F, S
170	Freshman Mathematics Laboratory	F, S	308	Differential Equations	F,S,SI,SII,S10
171	Calculus I	F, S	323	Linear Algebra	F, S
172	Calculus II	F, S	325	The Mathematics of Interest	F, S
			396	Communications in Mathematics	F
200	Horizons of Mathematics	F			
221	Several Variable Calculus	F, S			
225	Advanced Spreadsheet Techniques	F			
285	Directed Studies				
289	Special Topics in...				
407	Complex Variables	F, S	437	Principles of Numerical Analysis	F
409	Advanced Calculus I	F, S, S10	439	Differential Geometry of Curves and Surfaces	Even F
410	Advanced Calculus II	S	442	Mathematical Modeling	F, S
411	Mathematical Probability	F, S, S10	446	Principles of Analysis I	F
412	Theory of Partial Differential Equations	F, S, S10	447	Principles of Analysis II	S
414	Fourier Series and Wavelets	S	460	Tensors and General Relativity	Odd F
415	Modern Algebra I	F, S	467	Modern Geometry	F, S
416	Modern Algebra II	S	469	Introduction to Mathematical Biology	Even S
417	Numerical Methods	F, S	470	Communications and Cryptography	F, S, SII
419	Applications of Actuarial Science	S	471	Communications and Cryptography II	Odd S
423	Linear Algebra II	S	472	Elliptic Curve Cryptography	Odd F
424	Probability and Computing	Odd S	478	Topological Data Analysis	Even F
425	The Mathematics of Contingent Claims	F, S	482	Research Seminar	S
427	Introduction to Number Theory	Odd S	485	Directed Studies	
431	Structures and Methods of Combinatorics	Odd F	489	Special Topics in...	
433	Applied Algebra	S, SI	490	The Putnam Challenge	
436	Introduction to Topology	Even S	491	Research	

F - offered in fall semesters

S - offered in spring semesters

SI - offered in the first 5-week summer session

SII - offered in the second 5-week summer session

S10 - offered in the 10-week summer session

Bachelor of Arts for Students Seeking Teacher Certification (BA)

- Degree Plan

Category	Courses	Hours
Math Core	171, 172, 221, 300, 308, 323, 409	24
Math Elec. (see Note)	415 or 433; 467, 403, MATH 4xx, MSCI 4xx	15
STAT/CSCE	STAT 211; CSCE 110, 111, or 206	7
EDUC Core	ARSC 201, TEFB 322, TEFB 324, TEFB 407 (methods), INST 210, INST 222	16
EDUC Elec.	RDNG 372 or 465	3
Clinical Teaching	TEED 425 (lower-credit options exist – see advisor)	12
Science Elec. (see Note)	Freshman Science elec., Freshman Science elec., PHYS 206, PHYS 226	12
Gen. Core Elec.	ENGL 103 or 104; COMM 203, 205, or 243; Lang. Phil. and Cult., Creative Arts	12
HIST/POLS Elec.	HIST 105, HIST 106, POLS 206, POLS 207	12
General Elec.		7
Total Hrs.		120

NOTE

- **Math Electives:** (15 hours) Take 415 or 433; 467, 403. Of the remaining 6 hours of 4xx, at least 3 hours must be selected from MATH 325, 407 – 499. The other 3 hours should be selected from MATH 407 - 499; STAT 404 - 482; CSCE 210-470 (except CSCE 222, 285, 289, 291); ISEN 320-430.
- **Science Electives:** (8 hours) Select 4 hours from ASTR 111, BIOL 111, BIOL 112, CHEM 119, CHEM 120, CHEM 107/117; select 4 hours from any 100-level course(s) listed above that you have not taken or ATMO 201/202, GEOL 101/102, or OCNB 251/252.
- Note: Maximum of 3 hours of MATH 411 or STAT 414 may be used in this degree program.
- Note: Maximum of 4 hours of MATH 417 or MATH 437 may be used in this degree program.
- See the **Common requirements to all degrees** on Page 21 for details on HIST/POLS, Core, Freshman Science and General electives.

BA MATH for Students Seeking Teacher Certification Semester-by-Semester Degree Plan

First Semester

MATH 171	4
MATH 170 (elec)	1
Freshman Science elective	4
CORE elective (ex: HIST 105)	3
ENGL 103 or 104	3

 15
Third Semester

MATH 221	4
MATH 300	3
STAT 211	3
CSCE 110, 111, or 206	4
General Elective	2

 16
Fifth Semester

MATH 409	3
MATH elective	3
PHYS 206/226	4
CORE elective (ex: POLS 207)	3
TEFB 322	3

 16
Seventh Semester

MATH 403	3
MSCI elective	3
INST 210	3
TEFB 407	3
CORE elec. (ex: Lang/Phil/Cult)	3

 15
Second Semester

MATH 172	4
MATH 170 (elec)	1
Freshman Science elective	4
CORE elective (ex: HIST 106)	3
CORE elective (ex: Cr. Arts)	3
ARSC 201	1

 16
Fourth Semester

MATH 323	3
MATH 308	3
COMM 203, 205 or 243	3
INST 222	3
CORE elective (ex: POLS 206)	3

 15
Sixth Semester

MATH 415 or 433	3
MATH 467	3
TEFB 324	3
RDNG 465 or 372	3
General Elective	3

 15
Eighth Semester

Clinical Teaching (TEED 425)	12
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TEACHER CERTIFICATION

The demand for secondary mathematics teachers is always strong. There are three options a student may choose to obtain secondary (7-12) math certification, two through TAMU, and one outside of TAMU.

AGGIE TEACH Program Certification

This is the program outlined in the BA MATH (Certification) plan, and it requires a minimum overall 2.75 GPA and 2.5 GPA in mathematics teaching field courses. A suggested prerequisite for the aggieTEACH program is a 1-hour seminar course called ARSC 201, which should be taken as a freshman or sophomore. This program requires students to complete 18 hours of courses in the Secondary Education (SEED) minor: INST 210, INST 222, RDNG 465 (or RDNG 372), TEFB 322, TEFB 324, and TEFB 407. A final requirement is one full semester of student teaching with MEFB 497 (or TEFB 429 or TEED 425). The student teaching courses are not part of the SEED minor, but completing them after all coursework for the degree and minor are completed is required for certification. Students completing this program will be certified upon completing student teaching, graduating, and passing the TExES certification exams. Students interested in becoming certified through the aggieTEACH program should visit the aggieTEACH website (<https://aggieteachscience.tamu.edu/>) or contact Mr. Kenric Davies (kenric.davies@tamu.edu) or Dr. Vince Schielack (vinces@math.tamu.edu).

Graduate Certification Program

Students who choose this option need to complete 6 hours of education courses in their senior year: SPED 621 and TEFB 324. After graduating with at least a 2.75 GPA, students enter graduate school at Texas A&M in the College of Education and take 9 hours of courses in the summer, then 12 hours of courses during a one-year internship (or one semester of student teaching without pay). Students completing this plan will be certified upon completing the 21 hours of graduate courses, the internship (or student teaching), and passing the TExES exams for certification. If a student wishes to complete a Master's Degree in Education, they only need 15 additional hours after the 21 hours required for certification (36 hours total). Students interested in becoming certified through the Graduate Certification Program (GCP) should visit the GCP website (<https://tlac.tamu.edu/academics/distanceeducation-teacher-certification-program/>) or contact Ms. Jane Rankin (janerankin@tamu.edu) or Ms. Kara Bond (karabond@tamu.edu).

Alternative Certification (not offered at TAMU)

Many higher-education institutions, educational service centers, large school districts, and private entities offer one-year alternative certification programs after graduation. The requirements for these programs vary. Students interested in alternative certification should contact the institution they wish to attend to pursue this for specific requirements. Typically, students who choose this option will be certified after graduating with their degree, passing the certification exams, and completing accelerated training through the program, as well as one year of teaching. For more information, contact Dr. Vince Schielack at vinces@math.tamu.edu or Mr. Kenric Davies at kenric.davies@tamu.edu.

Bachelor of Arts - Non-Certification (BA)

- **Degree Plan**

Category	Courses	Hours
Math Core	171, 172, 221, 300, 308, 323, 409	24
Math Elec. (see Note)	415, 423 or 433; MATH 4xx, MATH 4xx, MATH 4xx, MSCI 4xx	15
STAT/CSCE	STAT 211; CSCE 110, 111, or 206	7
Science Elec. (see Note)	Freshman Science elec., Freshman Science elec., PHYS 206/PHYS 226	12
Core Elec.	ENGL 103 or 104; COMM 203, 205, or 243; Lang. Phil. and Cult. w/KUCD, Social and Behavioral Sci., Creative Arts w/KICD	15
HIST/POLS Elec.	HIST 105, HIST 106, POLS 206, POLS 207	12
General Elec.		17
Minor Elec.		18
Total Hrs.		120

NOTE

- **Math Electives:** (15 hours) Take 415, 423 or 433. Of the remaining 12 hours of 4xx, at least 9 hours must be selected from MATH 325, 403 – 499. The other 3 hours should be selected from MATH 403 - 499; STAT 404 - 482; CSCE 210-470 (except CSCE 222, 285, 289, 291); ISEN 320-430.
- **Science Electives:** (8 hours) Select 4 hours from ASTR 111, BIOL 111, BIOL 112, CHEM 119, CHEM 120, CHEM 107/117; select 4 hours from any 100-level course(s) listed above that you have not taken or ATMO 201/202, GEOL 101/102, or OCNG 251/252.
- Note: Maximum of 3 hours of MATH 411 or STAT 414 may be used in this degree program.
- Note: Maximum of 4 hours of MATH 417 or MATH 437 may be used in this degree program.
- See the **Common requirements to all degrees** on Page 21 for details on HIST/POLS, Core, Freshman Science and General electives.

BA MATH Non-Certification Semester-by-Semester Degree Plan

First Semester

MATH 171	4
MATH 170 (elec)	1
Freshman Science elective	4
CORE elective	3
ENGL 103 or 104	3
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	15

Second Semester

MATH 172	4
MATH 170 (elec)	1
Freshman Science elective	4
CSCE 110, 111, or 206	4
CORE elective	3
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	16

Third Semester

MATH 221	4
MATH 300	3
STAT 211	3
CORE elective	3
CORE elective	3
<hr/>	
	16

Fourth Semester

MATH 323	3
MATH 308	3
COMM 203, 205 or 243	3
CORE elective	3
Minor elective	3
<hr/>	
	15

Fifth Semester

MATH 409	3
PHYS 206/226	4
CORE elective	3
Minor elective	3
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	13

Sixth Semester

MATH 415, 423 or 433	3
MATH elective	3
Minor elective	6
General elective	3
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	15

Seventh Semester

MATH elective	3
MATH elective	3
CORE elective	3
Minor elective	3
General elective	3
<hr/>	
	15

Eighth Semester

MATH elective	3
CORE elective	3
Minor elective	3
Minor/General elective	3
General elective	3
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	15

This is just an example, and if there are any unintentional discrepancies between this at what is posted at catalog.tamu.edu, then what you see at catalog.tamu.edu is correct.

Bachelor of Sciences - Mathematics (BS)

- Degree Plan

Category	Courses	Hours
Math Core	171, 172, 221, 300, 308, 323, 409, 410 or 446, 415	30
Math Elec. (see Note)	MATH 416 or 472, MATH 411 or STAT 414; MATH 4xx, MATH 4xx, MATH 4xx, MATH 4xx	18
CSCE	CSCE 110, 111, or 206	4
PHYS	PHYS 206/PHYS 226; PHYS 207/PHYS 227 or OCNG 451	8
Fresh. Science Elec.	(see Note)	18
Core Elec.	ENGL 103 or 104; COMM 203, 205, or 243; Lang., Phil. and Cult. w/KUCD, Social and Behavioral Sci., Creative Arts w/KICD	15
HIST/POLS Elec.	HIST 105, HIST 106, POLS 206, POLS 207	12
General Elec.		15
Total Hrs.		120

NOTE

- **Math Electives:** (12 hours required) 3 to 12 hours to be selected from MATH 427, 431, 436, or 439. Up to 9 hrs. may be selected from MATH 325, 407- 499. Departmental permission is required to include MATH 485 or 491, or to enroll in a MATH 6xx course. Students who plan to attend graduate school are encouraged to take MATH 446 and 447 and at least one 6xx course as electives.
- **Science Electives:** (18 hours required) Select 4 hours from ASTR 111, BIOL 111, BIOL 112, CHEM 119, CHEM 120, CHEM 107/117; select 4 hours from any 100-level course(s) listed above that you have not taken or ATMO 201/202, GEOL 101/102, or OCNG 251/252. Select 6 hours from BICH 401-489, BIOL 200-470, CHEM 222-474, CSCE 206, CSCE 221, CSCE 411, CSCE 421/STAT 421, GENE 301-452, OCNG 251-252, 401-420, PHYS 221, 302-305, 307-314, 324-428, STAT 211, STAT 212, STAT 335/CSCE 320, STAT 408. The remaining 4 hours may be selected from ASTR 111, BICH 401-489, BIOL 111, BIOL 112, BIOL 200-470, CHEM 119, CHEM 120, CHEM 222-474, CSCE 110, CSCE 111, CSCE 121, CSCE 206, CSCE 221, GENE 301-452, OCNG 251-252, OCNG 404-420, PHYS 221, 302-305, 307-314, 324-428.
- Note: Maximum of 3 hours of MATH 411 or STAT 414 may be used in this degree program.
- Note: Maximum of 4 hours of MATH 417 or MATH 437 may be used in this degree program.
- See the **Common requirements to all degrees** on Page 21 for details on HIST/POLS, Core, Freshman Science and General electives.

BS MATH

Semester-by-Semester Degree Plan

First Semester

MATH 171	4
MATH 170 (elec)	1
Freshman Science elective	4
ENGL 103 or 104	3
CORE elective	3
<hr/>	
	15

Second Semester

MATH 172	4
MATH 170 (elec)	1
Freshman Science elective	4
CSCE 110, 111, or 206	4
CORE elective	3
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	16

Third Semester

MATH 221	4
MATH 300	3
Science elective	4
CORE elective	3
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	14

Fourth Semester

MATH 308	3
MATH 323	3
PHYS 206/226	4
CORE elective	3
CORE elective	3
<hr/>	
	16

Fifth Semester

MATH 409	3
MATH 415	3
COMM 203, 205 or 243	3
Science elective	3
CORE elective	3
<hr/>	
	15

Sixth Semester

MATH 410 or 446	3
MATH 416 or 472	3
PHYS 207/227 or OCNG 451	4
CORE elective	3
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	13

Seventh Semester

MATH 411 or STAT 414	3
MATH elective	3
Science elective	3
General elective	3
General elective	4
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	16

Eighth Semester

MATH elective	3
MATH elective	3
MATH elective	3
General elective	3
General elective	3
<hr/>	
	15

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Bachelor of Sciences - Applied Mathematics (APMT)

• Degree Plans: APMT MATH/STAT/ACTUARY

	BS APMT MATH		BS APMT STAT		BS APMT ACTUARY	
	Crs	Hrs	Crs	Hrs	Crs	Hrs
Math Core	171, 172, 221, 300, 308, 323, 409, 410 or 446, 437	31	171, 172, 221, 300, 308, 323, 409, 437	28	171, 172, 221, 300, 308, 323, 409, 437, 419	31
Math Elec.	MATH 415 or 433; MATH 412, 414, 442, 469, 470, 471, 472, or 478	6	MSCI 4xx, MSCI 4xx, MS 4xx, MS 4xx,	12	MATH 325, MATH 425, MATH 411 or STAT 414, MSCI 4xx, MSCI 4xx	15
Emphasis Electives	MATH 4xx, MATH 4xx, MATH 4xx, MSCI 4xx, MSCI 4xx	15	STAT 404, STAT 408, STAT 414 or MATH 411, ISEN 320 or 340	12	3 x ECON/ECMT/FINC 3xx or 4xx	9
STAT/CSCE	STAT 211, STAT 212, CSCE elec, CSCE elec	13	STAT 211, STAT 212, CSCE elec, CSCE elec	13	STAT 211, STAT 212, CSCE elec, CSCE elec	13
PHYS	PHYS 206/226; PHYS 207/227 or OCNB 451	8	PHYS 206/226; PHYS 207/227 or OCNB 451	8	PHYS 206/226; PHYS 207/227 or OCNB 451	8
Fresh. Science Elec.	See note 4 on page 21	8	See note 4 on page 21	8	See note 4 on page 21	8
Core Elec.	ENGL 103 or 104; COMM 203, 205, or 243; ECON 202 or 203; Lang., Phil. and Cult. w/ KUCD; Creative Arts w/KICD	15	ENGL 103 or 104; COMM 203, 205, or 243; ECON 202 or 203; Lang., Phil. and Cult w/ KUCD; Creative Arts w/KICD	15	ENGL 103 or 104; COMM 203, 205, or 243; ECON 202 or 203; Lang., Phil. and Cult. w/ KUCD; Creative Arts w/KICD	15
HIST/POLS Elec.	HIST 105, HIST 106, POLS 206, POLS 207	12	HIST 105, HIST 106, POLS 206, POLS 207	12	HIST 105, HIST 106, POLS 206, POLS 207	12
General Elec.		12		12		9
TOTAL HOURS		120		120		120

1. Math and Emphasis Electives:

- **APMT MATH** (21 hours): Take
 - MATH 415 or 433,
 - 6 hours from MATH 412, 414, 442, 469, 470, 471, 472, or 478.
 - 9-15 hours from MATH 325, 407-499.
 - Up to 6 hours may be from STAT 404-482; CSCE 210 - 470 (except CSCE 222, 285, 289, 291, 402); ISEN 320, 340.
- **APMT STAT** (24 hours): Take
 - ISEN 320 or 340.
 - Select 6-12 hours from MATH 325, 407-499; STAT 415, 485, 489.
 - Select up to 6 hours from CSCE 210-470 (except CSCE 222, 285, 289, 291, 402); ISEN 320-499; STAT 404-482.
- **APMT ACTUARY** (24 hours): Take
 - MATH 325, 425 and STAT 414 or MATH 411.
 - Of the remaining 6 hours of 4xx, select 2 courses from MATH 407-499; STAT 404-482; CSCE 210-470 (except CSCE 222, 285, 289, 291, 402); ISEN 320 or 340.
 - Select 3 courses from ECON 311-489; ECMT 463; FINC 309-489.
- **Note:** Maximum of 3 hours of MATH 411 or STAT 414 may be used in these degree programs.
- **Note:** Maximum of 4 hours of MATH 417 or MATH 437 may be used in these degree programs.

2. CSCE electives:

- **APMT MATH/STAT/ACTUARY:** (7 hours) Select 2 courses from CSCE 110, 111, 120*, and 206.
 - **CSCE 120** is a 3-hour course, while CSCE 110, 111, and 206 are 4-hour courses. If two of CSCE 110, 111, and 206 are taken to meet the programming requirement, then one less hour of general elective credit must be taken.

• Degree Plans: APMT ECON/CPCS

	BS APMT ECON		BS APMT CPS	
	Crs	Hrs	Crs	Hrs
Math Core	171, 172, 221, 300, 308, 323, 409, 411 or STAT 414, 437	31	171, 172, 221, 300, 308, 323, 409, 437	28
Math Elec.	325, 425, MATH 4xx, MATH 4xx	12	MATH 415 or 433, 3 x MATH 4xx, MSCI 4xx	15
Emphasis Electives	ISEN 320 or 340, ECON 323, ECON 459, ECMT 463	12	CSCE 221, CSCE 314, CSCE 411, CSCE 433	13
STAT/CSCE	STAT 211, STAT 212, CSCE elec., CSCE elec.	13	STAT 211, STAT 212, CSCE elec., CSCE 120	13
PHYS/CHEM	PHYS 206/226; PHYS 207/227 or OCNG 451	8	PHYS 206/226; PHYS 207/227 or OCNG 451	8
Fresh. Science Elec.	See note 4 on page 21	8	See note 4 on page 21	8
Core Elec.	ENGL 103 or 104; COMM 203, 205, or 243; ECON 202; Lang., Phil. and Cult. w/ KUCD; Creative Arts w/ KICD	15	ENGL 103 or 104; COMM 203, 205, or 243; ECON 202 or 203; Lang., Phil. and Cult. w/ KUCD; Creative Arts w/ KICD	15
HIST/POLS Elec.	HIST 105, HIST 106, POLS 206, POLS 207	12	HIST 105, HIST 106, POLS 206, POLS 207	12
General Elec.		9		8
TOTAL HOURS		120		120

1. Math and Emphasis Electives:

- **APMT ECON** (24 hours): Take
 - MATH 325 and 425
 - 6 hours from MATH 407-499
 - ISEN 320 or 340
 - ECON 323, ECON 459, and ECMT 463
- **APMT CPSC** (28 hours): Take
 - MATH 415 or 433
 - 9 hours from MATH 325, MATH 407-499
 - Select 3 hours from MATH 325, 407-499; STAT 404-482; CSCE 210-470 (except CSCE 222, 285, 289, 291); ISEN 320 or 340
 - CSCE 221, 314, 411, and 433

2. CSCE electives:

- **APMT ECON**: (7 hours) Select 2 courses from CSCE 110, 111, 120*, and 206.
 - CSCE 120 is a 3-hour course, while CSCE 110, 111, and 206 are 4-hour courses. If two of CSCE 110, 111, and 206 are taken to meet the programming requirement, then one less hour of general elective credit must be taken.
- **APMT CPCS**: (7 hours) Select 1 course from CSCE 110, 111, or 206; then take CSCE 120.

• Degree Plans: APMT CRYPTO/BIOL

	BS APMT CRYPTO		BS APMT BIOL	
	Crs	Hrs	Crs	Hrs
Math Core	171, 172, 221, 300, 308, 323, 409, 415 or 433, 437	31	171, 172, 221, 300, 308, 323, 409, 411	27
Math Elec.	411, 427 or 431, 2 x MSCI 4xx	12	MATH 469, 2 x MATH 4xx	12
Emphasis Electives	MATH 470, 471, 472, MC4xx	12	MATH 442, 2 x BIOL 2xx+	9
STAT/CSCE	STAT 211, STAT 212, CSCE elec., CSCE 120	13	STAT 312, CSCE elec.	7
PHYS/CHEM	PHYS 206/226; PHYS 207/227 or OCNB 451	8	PHYS 206/226, PHYS 207/227, CHEM 119, CHEM 120, CHEM 227/237, CHEM 228/238, BICH 410	27
Fresh. Science Elec.	See note 4 on page 21	8	BIOL 111, BIOL 112	8
Core Elec.	ENGL 103 or 104; COMM 203, 205, or 243; ECON 202; Lang., Phil. and Cult. w/ KUCCD; Creative Arts w/ ICD	15	ENGL 103 or 104; ENGL 203 or 210; Social Science; Lang., Phil. and Cult. w/ KUCCD; Creative Arts w/ ICD	15
HIST/POLS Elec.	HIST 105, HIST 106, POLS 206, POLS 207	12	HIST 105, HIST 106, POLS 206, POLS 207	12
General Elec.		9		3
TOTAL HOURS		120		120

3. Math and Emphasis Electives:

- **APMT CRYPTO** (24 hours): Take
 - MATH 411, 427 or 431
 - MATH 470, 471 and 472
 - 3 hours from MATH 325, 407-499; CSCE 210-470 (except CSCE 222, 285, 289, 291)
 - Select 6 hours from MATH 325, 407-499; STAT 404-482; CSCE 210-470 (except CSCE 222, 285, 289, 291); ISEN 320 or 340
- **APMT BIOL** (36 hours): Take
 - MATH 415 or 433
 - MATH 410 or 446
 - 12 hours from MATH 325, MATH 407-499
 - MATH 442 and 469
 - MATH/BIOL 285 6 times (1 hr. each)
 - BIOL 213 and 214
- **Note:** Maximum of 3 hours of MATH 411 or STAT 414 may be used in these degree programs.
- **Note:** Maximum of 4 hours of MATH 417 or MATH 437 may be used in these degree programs.

4. CSCE electives:

- **APMT CRYPTO:** (7 hours) Select 1 course from CSCE 110, 111, or 206; then take CSCE 120.
- **APMT BIOL:** (4 hours) Select 1 course from CSCE 110, 111, or 206.

BS APMT Actuarial Science Option Semester-by-Semester Degree Plan

First Semester

MATH 171	4
MATH 170 (elec)	1
Freshman Science elective	4
ENGL 103 or 104	3
CORE elective	3
<hr/>	
	15

Second Semester

MATH 172	4
MATH 170 (elec)	1
Freshman Science elective	4
ECON 202 or 203	3
CORE elective	3
<hr/>	
	15

Third Semester

MATH 221	4
MATH 300	3
STAT 211	3
CSCE 110, 111, or 206	4
<hr/>	
	14

Fourth Semester

MATH 308	3
MATH 325	3
STAT 212	3
CSCE 110, 111, 120, or 206	3
CORE elective	3
<hr/>	
	15

Fifth Semester

MATH 323	3
MATH 411 or STAT 414	3
PHYS 206/226	4
Emphasis elective	3
CORE elective	3
<hr/>	
	16

Sixth Semester

MATH 409	3
MATH 419	3
PHYS 207/227 or OCNG 451	4
Emphasis elective	3
CORE elective	3
<hr/>	
	16

Seventh Semester

MATH 425	3
Emphasis elective	3
Emphasis elective	3
COMM 203, 205 or 243	3
CORE elective	3
<hr/>	
	15

Eighth Semester

MATH 437	4
Emphasis elective	3
General elective	7
<hr/>	
	14

This is just an example, and if there are any unintentional discrepancies between this at what is posted at catalog.tamu.edu, then what you see at catalog.tamu.edu is correct.

BS APMT Biology Option Semester-by-Semester Degree Plan

First Semester

MATH 171	4
MATH 170 (elec)	1
BIOL 111	4
CHEM 119	4
ENGL 103 or 104	3
<hr/>	
	16

Second Semester

MATH 172	4
MATH 170 (elec)	1
BIOL 112	4
CHEM 120	4
ENGL 203 or 210	3
<hr/>	
	16

Third Semester

MATH 221	4
MATH 300	3
CHEM 227/237	4
BIOL elective	3
<hr/>	
	14

Fourth Semester

MATH 308	3
MATH 323	3
CHEM 228/238	4
BIOL elective	3
CORE elective	3
<hr/>	
	16

Fifth Semester

MATH 409	3
PHYS 206/226	4
BICH 410	3
STAT 312	3
CORE elective	3
<hr/>	
	16

Sixth Semester

MATH 411	3
MATH 469	3
PHYS 207/227	4
CORE elective	3
<hr/>	
	13

Seventh Semester

MATH elective	6
CSCE 110, 111, or 206	4
CORE elective	3
CORE elective	3
<hr/>	
	16

Eighth Semester

MATH 442	3
MATH elective	3
CORE elective	6
General elective	1
<hr/>	
	13

This is just an example, and if there are any unintentional discrepancies between this at what is posted at catalog.tamu.edu, then what you see at catalog.tamu.edu is correct.

BS APMT Computational Science Option Semester-by-Semester Degree Plan

First Semester

MATH 171	4
MATH 170 (elec)	1
Freshman Science elective	4
ENGL 103 or 104	3
CORE elective	3
<hr/>	
	15

Second Semester

MATH 172	4
MATH 170 (elec)	1
Freshman Science elective	4
ECON 202 or 203	3
CORE elective	3
<hr/>	
	15

Third Semester

MATH 221	4
MATH 300	3
STAT 211	3
CSCE 110, 111, or 206	4
<hr/>	
	14

Fourth Semester

MATH 323	3
MATH 308	3
STAT 212	3
CSCE 120	3
CORE elective	3
<hr/>	
	15

Fifth Semester

MATH 409	3
CSCE 221	4
Emphasis elective	3
PHYS 206/226	4
<hr/>	
	14

Sixth Semester

CSCE 314	3
MATH 437	4
PHYS 207/227 or OCNG 451	4
Emphasis elective	3
<hr/>	
	14

Seventh Semester

MATH 415 or 433	3
CSCE 411	3
Emphasis elective	3
COMM 203, 205 or 243	3
CORE elective	3
General elective	1
<hr/>	
	16

Eighth Semester

CSCE 433	3
Emphasis elective	3
CORE elective	3
CORE elective	3
General elective	5
<hr/>	
	17

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BS APMT Cryptography Option Semester-by-Semester Degree Plan

First Semester

MATH 171	4
MATH 170 (elec)	1
Freshman Science elective	4
ENGL 103 or 104	3
CORE elective	3
<hr/>	
	15

Second Semester

MATH 172	4
MATH 170 (elec)	1
Freshman Science elective	4
ECON 202 or 203	3
CORE elective	3
<hr/>	
	15

Third Semester

MATH 221	4
MATH 300	3
STAT 211	3
CSCE 110, 111, or 206	4
<hr/>	
	14

Fourth Semester

MATH 323	3
MATH 308	3
STAT 212	3
CSCE 120	3
CORE elective	3
<hr/>	
	15

Fifth Semester

MATH 409	3
MATH 470	3
PHYS 206/226	4
CORE elective	3
General elective	1
<hr/>	
	14

Sixth Semester

MATH 415 or 433	3
MATH 471	3
PHYS 207/227 or OCNG 451	4
CORE elective	3
General elective	3
<hr/>	
	16

Seventh Semester

MATH 427 or 431	3
MATH 472	3
Emphasis elective	3
COMM 203, 205 or 243	3
General elective	3
<hr/>	
	15

Eighth Semester

MATH 411	3
Math 437	4
Emphasis elective	3
CORE elective	3
General elective	3
<hr/>	
	16

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BS APMT Economics Option Semester-by-Semester Degree Plan

First Semester

MATH 171	4
MATH 170 (elec)	1
Freshman Science elective	4
ENGL 103 or 104	3
CORE elective	3
<hr/>	
	15

Second Semester

MATH 172	4
MATH 170 (elec)	1
Freshman Science elective	4
ECON 202	3
CORE elective	3
<hr/>	
	15

Third Semester

MATH 221	4
MATH 300	3
STAT 211	3
CSCE 110, 111, or 206	4
<hr/>	
	14

Fourth Semester

MATH 323	3
MATH 308	3
STAT 212	3
ECON 323	3
CSCE 110, 111, 120, or 206	3
<hr/>	
	15

Fifth Semester

MATH 325	3
MATH 409	3
PHYS 206/226	4
CORE elective	3
<hr/>	
	13

Sixth Semester

MATH 411 or STAT 414	3
MATH 425	3
PHYS 207/227 or OCNG 451	4
CORE elective	3
General elective	3
<hr/>	
	16

Seventh Semester

MATH 437	4
COMM 203, 205 or 243	3
Emphasis elective	3
CORE elective	3
ECON 459	3
<hr/>	
	16

Eighth Semester

ISEN 320 or 340	3
ECMT 463	3
Emphasis elective	3
CORE elective	3
General elective	4
<hr/>	
	16

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BS APMT Math Option Semester-by-Semester Degree Plan

First Semester

MATH 171	4
MATH 170 (elec)	1
Freshman Science elective	4
ENGL 103 or 104	3
CORE elective	3
<hr/>	
	15

Third Semester

MATH 221	4
MATH 300	3
STAT 211	3
CSCE 110, 111, or 206	4
<hr/>	
	14

Fifth Semester

MATH 409	3
MATH 412, 414, 442, 469, 470, 471, 472 or 478	3
Emphasis elective	3
PHYS 206/226	4
CORE elective	3
<hr/>	
	16

Seventh Semester

MATH 412, 414, 442, 469, 470, 471, 472 or 478	3
MATH elective	3
Emphasis elective	3
COMM 203, 205 or 243	3
General elective	4
<hr/>	
	16

Second Semester

MATH 172	4
MATH 170 (elec)	1
Freshman Science elective	4
CORE elective	3
CORE elective	3
<hr/>	
	15

Fourth Semester

MATH 323	3
MATH 308	3
STAT 212	3
ECON 202 or 203	3
CSCE 110, 111, 120 or 206	3
<hr/>	
	15

Sixth Semester

MATH 410 or 446	3
MATH 415 or 433	3
PHYS 207/227 or OCNG 451	4
CORE elective	3
<hr/>	
	13

Eighth Semester

MATH 437	4
MATH elective	3
CORE elective	3
General elective	6
<hr/>	
	16

This is just an example, and if there are any unintentional discrepancies between this at what is posted at catalog.tamu.edu, then what you see at catalog.tamu.edu is correct.

BS APMT Statistics Option Semester-by-Semester Degree Plan

First Semester

MATH 171	4
MATH 170 (elec)	1
Freshman Science elective	4
ENGL 103 or 104	3
CORE elective	3
<hr/>	
	15

Second Semester

MATH 172	4
MATH 170 (elec)	1
Freshman Science elective	4
ECON 202 or 203	3
CORE elective	3
<hr/>	
	15

Third Semester

MATH 221	4
MATH 300	3
STAT 211	3
CSCE 110, 111, or 206	4
<hr/>	
	14

Fourth Semester

MATH 323	3
MATH 308	3
STAT 212	3
CSCE 110, 111, 120 or 206	3
CORE elective	3
<hr/>	
	15

Fifth Semester

MATH 409	3
STAT 404	3
PHYS 206/226	4
CORE elective	3
General elective	3
<hr/>	
	16

Sixth Semester

MATH 417 or 437	4
STAT 408	3
PHYS 207/227 or OCNG 451	4
CORE elective	3
<hr/>	
	14

Seventh Semester

MATH 411 or STAT 414	3
ISEN 320 or 340	3
Emphasis elective	6
CORE elective	3
<hr/>	
	15

Eighth Semester

COMM 203, 205 or 243	3
Emphasis elective	6
General elective	7
<hr/>	
	16

This is just an example, and if there are any unintentional discrepancies between this at what is posted at catalog.tamu.edu, then what you see at catalog.tamu.edu is correct.

- **COMMON REQUIREMENTS TO ALL DEGREES**

The following requirements and remarks apply to all degree plans:

1. **Core Electives:** (15 hours) Take
 - ENGL 103 or 104 (3 hours) **Note: If taken at TAMU, must enroll before earning 60 credit hours.**
 - COMM 203, 205, or 243 (Exception: APMT-BIOL requires a second ENGL) (3 hours)
 - 3 hours of a Social and Behavioral Sciences CORE course is required.
 - For BA MATH (Non-Certification) and BS MATH, take any Social and Behavioral Sciences CORE course. (For a list of the acceptable Social and Behavioral Sciences courses, please visit core.tamu.edu.)
 - For BA MATH (Certification) take INST 210. **Note: Should be taken the semester before Clinical Teaching.**
 - For all APMT degrees, take ECON 202 or 203. **Note: APMT ECON majors must take ECON 202.**
 - 3 hours of a Language, Philosophy and Culture CORE course is required.
 - For a list of the acceptable Language, Philosophy and Culture courses, please visit core.tamu.edu.
 - 3 hours of a Creative Arts CORE course
 - For a list of the acceptable Creative Arts courses, please visit core.tamu.edu.
 - 3 hours of Cultural Discourse (KUCD) and 3 hours of International and Cultural Diversity (KICD) are required.
 - Some of these courses may be used to satisfy other degree requirements. In all degree plans shown on pages 9-25, we have assumed that at least two CORE courses with KUCD and KICD attributes (one each) have been selected. If you choose CORE courses that do not have these attributes, your available general electives will decrease by 6 credit hours. Please visit core.tamu.edu and check the very last two columns of the spreadsheet to determine which CORE courses carry the KUCD and KICD attributes.
2. **HIST/POLS:** (12 hours)
 - POLS 206 and 207 are required.
 - For the HIST requirement, 6 hours of American History are required.
 - Most students satisfy this requirement by taking HIST 105 and 106.
 - For other options, please visit core.tamu.edu.
3. **General Electives:** Almost every course offered at TAMU will count as a General Elective, with some exceptions.
 - Please see an advisor or the red print in the General Electives area of your Degree Evaluation in Howdy for a list of courses that cannot be used as General Electives.
 - Math 170 and Math 200 both count as General Elective hours.
4. **Freshman Science Electives (all degrees except APMT BIOL):** (8 hours)
 - Select 4 hours from ASTR 111, BIOL 111, BIOL 112, CHEM 119, CHEM 120, CHEM 107/117.
 - Select 4 hours from any 100-level course(s) listed above that you have not taken or ATMO 201/202, GEOL 101/102, or OCNG 251/252.
 - APMT-BIOL majors **must take BIOL 111 and BIOL 112.**
5. **Writing Requirement:**
 - All TAMU students are required to take two writing intensive (W) courses within their major. Students may opt, instead, to take one W and one C (communication intensive) course. One of these W course requirements is met with completion of MATH 300. The second requirement may be met with completion of MATH 396, MATH 442, or MATH 467. Some degrees have additional options as follows:
 - BA MATH (Certification): RDNG 372
 - APMT-ACT and APMT-ECON: ECMT 463
 - All degrees: MATH 482; or 491, with instructor approval
 - All W and C courses will appear in Howdy as 9xx sections.

MAJOR in MATHEMATICS with HONORS

What is an Honors Mathematics Program?

The Department of Mathematics offers a variety of honors courses. Mathematics majors who fulfill specific requirements, basically to take seven honors mathematics courses, can graduate with Honors in Mathematics. (An Honors Minor in Mathematics is also available.) Other honors programs, with overlapping but different requirements, are [Honors in Science](#) and [University Honors Fellows](#).

What is an Honors Course?

“Honors courses are intended to be more complex, not necessarily more difficult,” and “are expected to provide increased intellectual challenge through more sophisticated material, a higher level of intellectual engagement, and more responsibility for the learning process than would typically be expected in an undergraduate course,” says the university. The philosophy of the Department of Mathematics is that honors students should be more intellectually curious, more motivated, and more independent than the average undergraduate.

Perks of Being an Honors Mathematics Major

- Smaller, more interesting classes and the best professors (and, when possible, a reduction in routine busywork).
- Honors priority registration, which is the first two days of the pre-registration period.
- An increased probability of being taken to mathematics conferences with all expenses except for food paid for by the department.
- An increased probability to be hired for departmental positions such as undergraduate TA.
- A few honors mathematics students are invited to be Honors Mentors, students who run help sessions for honors classes for which they have earned an A.
- A greatly increased probability of being accepted into FastTrack, our five-year combined bachelors/master’s program in mathematics.
- Looks great on a résumé.

Becoming an Honors Mathematics Major

- Entering freshmen who are qualified are invited into the math honors program at their New Student Conference.
- Any mathematics major with at least a 3.5 GPA may ask the Director of Honors Programs in Mathematics to be added to the honors program in mathematics as long as the student can still take the required seven honors mathematics classes before graduation.

NOTE: Any student with at least a 3.5 GPA may take an honors class if there are seats available, but doing so does not, by itself, earn the student the Honors distinctions nor gain any of the perks listed above. Any honors classes taken before entering an Honors Program (e.g., Honors in Mathematics, College of Science Honors) can be used to fulfill the program requirements.

Remaining in the Honors Mathematics Program

1. Maintain at least a 3.5 GPA.
2. Take at least one honors math class each academic year.

Students with under a 3.5 but high enough GPA to be over a 3.5 at the end of the next semester will be put on probation for one semester and removed from the program if they are under a 3.5 a second consecutive semester.

Exceptions to Rule 2 must be approved by the Director of the Honors Programs in Mathematics. A year-long study abroad program in which there is no opportunity to take an honors mathematics class is an example of an acceptable reason.

Reinstatement into the Honors Mathematics Program

To be reinstated into the Honors Mathematics Program, the student must meet all the requirements to become a mathematics honors student and be registered for an honors mathematics class in the semester in which reinstatement is requested from the Director of Honors Programs in Mathematics.

Requirements to Earn the Transcript Distinction of Honors in Mathematics

In order to receive Honors in Mathematics, a mathematics major must complete all of the requirements for a BA or BS in Math or a BS in APMT of which 21 hours must be completed as follows:

1. at least 3 hours in a 100-level or above honors mathematics course (honors Calculus I does not count towards the Honors in Mathematics distinction, but does count towards the “at least one honors math class each academic year”),
2. additionally, at least 3 hours in a 200-level or above honors mathematics course,
3. additionally, at least 3 hours in a 300-level or above honors mathematics course,
4. additionally, at least 9 hours in 400-level or above honors mathematics courses,
5. additionally, at least 3 hours from one of the following:
 - a. a graduate mathematics class other than 601, 695, 696
 - b. Math 482H — Research Seminar in Mathematics
 - c. Math 485H — For approved supervised directed study on an advanced topic
 - d. Math 491H — supervised research, supervised projects for business/industry or education, or honors credit for an REU.

NOTES:

- With very few exceptions, all math honors courses must be taken at Texas A&M. (An example of an exception would be earning an A at Budapest Semesters in Mathematics. For more information, speak to the Director of Honors Programs in Mathematics.)
- APMT students with emphases in Computational Science or in Statistics may use honors level 4xx courses from CSCE or STAT that are on their degree plans or some 6xx courses in their emphasis area to count toward math honors. Approval from the Director of Honors Programs in Mathematics is required.
- A maximum of 6 hours total of 485H and 491H are normally allowed. Only under very unusual circumstances will the Director of Honors Programs in Mathematics allow 9.
- To earn credit for advanced independent study (485H) or for an REU (491H), the student must see the Director of Undergraduate Research in Mathematics after spring break but before finals of the spring term to set up the course and to fill out paperwork.

Grade Requirements at the Time of Graduation

1. A cumulative grade point average of at least 3.5;
2. A grade point average of at least 3.25 and no grade lower than a B in the 21 required honors hours;
3. No grade of F* on the transcript.

Eligible Honors Mathematics Courses When Offered (no guarantee that they will be)

- 172H (171H does not count towards the honors major distinction!)
- 300H, 221H
- 308H, 323H, 325H
- All 400-level honors math courses except 401, 403, 433, 490; as above 485H and 491H credit for an REU. No more than a combined total of 6 hours of 485H and 491H courses may be counted towards mathematics honors. Only under very unusual circumstances will the Director of Honors Programs in Mathematics allow 9 hours.
- All 600-level courses except 601, 695, 696.

NOTES:

- When no honors section of an eligible course is available, individual students have the option to negotiate an honors contract with the instructor. The steps for an honors contract are:
 - Ask the professor if an honors contract would be possible.
 - Ask the professor what such a contract would entail.
 - If both of you agree, you need to fill out the Honors Course Contract & Honors Independent Study Applications. You will need to log in under your TAMU User ID to bring up the form. It is recommended that you and your professor fill out the form online together.
 - Submit the form online. **This must be done before the 12th class day of the semester in which the contract is in effect.**
 - Fulfill the agreed upon contract.
- Honors Fellow requires 30 honors hours taken at A&M. College of Science Honors requires 28 hours. All of the hours for Math honors will count towards College of Science Honors and those taken at A&M towards Honors Fellow.
- Three sample programs to fulfill the honors requirements are:
 - 172H, 300H, 323H, 409H, 411H, 470H, 485H
 - 300H, 308H, 323H, 409H, 424H, 467H, 629
 - 409H, 415H, 416H, 446H, 447H, 482H, 491H

MISCELLANEOUS INFORMATION

Grade Point Requirements

All students must maintain both an overall grade point average and a mathematics grade point average of at least 2.0. Grades of S are not included in the GPA calculation. However, a grade of U is treated the same as a grade of F in the GPA calculation.

- **If a grade of D or F is earned in any of the following courses, MATH 171/151, 172/152, 221/251/253, 300, 323, or 308, this course must be *immediately* retaken and a grade of C or better earned.**
- **The department will allow at most two (2) D's in upper level (300-400) MATH courses. If a third D is earned, one of the three courses in which a D was earned must be retaken and a grade of C or better earned.**

Residency Requirement

Students must satisfy the University residency requirement by completing 36 hours of upper-level courses (300 - 400 level) at Texas A&M University.

Undergraduate Degree Planner

All students entering Texas A&M University are required to complete an online undergraduate degree plan. An initial degree plan may be submitted after the 7th class day of the student's first term of enrollment and the deadline to avoid a registration hold is September 30th and/or January 31st each semester for ALL students with more than 30 hours or more than two semesters at TAMU.

The Undergraduate Degree Planner is in Howdy in the My Dashboard tab under the My Record menu. Guides for using the Undergraduate Degree Planner are also available in Howdy. Completing a degree plan is important as it will help you plan your courses and graduate in the least amount of time.

University Foreign Language Requirement

The University foreign language requirement states that a student must either complete two years of high school foreign language (in the same language) or complete two semesters of college foreign language (in the same language).

General Electives

Aside from minor restrictions, a general elective is a course which is not used for a specific degree requirement. A list of ineligible general electives can be found within the Undergraduate Degree Planner on the Degree Evaluation tab. Any course which is more elementary than a required course in the student's major may not be used as a general elective. For example, no mathematics course numbered below MATH 403 may be used as a general elective, except Math 150, 170, 302, and 325. Students must use general electives to satisfy core curriculum and residency requirements which are not satisfied by their specific degree plan.

English 104 Restrictions

The English Department will not allow juniors and seniors to enroll in English 104. This is a strict rule, and they will make NO exceptions. As a result, if you plan to take ENGL 104 here at TAMU, it MUST BE TAKEN BEFORE YOU ACHIEVE 60 CREDIT HOURS. Otherwise, you will be required to take ENGL 1301 at another institution.

Credit by Examination

Credit by examination is available for courses in biology, chemistry, computer science, economics, English, foreign languages, mathematics, physics, psychology, sociology, and history. Students may obtain credit by exam through a variety of College Board advanced placement (AP) exams prior to entering college or through CLEP and departmental exams administered by Testing Services (testing.tamu.edu) located in the General Services Building on Agronomy Road.

Accepting Advanced Placement (AP) Credit

Advanced Placement (AP) credits through College Board exams do not automatically appear on a student's transcript. In order to formally accept AP credits, students must do so in the Howdy system. This is necessary because some students elect to retake courses rather than accept their AP credit. Note: AP credit for Statistics or Physics 1 or 2 cannot be used for credit for a math major even as a general elective, so it is recommended that these credits not be accepted. It is possible to accept them later should a student change to a major that will accept the credit(s). **Please consult with an advisor before accepting ANY AP credit.**

Preparation for Actuarial Examinations

Students interested in actuarial sciences should follow the APMT Actuarial Science degree plan. Interested students should talk to Prof. Todd Schrader or Prof. Heather Klein. Actuaries take a series of examinations prior to and during employment. Students should take as many exams as possible prior to graduation. The Math Department offers courses to help students prepare for the first two exams, Exam P and Exam FM. Notices of exam dates as well as registration information and study materials are available at soa.org.

Scholarships and Financial Aid

The Mathematics Department offers some undergraduate scholarships for mathematics majors. Continuing students may apply for Math scholarships by selecting "College of Arts and Sciences" on this website: <https://uwide.tamu.edu>. Other forms of financial aid and work study programs are available from Aggie One Stop, located in the General Services Complex (GSC).

Please note that only courses that satisfy degree requirements are eligible to be paid for with Financial Aid.

Mathematical Association of America (MAA), Association for Women in Mathematics (AWM), and Pi Mu Epsilon (PME)

The Texas A&M Math Department has student chapters of the three national mathematics organizations, MAA, AWM and PME. These organizations attempt to educate students about math outside their typical coursework and to give them an understanding of possible careers in math and math-related fields.

Texas A&M's MAA student chapter is open to all students who have an interest in mathematics. There are no scholastic requirements such as class standing or grade point average. Students from any major are welcome to join. The cost of membership ranges from \$20 to \$30.

The Association for Women in Mathematics (AWM) student chapter is open to all students, men and women, who wish to promote full participation in mathematics by women. There are no scholastic requirements such as classification or grade point average to join. Students from any major are welcome to join. AWM is free for our AWM chapter members, which are any members of our math club.

Pi Mu Epsilon is an honorary mathematics organization. Students are required to meet certain requirements to join. There is a \$30 lifetime membership fee. For more information about requirements, please contact Prof. Phil Yasskin at yasskin@math.tamu.edu.

The three organizations share student officers and hold joint monthly meetings and events. At the meetings, speakers are invited to talk to the group. Often, prospective employers are invited to give presentations.

Employment Search

The Texas A&M University Career Center helps all current and former students find prospective employers. Many companies have recruited mathematics majors through the Career Center. Some of these companies include Aon, Mercer, Fidelity, Willis Towers Watson, EY, Milliman, Schlumberger, CGG Veritas, IBM, Texas Instruments, General Motors, and Shell Oil Company. U.S. government agencies such as the CIA, the FBI, the Army, the Air Force, and NSA also interview through the Career Center. For more information, visit hireaggies.com or contact the Career Center Office, Suite 209 of the Koldus Building at (979)845-5139.

Graduate School

An undergraduate degree in mathematics is an excellent background for graduate studies in mathematics, computer science, statistics, industrial engineering, and business as well as many other fields. Graduate students usually receive financial support in the form of scholarships, fellowships, industrial internships or teaching assistantships. Students interested in graduate school should begin applying for admission and take the GRE (Graduate Records Examination) two semesters prior to graduation. Students planning to take the GRE at Texas A&M should register online at [GRE.org](https://www.gre.org) and select the “General Services Complex at TAMU” as the Testing Center.

The American Mathematical Society publishes a list of graduate programs and information associated with graduate assistantships and fellowships in the mathematical sciences each fall. Information on Graduate School in Mathematics at Texas A&M University is available through the Graduate Program Office located in Blocker 336C. Information on Graduate School in Statistics at Texas A&M University is available in the Statistics Office located in Blocker 447.