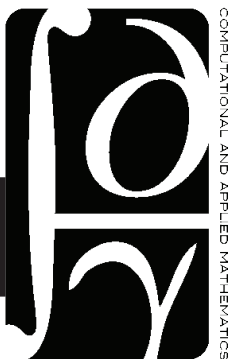


# CAAM

## Computational and Applied Mathematics

<b>WEB LINKS</b>	<a href="https://www.caam.rice.edu/undergraduate-program">https://www.caam.rice.edu/undergraduate-program</a>
<b>FRANK ADVICE</b>	CAAM 210 (Introduction to Engineering Computation) develops important MATLAB skills; most future CAAM classes require more mathematical analysis and less programming. Students with a strong math background and programming experience can potentially take CAAM 210 in the fall of their freshman year.
<b>ADVICE FOR STUDENTS WITH AP CREDIT</b>	CAAM majors with a 5 on the BC Calculus exam should strongly consider the Honors Calculus sequence (MATH 221/222) in place of the MATH 212 (Multivariable Calculus) requirement. Because the content from MATH 212 is spread over both semesters of 221/222 (in greater depth and breadth), students must complete both 221 and 222 in place of 212: but most students find the extra effort to be well worth it.
<b>ALTERNATIVE CURRICULA</b>	Double majors can coordinate some of the CAAM “specialization electives” with classes from their other majors. Students completing a senior design project in another engineering major can usually coordinate that with the CAAM senior design requirement. Please consult a CAAM major adviser to work out a program of study as soon as possible.
<b>BS VERSUS BA</b>	CAAM only offers a B.A. degree.
<b>NOT REQUIRED BUT HIGHLY RECOMMENDED COURSES</b>	Students who intend to pursue graduate study in applied math should take MATH 321 (Introduction to Analysis I) and MATH 322 (Introduction to Analysis II); these students would also benefit from MATH 425 (Integration Theory).



<p><b>RESEARCH</b></p>	<p>Many CAAM majors engage in undergraduate research, either with a CAAM professor or beyond (e.g., in the Texas Medical Center). Students often find a research opening by first making a positive impression on professors through active and constructive participation in class.</p>
<p><b>INTERNSHIPS</b></p>	<p>Summer research internships are often available, too. Many students also pursue industrial or lab internships; notices are posted to the CAAM undergrad email list.</p>
<p><b>STUDY ABROAD</b></p>	<p>Study abroad semesters are possible and encouraged.</p>
<p><b>PROFESSIONAL ORGANIZATION</b></p>	<p>The student chapter of the Society for Industrial and Applied Mathematics (SIAM) offers occasional talks on technical, career, and professional development topics. For membership and meeting details, see <a href="http://www.caam.rice.edu/~siamchapter/">http://www.caam.rice.edu/~siamchapter/</a> for details on membership and meetings.</p>
<p><b>INTERESTING COURSES FOR NON-MAJORS</b></p>	<p>CAAM 210: Intro to Engineering Computation (mathematical modeling and MATLAB programming)            CAAM 335: Matrix Analysis (matrices, linear systems, least squares, eigenvalues)            CAAM 336: Differential Equations in Science and Engineering (Fourier series and finite elements)            CAAM 378: Intro to Operations Research and Optimization (good for math econ (MTEC) majors)            CAAM 519: Computational Science I (scientific programming in C/C++ with advanced math libraries)</p>

# B.A. In Computational and Applied Mathematics

**Specializations:** Four additional quantitative courses at 300 level or above, two of which must be at the 400 level or above. Recommended courses include CAAM 415, 423, 436, 519, 560; MATH 425, 427; STAT 431. Students are strongly encouraged to develop expertise in other disciplines that use computational and applied mathematics.

## Sample Degree Plan

*THIS IS ONE EXAMPLE OF MANY POSSIBLE SCHEDULES.  
CONSULT A DIVISIONAL OR DEPARTMENTAL ADVISER TO CUSTOMIZE YOUR DEGREE PLAN.*

FALL			SPRING		
<b>FRESHMAN</b> 16 credits			<b>FRESHMAN</b> 15 credits		
MATH 101†	Single Variable Calculus I	3	MATH 102	Single Variable Calculus II	3
	or 105			or 106	
DIST	Distribution elective	3	CAAM 210	Intro to Eng Computation	3*
FWIS	Freshman Writing	3	DIST	Distribution elective	3
OPEN	Open elective	3	OPEN	Open elective	3
OPEN	Open elective	3	OPEN	Open elective	3
LPAP	Lifetime Phys Activity elective	1			
<b>SOPHOMORE</b> 15 credits			<b>SOPHOMORE</b> 15 credits		
CAAM 335	Matrix Analysis	3	CAAM 336	Diff Eqs in Science & Eng	3
MATH 212	Multivariable Calculus	3	STAT 310	Probability and Statistics	3
DIST	Distribution elective	3		or ECON 307	
OPEN	Open elective	3	DIST	Distribution elective	3
OPEN	Open elective	3	OPEN	Open elective	3
			OPEN	Open elective	3
<b>JUNIOR</b> 15 credits			<b>JUNIOR</b> 15 credits		
CAAM 378	Intro to Oper Res & Optim	3	SPEC	Specialization elective	3
MATH 302	Elements of Analysis	3	SPEC	Specialization elective	3
	or MATH 321		DIST	Distribution elective	3
SPEC	Specialization elective	3	OPEN	Open elective	3
DIST	Distribution elective	3	OPEN	Open elective	3
OPEN	Open elective	3			
<b>SENIOR</b> 14–16 credits			<b>SENIOR</b> 14–15 credits		
CAAM 453	Numerical Analysis I	3	CAAM 454	Numerical Analysis II	3
CAAM 495	Senior Design Project I	2†		or CAAM 471	
SPEC	Specialization elective	2	CAAM 496	Senior Design Project II	2
DIST	Distribution elective	3	OPEN	Open elective	3
OPEN	Open elective	3–4	OPEN	Open elective	3–4
			OPEN	Open elective	3

\* In addition to class hours, these courses have a regularly scheduled lab and/or discussion session that must fit into your schedule.

† Students with prior experience with calculus may replace this class with a 3-credit quantitative elective at the 200-level or above, as approved by a CAAM undergraduate adviser. (This quantitative elective is in addition to the four required specialization electives.)

BASIC REQUIREMENTS	General math & science courses Core courses in major	9–12 28–30
ELECTIVE REQUIREMENTS	Specialization electives Open electives and LPAP FWIS and distribution courses	12 48–50 21
Minimum credit required for the B.A.		120

Of the 120 total degree credits, the B.A. in Computational and Applied Mathematics requires 37–42 credits in general math and science courses and core courses.

## Major Requirements

NUMBER	CREDIT	TITLE
MATH 101†/105	3	Single Variable Calculus I /AP or other credit in Calculus I
MATH 102/106	3	Single Variable Calculus II /AP or other credit in Calculus I
MATH 212 or 221 and 222	3	Multivariable Calculus or Honors Calculus III and Honors Calculus IV
MATH 302/321	3	Elements of Analysis/Introduction to Analysis I
STAT 310 or ECON 307	3	Probability and Statistics
CAAM 210	3*	Introduction to Engineering Computation
CAAM 335	3	Matrix Analysis
CAAM 336	3	Differential Equations in Science and Engineering
CAAM 378	3	Intro to Operations Research & Optimization
CAAM 453	3	Numerical Analysis I
CAAM 454/471	3	Numerical Analysis II/Intro to Linear and Integer Programming
CAAM 495	2	Senior Design Project I
CAAM 496	2	Senior Design Project II
Specialization elective	3	300 or above
Specialization elective	3	300 or above
Specialization elective	3	400 or above
Specialization elective	3	400 or above

\* In addition to class hours, these courses have a regularly scheduled lab and/or discussion session that must fit into your schedule.

† Students with prior experience with calculus may replace this class with a 3-credit quantitative elective at the 200-level or above, as approved by a CAAM undergraduate adviser. (This quantitative elective is in addition to the four required specialization electives.)