

B.S. in Applied Mathematics for the Life and Social Sciences (AMLSS) Graduation Requirements 2009 and Beyond

College of Liberal Arts & Sciences students must satisfy the following to graduate:

- 1) University General Studies Requirements
- 2) College of Liberal Arts & Sciences Requirements
- 3) B.S. in Applied Mathematics for the Life and Social Sciences Requirements

1) Meeting the University General Studies Requirement:

A minimum of 35 semester hours plus the First-Year Composition requirement is required. Courses that fulfill the First-Year Composition requirement are ENG 101 & 102; or 105; or 107 & 108 (WAC 101 or 107 is also required in some cases).

The Five General Studies Core Areas: A single course cannot be used to satisfy two core area requirements, even if it is approved for more than one core area.

- Literacy and Critical Inquiry (**L**) – 6 semester hours with at least 3 upper-division credits.
- Mathematical Studies **MA** and **CS** Requirement – 3 semester hours **MA** and at least 3 semester hours **CS**. **CLAS majors require a “C” minimum in the MA area.**
- Combined **HU** and **SB** Requirement -15 semester hours, 6 semester hours must be taken in one of these two core areas and 9 hours in the other core area; and 3 of the 15 semester hours must upper-division.
- Natural Science-Quantitative (**SQ**) and Natural Science-General (**SG**) - 4 semester hours **SQ** and 4 semester hour **SQ** or **SG**.

Awareness Areas: A single course may be used to satisfy one core area and/or a maximum of two awareness area requirements. Students **must complete** courses that satisfy each of the **three awareness areas:** *Cultural Diversity in the United States (C)*, *Global Awareness (G)*, and *Historical Awareness (H)*.

General Studies course lists are available in the ASU General Catalog, the Schedule of Classes and on the web at http://catalog.asu.edu/ug_gsr

2) Meeting the College of Liberal Arts and Sciences Graduation Requirement:

a. Students pursuing BS degrees in the college must complete six semester hours (two courses) of “Science and Society” courses. Students should consult with an advisor in the department or school of their major for a list of appropriate courses. For a list of science and society courses as well as more information on requirements, go to: http://clas.asu.edu/students/degreerequirements/scienceand_society.htm

b. All students are required to take a minimum of MAT 119 or higher. A grade of “C” (2.00) or higher must be earned in the chosen mathematics course.

3) Meeting the School of Human Evolution & Social Change Requirements for an:

AMLSS—B.S.

The major consists of a minimum of 39 semester hours. At least **12 credit** hours must be taken in residence at ASU’s Tempe Campus and **at least 18** of the 39 hours must be upper-division. In addition to required courses, students select the remaining electives from the list approved courses. Other elective courses will be evaluated for suitability to count towards the major by the Executive Committee with the assistance of the School of Human Evolution and Social Change’s Undergraduate Advising Office.

I. REQUIRED COURSES (27 credits)

- a. Introductory Course
AML 100 Introduction to Applied Mathematics for the Life and Social Sciences (3)
- b. Modeling Course
AML 253 Modeling in the Life and Social Sciences (3)
- c. Life Science Courses (6)
- d. Social Science Courses (6)
- e. Applied Math Courses (6)
- f. Capstone Seminar
AML 406 Direct Reading and Research in Applied Mathematics for the Life and Social Sciences (3)

II. MAJOR ELECTIVE COURES (12 credits)

In addition to completing the degree, students must also take the following pre-requisite courses:

CSE 100 Principles of Programming with C++ (3) CS
OR *CSE 110 Principles of Programming with Java (3) CS*

*BIO 187 General Biology I (3) SQ **
BIO 188 General Biology II (3) SQ

MAT 270 Calculus with Analytic Geometry I (3) MA
MAT 271 Calculus with Analytic Geometry II (3) MA
MAT 272 Calculus with Analytic Geometry III (3) MA
MAT 274 Elementary Differential Equations (3) MA
MAT 275 Modern Differential Equations (3) MA
MAT 342 Linear Algebra (3) or MAT 343 Applied Linear Algebra (3)

*BIO 187/188 needed to take upper-division Life Science Courses

**Students should take SOC 101, ASB 102, PSY 101, POS 101, or any other intro Social Science Course to be able to take upper-division electives in the Social Science track.

For FAQs: <http://shesc.asu.edu/node/525>

School of Human Evolution and Social Change

B.S. in Applied Math Advising Worksheet (2009 and Beyond)

Name: _____
 ASU ID#: _____

Date: _____ G.P.A. _____
 Catalog Year: _____

Totals	Total
Hours Taken:	
Hours in Progress:	
Hours Still Needed:	
Upper Division Still Needed:	

University General Studies Requirements			
Course Number and Title	Hrs	UD	Fulfilled
First-Year Composition (3-6 Credits)			
ENG 101 (107)	3		
ENG 102 (108)	3		
<i>or if eligible</i> ENG 105	3		
Literacy and Critical Inquiry (L) (6 Credits)			
L (Upper-division):		3	
L:	3		
Mathematical Studies (MA/CS) (6 Credits)			
MA (MAT 119 or higher): (MAT 270)	3		
CS: (CSE 100 or CSE 110)	3		
Humanities and Fine Arts (HU) and Social and Behavioral Sciences (SB) (15 Credits)			
HU or SB (Upper division):		3	
HU:	3		
HU:	3		
SB:	3		
SB:	3		
Natural Sciences (SQ/SG) (8 Credits)			
Lab Science (SQ): (BIO 187)	4		
Lab Science (SQ or SG): (BIO 188)	4		
Awareness Areas			
C:			
G:			
H:			
CLAS Science & Society and Math Requirements*			
SS:			
SS:			
MAT 119 or higher (Fulfills MA Requirement): (MAT 270)	3		
University and College Graduation Requirements			
* B.S. degree seekers must complete six semester hours of "Science and Society" courses. For more information, go to http://clas.asu.edu/students/degreerequirements/scienceandsociety.htm .			
Students must complete a minimum of 120 credit hours to graduate. Of those hours only 64 can be from a two-year institution (community college).			
UD = Upper Division (300 or 400 level). 45 credits must be upper division.			
Students must complete MAT 119 or higher in addition to ENG 101 & 102.			
For more information about university general studies (L, SB, HU, etc.), go to http://catalog.asu.edu/ug_gsr .			
N = Needs IP = In Progress X = Fulfilled			

Major Pre-requisites			
Course Number and Title	Hrs	UD	Fulfilled
CSE 100 Principles of Programming with C++ <i>CS</i> <i>or</i> CSE 110 Principles of Programming with Java <i>CS</i>	3		
BIO 187 General Biology I <i>SQ*</i>	4		
BIO 188 General Biology II <i>SQ</i>	4		
MAT 270 Calculus with Analytic Geometry I <i>MA</i>	3		
MAT 271 Calculus with Analytic Geometry II <i>MA</i>	3		
MAT 274 Elementary Differential Equations <i>MA</i> <i>or</i> MAT 275 Modern Differential Equations <i>MA</i>	3		
MAT 342 Linear Algebra <i>MA</i> <i>or</i> MAT 343 Applied Linear Algebra <i>MA</i>		3	
* BIO 187/188 needed to take upper-division Life Sciences Courses			
Major Requirements (39 Credits)			
Introductory Course (3 Credits)			
AML 100 Intro to Applied Math for LSS	3		
Modeling Course (3 Credits)			
AML 253 Modeling in the LSS	3		
Life Sciences (6 Credits)			
BIO 320 Fundamentals of Ecology <i>L</i>		3	
BIO 321 Introductory Ecology Laboratory		1	
BIO 406 Computer Applications in Biology <i>CS</i>		3	
BIO 410 Techniques in Wildlife Conservation Bio <i>L</i>		3	
BIO 411 Quantitative Conservation Biology		3	
BIO 415 Biometry <i>CS</i>		3	
BIO 417 Experimental Design		3	
BIO 424 Mathematical Models in Ecology		3	
BCH 361 Principles of Biochemistry		3	
BIO 423 Population and Community Ecology		3	
BIO 455 Introduction to Comparative Genomics		3	
BIO 456 Bioinformatics and Molecular Evolution		3	
BIO 469 Computational Neuroscience		3	
Other Equivalent Course (Check w/Advisor)			
Social Sciences (6 Credits)			
GCU 495 Quantitative Methods in Geography <i>CS</i>		3	
GCU 496 Geographic Research Methods <i>L</i>		3	
GPH 370 Geographic Information Technologies <i>CS</i>		3	
GPH 371 Intro to Cartography and Geoprep <i>CS</i>		3	
GPH 483 Geographic Information Analysis		3	
ASM 345 Disease and Human Evolution		3	
ASM 465 Quantification and Analysis for Anthropology		3	
JUS 301 Research in Justice Studies <i>SB</i>		3	
JUS 302 Basic Statistical Analysis in Justice Studies <i>CS</i>		3	
POS 301 Empirical Political Inquiry <i>SB</i>		3	
POS 401 Political Statistics <i>CS</i>		3	
POS 485 Political Economy <i>SB</i>		3	
SOC 331 Environmental Sociology <i>SB, G</i>		3	
SOC 390 Social Statistics <i>SB, G</i>		3	
SOC 391 Sociological Research <i>L or SB</i>		3	
SOC 433 Applied Demography <i>SB</i>		3	
SOC 448 Epidemics and Society <i>SB, G</i>		3	
ECN 384 Economics of Social Behavior <i>SB</i>		3	
Other Equivalent Course (Check w/Advisor)			

Major Requirements Continue			
Course Number and Title	Hrs	UD	Fulfilled
Applied Mathematics (6 Credits)			
MAT 300 Mathematical Structures <i>L</i>		3	
MAT 371 Advanced Calculus		3	
MAT 451 Mathematical Modeling		3	
MAT 343 Applied Linear Algebra		3	
MAT 351 Math Methods for Genetic Analysis		3	
MAT 355 Intro to Computational Molecular Bio		3	
MAT 362 Adv Math for Engineers and Scientists		3	
Other Equivalent Course (Check w/Advisor)			
Capstone Course (3 Credits)			
AML 406 Direct Reading & Rsrch in AM for LSS		3	
Choose any 12 credits from the following			
Life Sciences			
BIO 320 Fundamentals of Ecology <i>L</i>		3	
BIO 321 Introductory Ecology Laboratory		3	
BIO 406 Computer Applications in Biology <i>CS</i>		3	
BIO 410 Tech in Wildlife Conservation Bio <i>L</i>		3	
BIO 411 Quantitative Conservation Biology		3	
BIO 415 Biometry <i>CS</i>		3	
BIO 417 Experimental Design		3	
BIO 424 Mathematical Models in Ecology		3	
BCH 361 Principles of Biochemistry		3	
BIO 423 Population and Community Ecology		3	
BIO 455 Introduction to Comparative Genomics		3	
BIO 456 Bioinformatics and Molecular Evo		3	
BIO 469 Computational Neuroscience		3	
Other Equivalent Course (Check w/Advisor)			
Social Sciences			
GCU 495 Quantitative Methods in Geography <i>CS</i>		3	
GCU 496 Geographic Research Methods <i>L</i>		3	
GPH 370 Geographic Info Tech <i>CS</i>		3	
GPH 371 Intro to Cartography and Geoprep <i>CS</i>		3	
GPH 483 Geographic Info Anlysis		3	
ASM 345 Disease and Human Evolution		3	
ASM 465 Quantification and Analysis for Anth		3	
JUS 301 Research in Justice Studies <i>SB</i>		3	
JUS 302 Basic Stats Anlysis in Justice Studies <i>CS</i>		3	
POS 301 Empirical Political Inquiry <i>SB</i>		3	
POS 401 Political Statistics <i>CS</i>		3	
POS 485 Political Economy <i>SB</i>		3	
SOC 331 Environmental Sociology <i>SB, G</i>		3	
SOC 390 Social Statistics <i>SB, G</i>		3	
SOC 391 Sociological Research <i>L or SB</i>		3	
SOC 433 Applied Demography <i>SB</i>		3	
SOC 448 Epidemics and Society <i>SB, G</i>		3	
ECN 384 Economics of Social Behavior <i>SB</i>		3	
Other Equivalent Course (Check w/Advisor)			
STP Electives			
STP 226 Elements of Statistics			
STP 231 Statistics for Life Sciences <i>CS</i>			
STP 326 Intermediate Probability <i>CS</i>		3	
STP 420 Introductory Applied Statistics <i>CS</i>		3	
STP 421 Probability		3	

Applied Math			
Course Number and Title	Hrs	UD	Fulfilled
MAT 300 Mathematical Structures <i>L</i>		3	
MAT 371 Advanced Calculus		3	
MAT 451 Mathematical Modeling		3	
MAT 343 Applied Linear Algebra		3	
MAT 351 Mathematical Methods for Genetic Analysis		3	
MAT 355 Intro to Computational Molecular Bio		3	
MAT 362 Adv Math for Engineers and Scientists		3	
One Probability: (STP 421)			
One Statistics: (STP 421)			
Other Equivalent Course (Check w/Advisor)			
Mathematics Education Courses*			
MAT 371 Advanced Calculus		3	
MAT 451 Mathematical Modeling		3	
MAT 343 Applied Linear Algebra		3	
MAT 351 Mathematical Methods for Genetic Analysis		3	
MAT 355 Intro to Computation Molecular Bio		3	
MAT 362 Adv Math for Engineers and Scientists		3	
One Probability:			
One Statistics:			
Other Equivalent Course (Check w/Advisor)			
* The College of Teacher Education and Leadership offers concurrent degree programs in Secondary Education.			
Applied Math Graduation Requirements			
At least 18 of the semester hours must be in upper-division courses (300-400 level).			
12 hours must be from the Tempe Campus.			
Classes may not count for two areas within the major.			
A single course may only be used to satisfy one major requirement, one general studies requirement, and/or up to two awareness areas at the same time.			
Consult with a School of Human Evolution and Social Change undergraduate advisor for courses not listed that may fulfill requirements.			
In addition to a cumulative GPA of 2.00 or higher, all AML students must obtain a minimum grade of "C" in all upper- and lower-division AML courses and all courses in related fields.			
Recommended Courses			
Course Number and Title	Hrs	UD	
Notes			