Mathematics Requirements – Policy Benchmarking

I. Summary

A review of 17 ABOR and peer institutions reveals that all but two institutions have institution-wide mathematics requirements, though some institutions may have additional requirements for select programs. Ten institutions, like the University of Arizona, require a minimum of 3 units to meet the mathematics requirement, and no institutions require beyond 6 units.

Nine institutions list the required coursework in the policy. Seven institutions do not name coursework that meets the requirements, but their course catalog may be filtered to view courses that meet the mathematics requirement.

Only two institutions besides the University of Arizona specify in-policy that the requirement may be waived through credit by exam and/or placement test; most institutions refer only to meeting the requirement via course work.

Almost all institutions allow students to select 1-2 courses from a list of pre-approved coursework to meet the requirement (with some majors requiring specific courses). No other institutions have multiple set strands designated by major like the University of Arizona.

At seven institutions, the only departments that may offer courses to satisfy the requirement are Mathematics, Statistics, and/or Data Science. The remaining nine institutions allow coursework from a wide assortment of departments not traditionally related to math.

Other than four institutions requiring students to complete the requirement within their first 30-60 units, no institution specified when in a plan of study the mathematics requirement needed to be completed.

A. Minimum Credits to Fulfill Math Foundations Requirement

INSTITUTION	MINIMUM CREDITS
• **University of Arizona** • Arizona State University • Northern Arizona University • University of California-Davis • University of California – LA • University of Iowa* • University of Maryland • University of Minnesota • University of North Carolina • University of Texas – Austin • University of Washington – Seattle • University of Wisconsin- Madison	3
• Ohio State University*	3; *"Additional mathematics courses may be necessary to fulfill your major or pre-major requirements."*
• University of Florida • University of Illinois • Michigan State University • Pennsylvania State University • Texas A&M University	6

*No institutional requirement; the data listed reflect the institutions' College of Arts and Sciences policy.

B. Does the Policy Specify the Required Courses?

INSTITUTION	COURSES SPECIFIED
• **University of Arizona** • University of California- Davis • University of Florida • University of Iowa* • Michigan State University • University of North Carolina • Ohio State University* • Pennsylvania State University • Texas A&M University • University of Texas	Yes
• Northern Arizona University	"You may use any course with an MAT or STA prefix included in your chosen degree plan to fulfill the mathematics requirement, EXCEPT the following courses: • MAT 101X • MAT 102X • MAT 100 • MAT 108 • MAT 123 • MAT 150"
• Arizona State University • University of California – Davis • University of Illinois • University of Maryland • University of Minnesota • University of Washington -Seattle • University of Wisconsin – Madison	No; course catalog filters for courses that meet requirement

*No institutional requirement; the data listed reflect the institutions' College of Arts and Sciences policy.

C. Pathways Specified to Meet Requirement

PATHWAYS	INSTITUTION																
	UA	ASU	NAU	UCD	UCLA	UF	UI- Urb	UI -Iowa*	UM- Col	MSU	UM -Twi	OSU*	PSU	TAMU	UT- Aus	UW -Sea	UW- Mad
College Credit	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Credit by Exam	X								X							X	X
Placement Test	X								X								X
SAT / ACT					X												

*No institutional requirement; the data listed reflect the institutions' College of Arts and Sciences policy.

D. Strands / Course Options

INSTITUTION	STRANDS
• **University of Arizona**	3 strands (general, moderate, & substantial), determined by major
• Michigan State University	4 different options of course combinations (options determined by placement exam)
• Arizona State University • Northern Arizona University • University of California – Davis • University of California- LA • University of Illinois • University of Iowa* • University of Maryland • University of Minnesota • University of North Carolina • Pennsylvania State University • Texas A&M University • University of Texas – Austin • University of Washington – Seattle • University of Wisconsin - Madison	Select 1 or more courses from several options
• University of Florida	Select 1 or more courses from several options. Note in policy: "*Some majors require or recommend specific general education courses.*"
• Ohio State University*	Select 1 or more courses from several options. Note in policy: "*Additional mathematics courses may be necessary to fulfill your major or pre-major requirements.*"

*No institutional requirement; the data listed reflect the institutions' College of Arts and Sciences policy.

E. Departments Offering Courses that Satisfy Requirement

OFFERING DEPARTMENT	**INSTITUTION**																
	UA	ASU	NAU	UCD	UCLA	UF	UI- Urb	UI – Iow*	UM - Col	MSU	UM- Twi	UNC	OSU*	PSU	TAMU	UT - Aus	UW - Sea
Agriculture				X			X						X	X			
Anthropology				X								X					
Astronomy							X					X	X				X
Atmospheric Sciences				X			X										
Biology		X		X	X							X	X				X
Chemistry				X									X				X
Communication		X		X				X									
Computer Science		X		X	X		X	X				X	X	X			X
Data Science								X	X			X		X			
Earth Science							X					X		X			X
Economics		X		X			X					X	X				X
Education																	
Engineering		X		X			X							X			X
Environmental Science				X			X					X	X				X
Geography		X					X	X				X	X				X
Human Development				X			X							X			
Journalism							X					X					
Kinesiology							X							X			
Linguistics	X			X				X				X	X				X
Management				X													
Math	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Neuroscience		X		X								X					
Philosophy	X	X			X		X	X				X	X	X	X	X	X
Physics		X		X			X				X	X	X				X
Planning / Architecture		X					X					X					
Political Science		X		X	X			X			X	X	X				
Psychology	X			X			X	X			X	X		X		X	X
Sociology				X			X				X	X	X			X	X
Statistics			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

*No institutional requirement; the data listed reflect the institutions' College of Arts and Sciences policy.

Note: University of Wisconsin – Madison does not name its courses in policy nor allow non-students to view the schedule of classes, where courses meeting the requirement are designated.

F. Required Completion Timeline

INSTITUTION	DEADLINE
• **University of Arizona**	Graduation requirement with no other deadline specified, but entry to some programs will require completion of mathematics requirement.
• Arizona State University	"All undergraduate degree-seeking students are expected to fulfill the university's mathematics requirement by the time they have accumulated 30 credit hours in residence at ASU. Any student who has more than 30 credit hours and has not fulfilled the mathematics requirement must enroll in a mathematics course or an appropriate prerequisite course and continue to do so every semester until the mathematics requirement is met."
• Northern Arizona University	"Any student who has more than 60 hours of credit and has not fulfilled the mathematics foundation requirement must enroll in a course that fulfills the requirement or an appropriate prerequisite course and continue to do so every semester until the mathematics requirement is met." "The Mathematics Foundations course helps students during their first year to develop the skills necessary for future mathematical reasoning within their major and in their future personal and professional lives."
• University of Maryland	"[Fundamental mathematics] courses must be attempted by 30 credits and successfully completed by 60 credits."
• University of Wisconsin - Madison	"[Students] should complete Part A of the Quantitative Reasoning requirement by the end of their first year, and must complete Part A before they enroll in Part B."
• University of California – Davis • University of California – LA • University of Florida • University of Illinois • University of Iowa* • Michigan State University	Graduation requirement with no other deadline specified

• University of Minnesota • University of North Carolina • Ohio State University • Pennsylvania State University • Ohio State University* • Texas A&M University • University of Texas – Austin • University of Washington - Seattle	

*No institutional requirement; the data listed reflect the institutions' College of Arts and Sciences policy.

G. Name for Requirement

INSTITUTION	TERM USED
• **University of Arizona**	Foundation Mathematics
• University of Maryland	Fundamental Mathematics
• University of Minnesota	Mathematical Thinking
• Ohio State University*	Mathematical and Quantitative Reasoning or Data Analysis
• Arizona State University • Northern Arizona University • University of Florida • Michigan State University • Texas A&M University • University of Texas – Austin	Mathematics
• Pennsylvania State University	Quantification
• University of California – Davis	Quantitative Literacy
• University of California – LA • University of Illinois • University of Iowa • University of North Carolina • University of Wisconsin - Madison	Quantitative Reasoning
• University of Washington – Seattle	Reasoning

*No institutional requirement; the data listed reflect the institution's College of Arts and Sciences policy.

II. Full Policy Texts

H. University of Arizona

https://catalog.arizona.edu/policy/program-graduation/general-education/foundations#mathematics-requirements

Mathematics Requirements

Mathematics Placement Test:
Registration in all MATH courses below MATH 129, as well as MATH 163, MATH 263, and MATH 302A, may require students to take the UA Mathematics Placement Test. Test scores are valid for one year. This requirement includes transfer students with or without mathematics credit and students with credit by examination, such as Advanced Placement (AP), CLEP, or International Baccalaureate (IB).

Eligibility rules and testing information may be found on the **Math Placement Homepage**.

Foundations Mathematics Requirement:
All students, as part of their Foundations requirements, are expected to demonstrate mathematical knowledge and quantitative reasoning by completing one of the following 3-unit courses or by achieving a minimum math placement code as stated below:

1. earning credit for LING 123, (Introduction to Mathematical Approaches to Language), or MATH 105 (Mathematics in Modern Society), or PHIL 110 (Logic and Critical Thinking)-check prerequisites, such as a minimum math placement code (see the chart provided on the **Math Placement Homepage**); or
2. earning credit for any 3-unit (or more) mathematics course numbered above Math 105, provided that the student has placed at the level required for the course (see the chart provided on the **Math Placement Homepage**); or
3. achieving a math placement code equivalent to that of students who have completed University of Arizona College Algebra-by the end of the student's first semester at the University (see the chart provided on the **Math Placement Homepage**, as well as **Proficiency and Exemption Exam Procedures and General Regulations**). [Note: the placement code is determined by the catalog and math placement regulations in effect when an exam is taken.] If the Math Placement Test is used for this purpose, the test must be proctored per Math Department guidelines, which may be found on the **Math Placement Homepage**.

Beyond this general minimum, however, the appropriate course for an individual student will depend on the student's major and the corresponding math strand appropriate to that major.

Math Strands:
Entry-level mathematics students should choose one of three strands according to their interests, preparation, and intended major. All strands presume that students will have completed the high school math required for entry to the University.

- **G-Strand** (General Knowledge) -- This strand involves the general understanding and appreciation of how mathematics is used to solve problems in everyday life. The G-strand does not prepare a student for any further work grounded in mathematics and assumes the student will not proceed beyond the basic Foundations level noted above. Thus only those students whose major requires the most general knowledge of mathematics should take this strand. The options to satisfy this strand are:

    1. earning credit for LING 123 (Introduction to Mathematical Approaches to Language), or MATH 105 (Mathematics in Modern Society), or PHIL 110 (Logic and Critical Thinking), or PSY 230 (Psychological Measurement and Statistics)-check prerequisites, such as a minimum math placement code (see the chart provided on the **Math Placement Homepage**); or

    2. earning credit for any 3-unit (or more) mathematics course numbered above Math 105, provided that the student has placed at the level required for the course (see the chart provided on the **Math Placement Homepage**); or

    3. achieving a math placement code equivalent to that of students who have completed UA College Algebra-by the end of the student's first semester at the UA (see the chart provided on the **Math Placement Homepage**, as well as **Proficiency and Exemption Exam Procedures and General Regulations**). [Note: t*he placement code is determined by the catalog and math placement regulations in effect when an exam is taken*.] If the Math Placement Test is used for this purpose, the test must be proctored per Math Department guidelines, which may be found on the **Math Placement Homepage**.

- **M-Strand** (Moderate Knowledge) -- The M-strand is for students who require mathematical facility at the level of at least MATH 112 (College Algebra Concepts) or 108 (Modeling with Algebraic and Trigonometric Functions). This strand involves reasonable facility with algebra and algebraic functions, graphs, and simple modeling. Students who choose the M-strand are prepared for further mathematical work. This work may include MATH 107 (Exploring and Understanding Data), MATH 113 (Elements of Calculus), MATH 116 (Calculus Concepts for Business), MATH 119A (Mathematics of Biological Systems: A Calculus Based Approach), or a statistics class from outside the Mathematics Department, such as ISTA 116 (Statistical Foundations for the Information Age) or SBS 200 (Statistics for the Social Sciences).

- **S-Strand** (Substantial Knowledge) -- This strand involves skill and facility with calculus. The S-strand begins at one of two calculus options - MATH 122A/B (Functions for Calculus and First-Semester Calculus) or MATH 125 (Calculus I). Students who successfully complete the S-strand may continue on to MATH 129 (Calculus II), MATH 223 (Vector Calculus), or beyond. Those who choose but are not ready to begin the S-strand will be required to take preparatory work.

Each major indicates the mathematics strand, or specific course from a strand, that is most appropriate for its students. It is important to note that each strand provides a different level of mathematical training, but students can satisfy the mathematics requirement in their

major by completing a more advanced mathematics course. Because the S-strand presumes the M-strand and the M-strand presumes the G-strand, students will have the most flexibility in their major choice by aiming for the S-strand. A student who chooses to meet the general education mathematics requirement with the G-strand will have the most restricted set of major choices.

Please direct all Math Placement questions to the Department of Mathematics:

Department of Mathematics
Math Placement Coordinator
Mathematics Building, 108
617 North Santa Rita

Phone: (520) 621-6892
Fax: (520) 621-8322
Email: **placement@math.arizona.edu**
Web: **Math Placement Homepage**
Web: **Department Homepage**

I. Arizona State University

https://catalog.asu.edu/ug_gsr
University undergraduate General Studies requirement

Mathematics (three credit hours)
The Mathematics studies requirement is intended to ensure that students have skill in basic mathematics and can use mathematical analysis in their chosen field of study. The mathematics requirement requires the student to complete a course in college mathematics, college algebra, or precalculus, or demonstrate a higher level of skill by completing a mathematics course for which a course in the above three categories is a prerequisite. A course in mathematics will include the application of mathematical skills in the solution of real-life problems and introduces or makes significant use of fundamental mathematical skills and concepts.

Learning outcomes
Upon completion of a course in Mathematics, students will be able to do the following:

1. demonstrate an understanding of mathematical relationships from multiple perspectives, such as functions from graphical, numerical and analytic points of view
2. apply mathematical skills in the solution of real-life problems

Arizona State University
https://catalog.asu.edu/undergraduatereq
Mathematics requirement

All undergraduate degree-seeking students are expected to fulfill the university's mathematics requirement by the time they have accumulated 30 credit hours in residence at ASU. Any student who has more than 30 credit hours and has not fulfilled the mathematics requirement must enroll in a mathematics course or an appropriate prerequisite course and continue to do so every semester until the mathematics requirement is met. A waiver may be granted for continuous enrollment if there are scheduling conflicts detrimental to the student's academic progress. Students should also see the Math Intensive Programs: Required Course Policy.

Arizona State University

https://catalog.apps.asu.edu/catalog/courses/courselist?advanced=true&gen_studies=GS-MATH&term=2257
Course Catalog Search – General Studies Mathematics

COURSE	TITLE	UNITS	GENERAL STUDIES
AML 100	Introduction to Applied Mathematics for the Life and Social Sciences	3	MATH
AML 253	Introduction to Mathematical Tools and Modeling for the Life and Social Sciences	3	MATH
AML 254	Introduction to Dynamics and Control in the Biological and Social Sciences	3	MATH
CAS 253	Introduction to Mathematical Tools and Modeling for the Life and Social Sciences	3	MATH
CAS 254	Introduction to Dynamics and Control in the Biological and Social Sciences	3	MATH
CPI 200	Mathematical Foundations of Informatics	3	MATH
MAT 114	College Mathematics	3	MATH
MAT 117	College Algebra	3	MATH
MAT 119	Finite Mathematics	3	MATH
MAT 170	Precalculus	3	MATH
MAT 171	Precalculus: Science, Technology, Engineering and Mathematics (STEM)	4	MATH
MAT 210	Brief Calculus	3	MATH
MAT 251	Calculus for Life Sciences	3	MATH
MAT 265	Calculus for Engineers I	3	MATH
MAT 266	Calculus for Engineers II	3	MATH
MAT 267	Calculus for Engineers III	3	MATH
MAT 270	Calculus with Analytic Geometry I	4	MATH

MAT 271	Calculus with Analytic Geometry II	4	MATH
MAT 272	Calculus with Analytic Geometry III	4	MATH
MAT 274	Elementary Differential Equations	3	MATH
MAT 275	Modern Differential Equations	3	MATH
MAT 421	Applied Computational Methods	3	MATH
MAT 423	Numerical Analysis I	3	MATH
PHY 201	Mathematical Methods in Physics I	3	MATH
SOS 101	Mathematics for Sustainability	3	MATH
SOS 211	Calculus and Probability for the Life and Social Sciences	3	MATH

J. Northern Arizona University

https://www9.nau.edu/policies/Client/Details/1470?whoIsLooking=Students&pertainsTo=All&sortDirection=Ascending&page=3

Liberal Studies Requirements

All students seeking their first baccalaureate degree from Northern Arizona University must take thirty-five (35) units of Liberal Studies. You will take courses to satisfy both the Foundation and Distribution requirements.

Foundation Requirements

- English Composition (minimum of 4 units)
- Mathematics (minimum of 3 units)

Distribution Block Requirements

- Aesthetic and Humanistic Inquiry - AHI (minimum of 6 units)
- Cultural Understanding - CU (minimum of 6 units)
- Science (minimum of 7 units)
    - 3-4 units of Science and Applied Science - SAS course(s) AND
    - 3-4 units of Science and Applied Science with embedded Lab Science course - LAB
- Social and Political Worlds - SPW (minimum of 6 units)
- 3 additional units from any distribution block or foundation category to meet the 35 unit Liberal Studies requirement

Make sure to choose classes from the approved list of Liberal Studies Courses with the help of an academic adviser. A *cross-listed* course may only be counted in one block. Some Liberal Studies courses may also fulfill NAU's Global or U.S. Ethnic Diversity requirements.

If your academic catalog is prior to 2014-2015, courses used for Liberal Studies may share the same prefix as your minor discipline but not your major discipline.

If your academic catalog is 2014-2015 (or a subsequent catalog), up to 9 units of major prefix courses may be used to satisfy Liberal Studies requirements; these same courses may also be used to satisfy major requirements. Courses used for the Liberal Studies distribution requirements can have the same prefix as your minor.

Completion of Liberal Studies Foundation Requirements

All undergraduate degree-seeking students are expected to fulfill the university's Liberal Studies foundation requirements in English and Mathematics by the time they have accumulated 60 hours of credit, including coursework completed at NAU and coursework accepted for transfer to NAU.

English

Any student who has more than 60 hours of credit and has not fulfilled the English foundation requirement must enroll in an English course that fulfills the requirement or an appropriate prerequisite course and continue to do so every semester until the requirement is met. If there are scheduling conflicts detrimental to the student's academic progress, enrollment in the appropriate English course may be deferred to the subsequent semester.

Mathematics

Any student who has more than 60 hours of credit and has not fulfilled the mathematics foundation requirement must enroll in a course that fulfills the requirement or an appropriate prerequisite course and continue to do so every semester until the mathematics requirement is met. If there are scheduling conflicts detrimental to the student's academic progress, enrollment in the appropriate mathematics course may be deferred to the subsequent semester.

New First-Year Students

Before new first-year students can register for the first time at NAU, they must determine what courses to take to complete the university mathematics and English foundation requirements. Students are then expected to enroll immediately in these courses and continue to do so until the requirements are met.

Transfer Students

Transfer students from public Arizona community colleges, tribal colleges or universities can determine the acceptability of their composition and mathematics courses by referring to the Course Applicability System in consultation with an academic advisor. Composition and mathematics courses transferred from out-of-state institutions must be evaluated according to university policies for its acceptability for meeting these requirements. Transfer students who have not completed the Liberal Studies foundation courses are expected to enroll promptly in these courses and continue to do so until the requirements are met. If there are scheduling conflicts detrimental to the student's academic progress, enrollment in the appropriate English and/or Mathematics course may be deferred to the subsequent semester.

Northern Arizona University
https://nau.edu/liberal-studies/
Liberal Studies Course Requirements

Mathematics

The Mathematics Foundations course helps students during their first year to develop the skills necessary for future mathematical reasoning within their major and in their future personal and professional lives. **(3 Credits)**

You may use any course with an MAT or STA prefix included in your chosen degree plan to fulfill the mathematics foundations requirement, EXCEPT the following courses:

- MAT 101X
- MAT 102X
- MAT 100
- MAT 108
- MAT 123
- MAT 150

If your major doesn't require a specific mathematics course, we suggest you take MAT 114 to satisfy the mathematics foundation requirement. Consult with your adviser to determine the most appropriate mathematics course for your major.

K. University of California – Davis

https://catalog.ucdavis.edu/undergraduate-education/university-degree-requirements/general-education-ge-requirements/
General Education (GE) Requirements

The General Education (GE) requirement promotes the intellectual growth of all undergraduates by ensuring that they acquire a breadth of knowledge that will enlarge their perspectives beyond the focus of a major and serve them well as participants in a knowledge-based society. It seeks to stimulate continued growth by providing knowledge of both the content and the methodologies of different academic disciplines. It involves students in the learning process by its expectation of considerable writing and class participation, and encourages students to consider the relationships between disciplines.

The GE requirement has two components, Topical Breadth and Core Literacies, and is defined in terms of units, not courses.

Topical Breadth Component—52 units

A GE course in topical breadth addresses broad subject areas that are important to the student's general knowledge. The units of most undergraduate courses at UC Davis are assigned to one of the three Topical Breadth Areas.

Note: In the case of a course that has been certified in more than one Topical Breadth Area, a student may count the units of the course in only one of the areas in which it has been certified.

- **Arts & Humanities—12-20 units**. Courses in this area provide students with knowledge of significant intellectual traditions, cultural achievements and historical processes.
- **Science & Engineering—12-20 units**. Courses in this area provide students with knowledge of major ideas and concepts of science and engineering and their applications.
- **Social Sciences—12-20 units**. Courses in this area provide students with knowledge of the individual, social, political and economic activities of people.

Core Literacies Component—35 units

The literacies are crucial both for success in one's profession and for a thoughtful, engaged citizenship in the community, nation and world.

Note: In the case of a course that has been certified in more than one Core Literacy Area, a student may count the units of the course in only one of the core literacy areas in which it has been certified.

1. **Literacy with Words & Images—20 units.** The objective of this core literacy is to help students communicate their ideas effectively in written, oral and visual forms. The requirement also seeks to enhance students' critical judgment of oral, written, and visual messages created by others.

   Note: No course passed prior to satisfaction of the Entry Level Writing Requirement may be used to satisfy the General Education requirements for Writing Experience coursework described in b and c, below. Students should contact their college before taking courses for requirement a, as there may be limitations on credit for students who have not completed the Entry Level Writing Requirement.
   a. **English Composition—8 units.** As described by College of Agricultural & Environmental Sciences, College of Biological Sciences, College of Engineering, or College of Letters & Science.
   b. **Writing Experience coursework in the student's major or in other departments—6 units.** Courses in writing experience provide students instruction on how to communicate ideas in the subject matter of the course. The opportunity to improve writing after having received careful commentary is crucial to this requirement.
   c. **Oral Skills coursework or additional Writing Experience coursework—3 units.** Courses in oral literacy involve effective communication of ideas through oral presentation and build on and strengthen the critical thinking skills exercised through writing. As an alternative to developing oral communication skills, students may take additional coursework certified as writing experience (see requirement b, above).

    d. **Visual Literacy coursework—3 units.** Courses in visual literacy provide students with the analytical skills they need to understand how still and moving images, art and architecture, illustrations accompanying written text, graphs and charts, and other visual embodiments of ideas inform and persuade people. Coursework may stress the skills needed to communicate through visual means as well as the analytical skills needed to be a thoughtful consumer of visual messages.

2. **Civic & Cultural Literacy—9 units.** The objective of this core literacy is to prepare students for thoughtful, active participation in civic society. Students will learn to think analytically about American institutions and social relations, understand the diversity of American cultures, and see the relationships between national and local cultures and the world.
    a. **American Cultures, Governance, & History—3 units.** Courses in American Cultures, Governance, & History provide students with an understanding and appreciation of the social and cultural diversity of the United States and of the relationships between these diverse cultures and larger patterns of national history and institutions.
    b. **Domestic Diversity—3 units.** Courses in Domestic Diversity provide students with an understanding of issues such as race, ethnicity, social class, gender, sexuality, and religion within the United States, and develop the student's ability to think critically about diverse socio-cultural perspectives.
    c. **World Cultures—3 units.** Courses in World Cultures provide students with a global perspective in a world where communication technologies, economic relationships, and the flow of people across national borders increasingly challenge national identities and create transnational cultures. Students can satisfy this requirement through coursework or through certified study abroad.
3. **Quantitative Literacy—at least 3 units.** The objective of this core literacy is to provide students with an understanding of quantitative reasoning and skills for evaluating claims and knowledge generated through quantitative methods.
4. **Scientific Literacy—at least 3 units.** The objective of this core literacy is to provide students with an understanding of the fundamental ways scientists approach problems and generate new knowledge, and an understanding of how scientific findings relate to other disciplines and to public policy.

Approved General Education Courses

Please note that you cannot claim GE credit for a course you completed *before* it was an approved GE course.

University of California – Davis
https://registrar-apps.ucdavis.edu/courses/search/index.cfm
General Education Search Tool

You can use this tool to search all current and former UC Davis General Education courses by selecting one or more of the GE attributes. If you need GE search results for courses in a specific term or quarter, see the General Education Search Tool – By Term.

Your search can be filtered by college and level. If no filters are chosen, the search may take several minutes to finish. Search results include the course code, title, units, GE details and attributes, and any course prerequisites. To see if the GE attributes have changed, or will change in the future, select **view** in the GE Details column. Your search results can be saved as Adobe PDF or Microsoft Excel formats.

Future term course information is available the week before Pass 1 registration begins for that term. For registration dates, see the Academic Calendar.

> For information about former GE course applicability, see the appropriate catalog version. For information about new or revised GE course applicability, see the General Catalog.

Be sure to review with your advisor all GE requirements, Notes and Additional Conditions before choosing courses to fulfill your General Education unit requirements, especially those related to Entry Level Writing and English Composition requirements.

Abbreviation Key

				New GE Attributes										
				Topical Breadth			Core Literacies							
Course	Title	Units	GE Details	AH	SE	SS	ACGH	DD	OL	QL	SL	VL	WC	WE
ABT 015	Wood Prop & Fabrication	2.0	view		SE				OL	QL		VL		
ABT 016	Metal Prop & Fabrication	2.0	view		SE					QL		VL		
ABT 017	Plastic Prop & Fabicatn	2.0	view		SE					QL		VL		
ABT 049	Field Eqpt Operation	2.0	view		SE					QL		VL		

ABT 052	Field Equipment Welding	2.0	view	SE					QL		VL				
Prereq:															
ABT 060	Unmanned Aerial Systems	4.0		SE					QL		VL				
ABT 101	Engine Technology	3.0	view	SE					QL		VL				
Prereq:															
ABT 110L	Food Engr Lab	2.0	view	SE					QL		VL			WE	
Prereq:															
ABT 142	Eqpt/Tech for Small Farm	2.0	view	SE					QL		VL				
ABT 161	Water Qual Aquaculture	3.0	view	SE					QL	SL	VL				
Prereq:															
ABT 163	Aquaculture Sys Engr	3.0	view	SE				OL	QL	SL	VL			WE	
Prereq:															
ABT 165	Irrig for Urban Envir	3.0	view	SE					QL		VL				
Prereq:															
ABT 182	Environ GIS Application	4.0	view	SE					QL	SL	VL				
Prereq:															

ANS 015	Intro Horse Husbandry	3.0	view	SE					QL		VL			
ANS 018	Introductory Aquaculture	4.0	view	SE				OL	QL	SL	VL			WE
ANS 042	Companion Animals	4.0	view	SE					QL	SL				WE
ANS 106	Animal Behavior Lab	3.0	view	SE					QL	SL				WE
Prereq:														
ANS 112	Sustainable Animal Agric	3.0	view	SE	SS			OL	QL					
Prereq:														
ANS 115	Horse Production	4.0	view	SE					QL	SL				WE
Prereq:														
ANS 128	Agr Applications of LP	4.0	view	SE					QL	SL				
Prereq:														
ANS 136	Tech of Fish Culture	3.0	view	SE					QL	SL	VL			WE
Prereq:														
ANS 136A	Fish Culture Techniques	2.0	view	SE					QL	SL	VL			WE
ANS 136B	Avian Growth Laboratory	2.0	view	SE					QL	SL	VL			WE

ANS 137	Avian Growth Laboratory	3.0	view	SE					QL	SL	VL		WE
Prereq:														
ANS 142	Companion Animal Care	4.0	view	SE				OL	QL	SL	VL		WE
Prereq:														
ANS 144	Beef Catl & Sheep Prod	4.0	view	SE				OL	QL	SL	VL		WE
Prereq:														
ANS 146	Dairy Cattle Production	5.0	view	SE				OL	QL	SL	VL		WE
Prereq:														
ANS 148	Enterprise Analy An Indu	4.0	view		SS			OL	QL				WE
Prereq:														
ANT 105	Evol Societies Cultures	4.0	view		SS				QL			WC	WE
Prereq:														
ANT 154B	Primate Evol Ecology	5.0	view	SE					QL				WE
Prereq:														
ANT 154BN	Primate Evol Ecology	5.0	view	SE					QL		VL		WE
Prereq:														

ANT 154C	Primate Behavior/Methods	2.0	view	SE					QL	SL				
Prereq:														
ANT 155	Primate Conservation Bio	4.0	view						QL	SL				
Prereq:														
ANT 157L	Adv Human Genetics Lab	4.0	view	SE					QL					
Prereq:														
ANT 159	Primate Epidemiology	4.0	view	SE	SS				QL	SL	VL			
Prereq:														
ANT 182	Archaeometry	4.0	view	SE					QL		VL		WE	
Prereq:														
ANT 183	Archeological Analysis	4.0	view	SE					QL				WE	
Prereq:														
ARE 100A	Intermed Microeconomics	4.0	view		SS				QL					
Prereq:														
ARE 100B	Intermed Microeconomics	4.0	view		SS				QL					
Prereq:														

ARE 106	Econometrics	4.0	view		SS				QL				
Prereq:													
ARE 155	Oper Res & Mgmt Sci	4.0	view		SS				QL				
Prereq:													
ARE 156	Intro Math Econ	4.0	view		SS				QL				
Prereq:													
ARE 171A	Financial Management	4.0	view		SS				QL				
Prereq:													
ARE 171B	Financial Management	4.0	view		SS				QL				
Prereq:													
ARE 194HA	Special Study/Honors Stu	4.0	view		SS				QL				WE
Prereq:													
ARE 194HB	Special Study/Honors Stu	4.0	view		SS				QL				WE
Prereq:													
ATM 005	Global Climate Change	3.0	view	SE					QL	SL	VL		
ATM 010	Severe & Unusual Weather	3.0	view	SE					QL	SL	VL		

Prereq:														
ATM 060	Intr Atmospheric Science	4.0	view	S E					Q L		V L			
Prereq:														
ATM 110	Weather Observ & Analy	4.0	view	S E				O L	Q L		V L			
Prereq:														
ATM 111	Weather Analysis Predict	3.0	view	S E					Q L		V L			
Prereq:														
ATM 111L	Weathr Analysis Pred Lab	2.0	view	S E				O L	Q L		V L			
ATM 111LY	Weather Anlys & Pred Lab	2.0	view	S E				O L	Q L		V L			
Prereq:														
ATM 116	Modern Climate Change	3.0	view	S E					Q L	S L	V L			
Prereq:														
ATM 120	Thermodyn & Cloud Physic	4.0	view	S E					Q L		V L			
Prereq:														
ATM 121A	Atmos Dynamics	4.0	view	S E					Q L					
Prereq:														

ATM 121B	Atmospheric Dynamic	4.0	view	SE					QL				
Prereq:													
ATM 124	Meteor Instr & Observ	3.0	view	SE					QL	SL	VL		
Prereq:													
ATM 128	Rad & Sat Meteorology	4.0	view	SE					QL		VL		
Prereq:													
ATM 133	Biometeorology	4.0	view	SE					QL	SL	VL		
Prereq:													
ATM 149	Air Pollution	4.0	view	SE					QL	SL			
Prereq:													
ATM 149N	Air Pollution	4.0		SE					QL	SL			
Prereq:													
ATM 158	Boundary-Layer Met	4.0	view	SE					QL		VL		
Prereq:													
ATM 160	Intro Atmospheric Chem	4.0	view	SE					QL	SL	VL		
Prereq:													

AVS 150	Nutrition of Birds	1.0	view	SE				QL				
Prereq:												
BIM 020	Fund of Bioengineering	4.0	view	SE				QL		VL		
Prereq:												
BIM 106	Biotransport Phenomena	4.0	view	SE				QL	SL	VL		
Prereq:												
BIM 140	Protein Engineering	4.0	view	SE				QL	SL	VL		
Prereq:												
BIM 141	Cell & Tissue Mechanics	4.0	view	SE				QL		VL		
Prereq:												
BIM 161A	Biomolecular Engineering	4.0	view	SE				QL				
Prereq:												
BIM 161L	Biomolecular Eng Lab	3.0	view	SE				QL	SL			
Prereq:												
BIM 161S	Biomol Eng Brief	1.0	view	SE				QL				
Prereq:												

BIM 162	Biophysics Molecule,Cell	4.0	view	SE					QL	SL			
Prereq:													
BIM 163	Bioelec & Mech	4.0	view	SE					QL				
Prereq:													
BIS 002B	Introduction to Biology	5.0	view	SE					QL	SL	VL		
BIS 002C	Introduction to Biology	5.0	view	SE				OL	QL	SL	VL		
Prereq:													
BIS 023A	Genome Hunters	3.0	view	SE					QL				
Prereq:													
BIS 023B	Genome Hunters	3.0	view	SE					QL		VL		
Prereq:													
BIS 101	Genes & Gene Expression	4.0	view	SE					QL	SL			
Prereq:													
BIS 102	Struc & Func Biomolecule	3.0	view	SE					QL				
Prereq:													
BIS 102Q	Quant Biomolec Concepts	1.0	view	SE					QL				

Prereq:													
BIS 105	Biomolecule & Metabolism	3.0	view	SE					QL				
Prereq:													
BIS 122	Pop Biology & Ecology	3.0	view	SE				OL	QL	SL	VL		WE
Prereq:													
BIS 124	Coastal Marine Research	6.0	view	SE				OL	QL		VL		WE
Prereq:													
BIS 132	Intro Dyn Models Biology	4.0	view	SE					QL	SL	VL		WE
Prereq:													
BIS 133	Collab Studies Math Bio	3.0	view	SE					QL	SL	VL		WE
Prereq:													
BIS 134	Systems Biology	2.0	view	SE				OL	QL		VL		
Prereq:													
BIS 181	Comparative Genomics	3.0	view	SE					QL	SL			
Prereq:													
BIS 183	Functional Genomics	3.0	view	SE					QL		VL		
Prereq:													

CDM 012	Media Computation	4.0		AH	SE					QL		VL		
CDM 177	Intro Game Programming	4.0	view	AH	SE					QL		VL		
Prereq:														
CDM 178	Spec Tpcs Game Program	4.0	view	AH	SE					QL		VL		
Prereq:														
CHE 002A	General Chemistry	5.0	view		SE					QL	SL			
Prereq:														
CHE 002AH	Honors General Chem	5.0	view		SE					QL	SL			
Prereq:														
CHE 002B	General Chemistry	5.0	view		SE					QL	SL			
Prereq:														
CHE 002BH	Honors General Chem	5.0	view		SE					QL	SL			
Prereq:														
CHE 002C	General Chemistry	5.0	view		SE					QL	SL			
Prereq:														
CHE 002CH	Honors General Chem	5.0	view		SE					QL	SL			

Prereq:												
CHE 003A	Gen Chem for Life Sci	5.0	view	S E				Q L	S L			
Prereq:												
CHE 003B	Gen Chem for Life Sci	5.0	view	S E				Q L	S L			
Prereq:												
CHE 003C	Gen Chem for Life Sci	5.0	view	S E				Q L	S L			
Prereq:												
CHE 004A	Chem for Phy Sci & Eng	5.0	view	S E				Q L	S L			
Prereq:												
CHE 004B	Chem for Phy Sci & Eng	5.0		S E				Q L	S L			
Prereq:												
CHE 004C	Chem for Phy Sci & Eng	5.0		S E				Q L	S L			
Prereq:												
CHE 105	Anly & Phys Chem Methods	4.0	view	S E				Q L	S L			
Prereq:												
CHE 110A	Phys Chem: Quantum Mech	4.0	view	S E				Q L				
Prereq:												

CHE 115	Instrumental Analysis	4.0	view	SE					QL					WE
Prereq:														
CHE 125	Adv Methods Phys Chem	4.0	view	SE					QL					WE
Prereq:														
CHI 040	Comparative Health	4.0	view	SE					QL					WE
Prereq:														
CHI 040S	Comparative Health	4.0	view	SE					QL				WC	WE
Prereq:														
CHI 140A	Quantitative Methods I	4.0	view	SE		ACGH	DD		QL					
Prereq:														
CMN 012Y	Data Visualization	4.0	view						QL		VL			
CMN 150V	Computational Soc Sci	4.0	view		SS				QL					
CMN 151	Simulating Comm Process	4.0	view		SS				QL					WE
CMN 152V	Soc Sci with Online Data	4.0	view		SS				QL	SL				
Prereq:														
CRD 150	Methods Community Res	5.0	view		SS				QL	SL				

Prereq:													
CRD 151	Community Field Research	5.0	view		SS	ACGH			QL				WE
Prereq:													
CRD 156	Community Econ Develop	5.0	view		SS				QL				WE
Prereq:													
EAD 108A	Optics I	4.0	view	SE					QL				
EAD 108B	Optics II	4.0	view	SE					QL				
EAD 115	Num Solutions Tech Prob	4.0	view	SE					QL				
EAD 165	Stat and Quantum Optics	4.0	view	SE					QL				
EAD 166	Lasers & Nonlin Opt	4.0	view	SE					QL				
EAD 167	Fourier Optics	4.0	view	SE					QL				
EAD 169	Opt Prop of Materials	4.0	view	SE					QL				
EAD 170	Optical Spectroscopy	4.0	view	SE					QL				
EAD 172	Opt Meth Bio Res	4.0	view	SE					QL				
EBS 001	Foundations Bio Sys Eng	4.0	view	SE				OL	QL	SL	VL		

EBS 075	Prop Mat Biol Sys	4.0	view	SE					QL	SL	VL		WE
Prereq:													
EBS 103	Fluid Mech Fundamentals	4.0	view	SE					QL		VL		
Prereq:													
EBS 114	Prin Field Machinery Des	3.0	view	SE					QL		VL		WE
Prereq:													
EBS 115	Forest Engineering	3.0	view	SE					QL	SL	VL		
Prereq:													
EBS 120	Power System Design	4.0	view	SE					QL	SL	VL		WE
Prereq:													
EBS 125	Heat Transfer in Bio Sys	4.0	view	SE				OL	QL		VL		WE
Prereq:													
EBS 127	Mass Transfer & Kinetics	4.0	view	SE					QL		VL		WE
Prereq:													
EBS 128	Biomchanics & Ergonomics	4.0	view	SE					QL	SL	VL		WE
Prereq:													

EBS 130	Modeling of Dynamic Proc	4.0	view	SE					QL	SL	VL		
Prereq:													
EBS 135	Bioenvironmental Engr	4.0	view	SE					QL	SL	VL		WE
Prereq:													
EBS 144	Groundwater Hydrology	4.0	view	SE					QL	SL	VL		WE
Prereq:													
EBS 145	Irrig & Drain Sys	4.0	view	SE					QL	SL	VL		
Prereq:													
EBS 161	Kin & Bioreactor Des	4.0	view	SE					QL		VL		
Prereq:													
EBS 162	Industrial Bioprocessing	4.0	view	SE					QL	SL	VL		WE
EBS 165	Bioinstrument & Control	4.0	view	SE					QL	SL	VL		WE
Prereq:													
EBS 170A	Engr Design & Prof Resp	3.0	view	SE				OL	QL	SL	VL		WE
Prereq:													
EBS 170B	Engr Projects: Design	2.0	view	SE				OL	QL	SL	VL		WE

Prereq:												
EBS 170BL	Engr Projects Design Lab	1.0	view	SE				OL	QL	SL	VL		WE
Prereq:												
EBS 170C	Eng Projects Des Eval	1.0	view	SE				OL	QL	SL	VL		WE
Prereq:												
EBS 170CL	Engr Proj Des Eval Lab	2.0	view	SE				OL	QL	SL	VL		WE
Prereq:												
EBS 175	Rheology	3.0	view	SE					QL		VL		
Prereq:												
ECH 005	Intro to Chem Eng	3.0	view	SE					QL				
ECH 060	CHE Eng Prob Solving	4.0	view	SE					QL				
Prereq:												
ECH 141	CHMS Fluid Mechanics	4.0	view	SE					QL				
Prereq:												
ECH 142	Heat Transfer	4.0	view	SE					QL				
Prereq:												

ECH 155A	Chem Eng Lab	4.0	view	SE				OL	QL		VL		WE
Prereq:														
ECH 155B	Chem Eng Lab	4.0	view	SE					QL		VL		WE
Prereq:														
ECH 157	Process Dynamics	4.0	view	SE					QL				
Prereq:														
ECH 158B	Separations & Unit Ops	4.0	view	SE					QL				
Prereq:														
ECH 160	Biomanufacturing	3.0	view	SE					QL		VL		
Prereq:														
ECH 161A	Biochem Engr Fund	4.0	view	SE					QL		VL		
Prereq:														
ECH 161B	Bioseparations	4.0	view	SE					QL				
Prereq:														
ECH 161C	Biotech Facility Design	4.0	view	SE	SS				QL	SL	VL		
Prereq:														

ECH 161L	Bioprocess Engr Lab	4.0	view	SE					QL		VL		WE
Prereq:													
ECI 016	Spatial Data Analysis	2.0	view	SE					QL				
ECI 114	Probabilistic Sys Anlys	4.0	view *	SE					QL				
Prereq:													
ECI 130	Structural Analysis	4.0	view	SE					QL				
Prereq:													
ECI 135	Struc Design: Concrete	4.0	view	SE					QL				
Prereq:													
ECI 137	Constr Prin & Proj Mgmt	4.0	view	SE	SS				QL				
ECI 139	Adv Structural Mechanics	4.0	view	SE					QL				
Prereq:													
ECI 142	Engineering Hydrology	4.0	view	SE					QL				
Prereq:													
ECI 143	Green Engineering Design	4.0	view	SE	SS				QL	SL			
Prereq:													

ECI 148B	Water Treatment	4.0	view	SE					QL		VL		WE	
Prereq:														
ECI 149	Air Pollution	4.0	view	SE					QL	SL				
Prereq:														
ECI 149N	Air Pollution	4.0		SE					QL	SL				
Prereq:														
ECI 153	Deterministic Opt & Desg	4.0	view	SE					QL	SL				
Prereq:														
ECI 155	Water Res Engr Planning	4.0	view	SE	SS				QL	SL			WE	
Prereq:														
ECI 161	Trans Sys Operations	4.0	view	SE					QL					
Prereq:														
ECI 178	Pavement Eng & Design	4.0		SE					QL	SL	VL			
Prereq:														
ECM 005	Chem/Materials Analysis	3.0	view	SE					QL					
ECM 006	Computational Methods	4.0	view	SE					QL					

ECM 194HC	Honors Project Thesis	Var	view		SE					QL				
ECN 001A	Princ Of Microecon	4.0	view			SS	ACGH			QL				
ECN 001AV	Princ of Microeconomics	4.0	view			SS	ACGH			QL				
ECN 001AY	Princ of Microeconomics	4.0				SS	ACGH			QL				
ECN 001B	Princ Of Macroecon	4.0	view			SS	ACGH			QL				
ECN 001BV	Princ of Macroeconomics	4.0				SS	ACGH			QL				
ECN 138	Intl Public Econ	4.0				SS				QL				
Prereq:														
ECS 010	Intro to Programming	4.0	view		SE					QL	SL			
Prereq:														
ECS 012	Media Computation	4.0	view	AH	SE					QL		VL		
ECS 015	Intro to Computers	4.0	view		SE					QL				WE
ECS 017	Data, Logic, & Computing	4.0	view		SE					QL				
Prereq:														
ECS 020	Discrete Math for CS	4.0	view		SE					QL				

Prereq:														
ECS 030	Programming&Prob Solving	4.0	view	SE					QL					
Prereq:														
ECS 060	Data Structures and Prog	4.0	view	SE					QL					
Prereq:														
ECS 120	Theory Computation	4.0	view	SE					QL					
Prereq:														
ECS 122B	Algorithm Design & Anlys	4.0	view	SE					QL					
Prereq:														
ECS 127	Cryptography	4.0	view	SE					QL	SL				
Prereq:														
ECS 132	Prob & Sta Model for CS	4.0	view	SE					QL					
Prereq:														
EDU 114	Quan Meth In Ed Res	4.0	view						QL					
EDU 119	Use/Misuse Standard Test	4.0	view		SS				QL					
EDU 121	Intro Ed Policy Analysis	4.0	view		SS				QL					

EEC 100	Circuits II	5.0	view	SE					QL		VL		
Prereq:													
EEC 147	MEMS	4.0	view	SE					QL				
EEC 150A	Intr Signals & Systems I	4.0	view	SE					QL				
Prereq:													
EEC 150B	Signals & Systems II	4.0	view	SE					QL				
Prereq:													
EME 107A	Experimental Methods	3.0	view	SE					QL		VL		
EME 107B	Experimental Methods	3.0	view	SE					QL		VL		WE
Prereq:													
EMS 147	Prin Polymer Mat	3.0	view	SE					QL				
Prereq:													
EMS 162	Struct Char Engr Matls	4.0	view	SE					QL				
Prereq:													
EMS 164	Kinetics of Materials	4.0	view	SE					QL	SL	VL		
Prereq:													

EMS 174	Mech Behavior of Matls	4.0	view	SE					QL	SL	VL		
Prereq:													
EMS 182	Failure Analysis	4.0	view	SE					QL		VL		WE
Prereq:													
ENG 020	Space: Explor & Envrmt	4.0	view	SE					QL	SL			
Prereq:													
ENG 104	Mech of Materials	4.0	view	SE					QL				
Prereq:													
ENG 106	Engin Economics	4.0	view	SE	SS				QL	SL	VL		
Prereq:													
ENG 111	Electric Machinery	4.0	view	SE					QL	SL	VL		
Prereq:													
ENG 121	Actuators and Systems	4.0	view	SE					QL		VL		WE
Prereq:													
ENH 120	Container Media	3.0	view	SE					QL				WE
Prereq:													

ENT 153L	Med Ent Lab	4.0		SE					QL	SL			WE
Prereq:													
ENT 180A	Experimental Ecology	4.0	view	SE					QL				
Prereq:													
ENT 180B	Experimental Ecology	4.0	view	SE					QL				WE
Prereq:													
ESM 047	Water in the Tahoe Basin	2.0	view	SE					QL	SL			
Prereq:													
ESM 100	Hydrologic Principles	4.0	view	SE					QL	SL			
Prereq:													
ESM 121	Water Science&Management	3.0	view	SE					QL	SL			
Prereq:													
ESM 125	River Conservation	4.0		SE				OL	QL	SL			
Prereq:													
ESM 131	Air As A Resource	3.0	view	SE					QL	SL			
Prereq:													

ESM 186	Environ Remote Sensing	5.0	view	SE					QL		VL			
Prereq:														
ESM 186L	Env Remote Sensing Lab	2.0	view	SE					QL	SL	VL			
ESP 105	Evol Societies Cultures	4.0	view		SS				QL			WC	WE	
Prereq:														
ESP 110	Princ Environ Science	4.0	view	SE					QL	SL				
Prereq:														
ESP 121	Population Ecology	4.0	view	SE					QL	SL				
Prereq:														
ESP 150A	Phys & Chem Oceanography	4.0	view	SE					QL					
Prereq:														
ESP 178	Appl Research Methods	4.0	view		SS				QL					
Prereq:														
ETX 102A	Env Fate of Toxicants	4.0	view	SE					QL	SL	VL		WE	
Prereq:														
ETX 127	Stress and Development	10.0	view	SE				OL	QL	SL	VL		WE	

Prereq:												
ETX 135	Toxic Risk Assessment	3.0	view	SE				QL	SL	VL		
Prereq:												
ETX 140	Genes & the Environment	3.0	view	SE				QL	SL			
Prereq:												
ETX 146	Exposure Assessment	3.0	view	SE				QL	SL	VL		
Prereq:												
ETX 180	Chem Tox of Metals	4.0		SE				QL	SL	VL		
Prereq:												
EVE 010	Evol for Non-Biologists	3.0	view	SE				QL	SL			
EVE 020	Darwinian Medicine	3.0	view	SE				QL	SL			
EVE 100	Intro to Evolution	4.0	view	SE				QL	SL			
Prereq:												
EVE 101	Introduction to Ecology	4.0	view	SE				QL	SL	VL		
Prereq:												
EVE 103	Phylogeny/Speciation	4.0	view	SE				QL	SL			

Prereq:																
EVE 106	Mech Design Organisms	3.0	view	SE					QL		VL		WE
Prereq:																
EVE 107	Animal Communication	4.0	view	SE					QL		VL		
Prereq:																
EVE 110	Run Swim Fly	3.0	view	SE					QL		VL		WE
Prereq:																
EVE 114	Exp Invertebrate Biology	3.0	view	SE					QL		VL		WE
Prereq:																
EVE 141	Principles Systematics	3.0	view	SE				OL	QL	SL	VL		WE
Prereq:																
EVE 147	Biogeography	4.0	view	SE					QL	SL	VL		WE
Prereq:																
EVE 180A	Experimental Ecology	4.0	view	SE					QL				
Prereq:																
EVE 180B	Experimental Ecology	4.0	view	SE					QL				WE
Prereq:																

EVE 181	Animal-Plant Interaction	4.0	view	SE				OL	QL	SL			WE
Prereq:													
EXB 103	Intro to Human Movement	4.0	view	SE					QL				
Prereq:													
EXB 111	Environmental Effects	3.0	view	SE					QL				
Prereq:													
EXB 126	Tissue Mechanics	3.0	view	SE					QL	SL			WE
Prereq:													
EXB 148L	Fitness Testing Lab	1.0	view	SE					QL				
Prereq:													
FPS 100	Prin Polymer Mat	3.0	view	SE					QL				
Prereq:													
FPS 150	Polym Synth & React	3.0	view	SE				OL	QL	SL	VL		WE
Prereq:													
FPS 161	Struct & Prop of Fibers	3.0	view	SE				OL	QL	SL	VL		WE
Prereq:													

FPS 161L	Text Chem Analy Lab	1.0	view	SE				OL	QL	SL	VL		WE
Prereq:													
FPS 180A	Intro Res Polymer Sci	2.0	view	SE					QL		VL		WE
Prereq:													
FPS 180B	Intro Res Polymer Sci	2.0	view	SE					QL		VL		WE
Prereq:													
FST 050	Food Preservation	3.0	view	SE					QL				
Prereq:													
FST 100B	Food Properties	4.0	view	SE					QL		VL		
Prereq:													
FST 101A	Food Chem Lab	3.0	view	SE					QL		VL		WE
Prereq:													
FST 101B	Food Properties Lab	2.0	view *	SE					QL		VL		WE
Prereq:													
FST 102B	Practical Malt & Brewing	4.0	view	SE					QL				
Prereq:													

FST 103	Food Analysis	4.0	view	SE					QL				WE		
Prereq:															
FST 104	Food Microbiology	3.0	view	SE					QL		VL				
Prereq:															
FST 104L	Food Micro Lab	4.0	view	SE					QL		VL		WE		
Prereq:															
FST 107	Food Sensory Science	4.0	view	SE					QL				WE		
Prereq:															
FST 109	Prin Of Qual Assurance	3.0	view	SE					QL						
Prereq:															
FST 110	Food Processing	4.0	view	SE					QL		VL				
Prereq:															
FST 110A	Food Proc Prncpl	3.0	view	SE					QL		VL				
FST 110B	Heat & Mass Transf Food	3.0	view	SE					QL						
FST 110L	Food Processing Lab	2.0	view	SE					QL	SL	VL				
Prereq:															

FST 117	Dsgn & Anlys Sensory Sci	4.0	view	SE				QL						
Prereq:														
FST 119	Chem & Tech of Dairy	4.0	view	SE				QL		VL				
Prereq:														
FST 123	Intro Enzymology	3.0	view	SE				QL		VL				
Prereq:														
FST 123L	Enzymology Lab	2.0	view	SE				QL		VL		WE		
Prereq:														
FST 127	Sensory Eval of Foods	4.0	view	SE				QL				WE		
Prereq:														
FST 151	Food Freezing	1.0	view	SE				QL						
FST 151Y	Food Freezing	1.0	view	SE				QL						
Prereq:														
GDB 101	Epidemiology	4.0	view	SE				QL						
Prereq:														
GEL 030	Fractals Chaos & Complex	3.0	view	SE				QL						

Prereq:															
GEL 100	Extension & Translation	3.0	view	S E					Q L						
GEL 146	Radiogenic Isotopes	3.0	view	S E					Q L						
Prereq:															
GEL 148	Isotope & Geochem Tracer	3.0	view	S E					Q L						
Prereq:															
GEL 150A	Phys & Chem Oceanography	4.0	view	S E					Q L						
Prereq:															
GEL 160	Geological Data Analysis	3.0	view	S E					Q L						
Prereq:															
GEL 161	Geophysical Field Method	3.0	view	S E					Q L	S L					
Prereq:															
GEL 162	Solid Earth Geophysics	3.0	view	S E					Q L						
Prereq:															
GEL 163	Planet Geol & Geophysics	3.0	view	S E					Q L						
Prereq:															

HDE 120	Res Method Human Develop	5.0	view		SS				QL				WE
Prereq:														
HYD 047	Water in the Tahoe Basin	2.0	view	SE					QL	SL			
Prereq:														
HYD 103N	Fluid Mech Fundamentals	4.0	view	SE					QL		VL		
Prereq:														
HYD 124	Plant-Water Relations	4.0	view	SE					QL	SL			
Prereq:														
HYD 141	Physical Hydrology	4.0	view	SE					QL	SL	VL		
Prereq:														
HYD 142	Systems Hydrology	4.0	view	SE				OL	QL				
Prereq:														
HYD 143	Ecohydrology	4.0	view	SE				OL	QL	SL			
Prereq:														
HYD 144	Groundwater Hydrology	4.0	view	SE					QL	SL	VL		WE
Prereq:														

HYD 145	Water Science and Design	4.0	view			SE					QL	SL			WE
Prereq:															
HYD 151	Hydrology Field Methods	4.0	view			SE					QL	SL			
Prereq:															
HYD 182	Environ GIS Application	4.0	view			SE					QL	SL	VL		
Prereq:															
IAD 142	Eqpt/Tech for Small Farm	2.0	view			SE					QL		VL		
LIN 127	Text Proc & Corpus Ling	4.0	view	AH			SS				QL				
Prereq:															
MAT 012	Precalculus	3.0	view			SE					QL	SL			
Prereq:															
MAT 016A	Short Calculus	3.0	view			SE					QL	SL			
Prereq:															
MAT 016B	Short Calculus	3.0	view			SE					QL	SL			
Prereq:															
MAT 016C	Short Calculus	3.0	view			SE					QL	SL			

Prereq:												
MAT 017A	Calculus for BioSci	4.0	view									
Prereq:												
MAT 017B	Calculus for BioSci	4.0	view									
Prereq:												
MAT 019A	Calculus & Data	4.0										
Prereq:												
MAT 019B	Calculus & Data	4.0										
Prereq:												
MAT 019C	Calculus & Data	4.0										
Prereq:												
MAT 021A	Calculus	4.0	view									
Prereq:												
MAT 021AH	Honors Calculus	4.0	view									
Prereq:												
MAT 021B	Calculus	4.0	view									
Prereq:												

MAT 021C	Calculus	4.0	view	SE				QL				
Prereq:												
MAT 021D	Vector Analysis	4.0	view	SE				QL				
Prereq:												
MAT 022A	Linear Algebra	3.0	view	SE				QL				
Prereq:												
MAT 022AL	Linear Algebra Comp Lab	1.0	view	SE				QL				
Prereq:												
MAT 022B	Differential Equations	3.0	view	SE				QL				
Prereq:												
MAT 115A	Number Theory	4.0	view	SE				QL				
Prereq:												
MAT 115B	Number Theory	4.0	view	SE				QL	SL			
Prereq:												
MAT 118A	Partial Diff Equations	4.0	view	SE				QL				
Prereq:												

MAT 118B	Partial Diff Eq	4.0	view	S E				Q L				
Prereq:												
MAT 118C	Partial Diff Eq	4.0	view	S E				Q L				
Prereq:												
MAT 119A	Ordinary Diff Equations	4.0	view	S E				Q L				
Prereq:												
MAT 119B	Ordinary Diff Equations	4.0	view	S E				Q L				
Prereq:												
MAT 124	Mathematical Biology	4.0	view	S E				Q L				
Prereq:												
MAT 128A	Numerical Analysis	4.0	view	S E				Q L				
Prereq:												
MAT 128B	Numerical Analysis	4.0	view	S E				Q L				
Prereq:												
MAT 128C	Numerical Analysis	4.0	view	S E				Q L				
Prereq:												

MAT 129	Fourier Analysis	4.0	view	SE					QL			
Prereq:												
MAT 133	Mathematical Finance	4.0	view	SE					QL	SL		
Prereq:												
MAT 145	Combinatorics	4.0	view	SE					QL			
Prereq:												
MAT 148	Discrete Mathematics	4.0	view	SE					QL			
Prereq:												
MAT 165	Mathematics & Computers	4.0	view	SE					QL			
Prereq:												
MAT 167	Applied Linear Algebra	4.0	view	SE					QL			
Prereq:												
MAT 168	Optimization	4.0	view	SE					QL			
Prereq:												
MAT 189	Advanced Problem Solving	3.0	view	SE				OL	QL			WE
Prereq:												

MCB 010	Intro To Human Heredity	4.0	view	SE					QL	SL			
MCB 115V	Introduction to Research	3.0		SE					QL	SL			
Prereq:													
MCB 120L	Molec Biol & Biochem Lab	3.0	view	SE					QL		VL		WE
Prereq:													
MCB 121	Adv Molecular Biology	3.0	view	SE					QL	SL			
Prereq:													
MCB 123	Enzymes & Receptors	3.0	view	SE					QL				
Prereq:													
MCB 140L	Cell Biology Laboratory	5.0	view	SE				OL	QL	SL	VL		
Prereq:													
MCB 143	Cell & Molecular Biophysics	3.0	view	SE					QL				
Prereq:													
MCB 160	Genetics Assoc Lect	3.0	view	SE					QL				WE
Prereq:													
MCB 160L	Genetics Lab	5.0	view	SE					QL		VL		WE

Prereq:														
MCB 161	Molecular Genetics	3.0		SE					QL	SL				
MCB 162	Human Genetics Genomics	3.0	view	SE					QL	SL				
Prereq:														
MGT 012Y	Life's Financial Decns	3.0	view		SS				QL					
MIC 102	Intro Microbiology	3.0	view	SE					QL	SL				
Prereq:														
MIC 104	General Microbiology	4.0	view	SE					QL					
MIC 117	Molec Genetic Circuits	4.0	view	SE					QL	SL				
Prereq:														
NPB 014	Illusions and the Brain	3.0	view	SE					QL	SL				
NPB 100	Neurobiology	4.0	view	SE					QL					
Prereq:														
NPB 106	Exp in Neuro Phy & Behav	3.0	view					OL	QL		VL		WE	
Prereq:														
NPB 111C	Adv Systemic Lab	3.0	view						QL		VL		WE	

Prereq:															
NPB 121	Reproductive Physiology	4.0	view							QL	SL				
Prereq:															
NPB 139	Frontiers in Physiology	3.0	view	SE						QL					
Prereq:															
NPB 141	Phys Adapt Mar Organ	3.0	view							QL		VL		WE	
Prereq:															
NPB 159	Frontiers in Behavior	3.0	view	SE						QL					
Prereq:															
NPB 169	Frontiers in Neurobiol	3.0	view							QL					
Prereq:															
NUT 112	Nutritional Assessment	4.0	view	SE						QL					
Prereq:															
NUT 113	Princ of Epi in Nutr	4.0	view	SE						QL					
Prereq:															
NUT 115	Animal Nutrition	4.0	view	SE					OL	QL	SL	VL		WE	
Prereq:															

NUT 122	Ruminant Nutrition	4.0	view	SE					QL					
Prereq:														
NUT 124	Fish Nutrition	3.0	view	SE					QL	SL				
Prereq:														
NUT 127	Stress and Development	10.0	view	SE				OL	QL	SL	VL		WE	
Prereq:														
PHY 030	Fractals Chaos & Complex	3.0	view	SE					QL					
Prereq:														
PLB 113	Plant Molec & Cell Biol	3.0	view						QL	SL	VL			
Prereq:														
PLP 101	Epidemiology	4.0		SE					QL					
PLS 120	Applied Stat in Ag Sci	4.0	view						QL					
Prereq:														
PLS 123	Plant & Crop Modeling	3.0	view						QL					
Prereq:														
POL 011A	America Decides	4.0	view		SS	ACGH			QL					

POL 011AV	America Decides	4.0				SS	ACGH			QL				
POL 012Y	Data Visualization	4.0	view							QL		VL		
POL 051	Scientific Study Politic	4.0	view	AH	SE	SS				QL		VL		WE
POL 102	Urban Public Policy	4.0	view			SS	ACGH	DD		QL				WE
Prereq:														
POL 107	Environ Pol & Admin	4.0	view			SS	ACGH			QL				WE
Prereq:														
POL 108	Public Sector Policy	4.0	view			SS	ACGH			QL				WE
Prereq:														
POL 109	Pub Pol & Gov Proc	4.0	view			SS	ACGH			QL				WE
Prereq:														
POL 110	Strategy of Politics	4.0	view			SS				QL				WE
Prereq:														
POL 114	Quant Anly Pol Data	4.0	view	AH	SE	SS				QL		VL		WE
Prereq:														
POL 121	Scientific Study War	4.0	view			SS				QL				WE

Prereq:														
POL 140A	Comp Electoral Systems	4.0	view		SS				QL				WE	
Prereq:														
POL 140D	When Institutions Fail	4.0	view		SS				QL				WE	
Prereq:														
POL 140E	Policy-Making Processes	4.0	view		SS				QL				WE	
Prereq:														
POL 140F	Exper in Social Change	4.0			SS				QL				WE	
Prereq:														
POL 160	Amer Pol Parties	4.0	view		SS	ACGH	DD		QL				WE	
Prereq:														
POL 175	Science, Technology	4.0	view		SS				QL				WE	
Prereq:														
POL 196E	Research Methods Seminar	4.0	view		SS				QL		VL		WE	
Prereq:														
PSC 012Y	Data Visualization	4.0	view						QL		VL			

PSC 041	Research Meth in Psych	4.0	view						QL					
Prereq:														
PSC 103A	Stat Analys Psych Data	5.0	view						QL					
Prereq:														
PSC 103B	Stat Analys Psych Data	5.0	view						QL					
Prereq:														
PSC 104	Applied Psychrometrics	4.0	view						QL					
Prereq:														
PSC 107	Quest & Survey Methods	4.0	view						QL					
Prereq:														
PSC 120	Agent-Based Modeling	4.0	view						QL					
Prereq:														
PSY 012U	Data Visualization	4.0							QL		VL			
SAF 165	Irrig for Urban Envir	3.0	view	SE					QL		VL			
Prereq:														
SAS 018	GIS & Society	3.0	view	SE	SS				QL	SL	VL			

SAS 025	Global Climate Change	4.0	view	SE	SS			OL	QL	SL	VL		WE
SAS 025V	Global Climate Change	4.0	view	SE	SS			OL	QL	SL	VL		WE
SOC 012Y	Data Visualization	4.0	view						QL		VL		
SOC 046B	Int Social Research	5.0	view		SS				QL				
SOC 056	Intro to Social Stats	5.0	view						QL				
Prereq:													
SOC 056Y	Intro to Social Stats	5.0							QL				
Prereq:													
SOC 106	Intermed Soc Stat	5.0	view		SS				QL	SL			
Prereq:													
SOC 170	Population	4.0	view		SS				QL				
Prereq:													
SPH 103	Survey of HESPAM	3.0	view		SS				QL				
SSC 010	Soils in Our Environment	3.0	view	SE					QL	SL			
SSC 100	Principles Soil Sci	5.0	view	SE					QL	SL	VL		

Prereq:														
SSC 102	Soil Chemistry	3.0	view	SE					QL	SL				
Prereq:														
SSC 105	Field Studies of Soils	5.0	view	SE					QL	SL	VL		WE	
Prereq:														
SSC 109	Sustainable Nutri Mangmt	4.0	view	SE				OL	QL	SL	VL		WE	
Prereq:														
SSC 111	Soil Microbiology	4.0	view	SE					QL	SL			WE	
Prereq:														
SSC 120	Soil Genesis	5.0	view	SE					QL	SL	VL			
Prereq:														
STA 010	Statistical Thinking	4.0	view	SE					QL					
Prereq:														
STA 012	Discrete Probabil	4.0	view	SE					QL					
Prereq:														
STA 013	Elementary Statistics	4.0	view	SE					QL					
Prereq:														

STA 013V	Elementary Statistics	4.0	view	S E				Q L				
STA 013Y	Elementary Statistics	4.0	view	S E				Q L				
Prereq:												
STA 015A	Intro to Data Science I	4.0	view	S E				Q L				
Prereq:												
STA 015B	Intro to Data Science II	4.0	view	S E				Q L		V L		
Prereq:												
STA 015C	Intro to DataScience III	4.0	view	S E				Q L				
Prereq:												
STA 032	Gateway to Data Science	4.0	view *	S E				Q L				
Prereq:												
STA 035A	Stat Data Science I	4.0	view *	S E				Q L				
Prereq:												
STA 035B	Stat Data Science II	4.0	view *	S E				Q L		V L		
Prereq:												
STA 035C	Stat Data Science III	4.0	view *	S E				Q L	S L			

Prereq:													
STA 100	Applied Stat for Bio Sci	4.0	view *	SE					QL				
Prereq:													
STA 101	Adv Stats for Bio Sci	4.0	view	SE					QL				
Prereq:													
STA 102	Prob Modeling & Stat Inf	4.0	view	SE					QL	SL			
Prereq:													
STA 103	Applied Statistics	4.0	view *	SE					QL				
Prereq:													
STA 104	Nonparametric Statistics	4.0	view	SE					QL				
Prereq:													
STA 108	Regression Analysis	4.0	view	SE					QL	SL			
Prereq:													
STA 120	Probability For Eng	4.0	view	SE					QL				
STA 130A	Brief Math Statistics	4.0	view *	SE					QL				
Prereq:													

STA 130B	Math Stat: Brief Course	4.0	view	S E				Q L				
Prereq:												
STA 131A	Probability Theory	4.0	view	S E				Q L				
Prereq:												
STA 133	Math Stat For Econ	4.0	view	S E				Q L				
Prereq:												
STA 135	Multivar Data Analysis	4.0	view	S E				Q L				
Prereq:												
STA 137	Applied Time Ser Analysis	4.0	view	S E				Q L				
Prereq:												
STA 138	Anly Categor Data	4.0	view	S E				Q L				
Prereq:												
STA 141	Statistical Computing	4.0	view	S E				Q L				
Prereq:												
STA 142	Reliability	4.0	view	S E				Q L				
Prereq:												

STA 144	Sampling Theory	4.0	view	SE					QL					
Prereq:														
STA 145	Bayesian Stat Infer	4.0	view	SE					QL					
Prereq:														
STS 101	Data & Society	4.0	view		SS				QL					
STS 112	Visualizing Society	4.0	view		SS		DD		QL					
TAE 020	Sustainable Energy Tech	4.0		SE					QL					
TAE 030	Comm & Computing Tech	4.0							QL		VL			
TAE 121	Controlled Environments	4.0							QL				WE	
Prereq:														
TXC 162L	Textile Fabric Lab	1.0	view	SE					QL		VL		WE	
Prereq:														
TXC 163L	Textile Color Lab	1.0	view	SE					QL	SL			WE	
Prereq:														
VEN 123L	Analysis Musts/Wines Lab	2.0	view	SE					QL		VL		WE	
Prereq:														

VEN 125	Wine Type & Sens Eval	2.0	view	S E					Q L					
Prereq:														
VEN 125L	Wine Sensory Evaluation	2.0	view	S E					Q L		V L		W E	
Prereq:														
VEN 140	Distd Bev Technol	3.0	view	S E					Q L					
Prereq:														

L. University of California – LA

https://catalog.registrar.ucla.edu/browse/College%20and%20Schools/SchooloftheArtsandArchitecture/School-Requirements/Quantitative-Reasoning-Requirement

Quantitative Reasoning Requirement

Students must demonstrate basic skills in quantitative reasoning. The requirement may be satisfied by completing one approved UCLA course (see list below) for a C or Passed or better grade (a C– or Not Passed grade is not acceptable), or an equivalent transfer course.

The quantitative reasoning requirement may also be satisfied by achieving an SAT Mathematics section score of 620 or better, or an SAT Subject Test in Mathematics score of 550 or better, or an ACT mathematics exam score of 26 or better. Approved courses include

- Biostatistics 100
- Life Sciences 20, 30A, 30B, 40
- Mathematics 3A, 31A, 31AL
- Philosophy 31
- Political Science 6, 6R
- Program in Computing 10A, 10B, 10C
- Public Affairs 60
- Statistics 10, 12, 13

M. University of Florida

https://undergrad.aa.ufl.edu/general-education/gen-ed-program/program-requirements/

General Education Program Requirements

All undergraduate students (except those transferring to UF with an A.A. degree from a Florida public college or an A.A. certificate from a Florida public state university) are required to complete UF's general education requirement to graduate.

Subject Area	State Core	Gen Ed Courses	Totals
Biological and Physical Sciences[1]	3	3	6
Composition	3	3	6
Humanities[1]	3	3	6
Social & Behavioral Science[1]	3	3	6
Mathematics	3	3	6
Additional Required Gen Ed Coursework (Humanities, Social Science, or Natural Science)[2]		6	6
OVERALL TOTALS	15	21	36

[1]To complete General Education, student must select a General Education course in the "Humanities" that features the "UF Quest 1" subject area for 3 credits, a General Education course in the "Social and Behavioral Science" or "Natural Science" that features the "UF Quest 2" subject area for 3 credits, and a General Education course that features the "International" subject area for 3 credits.

[2]Majors that feature extensive use of these subject areas may require a student to complete all 6 "Additional Required Gen Ed Coursework" credits in a particular subject area. See the Major Model Semester Plan for details.

*All general education courses are identified by letter in the course descriptions section of the University of Florida catalog. The subject area letter designations appear at the end of the course description. For example: PHI 2010 Introduction to Philosophy fulfills three credits in the Humanities (H) area.

The schedule of courses also includes a list of all courses that fulfill each Gen Ed subject area. In addition, course listings in every schedule identify whether a course section satisfies Gen Ed credit (refer to the G.E. column).

** Three credits must be from a general education mathematics course with a prefix of MAC, MAP, MAS, MGF or MHF (a.k.a., 'pure math').

*** Required of all students entering Fall 2020 or after. Students who entered Fall 2019 or earlier may satisfy this requirement with "What is the Good Life".

**** Some C, H, P, B and S general education courses carry the international (N) designation. The international (N) designation can be assigned only to courses with the former designations. The general education program requires the completion of a 3-credit

courses with the international (N) designation.

Important Considerations

- A minimum grade of C is required for general education credit. Courses intended to satisfy the general education requirement cannot be taken S-U.
- Some majors require or recommend specific general education courses.
- Certain classes are approved to count for multiple general education program areas. Students can count a general education course toward one area except (N) credits, which must be earned concurrently with another area. For example, a course designated as HN can count toward both the H and N requirements, but a course designated CH can count only as C or H.
- Study abroad courses can fulfill international credit, in addition to fulfilling credit in other subject areas. Study abroad must be approved in advance by an academic advisor and the UF International Center.

Successful completion of these requirements will result in the student learning outcomes.

Selecting General Education Courses
Students can take Gen Ed courses at the 1000-4000 levels. First-year students generally take introductory (1000/2000-level) courses. If a student has the academic background and the interest they may take more advanced courses, but they should first check the course prerequisites and/or consult an academic advisor.

University of Florida
https://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext
State Core Gen Ed Mathematics Courses

All are pure math except STA 2023.

MAC 1105	Basic College Algebra	3
MAC 1140	Precalculus Algebra	3
MAC 1147	Precalculus Algebra and Trigonometry	4
MAC 2233	Survey of Calculus 1	3
MAC 2311	Analytic Geometry and Calculus 1	4
MAC 2312	Analytic Geometry and Calculus 2	4
MGF 1106	Mathematics for Liberal Arts Majors 1	3
MGF 1107	Mathematics for Liberal Arts Majors 2	3
STA 2023	Introduction to Statistics 1	3

N. University of Illinois

http://catalog.illinois.edu/general-information/degree-general-education-requirements/
Degree and General Education Requirements

General Education Requirements

The University of Illinois Urbana-Champaign requires that all undergraduate students take General Education - or "Gen Ed" - courses to gain and use broad knowledge beyond the specialized learning they will do in a major field of study. These Gen Ed requirements cover the kinds of knowledge all students should have: the humanities and arts, social and behavioral sciences, natural sciences and technology, quantitative reasoning, composition/writing, and cultural studies.

General Education courses at Illinois are mindful of our students' diverse backgrounds, needs, and interests, and are an essential component of the transformative learning that prepares our graduates to become alumni who make a significant societal impact. These courses build students' abilities to think critically, solve problems, generate new ideas and create knowledge, make connections between academic disciplines, respect and understand differences, and develop as citizens and leaders.

General Education at Illinois is more than a set of required courses; it is a gateway into the Illinois experience.

Courses are noted as fulfilling one or more of the following categories:

- Composition I
- Advanced Composition
- Humanities and the Arts: Literature & the Arts or Historical & Philosophical Perspectives
- Natural Sciences and Technology: Life Science or Physical Science
- Quantitative Reasoning
- Social and Behavioral Sciences
- Cultural Studies: Western/Comparative Cultures, Non-Western Cultures, and US Minority Cultures

For a list of current courses approved for General Education credit, please visit the Course Explorer.

University of Illinois
https://provost.illinois.edu/assessment/learning-outcomes-assessment/general-education-assessment/quantitative-reasoning/quantitative-reasoning-i/
Quantitative Reasoning I Learning Outcomes

During the Spring 2019 General Education Assemblies for Learning Outcomes, faculty groups began to develop learning outcomes for the Quantitative Reasoning I Requirement. Then, smaller Working Groups(link opens in new window) from these Assemblies along with students and advisors worked together to digest the information from the larger group and to create draft learning outcomes for Quantitative Reasoning I (see below).

We invite feedback from the campus community on these outcomes.

After taking a course in **Quantitative Reasoning I**, students will be able to:

1. Identify abstract and relevant information to formulate an understanding of and clearly define and state the problem. (C-SLOs 1 & 2)
2. Construct or select and execute a logically appropriate process for solving the problem. (C-SLOs 1 & 2)
3. Formulate a conclusion and assess/justify its validity. (C-SLOs 1 & 2)
4. Interpret and communicate results broadly. (C-SLO 3)
5. Recognize patterns, transfer knowledge or integrate abstract/critical thinking with other problems or disciplines. (C-SLO 2)

University of Illinois
https://courses.illinois.edu/gened/2024/fall/QR
Quantitative Reasoning

If you entered college as a freshman between **Fall 1993 and Summer 2002,** you need to complete a Quantitative Reasoning I (QR1) course in order to graduate. To complete the QRI requirements you must take one course listed as QR1 from the list below.

If you entered college as a freshman in **Fall 2002** or later, you must complete both Quantitative Reasoning I (QR1) and Quantitative Reasoning II (QR2) courses in order to graduate. To complete the QR1 requirement you must take one course listed as QR1 from the list below. To complete the QR2 requirement you must take a second course from the list below - **either a second QR1 or a QR2.**

Effective for entering freshmen in Fall 2004, all courses on this list are approved for General Education credit on a campus wide basis. However individual Colleges or curricula may require specific courses or course categories. Students should consult their advisors about selecting the general education courses which best fit their programs of study.

Courses are added as they are approved.

COURSE		TITLE	QR
ACE 262		Applied Statistical Methods and Data Analytics I	QR1
ADV 200		Data Literacy	QR1
ASTR 121		Solar System and Worlds Beyond	QR2
ASTR 122		Stars and Galaxies	QR2

COURSE	✓	TITLE	QR
ATMS 120	✓	Severe and Hazardous Weather	QR2
ATMS 202		General Physical Climate	QR2
CPSC 241		Intro to Applied Statistics	QR1
CS 101	✓	Intro Computing: Engrg & Sci	QR2
CS 105	✓	Intro Computing: Non-Tech	QR1
CS 107	✓	Data Science Discovery	QR1
CS 124	✓	Introduction to Computer Science I	QR1
CS 125		Introduction to Computer Science	QR1
CS 128	✓	Introduction to Computer Science II	QR2
CS 225	✓	Data Structures	QR2
ECE 101	✓	Exploring Digital Info Technol	QR2
ECON 202	✓	Economic Statistics I	QR1
ENVS 101		Introduction to Energy Sources	QR2
EPSY 280		Elements of Statistics	QR1
ESE 120	✓	Severe and Hazardous Weather	QR2
ESE 380	✓	Geographic Information Systems II	QR2
GEOL 350		Volcanoes	QR2

COURSE	✓	TITLE	QR
GGIS 280	✓	Intro to Social Statistics	QR1
GGIS 371		Spatial Analysis	QR2
GGIS 380	✓	Geographic Information Systems II	QR2
GLBL 200		Foundations of Research	QR2
HDFS 330	✓	Statistical Reasoning for Everyday Life	QR2
HK 201	✓	Health Sciences Research Methods	QR2
HK 207	✓	Introduction to Epidemiology	QR1
HK 209	✓	Introduction to Biostatistics and Health Data Analysis	QR1
HK 416	✓	Applied Health Data Analysis	QR2
HK 466	✓	Measure & Eval in Kinesiology	QR2
IS 107	✓	Data Science Discovery	QR1
IS 145	✓	Mapping Inequalities	QR2
IS 203	✓	Analytical Foundations for Information Problems	QR2
IS 229	✓	Web Design Fundamentals	QR1
IS 305	✓	Programming for Information Problems II	QR1
JOUR 451	✓	Research Methods in Journalism	QR2

COURSE	✓	TITLE	QR
MATH 103	✓	Theory of Arithmetic	QR1
MATH 115	✓	Preparation for Calculus	QR1
MATH 117		Elementary Mathematics	QR1
MATH 119	✓	Ideas in Geometry	QR1
MATH 124	✓	Finite Mathematics	QR1
MATH 181		A Mathematical World	QR1
MATH 213	✓	Basic Discrete Mathematics	QR2
MATH 220	✓	Calculus	QR1
MATH 221	✓	Calculus I	QR1
MATH 231	✓	Calculus II	QR1
MATH 234		Calculus for Business I	QR1
MATH 241	✓	Calculus III	QR2
MATH 285	✓	Intro Differential Equations	QR2
MUS 339		Princpls and Technqs in Mus Ed	QR2
NPRE 101		Introduction to Energy Sources	QR2
NRES 105		Climate Change Impacts on Ecological Systems	QR2
PHIL 103	✓	Logic and Reasoning QR II	QR2
PHIL 202	✓	Symbolic Logic	QR1

COURSE	✓	TITLE	QR
PHIL 454		Advanced Symbolic Logic	QR2
PHYS 101	✓	College Physics: Mech & Heat	QR2
PHYS 102	✓	College Physics: E&M & Modern	QR2
PHYS 140		How Things Work	QR2
PHYS 150		Physics of Societal Issues	QR2
PHYS 211	✓	University Physics: Mechanics	QR2
PHYS 212	✓	University Physics: Elec & Mag	QR2
PSYC 235	✓	Intro to Statistics	QR1
PSYC 301		Psychological Statistics	QR1
RST 370	✓	Research Methods & Analysis	QR2
SOC 280	✓	Intro to Social Statistics	QR1
SOC 380	✓	Social Research Methods	QR2
SOC 488		Demographic Analysis	QR2
SOCW 225	✓	Social Work Statistics	QR1
STAT 100	✓	Statistics	QR1
STAT 107	✓	Data Science Discovery	QR1
STAT 200	✓	Statistical Analysis	QR1
STAT 207	✓	Data Science Exploration	QR2

COURSE	✓	TITLE	QR
STAT 212	✓	Biostatistics	QR1
UP 116		Urban Informatics I	QR1
UP 316		Urban Informatics II	QR2

O. University of Iowa

https://catalog.registrar.uiowa.edu/academics-iowa/general-education-requirements/
General Education Requirements

Undergraduate general education requirements vary based on the college. This table is intended to be used for comparative purposes between colleges. Some colleges and some programs of study do not have undergraduate general education requirements; others have general education requirements specific to an individual program of study, like those in Carver College of Medicine. Check each program of study's page in the catalog for program-specific requirements. World language graduation requirements by college can be found following this table.

General Education Requirement	College of Liberal Arts and Sciences	College of Public Health	Tippie College of Business	College of Education	College of Nursing	University College
Quantitative or Formal Reasoning	X	X		X		X

University of Iowa – College of Liberal Arts and Sciences
https://catalog.registrar.uiowa.edu/liberal-arts-sciences/general-education-program/#qfr
GE CLAS Core

Quantitative or Formal Reasoning
Courses in the Quantitative or Formal Reasoning area help develop analytical skills through the practice of quantitative or formal symbolic reasoning. Courses focus on presentation and evaluation of evidence and argument; understanding the use and misuse of data; and organization of information in quantitative or other formal symbolic systems, including those used in computer science, linguistics, mathematics, philosophy, and statistics.

All students must complete at least 3 s.h. of coursework in the Quantitative or Formal Reasoning area. Students also may fulfill this GE CLAS Core requirement by completing a course that lists an approved GE CLAS Core course as a prerequisite. The following courses are approved for the area.

Course #	Title	Hours
COMM:1117	Advocacy and Argument	3
CPH:1600	Public Health Science: Inquiry and Investigation in Public Health	3
CS:1020	Principles of Computing	3
CS:1110	Introduction to Computer Science	3
CS:1210	Computer Science I: Fundamentals	4
GEOG:1030	Our Digital Earth	3
LING:1050	Language and Formal Reasoning	3
MATH:1020	Elementary Functions	4
MATH:1120	Logic of Arithmetic	4
MATH:1260	PokeMath: The Mathematics of Pokemon Go	3
MATH:1340	Mathematics for Business	4
MATH:1350	Quantitative Reasoning for Business	4
MATH:1440	Mathematics for the Biological Sciences	4
MATH:1460	Calculus for the Biological Sciences	4
MATH:1550	Engineering Mathematics I: Single Variable Calculus	4
MATH:1850	Calculus I	4
PHIL:1636	Principles of Reasoning: Argument and Debate	3
POLI:1050/ RELS:1050	Big Ideas: Introduction to Information, Society, and Culture	3
POLI:1700	Introduction to Political Analysis	3
PSY:2811	Research Methods and Data Analysis in Psychology I	3
STAT:1010	Statistics and Society	3
STAT:1015 /DATA:1015	Introduction to Data Science	3

Course #	Title	Hours
STAT:1020/ PSQF:1020	Elementary Statistics and Inference	3
STAT:1030	Statistics for Business	4
STAT:2010	Statistical Methods and Computing	3

P. University of Maryland

https://academiccatalog.umd.edu/undergraduate/general-education-requirements/#requirementstext

Elements of the General Education Program

The General Education program is comprised of courses that build foundational skills (Fundamental Studies), courses that expand the breadth of your education (Distributive Studies) and courses that explore and study human, societal and cultural differences (Diversity). At least two of your Distributive Studies courses will delve in to a "Big Question" as seen through the lens of a particular academic discipline (Big Question).

Fundamental Studies

Master the skills.

The Fundamental Studies portion of the General Education program consists of 5 courses (nominally 15 credits), with one course in each of the following areas:

- Academic Writing[1]
- Analytic Reasoning
- Mathematics[1]
- Oral Communication
- Professional Writing

Mathematics

The goal of the Mathematics requirement is to convey the power of mathematics, demonstrated by the variety of problems that can be modeled and solved by quantitative means. Ability in mathematics is a critical measure of how well students are prepared to meet the challenges they will face in their lives beyond school.[1]

[1]These course must be attempted by 30 credits and successfully completed by 60 credits.

University of Maryland

https://gened.umd.edu/students/four-categories/fundamental-studies

Fundamental Studies

15 credits / 5 courses

Fundamental Studies courses ensure that students have the basic skills in written and oral communication, in mathematical analysis, and in critical thinking that are important to their success across the curriculum and in their professional lives.

- Academic Writing FSAW = 3 credits
- Professional Writing FSPW = 3 credits
- Oral Communication FSOC = 3 credits
- Math FSMA = 3 credits
- Analytic Reasoning FSAR = 3 credits

Mathematics

The goal of the Mathematics requirement is to convey the power of mathematics, demonstrated by the variety of problems that can be modeled and solved by quantitative means. Ability in mathematics is a critical measure of how well students are prepared to meet the challenges they will face in their lives beyond school.

The Mathematics requirement is satisfied by passing one in a suite of courses at the level of pre-calculus — courses that include "Elementary Mathematical Models," "Introduction to Probability," college algebra or pre-calculus, or statistics and probability. Scores on AP and similar exams provide exemption from the Mathematics requirement. Refer to the Undergraduate Catalog for exemption information. **This is a three-credit, one-course requirement.**

Mathematics needs to be attempted by 30 credits.

University of Maryland
https://app.testudo.umd.edu/soc/gen-ed/202408/FSMA
Schedule of Classes Fall 2024

DATA 100 / STAT 100	Elementary Statistics and Probability	Credits: 3	**Prerequisite:** MATH MATH110, MATH112, MATH113, or MATH115; or permission of CMNS-Mathematics department; or must have math eligibility of STAT100 or higher and math eligibility is based on the Math Placement Exam or the successful completion of Math 003 with appropriate eligibility.

			Restriction: Must not have completed MATH111; or must not have completed any STAT course with a prerequisite of MATH141.
MATH107 (formerly MATH 110 and MATH 111)	Introduction to Math Modeling and Probability	Credits: 3	**Prerequisite:** Must have math eligibility of MATH107 or higher; and math eligibility is based on Math Placement Exam or successful completion of MATH003 with appropriate eligibility. **Restriction:** Not open to students majoring in mathematics, engineering, business, life sciences, and the physical sciences; must not have completed STAT100, MATH113, MATH120, MATH135, MATH136 or MATH140 with a C- or better; must not have completed any MATH or STAT course with a prerequisite of MATH120, MATH136, or MATH140.
MATH113	College Algebra and Trigonometry	Credits: 3	**Prerequisite:** Must have math eligibility of MATH113 or higher; and math eligibility is based on the Math Placement Exam or the successful completion of MATH 003 with appropriate eligibility. **Restriction:** Must not have completed MATH115, MATH120, MATH135, MATH136 or MATH140 with a grade of C- or higher; and

			must not have completed any course with a prerequisite of MATH120, MATH130, MATH136, or MATH140.
MATH115	Precalculus	Credits: 3	**Prerequisite:** Must have math eligibility of MATH115 or higher; and math eligibility is based on the Math Placement Exam or the successful completion of MATH003 with appropriate eligibility. Or MATH113. **Restriction:** Must not have completed MATH140 with a grade of C- or better; and must not have completed any MATH or STAT course with a prerequisite of MATH140 or MATH141.
MATH120 (formerly MATH 220)	Elementary Calculus I	Credits: 3	**Prerequisite:** 1 course with a minimum grade of C- from (MATH113, MATH115). Or must have math eligibility of MATH120 or higher; and math eligibility is based on the Math Placement Test. **Restriction:** Not open to students majoring in mathematics, engineering, the biological sciences, biochemistry, chemistry, or the physical sciences; Must not have completed MATH130, MATH136 or MATH140 with a grade of C- or higher.
MATH135	Discrete Mathematics	Credits: 4	**Prerequisite:** Minimum grade of C- in MATH113 or MATH115; or must

	for Life Sciences		have math eligibility of MATH120 or higher; and math eligibility is based on the Math Placement Test. **Restriction:** Must be in the Biological Sciences or Neuroscience major; and not open to students majoring in mathematics, engineering, or the physical sciences.
MATH140	Calculus I	Credits: 4	**Prerequisite:** Minimum grade of C- in MATH115.
MATH140H	Calculus I	Credits: 4	**Prerequisite:** Minimum grade of C- in MATH115.

Q. Michigan State University

https://reg.msu.edu/AcademicPrograms/Print.aspx?Section=282

Undergraduate Education

Mathematics Requirements

The university Mathematics requirement ensures that all students build a foundation of quantitative literacy. Each student must complete the university Mathematics requirement by fulfilling one of the options below:

1. Complete one of the following:
   a. Mathematics 101 and 102.
   b. Mathematics 103 or (Mathematics 103A and 103B) and Mathematics 101.
   c. Mathematics 103 or (Mathematics 103A and 103B) and Mathematics 102.
   Students who waive Mathematics 103 via the Mathematics Placement Exam need only complete one course from 1.a. to fulfill the University Mathematics requirement.
2. Complete both of the following:
   a. Mathematics 103 or (Mathematics 103A and 103B) or Mathematics 101 or 102; and
   b. Statistics and Probability 200 or 201
   Students who place directly into Statistics and Probability 200 or 201 need only to complete one course from 2.b. to fulfill the university Mathematics requirement.
3. Complete both of the following:
   a. Mathematics 103 or (Mathematics 103A and 103B); and
   b. One of the following courses: Mathematics 114, 124, 132, 152H, or 201.
   Students who place into any course in 3.b. via the Mathematics Placement Exam need only complete the course in 3.b. to fulfill the university Mathematics requirement.
4. Complete one of the following:
   a. Mathematics 116 or Lyman Briggs 117.

5. Waiver through a *proctored* Mathematics Placement Exam yielding a score resulting in placement in Mathematics 132 (calculus). For additional information, refer to the statement on *Academic Placement Tests – Mathematics (Algebra)* in the *Undergraduate Education* section of this catalog.

Students who transfer one of the following: Mathematics 112, 114, or 201; or Statistics and Probability 200 or 201 alone, with no other mathematics course, must take the Mathematics Placement Exam. Based on the score achieved, additional course work may be required to fulfill the university Mathematics requirement.

First-year students who have taken a College Board Advanced Placement Examination in Mathematics should consult the statement on *Academic Placement Tests*. Transfer students should consult the statement on *Transfer Student Admission*.

R. University of Minnesota

https://onestop.umn.edu/academics/undergraduate/lib-ed-requirements-overview/liberal-education-requirements

Liberal education requirements

The University of Minnesota and its faculty are committed to providing an education that invites you to investigate the world from new perspectives, learn new ways of thinking, and grow as an active citizen and lifelong learner. The University's liberal education requirements for all students are designed to be integrated throughout your four-year undergraduate experience. These courses provide you an opportunity to explore fields outside your major and complement your major curriculum with a multidisciplinary perspective.

- Search for courses that fulfill your liberal education requirements
- Reference the Class Search when planning your degree
- Look up a program to find degree requirements

Current liberal education requirements

If you were admitted to a degree program in fall 2010 or later, you will follow the revised liberal education requirements listed below. However, if you are a student admitted prior to fall 2010, you will continue to follow the liberal education requirements prior to fall 2010 that were current when you were admitted.

The diversified core guides you through the "why" and "how" of different academic disciplines. These classes will equip you with a broad range of tools that can be used to approach problems in everyday life and work, and, ultimately, help you make a positive difference within communities, society, and the world. Students are required to satisfy all seven core requirements.

Requirements for students admitted after fall 2010	Required credits
Arts/Humanities	3 credits
Biological Sciences	4 credits; must include lab or field experience
Historical Perspectives	3 credits
Literature	3 credits
Mathematical Thinking	3 credits
Physical Sciences	4 credits; must include lab or field experience
Social Sciences	3 credits

University of Minnesota
https://www.myu.umn.edu/psp/psprd/EMPLOYEE/CAMP/c/SA_LEARNER_SERVICES.CLASS_SEARCH.GBL?
Mathematical Thinking Courses – Fall 2024

BA 2551	Business Statistics in R
CI 1806	College Algebra through Modeling
EPSY 1261	Understanding Data Stories through Visualization & Computing
MATH 1001	Basic and Applied Statistics
MATH 1031	Excursions in Mathematics
MATH 1042	College Algebra and Probability

MATH 1051	Mathematics of Design
MATH 1120	Precalculus I
MATH 1121	Precalculus I
MATH 1142	Precalculus II
MATH 1151	Short Calculus
MATH 1155	Precalculus II
MATH 1171	Intensive Precalculus
MATH 1241	Calculus I
MATH 1271	Calculus and Dynamical Systems in Biology
MATH 1371	Calculus I
MATH 1571H	CSE Calculus I
NURS 3710	Honors Calculus I
PHIL 1001	Statistics for Clinical Practice and Research
POL 3085	Introduction to Logic
POL 4087	Quantitative Analysis in Political Science
PSY 3801	Thinking Strategically About Politics
PSY 3801	Introduction to Psychological Measurement and Data Analysis
PSY 3801H	Honors Introduction to Psychological Measurement and Data Analysis
SOC 3811	Social Statistics
STAT 1001	Introduction to the Ideas of Statistics
STAT 1161	Introduction to Statistics
STAT 3011	Introduction to Statistical Analysis

S. University of North Carolina

https://catalog.unc.edu/undergraduate/ideas-in-action/

IDEAs in Action General Education Curriculum

Focus Capacities

Design your course of study! Students take one course for each of the nine Focus Capacity courses (3 credits each) plus a one-credit Empirical Investigation Lab. Focus Capacity courses introduce and reinforce a broad set of capacities for identifying, discovering, evaluating, and taking action upon ideas, knowledge, evidence, and argument.

Focus Capacities [1, 2, 3]	
1. Aesthetic and Interpretive Analysis	3

2. Creative Expression, Practice, and Production	3
3. Engagement with the Human Past	3
4. Ethical and Civic Values	3
5. Global Understanding and Engagement	3
6. Natural Scientific Investigation	3
7. Power, Difference, and Inequality	3
8. Quantitative Reasoning	3
9. Ways of Knowing	3
One Focus Capacity course must include or be associated with a one-credit lab:	
Empirical Investigation Lab	1
Total Hours	**28**

[1]A single course may be used to fulfill only one Focus Capacity requirement (not including lab).

[2]Students may fulfill up to five Focus Capacity courses (+Lab) using by-examination (BE) credit

[3]Every Focus Capacity course includes the following recurring capacities:

- Writing, totaling at least 10 pages in length or the intellectual equivalent
- Presenting material to the class, small groups, or the public through oral presentations, webpages, or other means that enable corroboration of fact and argument
- Collaborating in pairs or groups to learn, design, solve, create, build, research, or similar.

Disciplinary Distribution

All students must take at least one general education course (Focus Capacity, FY-Seminar/FY-Launch, High-Impact Experience, Research and Discovery, or Communication Beyond Carolina) in each of the three major divisions of the College of Arts and Sciences:

1. Humanities and fine arts
2. Mathematics and natural sciences
3. Social and behavioral sciences

Additional Focus Capacity Policies

- Courses used to satisfy Focus Capacity requirements may not be declared Pass/Low Pass/Fail.
- A Focus Capacity course may overlap with one or more of the following Gen Ed requirements: FY-Seminar/FY-Launch, Research and Discovery, High-Impact Experience, Communication Beyond Carolina.
- A Focus Capacity course may not double count with a Supplemental General Education course.

- The degree programs in Clinical Laboratory Science, Dental Hygiene, Nursing, and Radiologic Science require at least six of the nine Focus Capacities (plus lab). If a student pursues a different second major, then all nine Focus Capacities (plus Lab) are required.

University of North Carolina
https://catalog.unc.edu/undergraduate/ideas-in-action/quantitative/
Quantitative Reasoning

Quantitative Reasoning (FC-QUANT) is a required Focus Capacity course in the IDEAs in Action curriculum.

A single course may be used to fulfill only one Focus Capacity requirement (not including lab).

Approved Courses		
ANTH 520	Linguistic Phonetics	3
ANTH 680	Qualitative Methods in Archaeology	3
ASTR 100	Understanding the Universe	3
ASTR 101	Introduction to Astronomy: The Solar System[H]	3
ASTR 102	Introduction to Astronomy: Stars, Galaxies & Cosmology[H]	3
ASTR 103	Alien Life in the Universe	3
BIOL 75	First-Year Seminar: Biodiversity and Citizen Science[H]	3
BIOL 115	Reasoning with Data: Navigating a Quantitative World	3
BIOL 222	Introduction to Programming with Biological Data	3
BIOL 465	Global Diversity and Macroecology	3
BIOL 544L	Laboratory in Diseases of the Cytoskeleton	3
CLAR 270	Quantifying of the Past	3
COMP 110	Introduction to Programming and Data Science[H]	3
COMP 283	Discrete Structures[H]	3
COMP 550	Algorithms and Analysis	3
DATA 110	Introduction to Data Science	3
ECON 400	Introduction to Data Science and Econometrics[H]	4
ECON 445	Industrial Organization	3
ECON 470	Econometrics[H]	3
ECON 571	Advanced Econometrics	3
EMES 203	Data Analysis for Earth, Marine, and Environmental Sciences	3
ENEC 203	Introduction to Environmental Science Problem Solving	3

ENEC 465	Global Biodiversity and Macroecology	3
ENEC 473	Business and Finance Fundamentals for Change Makers	3
ENGL 482	Metadata, Mark-up, and Mapping: Understanding the Rhetoric of Digital Humanities	3
ENVR 135	Environment-ECUIPP Lab: Connecting with c communities through environmental research for Public Health	3
ENVR 335	Adv Environment-ECUIPP Lab: Connecting with Communities Through Environmental Research for PH Protection	3
GEOG 215	Introduction to Spatial Data Science	3
GEOG 370	Introduction to Geographic Information	3
GEOG 410	Modeling of Environmental Systems	3
GEOG 456	Geovisualizing Change	3
GEOG 477	Introduction to Remote Sensing of the Environment	3
GEOG 567	Geospatial Data Analysis with Google Earth Engine	3
GEOG 577	Advanced Remote Sensing	3
GEOG 591	Applied Issues in Geographic Information Systems	3
GEOG 592	Geographic Information Science Programming	3
LING 333	Human Language and Animal Communication Systens	3
LING 401	Language and Computers	3
LING 520	Linguistic Phonetics	3
LING 540	Mathematical Linguistics	3
LING 558	Ancient Mayan Hieroglyphs	3
MATH 115	Reasoning with Data: Navigating a Quantitative World	3
MATH 116	Intuitive Calculus	3
MATH 117	Aspects of Finite Mathematics	3
MATH 118	Aspects of Modern Mathematics	3
MATH 119	Introduction to Mathematical Modeling	3
MATH 130	Precalculus Mathematics	3
MATH 152	Calculus for Business and Social Sciences	3
MATH 210	Mathematical Tools for Data Science	3
MATH 231	Calculus of Functions of One Variable I[H]	4
MATH 232	Calculus of Functions of One Variable II[H]	4
MATH 233	Calculus of Functions of Several Variables[H]	4
MATH 235	Mathematics for Data Science	4
MEJO 379	Advertising and Public Relations Research	3
MEJO 479	Market Intelligence[H]	3
MEJO 570	Data Driven Journalism	3

NAVS 301	Naval Ships Engineering Systems	3
NAVS 302	Naval Weapon Systems	3
NSCI 419	Behavioral Endocrinology	3
PHIL 105	How to Reason and Argue: An Introduction to Critical Thinking	3
PHIL 155	Truth and Proof: Introduction to Mathematical Logic[H]	3
PHIL 157	Logic and Decision Theory[H]	3
PHIL 251	Inductive Logic and the Scientific Method	3
PHIL 357	Induction, Probability, and Confirmation	3
PHIL 455	Symbolic Logic	3
PHIL 456	Advanced Symbolic Logic	3
PHYS 55	First-Year Seminar: Introduction to Mechatronics	4
PHYS 101	Basic Concepts of Physics	4
PHYS 114	General Physics I: For Students of the Life Sciences	4
PHYS 115	General Physics II: For Students of the Life Sciences	4
PHYS 118	Introductory Calculus-based Mechanics and Relativity[H]	4
PHYS 119	Introductory Calculus-based Electromagnetism and Quanta[H]	4
PHYS 231	Physical Computing[H]	4
PLAN 363	Personal Finance, Wealth Building, and Public Policy	3
PLAN 364	Personal Finance II: Investing and Public Policy	3
PLCY 460	Quantitative Analysis for Public Policy[H]	4
PLCY 505	Data Science for Public Policy and Decision Making	4
POLI 209	Analyzing Public Opinion[H]	3
POLI 281	Data in Politics I: An Introduction	3
POLI 287	Strategy and International Relations	3
POLI 288	Strategy and Politics	3
POLI 439	Analyzing European Public Opinion	3
PSYC 115	Reasoning with Data: Navigating a Quantitative World	3
PSYC 210	Statistical Principles of Psychological Research[H]	3
PSYC 535	Programming for Psychologists: Computational Tools for Psychological Research	3
PWAD 287	Strategy and International Relations	3
SOCI 180	Introduction to Global Population Health	3
SOCI 251	Research Methods	3

SOCI 252	Data Analysis	3
STOR 113	Decision Models for Business and Economics	3
STOR 115	Reasoning with Data: Navigating a Quantitative World	3
STOR 120	Foundations of Statistics and Data Science	4
STOR 151	Introduction to Data Analysis	3
STOR 155	Introduction to Data Models and Interference	3
STOR 215	Foundations of Decision Sciences	3
STOR 235	Mathematics for Data Science	4
STOR 305	Introduction to Decision Analytics	3
STOR 315	Discrete Mathematics for Data Science	4
STOR 320	Introduction to Data Science	4

[H]Honors version available. An honors course fulfills the same requirements as the nonhonors version of that course. Enrollment and GPA restrictions may apply.

T. Ohio State University – College of Arts and Sciences

https://math.osu.edu/undergrad/non-majors/ge-new-gen-mathqr-or-data-analysis-requirements

GE New (GEN) – Math/ QR or Data Analysis Requirements

The seven universal categories of the Foundations component of GE-N introduce students to academic disciplines and their modes of inquiry. All students are required to complete *one course* in each of the seven categories. The following degree requirements apply to students who began as a regularly enrolled student at Ohio State during ***Autumn term 2022 or later.***

NOTE: Your degree program may require a specific course to fulfill this requirement. Please confirm your program's curriculum through your academic advisor and/or running your degree audit.

Mathematical and Quantitative Reasoning or Data Analysis (3-5 credit hours)*

Students will be able to apply quantitative or logical reasoning and/or mathematical/ statistical methods to understand and solve problems and will be able to communicate their results.

- AEDECON 2005
- ANIMSCI 2260
- ASTRON 3350
- CHEM 2210, 2210H
- COMLDR 3537
- CSE 1111, 2111
- ECON 3400
- ENR 2000
- GEOG 2200.01, 2200.02
- HCS 2260
- INTSTDS 3400

• LING 2001, 2051, 3802, 2051H, 3802H
• MATH 1116, 1120, 1121, 1130, 1131, 1140, 1141, 1148, 1149, 1150, 1151, 1152, 1156, 1161.01, 1161.02, 1181H
• PHILOS 1500, 1501, 1520, 2500, 2500
• PHYSICS 3700
• POLITSC 3780, 4781, 3780H
• SOCIOL 3549, 3549
• STAT 1350.01, 1350.02, 1430.01, 1430.02, 1450.01, 1450.02, 2450.01, 2450.02, 2480.01, 2480.02, 3450.01, 3450.02, 3460, 3470.01, 3470.02, 4202, 5301, 5302, 1430H

**Mathematics 1060 and 1075 are remedial and do not count toward the CH minimum requirement for a degree*

Additional mathematics courses may be necessary to fulfill your major or pre-major requirements.

Ohio State University
https://classes.osu.edu/#/?q=&client=class-search-ui&p=1&class-attribute=ge2&sort=subject&gen-categories=GEN%20Foundation:%20Math%20%26%20Quant%20Reason%20(or%20Data%20Anyl)&campus=col&term=1248#top-nav
Math and Quantitative Reasoning Courses

AEDECON 2005	Data Analysis for Agribusiness and Applied Economics	3
ANIMSCI 2260	Data Analysis and Interpretation for Decision Making	3
ASTRON 3350	Methods of Astronomical Observation and Data Analysis	3
CHEM 2210	Analytical Chemistry I: Quantitative Analysis	5
COMLDR 3537	Data Analysis in the Applied Sciences	3
CSE 1111	Introduction to Computer-Assisted Problem Solving	3
CSE 2111	Modeling and Problem Solving with Spreadsheets and Databases	3
ECON 3400	The Analysis and Display of Data	3
ENR 2000	Natural Resources Data Analysis	3
GEOG 2200.01	Mapping Our World	3
INTSTDS 3400	The Analysis and Display of Data	3
LING 2001	Language and Formal Reasoning	3
LING 2051	Analyzing the Sounds of Language	3
MATH 1116	Excursions in Mathematics	3
MATH 1120	Precalculus with Review I	5
MATH 1130	College Algebra for Business	4
MATH 1131	Calculus for Business	5

MATH 1140	Calculus with Review I	4
MATH 1148	College Algebra	4
MATH 1149	Trigonometry	3
MATH 1150	Precalculus	5
MATH 1151	Calculus I	5
MATH 1152	Calculus II	5
MATH 1156	Calculus for the Biological Sciences	5
MATH 1181H	Honors Calculus I	5
PHILOS 1500	Introduction to Logic	3
PHILOS 1501	Introduction to Logic and Legal Reasoning	3
PHILOS 1520	Probability, Data, and Decision Making	3
PHILOS 2500	Symbolic Logic	3
PHYSICS 3700	Experimental Physics Instrumentation and Data Analysis Lab	3
POLITSC 3780	Data Literacy and Data Visualization	3
POLITSC 4781	Data Analysis in Political Science I	3
PUBHBIO 2210	Biostatistics for Public Health Research	3
SOCIOL 3540	Statistics in Sociology	3
STAT 1350.01	Elementary Statistics	3
STAT 1350.02	Elementary Statistics	3
STAT 1430.01	Statistics for Business Sciences	4
STAT 1430.02	Statistics for Business Sciences	4
STAT 1450.01	Introduction to the Practice of Statistics	3
STAT 1450.02	Introduction to the Practice of Statistics	3
STAT 2450.01	Introduction to Statistical Analysis I	3
STAT 2480.01	Statistics for the Life Sciences	3
STAT 2480.02	Statistics for the Life Sciences	3
STAT 3450.01	Basic Statistics for Engineers	2
STAT 3450.02	Basic Statistics for Engineers	2
STAT 3470.01	Introduction to Probability and Statistics for Engineers	3
STAT 3470.02	Introduction to Probability and Statistics for Engineers	3
STAT 4202	Introduction to Mathematical Statistics II	4
STAT 5301	Intermediate Data Analysis I	4

U. Pennsylvania State University

https://senate.psu.edu/curriculum/policies-rules-for-undergraduate-instruction-and-curriculum/140-00-general-education/

Baccalaureate Degree Requirements in the General Education Program

The General Education program consists of 45 credits distributed among four components: Foundations (15 credits) in Writing/Speaking and Quantification; Knowledge Domain Breadth (15 credits) in the Natural Sciences, Arts, Humanities, Social and Behavioral Sciences, and Health and Wellness; Integrative Studies (6 credits), through completion of Inter-domain and/or other designated coursework; and Exploration (9 credits) through completion of additional coursework across particular knowledge domains, and/or the study of world language.

Each approved course is identified in the *Undergraduate Degree Programs Bulletin* and the Course Catalog by descriptive suffixes/ attributes as follows:

Foundations (15 credits) Build a basis of effective communication and quantitative literacy

Foundations courses must be completed with a grade of "C" or better. Courses may not be Integrative Studies/Inter-domain

- WRITING/SPEAKING (9 credits)
  Courses designated with the GWS attribute satisfy this component.
- QUANTIFICATION (6 credits)
  Courses designated with the GQ attribute satisfy this component. (3-6 credits are selected from mathematics, applied mathematics, and statistics; 3 credits may be selected from computer science or symbolic logic.)

Breadth in Knowledge Domains (15 credits) Practice applying a specific way of constructing knowledge to examine a topic.

Students must complete 3 credits in each the Knowledge Domain; courses may not be Integrative Studies/ Inter-domain.

- NATURAL SCIENCES (3 credits)
  Courses designated with the GN attribute satisfy this component.
- ARTS (3 credits)
  Courses designated with the GA attribute satisfy this component.
- HUMANITIES (3 credits)
  Courses designated with the GH attribute satisfy this component.
- SOCIAL AND BEHAVIORAL SCIENCES (3 credits)
  Courses designated with the GS attribute satisfy this component.
- HEALTH AND WELLNESS (3 credits)
  Courses designated with the GHW attribute satisfy this component.

Integrative Studies (6 credits) Practice synthesizing knowledge from different perspectives to examine a topic.

- **INTER-DOMAIN**
  Courses designated with the General Education-Integrative: Inter-domain attribute satisfy this requirement. (The suffix of N or Q (honors) is commonly used for identification purposes.)

Exploration (9 credits) Follow intellectual curiosity to deepen or widen learning

- Select 3 credits from courses with the GN attribute. This may be completed with inter-domain courses.
- Select 6 credits from courses with the GA, GH, GN, GS, or General Education Integrative: Inter-domain attributes and may include 3 credits of World Language course work beyond the 12th credit level or the requirements for the student's degree program, whichever is higher.

The General Education program extends the concept of flexibility to all aspects of the degree program. Penn State wants students to use General Education as an opportunity to experiment and explore, to take academic risks, to discover, and to learn. A student may:

1. Substitute a 200- to 499-level course in an area of General Education for a course found on the General Education list. For example, a student may take a 400-level course in history and use it to meet the General Education requirement satisfied by a comparable lower-level history course.

2. Substitute 3 units of a World Language course at the 12th credit level of proficiency or higher that exceed the student's minimum degree requirements in either of the Foundation areas (GWS or GQ) of General Education.

Pennsylvania State University
https://senate.psu.edu/curriculum/policies-rules-for-undergraduate-instruction-and-curriculum/190-00-general-education-course-designations-and-criteria/
General Education Foundations Course Criteria

QUANTIFICATION (GQ)

In Quantification (GQ) fields, students practice and master basic mathematical and statistical skills of lifelong value in solving real world problems. Students should learn to apply mathematical skills appropriate to solve such problems. (Senate Agenda March 15, 2016)

To help students achieve GQ goals and master foundational quantification skills, the university provides GQ coursework and an appropriate learning environment that will:

- *Provide experience in assessing and interpreting quantitative data and information*
- *Guide students to recognize patterns, establish relations, exercise conceptual thinking, develop problem-solving skills, and think logically and critically*
- *Support students in their efforts to draw accurate and useful conclusions; make informed decisions based on quantitative analysis; and use basic mathematical and statistical skills to solve conceptual problems.*
    - *GQ Student Learning Criteria. Upon successful completion of the General Education Quantification (GQ) requirement, students should have increased their abilities to:*

- *Use mathematical, statistical, or computational models, principles, and processes to integrate, synthesize, generalize, or make judgments about real world problems*
- *Recognize patterns, establish mathematical relations, apply problem-solving skills, and think logically and critically*
- *Develop, explore, analyze, and reason about multi-variable relationships using quantitative tools*
- *Use probability to reason and make judgments based on data that exhibit variability*
- *Communicate and explain mathematical and statistical ideas.*

Pennsylvania State University
https://bulletins.psu.edu/undergraduate/general-education/course-lists/quantification/
Quantification Courses

These courses have been approved as General Education Quantification courses. This course list is updated periodically. Descriptions and learning criteria for General Education Quantification courses can be found in the Foundation and Knowledge Domains section.

AGBM 106	Agribusiness Problem Solving	3
CMPSC 101	Introduction to Programming	3
CMPSC 200	Programming for Engineers with MATLAB	3
CMPSC 201	Programming for Engineers with C++	3
CMPSC 203	Introduction to Spreadsheets and Databases	4
CMPSC 208	Technical Game Development	3
CRIMJ 260	Statistical Analysis for the Social Sciences	3
DA 101	Introduction to Data Analytics	3
EDPSY 101	Analysis and Interpretation of Statistical Data in Education	3
EME 210	Data Analytics for Energy Systems	3

AGBM 106	Agribusiness Problem Solving	3
GAME 250	Technical Game Development	3
GAME 251	2D Game Programming	3
GEOSC 210	Geoscience Data Analytics	3
HDFS 200	Quantitative Skills for Human Services	3
HM 350	Hospitality Revenue and Profit Optimization	3
KINES 384	Biomechanics	3
MATH 21	College Algebra with Analytic Geometry with Applications I	3
MATH 22	College Algebra With Analytic Geometry and Applications II	3
MATH 26	Plane Trigonometry and Applications of Trigonometry	3
MATH 31	Mathematics of Music	3
MATH 32	Math for Allied Health Professions	3
MATH 33	Mathematics for Sustainability	3
MATH 34	The Mathematics of Money	3
MATH 35	General View of Mathematics	3
MATH 36	Insights Into Mathematics	3

AGBM 106	Agribusiness Problem Solving	3
MATH 37	Finite Mathematics	3
MATH 38	Elementary Linear Algebra	3
MATH 41	Trigonometry and Analytic Geometry	4
MATH 81	Technical Mathematics I	3
MATH 82	Technical Mathematics II	3
MATH 83	Technical Calculus	4
MATH 97N	Special Topics - InterDomain	1-9
MATH 110	Techniques of Calculus I	4
MATH 111	Techniques of Calculus II	2
MATH 140	Calculus With Analytic Geometry I	4
MATH 140B	Calculus and Biology I	4
MATH 140E	Calculus with Engineering Applications I	4
MATH 140G	Calculus with Earth and Mineral Sciences Applications I	4
MATH 140H	Honors Calculus with Analytic Geometry I	4
MATH 141	Calculus with Analytic Geometry II	4
MATH 141B	Calculus and Biology II	4

AGBM 106	Agribusiness Problem Solving	3
MATH 141E	Calculus with Engineering Applications II	4
MATH 141G	Calculus with Earth and Mineral Sciences Applications II	4
MATH 141H	Honors Calculus with Analytic Geometry II	4
MATH 197N	Special Topics - InterDomain	1-9
MATH 200	Problem Solving in Mathematics	3
MATH 201	Problem Solving in Mathematics II	3
MATH 210	Calculus with Engineering Technology Applications	3
MATH 211	Intermediate Calculus and Differential Equations with Applications	3
MATH 220	Matrices	2-3
MATH 220H	Honors Matrices	2-3
MIS 204	Introduction to Management Information Systems	3
PHIL 12	Symbolic Logic	3
PSYCH 200	Elementary Statistics in Psychology	4
SCM 200	Introduction to Statistics for Business	4
SCM 200H	Honors Introduction to Statistics for Business	4

AGBM 106	Agribusiness Problem Solving	3
STAT 100	Statistical Concepts and Reasoning	3
STAT 200	Elementary Statistics	4
STAT 240	Introduction to Biometry	3
STAT 250	Introduction to Biostatistics	3

V. Texas A&M University

https://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#text
University Core Curriculum

Mathematics – 6 SCH

Code	Title	Semester Credit Hours
MATH 135	Mathematics for Teachers I	3
MATH 136	Mathematics for Teachers II	3
MATH 140	Mathematics for Business and Social Sciences	3
MATH 142	Business Calculus	3
MATH 147	Calculus I for Biological Sciences	4
MATH 148	Calculus II for Biological Sciences	4
MATH 150	Functions, Trigonometry and Linear Systems	4
MATH 151	Engineering Mathematics I	4
MATH 152	Engineering Mathematics II	4
MATH 167	Explorations in Mathematics	3
MATH 168	Finite Mathematics	3
MATH 171	Calculus I	4

Code	Title	Semester Credit Hours
MATH 172	Calculus II	4
PHIL 240	Introduction to Logic	3
STAT 201	Elementary Statistical Inference	3

Course List

Courses in this category focus on quantitative literacy in logic, patterns, and relationships. Courses involve the understanding of key mathematical concepts and the application of appropriate quantitative tools to everyday experiences. The following skills will be addressed in the courses that comprise this area: critical thinking, communication, and empirical and quantitative.

W. University of Texas – Austin

https://catalog.utexas.edu/general-information/academic-policies-and-procedures/core-curriculum/

Core Curriculum*

Mathematics

One of the following courses:

> Advertising 309R

> African and African Diaspora Studies 302M, 350

> Educational Psychology 308

> Government 350K

> Mathematics 302, 305G, 408C, 408K, 408N, 408Q, 408R

> Philosophy 313

> Psychology 317L

> Sociology 317L

> Statistics and Data Sciences 301, 302F, 320E, 320H, 325H

Students in the Plan II Honors Program may complete this requirement by taking Mathematics 310P.

*The updates to Core Curriculum are pending approval of the Texas Higher Education Coordinating Board at the time of publication.

X. University of Washington – Seattle

https://advising.uw.edu/degree-overview/general-education/quantitative-and-symbolic-reasoning/

Reasoning

Although many students meet the requirement with a mathematics course, either because their intended majors require math or because they enjoy it, other students prefer to take a course that emphasizes reasoning or mathematical applications rather than traditional math.

Many students, for example, take economics to gain some insight into the world of business and finance. Many economic principles are expressed in mathematical terms, and in an introductory economics course you will apply simple mathematical principles to real-life situations.

Students interested in the study of language — students who may major or minor in a foreign language, English, communications, a behavioral science, or speech, for example — may wish to take linguistics, which sharpens awareness of verbal reasoning through the study of the history, nature, and structure of language.

We also offer courses entirely devoted to the study of reasoning and logical argument: PHIL 115: Practical Reasoning, and PHIL 120: Introduction to Logic.

Grade required

Any passing grade (0.7 or higher) is acceptable. The course may not be taken on the satisfactory/not satisfactory (S/NS) grading option.

Placement

The Math Department recommends taking the Guided Self-Pacement Assessment before registration in MATH 111, 120, and 124. For the prerequisites and registration restrictions of other Reasoning courses, consult the Course Descriptions.

Overlaps with other requirements

You may also count your Reasoning course toward the Areas of Inquiry requirement, in whichever Area it is listed. (A few Reasoning courses do not count toward Areas of Inquiry.) If your Reasoning course happens to be a W-course and/or is part of your major or minor, it can count toward those requirements as well.

AP and IB

There are several AP scores that can be used to satisfy the Reasoning requirement and can also be counted toward Areas of Inquiry. See the AP tables for more information.

There are several International Baccalaureate Higher Level exams that can be used to satisfy the Reasoning requirement and can also be counted toward Areas of Inquiry. See the IB tables for more information.

For transfer students

Any course that transfers as a "Q" course (for example, PSYCH Q-1XX), or any MATH X or STAT X course, will satisfy the Reasoning requirement if the course transfers as at least 4

credits. For other courses, consult an adviser. Bring a copy of the course syllabus or the description from the catalog of the college offering the course.

You can check the UW Equivalency Guide for Washington Community and Technical Colleges to determine which courses from Washington community colleges count toward the UW's Reasoning requirement; they are marked in the lists with an RSN notation.

Postbaccalaureate students
Postbaccalaureate students are not required to complete the Reasoning requirement.

Registering for Reasoning courses
You can generate a complete list of Reasoning courses with space still available using the MyPlan course search.

University of Washington – Seattle
https://myplan.uw.edu/course/#/courses?states=N4Igwg9grgTgzgUwMoIlYwMYAsQC4TAA6IAZhDALYAiqALqsbkSBqhQA5RyPGJ20AbBMQA0xAJZwUGWuIgA7FOmyNaMKAjEhJASXlw1UGeSWYsjEqgGItARw0wAnkjXj5Acx4gASkgByosQAJqiO3HjMAIwWVjbEAEwx1prEAMxJcSAALBkpIACsuVoAbLkAvloG6LQAovJBACriFAjhuADaAAwiAJzFnQC6Wm4YAlBBCH4KAPLsCIoIMnL6qup5I2MT3q2uMghB0rIKbYbr8qPjCAAKMAi3tnDb9uK3Qasaw%2BebCA0ARqiHZYnNaVLAQADu03kAkcVwwyEWRxWeEsyVBEKhML0VzucAUgOO5XR4IAQjAIYgisQsKgpGgzPt3nkgpJRhBEABBIIAN1Q532phUKNiCDKIBEIHB7DgeAIxHBbiCEIAEghxO4sLRGPkellUloFfUIVd2eIkdrUp14mKykA
Courses

Course Code	Course Title	Credits	Gen Ed Req
ACCTG 219	Essentials of Accounting	4 credits	RSN
ASTR 101	Astronomy	5 credits	NSc and RSN
ASTR 102	Introduction to Astronomy	5 credits	NSc and RSN
ASTR 150	The Planets	5 credits	NSc and RSN
ASTR 300	Introduction to Programming for Astronomical Applications	3 credits	RSN
BIO A 482	Human Population Genetics	5 credits	NSc and RSN
BIOL 359	Foundations in Quantitative Biology	3 credits	NSc and RSN
BIOST 310	Biostatistics for the Health Sciences	4 credits	RSN

Course Code	Course Title	Credits	Gen Ed Req
CFRM 405	Mathematical Methods for Quantitative Finance	3 credits	NSc and RSN
CHEM 120	Principles of Chemistry I	5 credits	NSc and RSN
CHEM 142	General Chemistry	5 credits	NSc and RSN
CHEM 143	Accelerated General Chemistry	6 credits	RSN
CHEM 145	Honors General Chemistry	5 credits	NSc and RSN
CHEM 152	General Chemistry	5 credits	NSc and RSN
CHEM 162	General Chemistry	5 credits	NSc and RSN
CS&SS 221	Statistical Concepts and Methods for the Social Sciences	5 credits	NSc and RSN
CSE 121	Introduction to Computer Programming I	4 credits	NSc and RSN
CSE 122	Introduction to Computer Programming II	4 credits	NSc and RSN
CSE 123	Introduction to Computer Programming III	4 credits	NSc and RSN
CSE 143	Computer Programming II	5 credits	NSc and RSN
CSE 154	Web Programming	5 credits	RSN
CSE 160	Data Programming	4 credits	NSc and RSN
CSE 311	Foundations of Computing I	4 credits	RSN
CSE 3127	Foundations of Computing II	4 credits	RSN
E E 201	Computer Hardware Skills	1 credits	RSN
ECE 401	Introduction to Research in Early Care and Education	5 credits	SSc and RSN and W
ECFS 401	Understanding Early Childhood and Family Studies Research	5 credits	SSc and RSN and W
ECON 200	Introduction to Microeconomics	5 credits	SSc and RSN
ECON 201	Introduction to Macroeconomics	5 credits	SSc and RSN

Course Code	Course Title	Credits	Gen Ed Req
EDPSY 490	Basic Educational Statistics	3 credits	NSc and RSN
EDPSY 490	Basic Educational Statistics	3 credits	NSc and RSN
ENVIR 301	Research Methods in Environmental Studies	5 credits	NSc and RSN
ENVIR 310	Data Analysis in Environmental Studies	5 credits	NSc and RSN
ESRM 250	Introduction to Geographic Information Systems in Forest Resources	5 credits	NSc and RSN
ESRM 304	Environmental and Resource Assessment	5 credits	NSc and RSN
ESS 469	Machine Learning in Geosciences	4 credits	RSN
GEOG 245	Geodemographics: Population, Diversity, and Place	5 credits	SSc and DIV and RSN
GEOG 317	Geographic Information and Spatial Analysis	5 credits	SSc and RSN
GEOG 360	GIS and Mapping	5 credits	SSc and RSN
GEOG 458	Advanced Digital Geographies	5 credits	SSc and RSN
I S 305	Essentials of Business Finance and Information Systems	5 credits	RSN
INFO 180	Introduction to Data Science	4 credits	RSN
INFO 201	Foundational Skills for Data Science	5 credits	RSN
INFO 310	Information Assurance and Cybersecurity	5 credits	SSc and RSN
INFO 330	Databases and Data Modeling	5 credits	RSN
INFO 340	Client-Side Development	5 credits	RSN
INFO 370	Core Methods in Data Science	5 credits	RSN
INFO 371	Advanced Methods in Data Science	5 credits	RSN

Course Code	Course Title	Credits	Gen Ed Req
INFO 474	Interactive Information Visualization	5 credits	A&H and RSN
INFO 478	Population Health Informatics	5 credits	SSc and RSN
LING 200	Introduction to Linguistics	5 credits	A&H or SSc, and RSN
MATH 111	Algebra with Applications	5 credits	NSc and RSN
MATH 112	Application of Calculus to Business and Economics	5 credits	NSc and RSN
MATH 120	Precalculus	5 credits	NSc and RSN
MATH 124	Calculus with Analytic Geometry I	5 credits	NSc and RSN
MATH 134	Accelerated [Honors] Calculus	5 credits	NSc and RSN
MATH 180	Topics in Mathematics for Non-Science Majors	3, 5 credits	NSc and RSN
PHIL 120	Introduction to Logic	5 credits	NSc or SSc, and RSN
PHYS 101	Introduction to Physics though Inquiry I	5 credits	NSc and RSN
PHYS 114	Mechanics	4 credits	NSc and RSN
PHYS 121	Mechanics	5 credits	NSc and RSN
PSYCH 315	Understanding Statistics in Psychology	5 credits	RSN
PSYCH 317	Introduction to Probability and Statistics for Psychology	5 credits	RSN
Q SCI 291	Calculus for Natural Systems I: Derivatives	5 credits	NSc and RSN
Q SCI 381	Introduction to Probability and Statistics	5 credits	NSc and RSN
QMETH 201	Introduction to Statistical Methods	4 credits	NSc and RSN
R E 408	Financial Modeling for Real Estate I	3 credits	RSN

Course Code	Course Title	Credits	Gen Ed Req
R E 413	Real Estate Finance and Investment	4 credits	RSN
SOC 221	Statistical Concepts and Methods for the Social Sciences	5 credits	NSc and RSN
STAT 220	Statistical Reasoning	5 credits	NSc and RSN
STAT 221	Statistical Concepts and Methods for the Social Sciences	5 credits	NSc and RSN
STAT 311	Elements of Statistical Methods	5 credits	NSc and RSN

Y. University of Wisconsin – Madison

https://policy.wisc.edu/library/UW-1059

General Education Requirements for Undergraduate Degrees

Quantitative Reasoning, 3 to 6 Credits

Quantitative Reasoning is the process of forming conclusions, judgments, or inferences from quantitative information. The Quantitative Reasoning requirement at UW–Madison has two parts: Part A and B. **Quantitative Reasoning A** courses provide students with skills in mathematics, computer science, statistics, or formal logic that are needed for dealing with quantitative information. The acquired skills are broad-based in order to have a positive impact on the readiness of students to take a Quantitative Reasoning B course in a variety of disciplines. **Quantitative Reasoning B** courses allow students to enhance their Quantitative Reasoning Proficiency in a more advanced setting, where they make significant use of quantitative tools in the context of other course material. To ensure timely completion of the undergraduate degree, students must demonstrate minimum math proficiency before they can enroll in a Quantitative Reasoning Part A course. They should complete Part A of the Quantitative Reasoning requirement by the end of their first year, and must complete Part A before they enroll in Part B.

***Quantitative Reasoning Part A**:*

An introductory course in college-level mathematics, computer science, statistics, or formal logic that is intended to prepare students for more advanced work in a disciplinary context.

Learning Outcomes

- Solve problems using quantitative information and the tools of college-level mathematics, computer science, statistics or formal logic
- Draw conclusions using quantitative information and the tools of college-level mathematics, computer science, statistics or formal logic

- Develop models and/or interpret data and/or devise algorithm using quantitative information and the tools of college-level mathematics, computer science, statistics or formal logic

Quantitative Reasoning Part A Requirement

Can be satisfied by approved college work while in high school, AP test scores, placement testing, or taking a 3-credit course at UW–Madison with a Quantitative Reasoning A designation.

***Quantitative Reasoning Part B**:*

In the disciplinary or interdisciplinary context of a course designed to build on the tools of college-level mathematics, computer science, statistics, or formal logic.

Learning Outcomes

- Manipulate quantitative information to create models, and/or devise solutions to problems using multi-step arguments, based on and supported by quantitative information
- Evaluate models and arguments using quantitative information
- Express and interpret in context models, solutions, and/or arguments using verbal, numerical, graphical, algorithmic, computational, or symbolic techniques

Quantitative Reasoning Part B Requirement

Can be satisfied by taking a designated QR-B course of at least 3 credits in a variety of fields of study which enhances students' proficiency in this domain. Students are encouraged to select a course in keeping with their interests or to satisfy other requirements for their major or degree program.

Identifying Courses That Meet General Education Requirements

The university offers hundreds of courses that meet the requirements described above. Students should consider their own interests and check with their advisor when deciding which courses to complete. Many undergraduate programs of study have breadth requirements that go beyond these basic university-wide requirements.

The following language is used in the UW–Madison course listings to indicate how courses count toward satisfying the communication, quantitative reasoning, and ethnic studies portions of the General Education Requirements. Courses that satisfy these requirements are also tagged with a mortarboard symbol.

- Communication Part A
- Communication Part B
- Ethnic Studies
- Quantitative Reasoning Part A

- Quantitative Reasoning Part B

Note: Some Communication Part B courses carry Communication B credit only at the lecture or section level and/or only in certain semesters; these courses will be indicated in the Schedule of Classes.

Course descriptions also include information about whether courses meet General Education Humanities, Natural Science, or Social Studies Breadth Requirements. (Click on course numbers in the *Guide* to see this information.) Students should also be aware that each school and college may, at its own discretion, designate additional courses that satisfy these requirements. For this reason, students should consult their advisors to obtain information about how these requirements are implemented in the school or college in which they are enrolled.

University of Wisconsin – Madison: must be a current student to view schedule of classes w/ list of courses meeting Quantitative A & B requirements.