

## Academic Advisement Report

UGRD.USCNC.MATHBS.APPL

Undergraduate Career

College of Science Program

Mathematics Major (BS)

Applied Emphasis

Requirement Term: Fall 2023

### MAIN Campus at TUCSON Location

A focus on applied mathematics prepares you to enter the job market with an undergraduate degree or to attend graduate school for science or engineering. Applied mathematicians use mathematical models to solve complex problems. Students earning a Bachelor of Science or Bachelor of Arts in Mathematics with an Applied Mathematics emphasis engage in interdisciplinary study with core mathematics courses and a minor that is independent of the Department of Mathematics. They master a variety of mathematical problem-solving methods. Upon graduation, students are primed to apply their quantitative and computational knowledge and logical thinking skills across industries like engineering, technology, natural science, manufacturing, business and government. Others choose to further their education in science or engineering graduate studies, taking on challenging research projects.

### LEARNING OUTCOMES

- Apply computational methods; Math majors should be able to apply computational methods and mathematical concepts to analyze scientific problems
- Apply mathematical models to current problems; Math majors should be able to critically evaluate and extend selected mathematical models in the current scientific literature.
- Create valid proofs; Students should be able to identify an appropriate proof strategy and almost always able to create a correct proof using multiple strategies as appropriate.
- Define Terms Precisely; Precision is essential in mathematics, and a crucial skill for math majors is to learn to define mathematical terms precisely.
- Effective communication of results; Math majors should be able to effectively communicate results to non-specialized audiences in written and verbal form.
- Recognize valid arguments; Logical rigor is a critical component of mathematical argumentation. We expect math majors to develop the ability to recognize when arguments are valid, and identify logical gaps and flaws.

### Undergraduate Graduation Requirements

(RG511)

All course work and requirements for this degree must be completed prior to the date the degree is awarded. The University of Arizona requirements to follow in this audit are required for graduation and awarding of the degree.

#### Curriculum:

1. The University of Arizona and the Arizona Board of Regents have sole discretion over all curricula changes.
2. Courses, programs & requirements may be suspended, deleted, restricted, or changed in any manner, at any time.
3. Students must remain currently informed about all policies & other info that bears on completing a degree.

#### Required Units:

Additional units will be required to complete this degree if a student:

- A) is admitted to the UA with deficiencies;
- B) changes their academic plan(s);
- C) fails to meet minimum course/plan requirements;
- D) ineffectively plans or fails to execute a course of study that leads directly to degree completion; or
- E) Candidates for a second bachelor's degree at The University of Arizona with a different award date than the first must earn no fewer than 30 units of University Credit in addition to the units required for the first degree, and must meet all requirements for the second degree.

The following requirements must be met for graduation.

#### Units Required and Cumulative GPA

(R2903/L10)

120 units are required at a 2.0 GPA. View the pdf report grid for units earned toward this degree and cumulative GPA.

Completing a second bachelor's degree at The University of Arizona requires no fewer than 30 units in addition to the units required for the first degree, and all requirements for the second degree must be met.

#### Upper Division Units

(R538/L40)

**Not Satisfied:** A minimum of 42 units of upper-division credit are required for this degree.

· **Units:** 42.00 required, 0.00 completed, 42.00 needed

Units in Residence

(R538/L60)

**Not Satisfied:** A minimum of 30 units in residence at The University of Arizona (excluding correspondence credit and credit by exam) is required.

· **Units:** 30.00 required, 0.00 completed, 30.00 needed

Upper Division Units in Residence

(R538/L65)

**Not Satisfied:** A minimum of 18 units of upper division credit in residence at the University of Arizona (excluding correspondence credit and credit by exam) is required.

· **Units:** 18.00 required, 0.00 completed, 18.00 needed

Correspondence and/or Exam Credit Limit

(R2075/L10)

**Satisfied:** A maximum of 60 units of Correspondence Credit and/or Exam Credit may apply toward graduation.

· **Units:** 0.00 completed

Non Degree Seeking Limit

(R838/L10)

A maximum of 15 units completed as a non-degree seeking student may be used for fulfilling undergraduate degree requirements.

Units exceeding this limit (shown below) must be subtracted from the units required towards the degree and graduation requirements.

Non-Community College Units

(R1227/L10)

**Not Satisfied:** Non-Community College Units: While there is no limit to the total number of units of course work that may be transferred from an accredited community college to The University of Arizona, no more than 64 units from a 2-year institution may be applied toward the requirements for a bachelor's degree. Therefore, to reach the required 120 units for a bachelor's degree, a minimum of 56 units must be completed from 1) coursework at a 4-year institution, 2) approved credit by examination (refer to UA Catalog for approved examinations and scores), or 3) any combination thereof.

· **Units:** 56.00 required, 0.00 completed, 56.00 needed

Success Course Limit

(R3297/L15)

**Satisfied:** No more than 3 units will apply toward a student's graduation requirements.

All Success courses taken can be seen below. Success Course units exceeding the 3 unit maximum must be subtracted from the total units, residency requirements and cumulative grade point average.

PE Activity Course Limit

(R3297/L25)

**Satisfied:** No more than 3 units will apply toward a student's graduation requirements.

All PE activity courses taken can be seen below. PE Activity units exceeding the 3 unit maximum must be subtracted from the total units, residency requirements and cumulative grade point average.

**General Education Entry Course**

(RG18614)

**Not Satisfied:** General Education Entry Course

Introduction to General Education course

(R16657/L10)

**Not Satisfied:** Introduces students admitted to the university as First-Year students to General Education, reflecting on learning, and developing an ePortfolio. (1 unit)

 · **Units:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

UNIV 101

**General Education Foundation Mathematics**

(RG1434)

**Not Satisfied:** General Education Foundation Mathematics

**GE Substantial Math Strand**

(R2612)

**Not Satisfied:** Complete 1 course.

GE Substantial Math Strand

(R2612/L10)

**Not Satisfied:** Complete 1 course.

 · **Units:** 2.67 required, 0.00 completed, 2.67 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

MATH 122B, MATH 125, MATH 129, MATH 215, MATH 223, MATH 254, MATH 313

**General Education Foundation Composition & Second Language**

(RG507)

**Overall Requirement Not Satisfied:** Undergraduate General Education Foundation Composition & Second Language

**Foundation Composition**

(R532)

**Not Satisfied:** Complete 1 of the following 4 Foundation Composition options:

1. 3 Course Foundation Composition Sequence
2. 2 Course Foundation Composition Sequence
3. Honors Composition with grade of C or higher
4. Honors Composition with a grade of D and Second Semester Composition.

Please note: Students who earn a grade of D in Honors Composition may choose to repeat the course in order to earn a higher grade to satisfy the requirement. Please consult with your major advisor.

Mid-Career Writing Assessment - Complete 2nd semester English Composition with a B grade or higher. Students who do not earn a grade of B or better in 2nd semester English Composition must also satisfy a college or department writing requirement. Consult your major advisor if you do not earn a grade of B in 2nd semester English Composition.

Option 1: Foundation Composition - 3 Course Sequence

(R532/L10)

**Not Satisfied:** Complete 3 courses. Complete ENGL 106 AND ENGL 101/107 AND ENGL 102/108.

· **Courses:** 3.00 required, 0.00 completed, 3.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

ENGL 1EIB, ENGL 101, ENGL 101A, ENGL 107, ENGL 107A, (\*\*\*) (###), ENGL 102, ENGL 108, ENGL 106

OR Option 2: Foundation Composition - 2 Course Sequence

(R532/L20)

**Not Satisfied:** Complete 2 courses. Complete ENGL 101/107 AND ENGL 102/108

· **Courses:** 2.00 required, 0.00 completed, 2.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

ENGL 1EIB, ENGL 101, ENGL 101A, ENGL 107, ENGL 107A, (\*\*\*) (###), ENGL 102, ENGL 108

OR Option 3: Honors Composition

(R532/L40)

**Not Satisfied:** Complete 1 course with a C or better.

· **Courses:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type
	ENGL	109H						

**Courses Available**

ENGL 109H

**Foundation Second Language - Second Semester Proficiency**

(R521)

**Not Satisfied:** Credit will not be given for a course at an equivalent or lower level than prior language credit earned. Course must be taken for a grade, not as pass/fail. Third semester or higher courses used to fulfill this requirement may also be used to fulfill other requirements. A grade of C or higher is required in the course that satisfies the second language requirement.

Demonstrate second semester proficiency in a second language by completing a sequence of courses through a second semester or higher level or by passing a language proficiency examination at the second semester level or higher.

Second Semester Language Course

(R521/L10)

**Not Satisfied:** Complete 1 course with a grade of C or better.

Not from: FREN 325, 391, 393, 396H, 399, 399H, 414, 425, 432, 433, 434, 442, 443, 448, 453, GRK 412, 422, HIST 465D, ITAL 330A, 330B, 330C, 330D, 393, 393H 399, 399H, 410, 431, 496A, 498H, LAT 411, 413, 414, 415, 421, 425, 426, PORT 325A, 430, 440, 449, RSSS 305, 405A, 405B, SPAN 204C, 303, 305, 340, 343, 350, 360, 371A 371B 375, 381, 382, 397W, 399, 400, 401, 402, 403, 406A, 410, 411, 412, 414, 423A, 423B, 433, 435, 436, 437, 438, 441, 442, 445, 446, 447, 448, 452, 453, 455A,

457, 458, 459, 465A, 465C, 465D, 465E, 471, 472, 473, 482, TTE 414.

· **Courses:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

### Courses Available

AIS 104B, AIS 307B, ARB 102, CHN 102, CRL 102, FREN 102, FREN 112, GER 102, GRK 102, GRK 104, GRK 112, ITAL 102, ITAL 102Z, JPN 102, JUS 103B, KOR 102, LAS 305A, LAT 102, LAT 112, LING 104B, LING 307B, MENA 103B, PORT 102, PORT 305A, PORT 325A, PRS 102, RSSS 102, SERP 370B, SPAN 102, SPAN 103, SPAN 205, TURK 102

### **General Education Core Requirements**

(R18630)

**Overall Requirement Not Satisfied:** General Education Core Requirements

### GE Exploring Perspectives

(R16656)

**Overall Requirement Not Satisfied:** Choose one course from each category.

### Artist Courses

(R16656/L10)

**Not Satisfied:** Complete 1 course, 3 units total. Transfer students with quarter system credits may satisfy requirement with 1 course and 2.67 units.

- **Units:** 2.67 required, 0.00 completed, 2.67 needed
- **Courses:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

### Courses Available

AFAS 218, AFAS 245, AFAS 373, ARC 160C1, ARC 303, ARH 320, ARH 322, ART 150B2, ART 242, ART 358, DNC 100, DNC 101, DNC 144A, DNC 152C, DNC 178A, DNC 179A, EAS 240, ENGL 201, ENGL 209, ENGL 210, ENGL 215, ENGL 245, ENGL 248B, FREN 245, FREN 284, FREN 373, FTV 352, HNRS 216, HNRS 222, ISTA 401, ITAL 330B, JPN 245, LAS 322, LAS 337, MAS 337, MUS 101A, MUS 109, MUS 328, MUS 337, MUS 360, PAH 150A1, RELI 240, SPAN 160C1, TAR 100, TAR 303

### Humanist Courses

(R16656/L50)

**Not Satisfied:** Complete 1 course, 3 units total. Transfer students with quarter system credits may satisfy requirement with 1 course and 2.67 units.

- **Units:** 2.67 required, 0.00 completed, 2.67 needed
- **Courses:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

### Courses Available

AFAS 150B1, AFAS 160A1, AFAS 160D1, AFAS 200, AIS 212, APAS 250, ARH 201, ARH 316B, ARH 329, ART 329, CLAS 160D2, CLAS 329, CLAS 335, EAS 160A1, EAS 160A3, EAS 250, ENGL 160A1, ENGL 160D2, ENGL 265, ENGL 266, ENGL 280, ENGL 300, ENGL 375, FREN 280, FREN 375, FTV 325, FTV 375, GEOG 205, GER 160D1, GER 246,

GER 273, GER 325, GER 371, HIST 160A2, HIST 160B1, HIST 160C1, HIST 203, HIST 207, HIST 277A, HIST 277B, HIST 316, HUMS 150B1, ITAL 250A, ITAL 250C, ITAL 330D, JUS 301, MAS 265, MENA 160A1, MENA 277A, MENA 277B, MENA 334, PAH 150A2, PAH 150A3, PAH 160D2, PAH 160D4, PAH 200, PAH 220, PAH 221, PAH 330, PHIL 150B1, PHIL 160D1, PHIL 210, PHIL 213, PHIL 220, PHIL 262, POL 203, RELI 160A1, RELI 160D4, RELI 160D7, RELI 212, RELI 277A, RELI 280, RELI 325, RELI 334, RSSS 150B1, RSSS 160C2, RSSS 315, RSSS 325, RSSS 340, RSSS 345, SPAN 150B1

Natural Scientist Courses

(R16656/L90)

**Not Satisfied:** Complete 1 course, 3 units total. Transfer students with quarter system credits may satisfy requirement with 1 course and 2.67 units.

- **Units:** 2.67 required, 0.00 completed, 2.67 needed
- **Courses:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

AGTM 170A1, ANTH 160D2, ANTH 170C1, ANTH 261, ASTR 170B1, ASTR 206, ATMO 170A1, BE 170A1, BE 170A2, CHEM 151, CHEM 152, CHEM 161, CHEM 162, ECOL 170C1, ECOL 170C2, ENVS 170A1, ESOC 210, GC 170A1, GEOG 230, GEOS 170A1, GEOS 212, GEOS 218, GEOS 220, HWRS 170A1, MSE 220, NSC 170C1, NSC 375, PHYS 141, PHYS 161H, PLS 170C1, PLS 170C2, PLS 307, PTYS 206, RNR 170C1

Social Scientist Courses

(R16656/L130)

**Not Satisfied:** Complete 1 course, 3 units total. Transfer students with quarter system credits may satisfy requirement with 1 course and 2.67 units.

- **Units:** 2.67 required, 0.00 completed, 2.67 needed
- **Courses:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

AED 150A1, AED 408, AFAS 260, AFAS 280, AFAS 376, ANTH 150A1, ANTH 150B1, ANTH 160A1, ANTH 280, ANTH 317, ANTH 339, AREC 210, AREC 217, CLAS 160D3, ECON 200, EDP 150B1, EDP 200, ENGL 160D1, ENGL 322, FIN 150C1, FITS 204, FREN 150B1, FREN 150C1, GEOG 150B2, GEOG 222, GEOG 250, GEOG 367, GER 150A1, GER 244, GWS 252, GWS 448, GWS 459, HDFS 200, HED 350, HIST 150C1, HIST 150C2, HIST 150C3, HIST 252, HIST 307, HNRS 219, HPS 178, HPS 200, HUMS 376, ITAL 150B1, ITAL 150C1, ITAL 160B1, ITAL 160D1, LAS 150B1, LAS 150B2, LAS 204, LAS 230, LAS 280, LAS 312, LAS 317, LAW 389, LING 320, LING 322, MAS 150B2, MAS 150C1, MAS 317, MAS 365, PA 241, PA 312, PHP 150C, PHP 308, POL 202, POL 204, POL 312, PORT 280, PPEL 210, PSY 101, PSY 150A1, PSY 200, SERP 200, SERP 416, SOC 150B1, SOC 150C2, SOC 222, SOC 241, SOC 260, SOC 324, SOC 325, SOC 367, SOC 448, SOC 459, SPAN 280, TLS 150B1, TLS 150C1, TLS 310, TLS 331

GE Building Connections

(R16658)

**Not Satisfied:** Building Connections brings together knowledge and modes of thinking from two or more disciplines and/or perspectives. Choose three courses (9 units minimum).

Building Connections Courses

(R16658/L10)

**Not Satisfied:** Complete 3 courses, 9 units total. Transfer students with quarter system credits may satisfy requirements with 3 courses and 8.01 units.

- **Units:** 8.01 required, 0.00 completed, 8.01 needed
- **Courses:** 3.00 required, 0.00 completed, 3.00 needed



**Not Satisfied:** Students admitted to the university as First-Year students reflect on their General Education experience and complete their ePortfolio in the GE Capstone course. (1 unit)

· **Units:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

UNIV 301

**Additional Coursework** (RG521)

Courses listed in this section may include general elective credits, UA courses and transferable courses from other institutions. Consult with your advisor to determine if courses listed in this section may be used to fulfill a requirement or sub-requirement in your degree program.

Courses taken for Pass/Fail option can only count as elective credit. They cannot fulfill any General Education, Major, or Minor requirements.

**BS in Mathematics** (RG772)

**Overall Requirement Not Satisfied:** Will appear fully satisfied when student satisfies Mathematics Supporting Laboratory Science Coursework, Mathematics Application Coursework, Mathematics Computer Science, Math Major Core Requirements, and selects an emphasis. All emphases require a minimum of 15 units of 400-level coursework in the major.

The Bachelor of Science in Mathematics requires the same Core Mathematics courses as the BA; BS students must satisfy specialized supporting laboratory science and application course requirements.

Equivalent MATV courses may be available through UA South. For approved courses consult with your advisor.

**Mathematics Supporting Laboratory Science Coursework** (R1192)

**Overall Requirement Not Satisfied:** Will appear fully satisfied when student has satisfied two of the approved laboratory science courses.

Students seeking a BS in Mathematics must complete 2 of the following requirements. Choose from Chemistry, Physics, Biology, Physiology, and/or Geosciences.

Courses used to fulfill this requirement may also be used to fulfill other requirements.

Chemistry I (R1192/L2)

**Not Satisfied:** Complete 4 units from Chemistry 141 & (143 or 145), 151, 161 & 163, or 181

· **Units:** 4.00 required, 0.00 completed, 4.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

CHEM 141, CHEM 143, CHEM 145, CHEM 151, CHEM 161, CHEM 163, CHEM 181, Approved Transfer Course

Chemistry II (R1192/L5)

**Not Satisfied:** Complete 4 units from Chemistry 142 & (144 or 146), 152, 162 & 164, or 182



· **Units:** 4.00 required, 0.00 completed, 4.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

CHEM 142, CHEM 144, CHEM 146, CHEM 152, CHEM 162, CHEM 164, Approved Transfer Course

Geosciences

(R1192/L10)

**Not Satisfied:** Complete 1 course

· **Courses:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type
	GEOS	251						

**Courses Available**

GEOS 251

Geosciences

(R1192/L15)

**Not Satisfied:** Complete 1 course

· **Courses:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

GEOS 255, GEOS 302, GEOS 304, GEOS 308, GEOS 322

Biology I

(R1192/L20)

**Not Satisfied:** Complete 4 units

· **Units:** 4.00 required, 0.00 completed, 4.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

MCB 181L, MCB 181R, Approved Transfer Course, MCB 184

Biology II

(R1192/L25)

**Not Satisfied:** Complete 4 units

· **Units:** 4.00 required, 0.00 completed, 4.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

ECOL 182L, ECOL 182R, Approved Transfer Course

Physiology I

(R1192/L27)

**Not Satisfied:** Complete 1 course

· **Courses:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type
	PSIO	201						

**Courses Available**

PSIO 201

Physiology II

(R1192/L30)

**Not Satisfied:** Complete 1 course

· **Courses:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type
	PSIO	202						

**Courses Available**

PSIO 202

Introductory Mechanics

(R1192/L40)

**Not Satisfied:** Complete Introductory Mechanics Lecture with Lab

· **Units:** 4.00 required, 0.00 completed, 4.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

PHYS 139, PHYS 140, PHYS 141, PHYS 161H

Intro Optics and Thermodynamics

(R1192/L50)

**Not Satisfied:** Complete Introductory Thermodynamics & Optics with Lab

· **Courses:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

PHYS 142, PHYS 162H

Introductory Electricity and Magnetism with Lab

(R1192/L60)

**Not Satisfied:** Complete Introductory Electricity and Magnetism with Lab

· **Units:** 4.00 required, 0.00 completed, 4.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

PHYS 239, PHYS 240, PHYS 241, PHYS 261H

Mathematics Application Coursework

(R1217)

**Overall Requirement Not Satisfied:** Will appear fully satisfied when student has satisfied 3 units of non-math coursework with a prerequisite or corequisite of at least Calculus I (MATH 122B or higher).

Courses used to fulfill this requirement may also be used to fulfill other requirements.

This requirement does not apply to the Mathematics Education Emphasis.

Courses with Calculus Prerequisite

(R1217/L10)

**Not Satisfied:** Consult with the advisor to discuss approved courses. Up to 3 units of internship credit (MATH 493) may apply to the application course requirement.

· **Units:** 3.00 required, 0.00 completed, 3.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

AREC 304, AREC 464, AREC 479, ASTR 250, ATMO 430, ATMO 436A, ATMO 469A, ATMO 469B, BAT 201, BE 201, BE 284, BE 428, BE 481A, BE 481B, BIOC 462A, BIOC 462B, BIOC 466, BME 214, BME 481B, CE 214, CHEE 201, CHEE 202, CHEE 297, CHEE 481A, CHEE 481B, CHEM 161, CHEM 162, CHEM 325, CHEM 404A, CHEM 480A, CHEM 480B, CHEM 481, CSC 345, CSC 355, CSC 422, CSC 433, CSC 436, CSC 437, CSC 444, CSC 445, CSC 453, CSC 460, CSC 477, CSC 483, CSCV 345, ECE 201R, ECE 404, ECOL 302, ECOL 419, ECOL 447, ECOL 496N, ECON 332, ECON 361, ENGR 211C, ENGR 211E, ENGR 211P, ENGR 265, ENVS 420, ENVS 470, ENVS 479, GEOG 463, GEOS 322, GEOS 356, GEOS 419, GEOS 432, GEOS 434A, GEOS 440, GEOS 469, GEOS 479, HWRS 349A, HWRS 421, HWRS 431, HWRS 460A, HWRS 479, ISTA 421, ISTA 450, MATH 493, MCB 303, MCB 480, MSE 222, MSE 345, MSE 404, MSE 415, OPTI 201R, OPTI 404, OPTI 495B, PHYS 140, PHYS 143, PHYS 240, PHYS 241, PHYS 261H, PSIO 303, PSIO 305, PSIO 472, PTYS 407, RCSC 216, RNR 479, SIE 250, SIE 265, WFSC 444, WFSC 445, WSM 460A, PHYS 142, PHYS 162H, PHYS 141, PHYS 161H

**Mathematics Supporting Computer Science**

(R15810)

**Not Satisfied:** Will appear fully satisfied when student satisfies Computer Science requirements.

Computer Science

(R15810/L10)

**Not Satisfied:** Complete 1 course. One of the following courses is recommended for most students: CSC 110, ISTA 130, ECE 175, or CHEE 205; other options may require additional prerequisites and/or a major or minor declared in another subject.

Courses used to fulfill this requirement may also be used to fulfill other requirements.

· **Courses:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

BME 225, CHEE 205, CSC 110, CSC 120, CSC 250, ECE 175, GEOS 280, ISTA 130, MIS 301, NROS 311, PHYS 305

**Math Major Core Requirements**

(R1173)

**Overall Requirement Not Satisfied:** Will appear fully satisfied when student satisfies Calculus I and other Core Courses.

Calculus I

(R1173/L10)

**Not Satisfied:** Complete 1 course

· **Courses:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

MATH 122B, MATH 125

Core Courses

(R1173/L50)

**Not Satisfied:** Complete 5 courses. Credit allowed for only one course in each pair: MATH 313 or MATV 313, MATH 323 or MATV 323, MATH 355 or MATV 355. MATV courses are only available to UA South students.

· **Courses:** 5.00 required, 0.00 completed, 5.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

MATH 129, MATH 223, MATH 313, MATH 323, MATH 355, MATV 313, MATV 323, MATV 355

**Emphasis in Applied Mathematics**

(RG17553)

**Overall Requirement Not Satisfied:** Will appear fully satisfied when student satisfies Applied Emphasis course requirements, Graduation Requirements, and declares a minor.

Equivalent MATV courses may be available through UA South. For approved courses consult with your advisor.

Required Applied Math Modeling Course

(R16894/L10)

**Not Satisfied:** Complete 1 course.

· **Courses:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

MATH 481, MATH 485

Applied Required Course

(R16894/L15)

**Not Satisfied:** Complete 1 course.

· **Courses:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type
	MATH	422						

**Courses Available**

MATH 422

**Applied Emphasis Options**

(R16646)

**Not Satisfied:** Will appear fully satisfied when student satisfies Option 1, 2, OR 3.

Option 1: Differential Equations

(R16646/L20)

**Not Satisfied:** Complete Math 454 and 456

· **Courses:** 2.00 required, 0.00 completed, 2.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type
	MATH	454						
	MATH	456						

**Courses Available**

MATH 454, MATH 456

OR Option 2: Probability and Statistics

(R16646/L30)

**Not Satisfied:** OR Complete Math 464 and 466

· **Courses:** 2.00 required, 0.00 completed, 2.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type
	MATH	464						
	MATH	466						

**Courses Available**

MATH 464, MATH 466

OR Option 3: Numerical Analysis

(R16646/L40)

**Not Satisfied:** OR Complete Math 475A and one course from the list below

· **Courses:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type
	MATH	475A						

**Courses Available**

MATH 475A

AND Option 3: Courses to Pair With Numerical Analysis

(R16646/L50)

**Not Satisfied:** Complete MATH 475A and one course from MATH 413, 424, 443, 445, 447, 454, 456, 464, 475B, 481, 485

· **Courses:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

MATH 413, MATH 424, MATH 443, MATH 445, MATH 447, MATH 454, MATH 456, MATH 464, MATH 475B, MATH 481, MATH 485

**Applied Fifth Course**

(R1180)

**Overall Requirement Not Satisfied:** Will appear fully satisfied when the additional advisor-approved course and 15 units of 400-level coursework are satisfied.

Additional Course

(R1180/L50)

**Not Satisfied:** Complete one 400-level MATH course in consultation with your math faculty advisor. You may choose from the pre-approved list. If you prefer to select another course, you may do so **ONLY** if approved by your math faculty advisor.

· **Units:** 3.00 required, 0.00 completed, 3.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

**Courses Available**

DATA 412, DATA 468, MATH 412, MATH 413, MATH 424, MATH 454, MATH 456, MATH 464, MATH 468, MATH 475A,

MATH 481, MATH 485, MATH 488

Major 400-level Upper Division

(R1180/L60)

**Not Satisfied:** A minimum of 15 units of 400-level upper-division major coursework must be completed.

· **Units:** 15.00 required, 0.00 completed, 15.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

Applied Emphasis Graduation Requirements

(R1181)

**Overall Requirement Not Satisfied:** Will appear fully satisfied when student satisfies Mid Career Writing Assessment, Major GPA, Residency requirement, and Major Upper Division unit requirement.

Mid Career Writing Assessment

(R1181/L3)

**Not Satisfied:** Complete 2nd semester English Composition with a B grade or higher. Students who do not earn a grade of B or higher in 2nd semester English Composition must also satisfy a college or department writing requirement. Consult your major advisor if you do not earn a grade of B or higher in 2nd semester English Composition.

· **Courses:** 1.00 required, 0.00 completed, 1.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

Major GPA

(R1181/L10)

**Satisfied:** A minimum 2.0 GPA is required in the major coursework.

· **GPA:** 2.000 required, 0.000 completed

Major Units

(R1181/L15)

**Not Satisfied:** A minimum of 34 units must be completed in the major.

· **Units:** 34.00 required, 0.00 completed, 34.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

Major Residency

(R1181/L20)

**Not Satisfied:** A minimum of 18 units in the major must be taken at the University of Arizona.

· **Units:** 18.00 required, 0.00 completed, 18.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

Major Upper Division

(R1181/L30)

**Not Satisfied:** A minimum of 18 units of upper-division major coursework must be completed.

· **Units:** 18.00 required, 0.00 completed, 18.00 needed

Term	Subject	Catalog Nbr	Course Title	Grade	Units	RptCd	RqDes	Type

Minor Required

(R16193)

**Not Satisfied:** A minor outside of the Mathematics Department is required for this major. Consult with your advisor to select a minor or discuss other options such as selecting a second major.