# 2018 - 2019 Major Map
## Computational Mathematical Sciences, BS

**School/College:** The College of Liberal Arts and Sciences  
**Location:** Tempe campus  
LACMSBS

### Term 1: 0 - 14 Credit Hours  
**Critical course signified by $\heartsuit$**  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\heartsuit$ CSE 110: Principles of Programming with Java (CS)</td>
<td>3</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\heartsuit$ MAT 270: Calculus with Analytic Geometry I (MA)</td>
<td>4</td>
<td>C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
|  | ENG 101 or ENG 102: First-Year Composition OR  
ENG 105: Advanced First-Year Composition OR  
ENG 107 or ENG 108: First-Year Composition | 3 | C | |
|  | LIA 101: Student Success in the College of Liberal Arts and Sciences | 1 | | |
|  | Elective | 3 | | |

Maintain 2.50 GPA in Critical Tracking Courses.

**Term hours subtotal:** 14

### Term 2: 14 - 31 Credit Hours  
**Critical course signified by $\heartsuit$**  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\heartsuit$ CSE 205: Object-Oriented Programming and Data Structures (CS)</td>
<td>3</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\heartsuit$ MAT 271: Calculus with Analytic Geometry II (MA)</td>
<td>4</td>
<td>C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
|  | ENG 101 or ENG 102: First-Year Composition OR  
ENG 105: Advanced First-Year Composition OR  
ENG 107 or ENG 108: First-Year Composition | 3 | C | |
|  | Science Sequence Course AND Natural Science - Quantitative (SQ) | 4 | C | |
|  | Literacy and Critical Inquiry (L) ( PHI 103 recommended) | 3 | | |
|  | Complete ENG 101 OR ENG 105 OR ENG 107 course(s). | | | |

Maintain 2.50 GPA in Critical Tracking Courses.

**Minimum 2.00 GPA in MAT and STP.**

**Term hours subtotal:** 17

### Term 3: 31 - 47 Credit Hours  
**Critical course signified by $\heartsuit$**  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\heartsuit$ CSE 240: Introduction to Programming Languages</td>
<td>3</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\heartsuit$ MAT 272: Calculus with Analytic Geometry III (MA)</td>
<td>4</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\heartsuit$ MAT 275: Modern Differential Equations (MA)</td>
<td>3</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CLAS Science and Society Elective</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Humanities, Arts and Design (HU) AND Historical Awareness (H)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Complete First-Year Composition requirement.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Complete Mathematics (MA) requirement.</td>
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</tr>
</tbody>
</table>

Maintain 2.50 GPA in Critical Tracking Courses.

**Minimum 2.00 GPA in MAT and STP.**

**Term hours subtotal:** 16

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* An SAT, ACT, Accuplacer, IELTS, or TOEFL score determines placement into first-year composition courses  
* Mathematics Placement Assessment score determines placement in mathematics course  
* ASU 101 or college-specific equivalent  
* First-Year Seminar required of all freshman students  
* Select your career interest area and play me3@ASU.
### Term 4 47 - 63 Credit Hours

**Critical course signified by ⚫**

<table>
<thead>
<tr>
<th>Hours</th>
<th>Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 300: Mathematical Structures (L)</td>
<td>3</td>
<td>Grade of B or better strongly correlated with timely graduation</td>
</tr>
<tr>
<td>MAT 342: Linear Algebra OR MAT 343: Applied Linear Algebra</td>
<td>3</td>
<td>Meet with your academic advisor to discuss options for adding a minor, certificate, or concurrent major to your degree program.</td>
</tr>
<tr>
<td>Science Sequence Course AND Natural Science - Quantitative (SQ) or Natural Science - General (SG)</td>
<td>4</td>
<td>Develop professional skills</td>
</tr>
<tr>
<td>Humanities, Arts and Design (HU) AND Cultural Diversity in the U.S. (C)</td>
<td>3</td>
<td>Upper division MAT/STP courses should be taken through the Tempe campus, unless approved by a SoMSS advisor.</td>
</tr>
<tr>
<td>Social-Behavioral Sciences (SB) AND Global Awareness (G)</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Maintain 2.50 GPA in Critical Tracking Courses.

**Term hours subtotal:** 16

### Term 5 63 - 77 Credit Hours

**Necessary course signified by ⭐**

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 370: Intermediate Calculus OR MAT 371: Advanced Calculus I</td>
<td>3</td>
<td>Minimum grade of C required in all MAT and STP classes; grade of B or better strongly correlated with timely graduation</td>
</tr>
<tr>
<td>MAT 420: Scientific Computing</td>
<td>3</td>
<td>Meet with your academic advisor to discuss post-graduation plans, e.g. graduate school, career preparation.</td>
</tr>
<tr>
<td>Science Sequence Course</td>
<td>4</td>
<td>Develop your professional online presence.</td>
</tr>
<tr>
<td>Elective</td>
<td>4</td>
<td>Upper division MAT/STP courses should be taken through the Tempe campus, unless approved by a SoMSS advisor.</td>
</tr>
<tr>
<td>Minimum 2.00 GPA in MAT and STP.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Term hours subtotal:** 14

### Term 6 77 - 93 Credit Hours

**Necessary course signified by ⭐**

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 421: Applied Computational Methods (CS)</td>
<td>3</td>
<td>Minimum grade of C required in all MAT and STP classes; grade of B or better strongly correlated with timely graduation</td>
</tr>
<tr>
<td>Science Sequence Course</td>
<td>4</td>
<td>Upper division MAT/STP courses should be taken through the Tempe campus, unless approved by a SoMSS advisor.</td>
</tr>
<tr>
<td>Social-Behavioral Sciences (SB)</td>
<td>3</td>
<td>Meet with a career counselor from ASU Career Services for a review of your resume and interviewing tips for success.</td>
</tr>
<tr>
<td>Complete 2 courses: Upper Division Elective</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Complete Cultural Diversity in the U.S. (C) AND Global Awareness (G) AND Historical Awareness (H) course(s).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum 2.00 GPA in MAT and STP.</td>
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<td></td>
</tr>
</tbody>
</table>

**Term hours subtotal:** 16

### Term 7 93 - 108 Credit Hours

**Necessary course signified by ⭐**

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Division Internship/Research/Advanced Science Course</td>
<td>3</td>
<td>Minimum grade of C required in all MAT and STP classes; grade of B or better strongly correlated with timely graduation</td>
</tr>
<tr>
<td>Upper Division Advanced Courses</td>
<td>3</td>
<td>Upper division MAT/STP courses should be taken through the Tempe campus, unless approved by a SoMSS advisor.</td>
</tr>
<tr>
<td>Upper Division CLAS Science and Society Elective</td>
<td>3</td>
<td>Meet with your academic advisor to discuss post-graduation plans, e.g. graduate school, career preparation.</td>
</tr>
<tr>
<td>Upper Division Elective</td>
<td>3</td>
<td>Gather professional references.</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Minimum 2.00 GPA in MAT and STP.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Term hours subtotal:** 15

### Term 8 108 - 120 Credit Hours

**Necessary course signified by ⭐**

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete 2 courses: Upper Division Advanced Courses</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>
Upper Division Humanities, Arts and Design (HU) OR Upper Division Social-Behavioral Sciences (SB) 3

Upper Division Elective 3

Minimum 2.00 GPA in MAT and STP.

Term hours subtotal: 12

- All students pursuing a B.S. or B.S.P. degree in the College of Liberal Arts and Sciences must complete two courses from the Science and Society list found at https://clas.asu.edu/advising-and-academic-services/science-and-society. At least one of the two courses must be upper division. Students must earn a C or better in the courses, and no more than one of the two can also be used to simultaneously fill a requirement of the major, minor or related area. Science and Society courses cannot also be used to fill the general studies HU, SB, SQ or SG requirements.

The Computational Mathematical Sciences degree requires students to select and complete two one-year lecture and lab combinations. Upon advisor approval, two advanced courses for which the first one-year science and lab sequence is a prerequisite may be substituted for the second one-year science and lab sequence.

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Science Sequence Courses


BIO 181: General Biology I (SQ) AND BIO 182: General Biology II (SG)

CHM 113: General Chemistry I (SQ) AND CHM 116: General Chemistry II (SQ)

CHM 114: General Chemistry for Engineers (SQ) AND CHM 231: Elementary Organic Chemistry (SQ) AND CHM 235: Elementary Organic Chemistry Laboratory (SQ)

CHM 117: General Chemistry for Majors I (SQ) AND CHM 111: General Chemistry Laboratory for Majors I (SQ) AND CHM 118: General Chemistry for Majors II (SQ) AND CHM 112: General Chemistry Laboratory for Majors II (SQ)

GLG 101: Introduction to Geology I (Physical) (SQ) AND GLG 103: Introduction to Geology I-Laboratory (SQ) AND GLG 102:

Internship, Research, or Advanced Science

AST Upper Division Elective

BIO 320: Fundamentals of Ecology

BME Upper Division Elective

CEE Upper Division Elective

CHE Upper Division Elective

CHM Upper Division Elective

CIS Upper Division Elective

CSE Upper Division Elective

EEE Upper Division Elective

GLG 305: Dynamic Earth

GLG 321: Mineralogy

GLG 362: Geomorphology

GLG 4** Elective

IEE Upper Division Elective

MAE Upper Division Elective

MAT 484: Internship

MAT 493: Honors Thesis (L)

MAT 495: Supervised research in mathematical sciences

Advanced Courses

MAT 351: Mathematical Methods for Genetic Analysis (CS)

MAT 415: Introduction to Combinatorics

MAT 416: Introduction to Graph Theory

MAT 419: Introduction to Linear Optimization (CS)

MAT 423: Numerical Analysis I (CS)

MAT 425: Numerical Analysis II (CS)

MAT 447: Cryptography I

MAT 451: Mathematical Modeling (CS)

MAT 452: Introduction to Chaos and Nonlinear Dynamics

MAT 461: Applied Complex Analysis

MAT 462: Applied Partial Differential Equations

MAT 475: Differential Equations

MAT 476: Partial Differential Equations

STP 420: Introductory Applied Statistics (CS)

STP 421: Probability

STP 425: Stochastic Processes

STP 427: Mathematical Statistics

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Minimum grade of C required in all MAT and STP classes; grade of B or better strongly correlated with timely graduation.

Upper division MAT/STP courses should be taken through the Tempe campus, unless approved by a SoMSS advisor.

Meet with your academic advisor for final degree check and apply for graduation through your My ASU.

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Hide Course List(s)/Track Group(s)
Notes:

- Please keep in mind that the applicability of a specific transfer course toward an ASU degree program depends on the requirements of the department, division, college or school in which you are enrolled at ASU. Transfer agreements that guarantee the completion of university level requirements do not necessarily meet college and major requirements. Please consult with an advisor for more information.

**Total Hours:** 120

**Upper Division Hours:** 45 minimum

**Major GPA:** 2.00 minimum

**Cumulative GPA:** 2.00 minimum

**Total hrs at ASU:** 30 minimum

**Hrs Resident Credit for Academic Recognition:** 56 minimum

**Total Community College Hrs:** 64 maximum

**Total College Residency Hrs:** 12 minimum

**General University Requirements Legend**

General Studies Core Requirements:
- Literacy and Critical Inquiry (L)
- Mathematical Studies (MA)
- Computer/Statistics/Quantitative Applications (CS)
- Humanities, Arts and Design (HU)
- Social-Behavioral Sciences (SB)
- Natural Science - Quantitative (SQ)
- Natural Science - General (SG)

**General Studies Awareness Requirements:**
- Cultural Diversity in the U.S. (C)
- Global Awareness (G)
- Historical Awareness (H)

**First-Year Composition**

General Studies designations listed on the major map are current for the 2018 - 2019 academic year.

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**Notes:**

- Introduction to Geology II (Historical) (SG & H) AND GLG 104: Introduction to Geology II-Laboratory (SG)
- PHY 150: Physics I (SQ) AND PHY 151: Physics II (SQ)
- MIC Upper Division Elective
- MSE Upper Division Elective
- PHI 413: Advanced Symbolic Logic
- PHY Upper Division Elective
- PLB Upper Division Elective
- STP 429: Experimental Statistics (CS)