BS in Mathematics and Computer Science

Program Codes:
20FT1438BS

The BS in Mathematics and Computer Science curriculum is designed for students who seek careers in computer science and/or computer related fields requiring a strong mathematical background. The program is flexible and provides the students with a well-rounded education. Students who successfully complete the program are awarded the degree of Bachelor of Science in Mathematics and Computer Science.

Degree Requirements

To earn a Bachelor of Science in Mathematics and Computer Science degree from UIC, students must complete university, college, and department degree requirements. The Department of Mathematics, Statistics, and Computer Science degree requirements are outlined below. Students should consult the College of Liberal Arts and Sciences section for additional degree requirements and college academic policies.

Summary of Requirements

Requirements for the Curriculum

| Requirements for the Curriculum | 120 |

Total Hours | 120 |

Requirements for the Curriculum

The Requirements for the Curriculum include courses necessary to complete the General Education and Writing-in-the-Discipline requirements described in the College of Liberal Arts and Sciences section.

Required Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 160</td>
<td>Academic Writing I: Writing in Academic and Public Contexts</td>
<td>3</td>
</tr>
<tr>
<td>ENGL 161</td>
<td>Academic Writing II: Writing for Inquiry and Research</td>
<td>3</td>
</tr>
<tr>
<td>Foreign language (the equivalent of two years of a single language at the college level)</td>
<td>0-16</td>
<td></td>
</tr>
<tr>
<td>Exploring World Cultures course a</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Understanding the Arts course a</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Understanding the Individual and Society course a</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Understanding the Past course a</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Understanding U.S. Society course a</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Analyzing the Natural World two laboratory courses a,b</td>
<td>8-10</td>
<td></td>
</tr>
<tr>
<td>MATH 180</td>
<td>Calculus I c,d</td>
<td>4</td>
</tr>
<tr>
<td>MATH 181</td>
<td>Calculus II c</td>
<td>4</td>
</tr>
<tr>
<td>MATH 210</td>
<td>Calculus III c</td>
<td>3</td>
</tr>
<tr>
<td>MATH 215</td>
<td>Introduction to Advanced Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>MCS 260</td>
<td>Introduction to Computer Science c</td>
<td>4</td>
</tr>
<tr>
<td>MCS 275</td>
<td>Programming Tools and File Management</td>
<td>4</td>
</tr>
<tr>
<td>MATH 300</td>
<td>Writing for Mathematics e</td>
<td>1</td>
</tr>
<tr>
<td>MATH 310</td>
<td>Applied Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>or MATH 320</td>
<td>Linear Algebra I</td>
<td></td>
</tr>
<tr>
<td>MCS 320</td>
<td>Introduction to Symbolic Computation</td>
<td>3-4</td>
</tr>
<tr>
<td>or MCS 360</td>
<td>Introduction to Data Structures</td>
<td></td>
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</tbody>
</table>

Electives

Select four electives from mathematics, statistics, and mathematical computer science courses, related to computer science at the 200-level or higher. At least 6 hours must be at the 400-level, excluding MATH 496, MCS 496, and STAT 496.

Electives to complete degree requirement of 120 hours | 31-50 |

Total Hours | 120 |

a Students should consult the General Education (http://catalog.uic.edu/ucat/degree-programs/general-education) section of the catalog for a list of approved courses in this category.

b Students are encouraged to choose a natural sciences sequence of PHYS 141 and PHYS 142; CHEM 122, CHEM 123, CHEM 124, and CHEM 125; CHEM 116 and CHEM 118; or BIOS 100 and BIOS 101. Any of these sequences would fulfill the LAS General Education requirement of two laboratory courses within the Analyzing the Natural World General Education category.

c This course is approved for the Analyzing the Natural World General Education category.

d MATH 180 also fulfills the LAS Quantitative Reasoning requirement.

e MATH 300 fulfills the LAS Writing-in-the-Discipline requirement.

Recommended Plan of Study

A recommended basic sequence of courses is listed below. Students who do not place into MATH 180 should expect to take summer session courses and possibly take longer than four years to graduate. Students who have taken AP exams in calculus or computer science need to see a departmental advisor for correct placement.

Course | Title | Hours |
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>First Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall Semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 180</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>Foreign Language</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>ENGL 160</td>
<td>Academic Writing I: Writing in Academic and Public Contexts</td>
<td>3</td>
</tr>
<tr>
<td>General Education Core course</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td>Spring Semester</td>
<td></td>
<td>14-15</td>
</tr>
<tr>
<td>MATH 181</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MCS 260</td>
<td>Introduction to Computer Science</td>
<td>4</td>
</tr>
<tr>
<td>Foreign Language</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>ENGL 161</td>
<td>Academic Writing II: Writing for Inquiry and Research</td>
<td>3</td>
</tr>
<tr>
<td>Second Year</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Fall Semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 210</td>
<td>Calculus III</td>
<td>3</td>
</tr>
<tr>
<td>MATH 215</td>
<td>Introduction to Advanced Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>Foreign Language</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Analyzing Natural World course</td>
<td></td>
<td>4-5</td>
</tr>
<tr>
<td></td>
<td>Hours</td>
<td>14-15</td>
</tr>
</tbody>
</table>
Spring Semester
MATH 310 Applied Linear Algebra 3
or MATH 320 Linear Algebra I
MCS 275 Programming Tools and File Management 4
Analyzing Natural World course 4-5
Foreign Language 4

Hours 15-16

Third Year
Fall Semester
MCS 320 Introduction to Symbolic Computation 3-4
or MCS 360 Introduction to Data Structures
MATH 300 Writing for Mathematics 1
Elective 3-4
General Education Core course 3
General Education Core course 3-4

Hours 13-14

Spring Semester
Electives 6
MATH, MCS, or STAT elective 3-4
General Education Core course 3
General Education Core course 3

Hours 15-16

Fourth Year
Fall Semester
MATH, MCS, or STAT elective 3-4
MATH, MCS, or STAT elective 3-4
Electives 10-12

Hours 16-20

Spring Semester
MATH, MCS, or STAT elective from list 3-4
Electives 13-15

Hours 16-19

Total Hours 120

Elective Course Suggestions for MCS Majors
A minor is strongly recommended in: physics, biology, economics, or from the College of Engineering, except computer science.

It is strongly recommended that at least three of the MATH or MCS electives be chosen from one of the following clusters:

Discrete Mathematical Computer Science Courses
MCS 361 Discrete Mathematics 3
MCS 421 Combinatorics 3
MCS 423 Graph Theory 3
MCS 425 Codes and Cryptography 3
MCS 441 Theory of Computation I 3
MATH 430 Formal Logic I 3
MATH 435 Foundations of Number Theory 3

MATH 436 Number Theory for Applications 3

Algorithms and Programming Courses
MCS 360 Introduction to Data Structures 4
MCS 401 Computer Algorithms I 3
MCS 415 Programming Language Design 3
MCS 451 Object-Oriented Programming in C++ 3
MCS 481 Computational Geometry 3

Computational Methods Courses
MATH 220 Introduction to Differential Equations 3
MATH 480 Applied Differential Equations 3
MATH 481 Applied Partial Differential Equations 3
MCS 320 Introduction to Symbolic Computation 3
MCS 471 Numerical Analysis 3
MCS 472 Introduction to Industrial Math and Computation 3

Statistical Computation Courses
STAT 381 Applied Statistical Methods I 3
STAT 401 Introduction to Probability 3
STAT 481 Applied Statistical Methods II 3
STAT 486 Statistical Consulting 3
STAT 471 Linear and Non-Linear Programming 3

Actuarial Science Courses
STAT 381 Applied Statistical Methods I 3
STAT 401 Introduction to Probability 3
STAT 481 Applied Statistical Methods II 3
STAT 461 Applied Probability Models I 3
or STAT 411 Statistical Theory 3
STAT 475 Mathematics and Statistics for Actuarial Sciences I 3

Strongly recommended:
ECON 120 Principles of Microeconomics 4
ECON 121 Principles of Macroeconomics 4
ECON 220 Microeconomics: Theory and Applications 3
ECON 221 Macroeconomics in the World Economy: Theory and Applications 3

Electives:
ECON 300 Econometrics 3
ECON 450 Business Forecasting Using Time Series Methods 3