BACHELOR OF SCIENCE IN MATHEMATICS

Degree requirement

Current BS in Applied Math majors have options to stay with Applied or change to BS in Math major. The new BS in Math gives students flexibility in Science Requirement highlighted on page 2 of this document.

The new BS in Math is especially beneficial for students considering double major in Math with Physics, Biology, Chemistry, Computer Science and Economics.

Feel free to contact me or your academic adviser with any questions.

With best wishes,

Yu Song, Chair
IU South Bend Mathematics
yusong@iusb.edu
**B.S. in Mathematics** (updated on 12/11/2015)

<table>
<thead>
<tr>
<th><strong>MATHEMATICS COURSES:</strong></th>
<th><strong>MATHEMATICS REQUIRED COURSES COMMON TO BOTH TRACKS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH-M 215 Calculus I (5 cr.)</td>
<td>MATH-M 215 Calculus I (5 cr.)</td>
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<tr>
<td>MATH-M 216 Calculus II (5 cr.)</td>
<td>MATH-M 216 Calculus II (5 cr.)</td>
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<tr>
<td>MATH-M 301 Linear Algebra and Applications</td>
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<tr>
<td>MATH-M 311 Calculus III (5 cr.)</td>
<td>MATH-M 311 Calculus III (5 cr.)</td>
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<tr>
<td>MATH-M 343 Introduction to Differential Equations with Applications I</td>
<td>MATH-M 343 Introduction to Differential Equations with Applications I</td>
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<tr>
<td>MATH-M 391 Introduction to Mathematical Reasoning</td>
<td>MATH-M 391 Introduction to Mathematical Reasoning</td>
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<tr>
<td>MATH-M 413 Introduction to Analysis 1</td>
<td>MATH-M 413 Introduction to Analysis 1</td>
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<tr>
<td>MATH-M 463 Introduction to Probability Theory 1 (4 cr.)</td>
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**31 credit hours**

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<tr>
<th><strong>MATHEMATICS COURSES REQUIRED FOR PURE TRACK</strong></th>
<th><strong>MATHEMATICS COURSES REQUIRED FOR APPLIED TRACK</strong></th>
</tr>
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<tbody>
<tr>
<td>MATH-M 403 Introduction to Modern Algebra 1</td>
<td>MATH-M 403 Introduction to Modern Algebra 1</td>
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<tr>
<td>one of MATH-M 404, 405, or 409</td>
<td>one of MATH-M 404, 405, or 409</td>
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<tr>
<td>one of MATH-M 414, 415, or 420</td>
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</table>

**9 credit hours**

1. Total number of mathematics course hours: 46
2. Two Additional Courses from those listed below OR an upper division or graduate course approved by the Department Chair.
   - *Suggested for Pure Track*
     - MATH-M 427 Combinatorics
     - MATH-M 435 Introduction to Differential Geometry
     - MATH-M 436 Introduction to Geometries
   - *Suggested for Applied Track*
     - MATH-M 344 Introduction to Differential Equations with Applications II
     - MATH-M 448 Mathematical Models and Applications 2
     - MATH-M 451 The Mathematics of Finance
     - MATH-M 472 Numerical Analysis 2
3. Required Cognate Discipline Courses (10-12 cr.)
   Complete one of the following sequences.

   (a) Physics
       PHYS-P 221 Physics 1 (5 cr.)
       PHYS-P 222 Physics 2 (5 cr.)

   (b) Biology
       BIOL-L 101 Introduction to Biological Sciences 1 (5 cr.)
       BIOL-L 102 Introduction to Biological Sciences 2 (5 cr.)

   (c) Chemistry
       CHEM-C 105 Principles of Chemistry I (3 cr.)
       CHEM-C 125 Experimental Chemistry I (2 cr.)
       CHEM-C 106 Principles of Chemistry II (3 cr.)
       CHEM-C 126 Experimental Chemistry II (2 cr.)

   (d) Computer Science
       CSCI-C 201 Computer Programming II (4 cr.)
       CSCI-C 151 Multiuser Operating Systems (2 cr.)
       CSCI-C 243 Introduction to Data Structures (4 cr.) [note: prereq CSCI-C 151 and CSCI-C 201]

   (e) Economics
       ECON-E 103 Introduction to Microeconomics
       ECON-E 104 Introduction to Macroeconomics
       ECON-E 321 Intermediate Microeconomic Theory [note: prereq ECON-E 103]
       ECON-E 322 Intermediate Macroeconomic Theory [note: prereq ECON-E 104]
4. Other Requirements

(a) Fundamental Literacies (17 cr)  (one course from each of the seven areas below)

- Writing — ENG-W 131 Elementary Composition 1 (required)
- Critical Thinking — CSCI-C 250 Discrete Structures (suggested)
- Oral Communication — SPCH-S 121 Public Speaking (required)
- Visual Literacy — Select from approved course list
- Quantitative Reasoning — Fulfilled with required mathematics courses
- Information Literacy (1 cr.) — COAS-Q 110 Introduction to Information Literacy (1 cr.) (required)
- Computer Literacy — CSCI-C 101 Computer Programming I (4 cr.) (required)

(b) Common Core Courses (12 cr.)  (One course from each of the following four areas. At least one must be completed at the 300-level.)

- The Natural World — MATH N-390 Mathematics as a Human Activity (required)
- Human Behavior and Social Institutions — Select from approved course list
- Literary and Intellectual Traditions — Select from approved course list
- Art, Aesthetics, and Creativity — Select from approved course list

(c) Contemporary Social Values (8 cr)  (Complete one course from each of the following three areas.)

- Non-Western Cultures — Select from approved course list
- Diversity in United States Society — Select from approved course list
- Health and Wellness (2 cr.) — Select from approved course list

(d) World Languages (0-6 cr.)  (Successful completion of a second-semester language class, designated as 102 in the IU South Bend Bulletin.

The Department of World Language Studies (W.L.S.) offers a placement examination to determine into which semester a student should enroll and/or to qualify students for credit by examination. Students may earn up to 6 credit hours for testing out of any two of the language classes 101, 102, 203, or 204. For more details, see the Department of World Language Studies website.)

(e) Elective courses (19-31)  (Choose any number of courses from any number of disciplines to bring the total number of credits to 120 cr.)