PROGRAM C, B.A./B.S.
MATHEMATICS + Physics
2023

Department of Mathematics encourages students of other majors to take more math courses and attempt a B.A. or B.S. secondary major, or a secondary degree if your first major is outside CLAS, in mathematics. This will benefit your future career greatly as mathematics has become more and more important in technology and society. Math Program C offers a curricular path to achieve this goal.

Students of Physics major who declared math major for the first time in Fall 2023 or later at the UI must use this template. Students who declared math major by Summer 2023 at the UI may choose to follow this template or the previous template.

The coursework for Math Program C consists of two parts: math courses and courses from other departments. There are general course requirements as outlined on pp.1-2, while pre-approved specific course requirements for double Math + Physics major are given on p.3.

General Requirements

1. **Five core math courses**
   - Calculus I and Calculus II, 8 s.h.
     NOTE: Either sequence MATH:1550-1560 or MATH:1850-1860 is acceptable. The coverages of these two sequences are different so that students should not mix and match unless there is a strong need with good preparation. Advanced placement (AP), CLEP, and credits obtained through the Mathematics Incentive Program are acceptable for all or part of this calculus requirement.
   - MATH:2700 Introduction to Linear Algebra, 4 s.h.
   - MATH:2850 Calculus III, 4 s.h.
   - MATH:3720 Introduction to Abstract Algebra I, 4 s.h.
     or
     MATH:3770 Fundamental Properties of Spaces and Functions I, 4 s.h.
   - Higher-level math courses or engineering math courses may be used to substitute for core math courses if approved by the Math Department Director of Undergraduate Study in advance.
2. **Elective courses**
   - For a B.A. degree, all students must take at least 6 electives.
   - For a B.S. degree, all students must take at least 8 electives.
   - Each elective here must have at least 3 s.h. Combining lower semester-hour courses to satisfy one course requirement is not allowed.
3. **Mathematics elective courses**
   - For a B.A. degree, at least 3 of the 6 electives must be math courses as define here.
   - For a B.S. degree, at least 4 of the 8 electives must be math courses as define here.

- Mathematics (MATH) courses: MATH: 3600 or higher, but excluding 3700, 3750, 3995-3997, 4010, 4020, and 4120.
- Independent study, reading, topics, seminar, and project courses are not allowed unless approved by the Math Department Director of Undergraduate Study in advance.

4. **Upper-level math courses**
   - For a B.A. degree, at least 1 of the 3 math courses must be an upper-level math course.
   - For a B.S. degree, at least 2 of the 4 math courses must be upper-level math courses.
   - Upper-level math courses are MATH:3900 and MATH courses numbered 4000 or higher except MATH:4010, 4020, and 4120.
   - MATH courses numbered 6000 or above are not allowed unless approved by the Math Department Director of Undergraduate Study in advance.

5. **Other electives**
   - Pre-approved electives for Mathematics + Physics are listed on p.3.
   - If a student and their advisor select courses which are not listed on p.3 of this template, approval is required from Math Department Director of Undergraduate Study in advance.

6. **Residency requirement of the Math Department**
   - Every math major must earn at least 15 s.h. at the UI in courses offered by the Department of Mathematics or cross-listed with a MATH-prefixed course.

7. **Plan of study**
   - Every Program C student must file a Plan of Study before the start of their senior year. With the help of their advisor, a student prepares a list of courses as their Plan of Study according to Requirements 1-6 above. With advisor's approval, this Plan of Study is then submitted to the Math Department Director of Undergraduate Study for approval. Approved Plan of Study will be uploaded and appear in MyUI.
   - If a student needs to change courses, a new Plan of Study must be submitted.
   - Please use this [Fillable PDF Form for Plan of Study for Program C](#).

8. **Math Department and college's requirements**
   - Students earning a major or degree in mathematics must also satisfy the [Math Department's rules](#) and the [requirements of the College of Liberal Arts and Sciences](#).
   - More information about CLAS regulations can be found in the University of Iowa General Catalog.

Pre-approved Template for Mathematics + Physics 2023

1. **Required core math courses**
   - 5 core math courses (General Requirements #1, p.1).

2. **Elective courses for B.A.**
   - 6 electives, all from Groups I and II, are required.
   - Of these 6 electives, at least 3 must be math courses.
   - Of these 3 math courses, at least one must be an upper-level math course as define on p.2, #4 above.
   - Of these 6 electives, at least 3 must be from Group I of which 2 must be physics courses.

3. **Elective courses for B.S.**
   - 8 electives, all from Groups I and II, are required.
   - Of these 8 electives, at least 4 must be math courses.
   - Of these 4 math courses, at least 2 must be upper-level math courses as define on p.2, #4 above.
   - Of these 8 electives, at least 3 must be from Group I of which 2 must be physics courses.

4. **Group I: requires at least 3 courses of which at least 2 are physics courses**
   - PHYS:3710 Intermediate Mechanics
   - PHYS:3730 Statistical Physics
   - PHYS:3811 Electricity and Magnetism I
   - PHYS:3812 Electricity and Magnetism II
   - PHYS:3741 Introduction to Quantum Mechanics I
   - PHYS:3742 Introduction to Quantum Mechanics II
   - MATH:3600 Introduction to Ordinary Differential Equations
   - MATH:3800 Elementary Numerical Analysis
   - MATH:4200 Complex Variables (an upper-level math course)

5. **Group II:**
   - If both MATH:3720 and MATH:3770 are taken, one will be counted as a Core Math Course and the other will be counted as an elective.
   - Any upper-level math courses as defined on p.2, #4 above.
   - PHYS or ASTR courses numbered 3000 or higher that count toward an undergraduate major in Physics or Astronomy, excluding independent study, reading, topics, seminar, lab, and project courses unless approved by the Math Department Director of Undergraduate Study in advance.