

## **PROGRAM C, B.A./B.S. MATHEMATICS + DATA SCIENCE 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 Data Science 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. Only a few additional courses are required to earn a double major in Mathematics after completing a major in Data Science.

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 + Data Science 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 + Data Science 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 + Data Science 2023

### 1. Required core math courses

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

### 2. Elective courses for B.A.

- 6 electives beyond the courses listed in #1 above are required.
- At least 3 electives must be from Group I below.
- At least 3 electives must be from Group IIc and Group IIs together.
- Of the 3 electives from Group I, at least one must be an upper-level math course.
- Of the 3 electives from Group IIc and Group IIs together, at least one course must be chosen from each of Group IIc and Group IIs.
- Of the 3 electives from Group IIc and Group IIs together, at most one course can be below the 3000 level from each of Group IIc and Group IIs.

### 3. Elective courses for B.S.

- 8 electives beyond the courses listed in #1 are required.
- At least 4 electives must be from Group I.
- At least 2 electives must be from Group IIc with at most one course below the 3000 level.
- At least 2 electives must be from Group IIs with at most one course below the 3000 level.
- Of the 4 electives from Group I, at least 2 must be upper-level math courses.

### 4. Group I: math courses

- MATH: 3600 Introduction to Ordinary Differential Equations.
- 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.
- MATH:3800 Elementary Numerical Analysis
- Upper-level math courses as defined in #4, p.2.
- Recommended upper-level math courses:
  - MATH:4050 (fall),
  - 4060 (spring),
  - 4820 (spring), and
  - 5800-5810 (fall-spring).

### 5. Group IIc: computer science courses

- CS:1210, 2210, 2230, 3330, 4400, 4440, 4470, 5430, and 5630.

### 6. Group IIs: statistics courses

- STAT:2010, 3100, 3101, 3200, 3210, 4520, 4540, 4560, 4580, and 5810.