

# Essentials of the proposed interdisciplinary minor in Mathematical Biology

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The proposed interdisciplinary minor in Mathematical Biology provides Truman students the avenue to certify training in the interdisciplinary field of mathematical biology. It allows students and constituent departments a way to use existing courses and research projects to prepare students in this area. The proposed interdisciplinary minor also provides Truman State University the avenue to show prospective students that the Departments of Biology and of Mathematics & Computer Science provide students with training and preparation needed by industry and many graduate programs.

To earn an interdisciplinary minor in Mathematical Biology an undergraduate student will use an on-line portfolio to provide ongoing evidence of mastery of the following proficiencies:

**Data Acquisition:** acquiring data on biological phenomena in a lab, in the field, or both

**Modeling:** developing or applying mathematical models in a biological context

**Computation:** developing or applying computational tools in a biological context

**Statistical Analysis:** applying statistical tests to biological hypotheses

**Research:** investigating an open-ended question by conducting research at the intersection of the life and mathematical sciences

We regard the above as the interdisciplinary minor's outcome statements. Many existing courses in Biology, Mathematics, Computer Science, and Statistics will provide students with the experiences (course content, semester projects, *etc.*) they need earn the minor.

The portfolio approach will allow the minor to be very flexible. To assure a necessary degree of continuity in the program, the minor will also require that every student:

- will earn a minimum of 15 credit hours in residence at Truman with at least 9 credit hours at or above the 300-level, including
  - *Introduction to Mathematical Biology* (current co-listed as BIOL 345 and MATH 345; 3 credits)
  - at least two MABI seminar courses (1 credit each, to be created)
  - at least one credit-bearing interdisciplinary research experience (3 credits), where courses count toward the Biology, Mathematics, or Computer Science majors, minors, or their required support, with no more than two courses double-counted for the requirements of one of the student's majors, and
- will attend 10 or more meetings of the Mathematical Biology Seminar series (or related seminars) over two semesters.

Students will use a learning plan to craft a minor in which they will also provide a rationale for how their chosen courses and experiences create an integrated experience resulting in interdisciplinary training. A faculty member associated with the minor will advise them as they put their plan into action.

This interdisciplinary minor will be administered by an oversight committee consisting of two faculty from the Department of Mathematic and Computer Science and two faculty from the Department of Biology. These faculty will be selected from those participating in the Mathematical Biology program by their peers. This oversight committee will communicate with constituent departments but will report to the Director of Interdisciplinary Studies.

The proposal for the minor sets out an initial plan for oversight and administration. Faculty do understand that slight adjustments to the program will be made to better serve the students and faculty involved.