Mathematical & Statistical Modeling of Complex Systems Minor

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This minor focuses on training students in current quantitative modeling techniques for understanding complex systems. Complex Systems is a field at the intersection of social, behavioral, and biomedical sciences studying how different parts of a system and its environment interact and give rise to the collective dynamics of the system. This minor program is designed to prepare students for careers, which apply quantitative methodology to government organization, industries and research involving complex behavior and biomedical fields. The courses required in the minor are interdisciplinary crossing mathematics with public health, biology, chemistry, psychology and sociology.

University Core Curriculum Requirements

General Education Distribution Area	Cr. Hrs.
Fine Arts (FA)* 2 courses, from at least two of the following areas of study: Art, CMT (Mass Media or Theatre), Music (includes Dance).	6
Humanities (HU)* 3 courses, from at least two of the following areas of study: CMT (Communication), English, Linguistics. Philosophy, Women's and Gender Studies, World Languages and Cultures, (Note: No more than two foreign language courses may be used to fulfill this requirement.)	9
Behavioral/Social Sciences (SB)* 3 courses, from at least two of the following areas of study: African & African American Studies, Anthropology, Computer Science, Economics, Geography & Environmental Studies, History, Justice Studies, Latino & Latin American Studies, Political Science, Psychology, Sociology, Social Work	9
Natural Sciences (NS and NSL)** 3 courses, from at least two of the following areas of study; one course must have a laboratory component (NSL): Biology, Chemistry, Earth Science, Environmental Science, Physics (Note: If an FYE ANTH that counts as Natural Science is taken, only one Biology course may be used for Natural Science).	9

Engaged Learning Experiences

Students must complete, at Northeastern, three courses designated as Engaged Learning Experiences courses. One of the Engaged Learning Experiences courses must be at the 300-level, and one Engaged Learning Experiences course must be designated as "Boundary Crossing".

Discipline Specific (ELE-DS)
These courses have pre-requisites that are specific courses within a program of study. Discipline Specific courses give students a deeper understanding of how knowledge is created and applied in their field.

Boundary Crossing (ELE-X)
These are courses that cross disciplinary boundaries and/or cross boundaries through engagements outside the classroom or University allowing students to see how knowledge gained in one field might inform other fields or other aspects of society.

Math/Quantitative Reasoning (MA)
1 Math course, that has intermediate Algebra as prerequisite OR is a course listed on the General Education Distributive Learning List of Approved Courses. Any 3 hour college level math course, beyond Intermediate Algebra, meets this requirement.

* Majors in Fine Arts, Humanities or Social/Behavioral Sciences, may waive up to 6 credit hours of General Education requirements in the corresponding distribution area.

** Majors in Natural Sciences may waive up to 9 credit hours of General Education requirements in the Natural Sciences distribution area.

Students should also be aware of all other university requirements to obtain a degree - NEIU requirements (http://catalog.neiu.edu/graduation-requirements/bachelors-degree/)

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The program requires students to take 6 courses totaling 22-24 credit hours.

Code	Title	Hours
Required core courses		
MATH-187	Calculus I	4
MATH-202	Calculus II	4
MATH-275	Applied And Computational Statistics (minor advisor consultation required, MATH-334 is 3 crs.)	4
or MATH-334	Mathematical Statistics I	
MATH-370	Mathematical Modeling In The Natural Sciences	4
MATH-374	Modeling And Simulations Of Complex Systems Networks (or other modeling course recommended by the advisor)	4

Code	Title	Hours
Electives: At least one course from the following list:		
MATH-302	Ordinary Differential Equations II	
MATH-303	Partial Differential Equations	
MATH-304	Introduction To Numerical Analysis	
MATH-307	Introduction To Stochastic Processes	
MATH-324	Independent Study In Mathematics (minor advisor consultation required)	
MATH-336	Statistical Inference (only if not taken under Group A)	
MATH-340	Computing For Mathematicians (or other 300-level course approved by the advisor)	
Total Hours:		22-24