Bioinformatics

This section presents the requirements for programs in:

- M.A.Sc. Biomedical Engineering with Collaborative Specialization in Bioinformatics
- M.Sc. Biology with Collaborative Specialization in Bioinformatics
- M.Sc. Mathematics and Statistics with Specialization in Bioinformatics

Program Requirements

The student is responsible for fulfilling both the participating unit requirements for the Master's degree, and the requirements of the Collaborative Program.

The minimum requirements of the collaborative program include successful completion of two required courses, and a master's thesis on an approved bioinformatics topic.

Required courses:

- 0.5 credit in BIOL 5515 Bioinformatics
- 0.5 credit in BIOL 5517 Bioinformatics Seminar
- Thesis - candidates must successful complete a research thesis on a topic in bioinformatics supervised by a faculty member of the Collaborative Program in Bioinformatics.

Notes:

1. Students in programs in Biology and Mathematics & Statistics may use BIOL 5515 Bioinformatics to count towards degree requirements; BIOL 5517 Bioinformatics Seminar must be taken in addition to the regular seminar course.
2. Students in Biomedical Engineering may use both BIOL 5515 Bioinformatics and BIOL 5517 Bioinformatics Seminar to count towards degree requirements.
3. In addition, the student's thesis committee or advisory committee may direct the student to take or audit further courses to complement the student's background and research program.

M.A.Sc. Biomedical Engineering with Collaborative Specialization in Bioinformatics (5.0 credits)

Consult the Bioinformatics section for details regarding admission requirements to this program.

Requirements - thesis pathway (5.0 credits)

1. 0.5 credit in:		0.5
BIOL 5010 [0.5]	Introduction to Biomedical Engineering	
2. 1.0 credit in:		1.0
BIOL 5515 [0.5]	Bioinformatics	
BIOL 5517 [0.5]	Bioinformatics Seminar	
3. 1.0 credit in BIOM (BMG) courses		1.0
4. 2.5 credits in:		2.5
BIOM 5909 [2.5]	M.A.Sc. Thesis (in the specialization)	
5. 0.0 credit in:		0.0

BIOM 5800 [0.0]	Biomedical Engineering Seminar	
Total Credits		**5.0**

M.Sc. Biology with Collaborative Specialization in Bioinformatics (5.0 credits)

Requirements:

1. 1.0 credit in:		1.0
BIOL 5515 [0.5]	Bioinformatics	
BIOL 5517 [0.5]	Bioinformatics Seminar	
2. 4.0 credits in:		4.0
BIOL 5909 [4.0]	M.Sc. Thesis (in the specialization, including successful oral defence)	
Total Credits		**5.0**

M.Sc. Mathematics and Statistics with Specialization in Bioinformatics (4.5 credits)

Requirements:

1. 1.0 credit in:		1.0
BIOL 5515 [0.5]	Bioinformatics	
BIOL 5517 [0.5]	Bioinformatics Seminar	
2. 1.5 credits in coursework		1.5
3. 2.0 credits in:		2.0
MATH 5909 [2.0]	M.Sc. Thesis in Mathematics (on an approved bioinformatics topic)	
Total Credits		**4.5**

1. Students must receive approval for course selection from their supervisor before registering in courses.
2. All master's students should normally participate in a seminar or research talks under the guidance of their supervisors.

Bioinformatics-Related Courses

Biology

BIOL 5105 (BIO 5302) Methods in Molecular Genetics	
BIOL 5201 (BIO 8301) Evolutionary Bioinformatics	
BIOL 5409 (BIO 5306) Modelling for Biologists	
BIOL 5501 (BIO 8120) Directed Studies in Biology	
BIOL 5502 (BIO 8102) Selected Topics in Biology	
BIOL 5516 (BNF 5107)	Applied Bioinformatics

Biomedical Engineering

BIOM 5405 (BMG 5305)	Pattern Classification and Experiment Design

Computer Science

COMP 5306 (CSI 5100)	Data Integration
COMP 5307 (CSI 5101)	Knowledge Representation
COMP 5704 (CSI 5131)	Parallel Algorithms and Applications in Data Science
COMP 5703 (CSI 5163)	Algorithm Analysis and Design
COMP 5108 (CSI 5126)	Algorithms in Bioinformatics

Mathematics and Statistics

STAT 5708 (MAT 5170)	Probability Theory I
STAT 5709 (MAT 5171)	Probability Theory II
STAT 5703 (MAT 5181)	Data Mining
STAT 5702 (MAT 5182)	Modern Applied and Computational Statistics
STAT 5600 (MAT 5190)	Mathematical Statistics I
STAT 5501 (MAT 5191)	Mathematical Statistics II
MATH 6507 (MAT 5319)	Topics in Probability

Systems and Computer Engineering

SYSC 5104 (ELG 6114)	Methodologies For Discrete-Event Modeling And Simulation
SYSC 5703 (ELG 6173)	Integrated Database and Cloud Systems

Regulations

See the General Regulations section of this Calendar, and the regulations pertaining to the participating units offering this specialization.

Admission

Application to the Program

Applications should be directed to the primary participating unit which is the most appropriate to the student's research interests. Once accepted into one of the participating graduate programs, students must then be sponsored into the collaborative program in Bioinformatics by a faculty member. This is normally the student's supervisor. This faculty member must be appointed, cross-appointed or stand as an adjunct at one or more of the participating units.

Application forms and further information can be obtained by writing directly to any of the participating institutes or departments, or the program coordinator.

Requirements

The requirements for admission to the master's in the Collaborative Program in Bioinformatics are as follows:

- prior admission to the master's program in one of the supporting units participating in the program.
- a letter of recommendation from the participating faculty member of the Collaborative Program, which both recommends admission and indicates the willingness of the faculty member to supervise the candidate's research program in Bioinformatics.