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School of Biological Sciences Certificates

Each certificate requires 12 credit-hours of coursework, including at least 9 credits at the 3000+ level. Courses required by name and number for a student’s major program of study may not count towards a certificate. Students may not double-count courses towards more than one certificate or minor. Non- Biology majors will be required to include at least 9 credits of BIOS coursework within their certificate.

**1) Bio Inspired Design**

Students must take BIOS/ISyE/MSE/ME 4740-Bio-Inspired Design in addition to 9 hrs from the list below:

BIOS 3753 Anatomy

BIOS 3755 Human Physiology
BIOS 4464 Developmental Biology
BIOS 4471 Behavioral Biology
BIOS 4803 Special Topics: Urban Ecology
BIOS 4803 Special Topics: Vertebrate Biology
BIOS/MSE 4802 Special Topics: Bioinspired Materials Design

ARCH 4411 Introduction to Visual Arts: Drawing on Nature

BMED 3100 Systems Physiology
BMED 3110 Quant Engr Physio Lab
BMED 4400 Neuroengineering Fund
BMED 4500 Cell and Tissue Engineering Lab

BMED 4752 Introduction to Neuroscience

AE/CHE/ME/BMED 4757 Biofluid Mechanics

AE/CHE/ME/BMED 4758 Biosolid Mechanics

CEE 3040 Fluid Mechanics

ME/MSE 4790 Materials Selection and Design

**2) Biomedical Science**

BIOS 3753 Human Anatomy

BIOS 3754 Anatomy Lab

BIOS 3755 Human Physiology

BIOS 3756 Physiology Lab

BIOS 4150 Genomics and Applied Bioinformatics

BIOS 4400 Human Neuroanatomy

BIOS 4340 Medical Microbiology

BIOS 4464 Developmental Biology

BIOS 4401 Experimental Design and Statistical Methods
BIOS 4464 Developmental Biology
BIOS 4570 Immunology
BIOS 4607 Molecular Microbiology

BIOS 4651 Bioethics
BIOS 4668 Eukaryotic Molecular Genetics

BIOS 4520 Health, Genes, and Society
NEUR 2001Intro to Neuroscience

BMED 3100 Systems Physiology
BMED 3110 Quantitative Engineering Physiology Laboratory
BMED 4400 Neuroengineering Fundamentals
BMED 4500 Cell and Tissue Engineering Laboratory.

BIOS 4500 Drug Discovery

BIOS 4520 Health, Genes & Society

BIOS 4540 Human Motor Control

BIOS 4560 RNA Biology and Biotechnology

LMC 3219. Literature and Medicine.

PSYC 3020 Biopsychology

PSYC 4090. Cognitive Neuroscience

**3) Biomolecular Technology**

BIOS 3380 Microbiology
BIOS 3381 Microbiology Lab
BIOS 4012 Protein Biology
BIOS 4150 Genomics and Applied Bioinformatics
BIOS 4225 Molecular Evolution
BIOS 4607 Molecular Microbiology
BIOS 4668 Eukaryotic Mol Genetics
BIOS 4500 Drug Discovery
BIOS 4560 RNA Biology and Biotechnology

BIOS 4510 Epigenetics

BIOS 4744 Microbial Symbiosis & Microbiomes

CHEM 3511 Survey of Biochemistry

CHEM 4511 Biochemistry I

CHEM 4512 Biochemistry II

CHEM 4521 Biophysical Chemistry

CHEM 4803 Special Topics: Macromolecular Structure

CHBE 4760. Biocatalysis and Metabolic Engineering

BMED 3110. Quantitative Engineering Physiology Laboratory

BMED 4400. Neuroengineering Fundamentals
BMED 4500 Cell and Tissue Engineering Lab

**4) Computational & Quantitative Biology**

BIOS 2400 Mathematical Models in Biology

BIOS 4150 Genomics & Appl Bioinformatics

BIOS 4225 Molecular Evolution
BIOS 4401 Experimental Design and Statistical Methods

BIOS 4410 Microbial Ecology

BIOS 4428 Population Dynamics

BIOS 4530 Human Evolutionary Genomics

BIOS 4545 Human Genetics
BMED 4477 Bio Networks & Genomics
CS 4400 Introduction to Database Systems
CS 4710 Intro to Computing Concepts in Bioinformatics Applied Combinatorics
MATH 3012 Probability & Statistics
MATH 3215 Introduction to Graph Theory
MATH 4022 CEE/ISYE/MATH 3770 Statistics & Applications

**5) Environmental Science**

 BIOS 2100 Biogeography of New Zealand

 BIOS 3100 Ecology and Evolution of Australia

 BIOS 3380 Microbiology

 BIOS 3381 Microbiology Lab

 BIOS 4221 Biological Oceanography

 BIOS 4410 Microbial Ecology

 BIOS 4417 Marine Ecology

 BIOS 4418 Microbial Physiology

 BIOS 4471 Behavior Biology

 BIOS 4620 Aquatic Chemical Ecology

 BIOS 4803 Special Topics: Biology in a Changing Environment

 BIOS 4428 Population Dynamics

 BIOS 4744 Microbial Symbiosis & Microbiomes

 CEE 2300 Environmental Engineering Principles

 CEE 3340 Environmental Engineering Laboratory

 CEE 4300 Environmental Engineering Systems

 CEE 4620 Environmental Impact Assessment

 EAS 1600 Introduction to Environmental Science

 EAS 1601 Habitable Planet

 EAS 2420 Environmental Measures of Urban and Regional Change

 EAS 2600 Earth Processes

 EAS 2602 Earth Through Time

 EAS 4110 Resources, Energy and the Environment

 EAS 4300 Introduction to Physical and Chemical Oceanography

 EAS 4350 Paleoclimatology and Paleoceanography

 EAS 4410 Climate and Global Change

 EAS 4602 Biogeochemical Cycle

**6) Integrative Biology**

12 credits chosen from courses represented in four of the other certificates (e.g., 3 credits from each of 4 other certificates = 12 credits total).

**7) Marine Science**

BIOS 4221 Biological Oceanography

BIOS 4417 Marine Ecology

BIOS 4620 Aquatic Chemical Ecology

BIOS 3100 Ecology&Evol-Australia

BIOS 4410 Microbial Ecology
CEE 3040 Fluid Mechanics

CEE 4225. Introduction to Coastal Engineering

CEE 4310. Water Quality Engineering

EAS 4220. Environmental Geochemistry

EAS 4300 Introduction to Physical and Chemical Oceanography

EAS 4305 Physical and Chemical Oceanography

EAS 4410 Climate and Global Change

 **8) Physiology**

Required BIOS Courses (6 credit hours)

BIOS 3753 Fundamentals of Anatomy

BIOS 3755 Human Physiology

Other BIOS Courses (minimum 3 credit hours)

BIOS 2500 Introduction to Sport Science

BIOS 3000 Survey of Medicine

BIOS 3754 Anatomy Lab

BIOS 3756 Physiology Lab

BIOS 4100 Exercise Physiology
BIOS 4200 Kinesiology

BIOS 4238 Ion Channels

BIOS 4600 – ~~Human~~ Neuroanatomy

BIOS 4540 Human Motor Control

BIOS 2698-4699 Undergraduate Research in Physiology

Optional Elective Courses outside BIOS Applied Physiology classes (maximum 3 credit hours)
BIOS 3450 – Cell Molecular Biology (Note Biology majors cannot count BIOL 3450

toward the Physiology certificate)

BIOS 3451 – Cell Molecular Biology Lab (Note Biology majors cannot count BIOS

3451 toward the Physiology certificate if it is being used to fulfill the Biology core lab

requirement)

BIOS 4464 – Developmental Biology
BMED 3100 – Systems Physiology
ECE 4781 - Biomedical Instrumentation

ME 4757 - Biofluid Mechanic
ME 4758 - Biosolid Mechanics
PSYC 2230 - Abnormal Psychology

PSYC 3020 - Biopsychology
PSYC 4100 - Behavioral Pharmacology

**For non-Biology majors:**

Additional courses that can count towards any of the above certificates (with exception of the Physiology certificate): BIOS 1107 + 1107L, BIOS 1108 + 1108L, BIOS 2300/2301, BIOS 2310/2311, BIOS 2600/2601, BIOS 2610/2611, BIOS 3450/3451 (as long as these courses are not required for their major program of study, and only up to 3 credits of courses at the 1xxx-2xxx level can count). At least 9 credits of BIOS coursework are required for each certificate.

**New special topics courses may be added to the relevant biology certificates with approval from the School of Biological Sciences.**

**Contact the Director of our certificate program: Dr. Mirjana Milosevic Brockett (mirjana.brockett@biology.gatech.edu) for any questions.**

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**Georgia Tech School of Biological Sciences Certificate Application**

This form should be turned in two weeks before the end of your graduating semester to Ms. Benita Black in Clough Commons office 385A. This form can also be emailed to benita.black@biosci.gatech.edu

Be sure that the address given is where you would like your certificate to be mailed.

Name to be printed on certificate

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Which certificate are you applying to receive?

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Graduation Semester

Signature

GTID Number

Major School

E-mail Address Mailing Address:

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Please list the courses completed to count toward your certificate

Course
1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Grade Semester
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