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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 BIOL coursework within their certificate.

1) Bio-Inspired Design ((Students must take BIOL/ISyE/MSE/ME 4740-Bio-Inspired Design in addition to 9hrs from the list below)

APPH/BIOL 3753 Anatomy
APPH/BIOL 3755 Human Physiology
BIOL 4440 Plant Physiology
BIOL 4464 Developmental Biology
BIOL 4478 Biophysics
BIOL 4101 Sensory Ecology
BIOL 4446 Animal Physiology
BIOL 4471 Behavior Biology
BIOL 4752 Introduction to Neuroscience
BIOL 4803 Special Topics: Urban Ecology
BIOL 4803 Special Topics: Vertebrate Biology
BIOL/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

APPH/BIOL 3751	Human Anatomy and Physiology
APPH/BIOL 3753	Anatomy
APPH/BIOL 3754	Anatomy Lab
APPH/BIOL 3755	Human Physiology
APPH/BIOL 3756	Physiology Lab
BIOL 4015	Cancer Bio/Tech
BIOL 4105	Macromolecular Modeling
BIOL 4150	Genomics
BIOL 4340	Medical Microbiology
BIOL 4401	Experimental Design and Statistical Methods
BIOL 4464	Developmental Biology
BIOL 4570	Immunology and Immunochemistry
BIOL 4607	Molecular Biology of Microbes: Disease, Nature, and Biotechnology
BIOL 4608	Prokaryotic Molecular Genetics

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BIOL 4650	Bioethics
BIOL 4668	Eukaryotic Molecular Genetics
BIOL 4752	Introduction to Neuroscience
BIOL 4802	Special Topics: Current Trends in Biomedical
Entrepreneurship/Entrepreneurship in the Life Sciences	
BIOL 4802	Special Topics: Drug Discovery
BIOL 4803	Special Topics: Molecular Basis of Neurodegeneration
BIOL 4803	Special Topics: Virology
BIOL 4803	Special Topics: Endocrinology
BIOL 4803 (and 4801)	Special Topics: Epigenetics
BIOL 4803	Special Topics: Health, Genes, & Society
BIOL 4803	Special Topics: Biological Basis of Public Health
BMED 3100	Systems Physiology
BMED 3110	Quant Engr Physio Lab I
BMED 4400	Neuroengineering
BMED 4500	Cell and Tissue Engineering Lab
BMED 4570	Diagnostic Imaging Physics
BMED/CHEM/CHBE 4765	Drug design, development and delivery
LCC 2300	Intro Biomedicine & Culture
LCC 3318	Biomedicine & Culture
PSYC 3020	Biopsychology

3) Biomolecular Technology

BIOL 3380	Microbiology
BIOL 3381	Microbiology Lab
BIOL 4012	Protein Biology
BIOL 4105	Macromolecular Modeling
BIOL 4150	Genomics
BIOL 4225	Molecular Evolution
BIOL 4440	Plant Physiology
BIOL 4746	Signaling Molecules
BIOL 4478	Biophysics
BIOL 4607	Molecular Biology of Microbes: Disease, Nature, & Biotechnology
BIOL 4608	Prokaryotic Molecular Genetics
BIOL 4668	Eukaryotic Molecular Genetics
BIOL 4802	Special Topics: Drug Discovery
BIOL 4803	Special Topics: Regulatory RNAs
BIOL 4803	Special Topics: Environmental Microbial Genomics
BMED/CHEM/CHBE 4765	Drug design, development and delivery
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

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4) Computational & Quantitative Biology

BIOL 2400	Mathematical Models in Biology
BIOL 4105	Macromolecular Modeling
BIOL 4150	Genomics
BIOL 4225	Molecular Evolution
BIOL 4401	Experimental Design and Statistical Methods
BIOL 4422	Theoretical Ecology
BIOL/MATH 4755	Mathematical Biology
BIOL 4803	Special Topics: Computational Systems Biology
BIOL 4803	Special Topics: Programming Biological & Health Sciences
BMED 4477	Bio Networks & Genomics
CS 4400	Introduction to Database Systems
CS 4710	Intro to Computing Concepts in Bioinformatics
MATH 3012	Applied Combinatorics
MATH 3215	Probability & Statistics
MATH 4022	Introduction to Graph Theory
CEE/ISYE/MATH 3770	Statistics & Applications

5) Environmental Science

BIOL 2100	Biogeography of New Zealand
BIOL 3100	Ecology and Evolution of Australia
BIOL 3300	Tropical Ecology
BIOL 3380	Introductory Microbiology
BIOL 3381	Introductory Microbiology Lab
BIOL 4101	Sensory Ecology
BIOL 4221	Biological Oceanography
BIOL 4410	Microbial Ecology
BIOL 4417	Marine Ecology
BIOL 4418	Microbial Physiology
BIOL 4422	Theoretical Ecology
BIOL 4440	Plant Physiology
BIOL 4446	Animal Physiology
BIOL 4471	Behavior Biology
BIOL 4620	Aquatic Chemical Ecology
BIOL 4802	Special Topics: Community Ecology
BIOL 4803	Special Topics: Population Biology
BIOL 4803	Special Topics: Environmental Microbial Genomics
BIOL 4803	Special Topics: Urban Ecology
BIOL 4803	Special Topics: Conservation Biology
BIOL 4803	Special Topics: Microbial Symbiosis
BIOL 4803	Special Topics: Biology of Terrestrial Vertebrates
BIOL 4803	Special Topics: Mediterranean Ecology
BIOL 4803	Special Topics: Biology in a Changing Environment
CEE 2300	Environmental Engineering Principles
CEE 3340	Environmental Engineering Laboratory
CEE 4300	Environmental Engineering Systems
CEE 4620	Environmental Impact Assessment

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CHEM/EAS 4740	Atmospheric Chemistry
EAS 1600	Intro Environmental Science
EAS 1601	Habitable Planet
EAS 2420	Environmental Measures
EAS 2600	Earth Processes
EAS 2602	Earth Through Time
EAS 4110	Resources, Energy & the Environment
EAS 4300	Oceanography
EAS 4350	Paleoclimate & Paleoceanography
EAS 4410	Climate & Global Change
EAS 4602	Biogeochemical Cycles

6) Marine Science

BIOL 4221	Biological Oceanography
BIOL 4410	Microbial Ecology
BIOL 4417	Marine Ecology
BIOL 4446	Animal Physiology
BIOL 4620	Aquatic Chemical Ecology
CEE 3040	Fluid Mechanics
CEE 4225	Coastal Engineering
EAS 3620	Geochemistry
EAS 4300	Oceanography
EAS 4350	Paleoclimatology and Paleoceanography
EAS 4602	Biogeochemical cycles
NS 2323	Navigation

7) 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).

8) Physiology

Required APPH Courses (6 credit hours)

APPH/BIOL 3753 - Fundamentals of Anatomy

APPH/BIOL 3755 – Human Physiology

Other APPH Courses (minimum 3 credit hours)

APPH 2500 – Introduction to Sport Science

APPH 3000 – Survey of Medicine

APPH 3500 - Nutrition and Health

APPH 3754 – Laboratory in Human Anatomy

APPH 3756 – Laboratory in Human Physiology

APPH 4100 - Exercise Physiology

APPH 4200 - Kinesiology

APPH 4400 – Human Neuroanatomy

APPH 4600 - Muscle Structure & Plasticity

APPH 3801-2-3 – Special Topics

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APPH 3901-2-3 – Special Problem
APPH 2698-4699 Undergraduate Research

Optional Elective Courses outside APPH (maximum 3 credit hours)

- BIOL 3450 – Cell Molecular Biology (Note Biology majors cannot count BIOL 3450 toward the Physiology certificate)
- BIOL 3451 – Cell Molecular Biology Lab (Note Biology majors cannot count BIOL 3451 toward the Physiology certificate if it is being used to fulfill the Biology core lab requirement)
- BIOL 4446 – Animal Physiology
- BIOL 4464 – Developmental Biology
- BMED 3100 – Systems Physiology
- ECE 4781 - Biomedical Instrumentation
- LMC 3318 – Biomedicine and Culture
- 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): BIOL 1510/1511, BIOL 1520/1521, BIOL 2335/2337, BIOL 2344/2345, BIOL 3340 (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 BIOL 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 Dr. Brockett (Mirjana.brockett@biosci.gatech.edu) for approval.

Contact Dr. Mindy Millard-Stafford at 404-894-6274 for questions related to the physiology certificate.

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Georgia Tech School of Biological Sciences

Certificate Application

1. This form should be turned in two weeks before the end of your graduating semester to Benita Black in Clough Commons office 385A. This form can also be emailed to Benita.black@biosci.gatech.edu.
2. Be sure that the address given is where you would like your certificate to be mailed.

Name to be printed on certificate _____

Which certificate are you applying to receive? _____

Graduation Semester _____

Signature _____

GTID Number _____

Major School _____

E-mail Address _____

Mailing Address:

Please list the courses completed to count toward your certificate

Course	Grade	Semester
1. _____	_____	_____
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____