



**MOREHOUSE**  
COLLEGE

**DEPARTMENT OF  
BIOLOGY**



*David B. Cooke III*  
*Chairperson*

**Fall 2014**

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Prepared By: Dr. Natasha M. Crosby

## INTRODUCTION

This handbook is intended to provide Biology majors with information about department policies and procedures, to acquaint the student with the department faculty, to review requirements for the major and recommended courses and sequences, and to provide information on special programs and opportunities. It also contains a description of courses currently offered in the department. You should familiarize yourself with its content, but be reminded that 1) the information may change, 2) it is important to explore additional sources to supplement this document, and 3) it is the student's responsibility to keep in touch with his advisor and be aware of any changes in policies or requirements.

## **DEPARTMENT OF BIOLOGY MISSION**

The mission of the Morehouse College Biology Department is to:

- Provide students with a fundamental knowledge of Biology.
- Prepare students for and assist them in entering graduate and professional school, and the workforce.
- Strengthen students' reading, writing and quantitative skills.
- Develop students' analytical reasoning and creative thinking skills.
- Expose students to contemporary research techniques in Biology and enhance their understanding of the Scientific Method.
- Conduct meritorious research in the field of Biology.
- Acquaint students with the history of Biology, including the contributions of Black scientists.
- Engender an appreciation among students of the social and economic implications of discoveries in Biology.
- Build students' awareness of ethical and moral issues related to basic tenets in Biology.

## CAREER OPTIONS AND DEGREES

The most important thing you will do in college is determine what you enjoy doing and what subjects and activities really excite you. Those are the areas you should pursue. Answering the questions, what do you like and what do you do very well are the first steps to pursuing a successful academic career and finding your life's work. This is more than just taking classes, but getting real life experiences, on and off campus.

### What can you do with a degree in Biology?

There are many career options available to you and it depends on what degree you have, namely a bachelors, graduate or professional school degree or certification.

Explore the Division of Math and Science Cyber Village

([www.morehouse.edu/cybervillage](http://www.morehouse.edu/cybervillage)), which provides a myriad of careers for a degree in biology.

The degrees one can earn in biology are listed below:

a. **Bachelor of Science (B.S.)**

This degree can be obtained in four years at an undergraduate institution.

b. **Master of Science (M.S.); Master of Education (M.Ed.)**

The Master's degree requires an additional 1-3 years after the Bachelor's degree depending on if it is with or without a thesis.

c. **Doctor of Philosophy (Ph.D.)**

This is a specialized degree that emphasizes research skills in your major.

It takes approximately 5-7 years after the Bachelor's degree. The most

versatile degree, it enables the individual to teach, work in private practice, consult, and/or conduct research.

d. **Doctorate in Education (Ed.D.)**

The Ed.D is a Doctoral degree in education. It takes approximately 5 years after the Bachelor's degree or 1-3 years after the Master's degree. This degree is mainly sought by those interested in a career in administration in the field of education.

e. **Doctor of Medicine (M.D.)**

The MD is a doctoral degree for physicians. The M.D. degree is typically earned in four years after the Bachelor's degree. Before graduating from a medical school and achieving the Doctor of Medicine degree, most schools require their students to take the United States Medical Licensing Examination (USMLE) Step 1 and both the Clinical Knowledge and Clinical Skills parts of Step 2. Following the awarding of the M.D., physicians who wish to practice in the United States are required to complete at least one internship year and pass the USMLE Step 3. Depending upon the physician's chosen field, residencies and fellowships involve an additional 3-8 years of training after obtaining the M.D.

These descriptions represent only a small portion of areas of study/work in the field of biology. You should make it a point to ***explore the many options*** available by talking with Department faculty, exploring Cyber Village ([www.morehouse.edu/cybervillage](http://www.morehouse.edu/cybervillage)), attending special seminars, and being aware of career/job oriented events sponsored by various student services such as the Office of Career Planning and Placement, Office of Health Professions, etc.

## ***DEPARTMENT OF BIOLOGY FACULTY AND STAFF***

### ***FULL-TIME FACULTY AND STAFF***

***Dr. David B. Cooke III***, Professor and Chairperson  
Ph.D., Howard University School of Medicine  
Nabrit-Mapp-McBay, Room 134; [david.cooke@morehouse.edu](mailto:david.cooke@morehouse.edu); (404) 653-7871

#### *Research Interests*

1. *Endocrinology and Cell Metabolism*
2. *Role of Oncogene Expression in Prostate Cancer*
3. *Tumor Progression in Prostate Cancer*

***Dr. Lawrence S. Blumer***, Professor  
Ph.D., University of Michigan  
Hope Hall, Room 302; [lawrence.blumer@morehouse.edu](mailto:lawrence.blumer@morehouse.edu); (404) 653-7873 or  
(404) 658-1142

#### *Research Interests:*

1. *Ecology, Animal Behavior*
2. *Evolution*
3. *Instructional Laboratory Pedagogy*

***Dr. Dwann Davenport***, Assistant Professor  
Ph.D., Howard University  
MSPH, George Washington University  
Nabrit-Mapp-McBay, Room 132; [dwann.davenport@morehouse.edu](mailto:dwann.davenport@morehouse.edu); (404) 681-5389

#### Research Interest:

1. Immunoparasitology

***Dr. Gregory D. Ford***, Assistant Professor  
Ph.D., Meharry Medical College  
Hope Hall, Room 215; [gregory.ford@morehouse.edu](mailto:gregory.ford@morehouse.edu); (404) 614-6015

#### *Research Interests:*

1. *Acute Brain Injury (ABI) and Stroke*
2. *Neuroinformatics*
3. *Identify Biomarkers and Novel Therapeutic Targets for ABIs and Stroke*

**Dr. Valerie K. Haftel**, Associate Professor  
Ph.D., Emory University  
Nabrit-Mapp-McBay Hall, Room 320; [valerie.haftel@morehouse.edu](mailto:valerie.haftel@morehouse.edu); (404) 653-7874

*Research Interests:*

1. *Neurobiology*
2. *Physiology*

**Dr. Jeffrey Handy**, Assistant Professor

Ph.D., Meharry Medical College  
Nabrit-Mapp-McBay, Room 129; [Jeffrey.handy@morehouse.edu](mailto:Jeffrey.handy@morehouse.edu); (404) 653-7877

*Research Interests:*

- A. The Influence of Adipokines on the development and Progression of:
  1. Hepatic Fibrosis and Hepatocellular Carcinoma
  2. Multiple Myeloma
  3. Prostate Cancer
- B. Mechanisms of Cross-Talk Among Adipokines

**Dr. J. K. Haynes**, Professor and Dean of Science and Mathematics

Ph.D., Brown University  
Nabrit-Mapp-McBay, Room 104; [john.haynes@morehouse.edu](mailto:john.haynes@morehouse.edu); (404) 215-2610

*Research Interests:*

1. *Cell Biology*
2. *Cell Membranes*
3. *Biochemical Characterization of Sickle Cell Membranes*
4. *Regulation of Cell Volume*
5. *Higher Education and Leadership Development*

**Dr. Triscia Hendrickson**, Associate Professor

Ph.D., Emory University  
Nabrit-Mapp-McBay, Room 205; [triscia.hendrickson@morehouse.edu](mailto:triscia.hendrickson@morehouse.edu); (404) 653-7875

*Research Interests:*

1. *Mechanisms that Regulate Cell Motility*

**Dr. Keith M. Howard**, Associate Professor  
Ph.D., Ohio State University  
Hope Hall, Room 115; [keith.howard@morehouse.edu](mailto:keith.howard@morehouse.edu); (404) 653-7876

*Research Interests:*

1. *Plant Pathology, Parasite-Plant Interaction, Fungal Biochemistry and Development*
2. *Microbial Physiology*

**Dr. Joseph W. McCray**, Associate Professor  
Ph.D., Purdue University  
Nabrit-Mapp-McBay Hall, Room 322; [joseph.mccray@morehouse.edu](mailto:joseph.mccray@morehouse.edu); (404) 653-7872

*Research Interests:*

1. *Immunochemistry*
2. *Peptide Antibodies as Vaccines for the Common Cold and Schistosomiasis*

**Dr. Alexandra Peister**, Assistant Professor  
Ph.D., Tulane University  
Hope Hall, Room 315; [alexandra.peister@morehouse.edu](mailto:alexandra.peister@morehouse.edu); (404) 653-7879

*Research Interests:*

1. *Evaluation of Stem Cell Sources for the Production of Engineered Tissues*

**Dr. Wallace Sharif**, Assistant Professor  
Ph.D., Vanderbilt University  
Hope Hall, Room 303; [wallace.sharif@morehouse.edu](mailto:wallace.sharif@morehouse.edu); (404) 653-7880

*Research Interests:*

1. *Molecular Mechanisms of Aging*

**Ms. Karen Morris**, Administrative Assistant  
Nabrit-Mapp-McBay, Room 136; [karen.morris@morehouse.edu](mailto:karen.morris@morehouse.edu); (404)-215-2609

**Dr. Natasha M. Crosby**, Division Academic Advisor Specialist  
Ph.D., Indiana University  
Nabrit-Mapp-McBay, Room 108; [natasha.crosby@morehouse.edu](mailto:natasha.crosby@morehouse.edu); (404) 954-6599

## **COURSE REQUIREMENTS FOR A DEGREE IN BIOLOGY**

For a degree in biology a total of 33 semester hours in biology is required. An additional 32 semester hours of cognate courses (Chemistry, Mathematics and Physics) are also required. A minimum of 11 additional courses are required in Biology beyond the introductory course. These courses include six core courses: Plant Sciences (BIO 220), Ecology (BIO 320), Cell Biology (BIO 251) Physiology (BIO 316), Molecular Genetics (BIO 312), and Biochemistry (BIO 315), three laboratory courses (described below), Senior Seminar (BIO 425), and an elective course in Biology. Each of the six core Biology courses has a laboratory course associated with it. Students must take a total of three of these laboratory courses concurrently with the lecture courses, one from each of the following three groups:

Cell Biology Group: Cell Biology Laboratory BIO 251L or Physiology Laboratory BIO 316L

Molecular Biology Group: Molecular Genetics Laboratory BIO 312L or Biochemistry Laboratory BIO 315L

Environmental Biology Group: Plant Sciences Laboratory BIO 220L or Ecology Laboratory BIO 320L

To complete a degree in Biology, you must have:

- 1) a total of 120 academic semester hours
- 2) a total of 36 hours in Biology (including elective)
- 3) a minimum overall GPA of 2.0
- 4) satisfactory completion of required courses in the department
- 5) satisfactory completion of general studies courses required in the core curriculum

## POSSIBLE COURSE SEQUENCE FOR MAJORS IN BIOLOGY

*Warning: Students who enroll in courses for which they have not met the stated prerequisites are subject to disenrollment by the department regardless of performance or time lapsed.*

### BACHELOR OF SCIENCE DEGREE IN BIOLOGY

#### Freshman Year

##### **Fall Semester**

MTH 100 College Algebra	3 hours
MFL 201 Intermediate Foreign Language	3
HIST 111 World History	3
ENG 101 English Composition	3
BIO 111 General Biology	4
Health & Physical Education	1
EDU 151 Freshman Orientation	0
EDU 153 Crown Forum	0
	<b>17 hours</b>

##### **Spring Semester**

MTH 120 Pre-Calculus	3 hours
MFL 202 Intermediate Foreign Language	3
HIST 112 World History	3
ENG 102 English Composition	3
BIO 112 General Biology	4
Health & Physical Education	1
EDU 152 Freshman Orientation	0
EDU 154 Crown Forum	0
	<b>17 hours</b>

#### Sophomore Year

##### **Fall Semester**

MTH 161 Calculus I	4 hours
ENG 250 World Literature	3
BIO 251 Cell Biology	3
CHE 111 Elementary Inorganic Chemistry	4
Social Science	3
EDU 251 Crown Forum	0
	<b>17 hours</b>

**Spring Semester**

MTH 162 Calculus II	4 hours
BIO 220 Plant Sciences	3
CHE 112 Elementary Inorganic Chemistry	4
Social Science	3
Humanities	3
EDU 252 Crown Forum	0
	<b>17 hours</b>

**Junior Year****Fall Semester**

ENG 350 or 351 Speech	3 hours
BIO 312 Molecular Genetics	3
CHE 231 Elementary Organic Chemistry	4
PHY 151 General Physics	4
Humanities	3
EDU 353 Crown Forum	0
	<b>17 hours</b>

**Spring Semester**

BIO 315 Biochemistry	3 hours
CHE 232 Elementary Organic Chemistry	4
PHY 152 General Physics	4
Humanities	3
EDU 354 Crown Forum	0
	<b>14 hours</b>

## Senior Year

### **Fall Semester**

BIO 316 Physiology	3 hours
BIO 425 Senior Seminar	1
Humanities	3
Free Elective	3
Free Elective	3
	<b>13 hours</b>

### **Spring Semester**

BIO 320 Ecology	3 hours
BIO Elective	3
Free Elective	3
Free Elective	3
	<b>12 hours</b>

## COURSES TAUGHT IN THE BIOLOGY DEPARTMENT

### **101. Biological Science for Non-Majors**

**3 hours**

Provides students with an understanding of the diversity of living things, their special adaptations to the environment, and their evolutionary and ecological relationships. Course content include cell structure and function; function of biomolecules; principles of genetics, ecology and evolution; plant development and adaptation; and the function of selected organ systems. In addition to the lecture section, this course has a required laboratory component. The course is a core requirement for non-biology majors.

### **110. Phage Hunters: Introduction to Laboratory Research**

**4 hours**

This is a research immersion course in which students isolate and characterize bacteriophages (phage) from the environment. Students will receive elective credit for this course toward the biology major. This course is to be taken prior to BIO 111 and admission is by permission of instructor.

### **111-112. General Biology**

**8 hours**

Required of all biology majors and pre-health professional students. Study of the anatomy, morphology, physiology, molecular biology, ecology, heredity, evolution and interrelationships of life.

### **113. Comprehensive Biology**

**4 hours**

An introductory course for students in the Division of Science and Mathematics seeking a BS degree in majors other than Biology. This is a one-semester course examining the complexity of life on molecular and organismal levels. The course content includes cell structure and function, genetics, the function of organ systems, and ecology and evolution. This course consists of both a lecture and laboratory component and is a substitute for Bio111 or Bio101 to satisfy the core requirement for Biology.

### **123. Mind and Brain**

**3 hours**

This course is designed to provide an overview of scientific study of the brain, focusing on topics of broad interest. Material will be presented by the course director as well as several neuroscientists from other institutions who will, as guest lecturers, present material related to their expertise and research. Course topics include drugs and the brain; mental health and emotion; appetite and eating; philosophy of mind, memory, attention and thought; the neuroscience of aging; artificial intelligence; and language and communication.

### **201. Intermediate Biology Seminar**

**1 hour**

Constructed around selected topics in biology on which students present seminars.  
*Prerequisites: BIO 111-112.*

- 213. Introduction to Biological Research** **1 hour**  
Familiarizes students with the basic methods used to investigate a problem in science. Emphasis is placed on the scientific method, analysis and interpretation of data, and on scientific writing and reporting. Primarily for freshmen and sophomores who have had limited exposure to research. *Prerequisite: Consent of instructor.*
- 220. Plant Sciences** **3 hours**  
Study of plant biology at all levels of analysis. Topics include morphology and diversity, evolution and systematics, physiology, biochemistry, genetics, development, reproduction, and ecology. Differences and similarities between plant and animal biology, and the dependence of animals on plants will be emphasized. *Prerequisites: BIO 111-112.*
- 220L. Plant Sciences Laboratory** **1 hour**  
Emphasizes experiments and demonstrations on the subjects of plant diversity and anatomy, systematics, biochemistry, physiology, genetics, development, ecology, evolution and reproduction.
- 240. Introduction to Public Health Science** **3 hours**  
Designed to give students a strong foundation in the administration and practice of public health; to provide an understanding of the technical, social and political parameters surrounding public health research and practice. Includes a lecture series; field trips to local, state and federal agencies and services; and a research project. This course is identical to PSY 240.
- 251. Cell Biology** **3 hours**  
Examines the molecular mechanisms responsible for cell function, including the anatomy and biochemistry of cellular organelles; the structure and function of macromolecules; and the control of cellular biochemistry and energy production. *Prerequisite: BIO 111-112.*
- 251L. Cell Biology Laboratory** **1 hour**  
Designed to acquaint students with techniques in the field of cell biology, including cytochemical procedures, methods for fractionating organelles and macromolecules, and specific biochemical assays for characterizing macromolecules. *Must be taken concurrently with BIO 251.*
- 312. Molecular Genetics** **3 hours**  
Focuses on the basics of genetics and integrates classical with molecular genetics. Examines the structure, composition and replication of the genetic material; gene expression through transcription, RNA processing and translation; regulation of gene activity; the nature of mutations; and the applications of recombinant DNA technology. *Prerequisites: BIO 111-112, and CHE 111.*

**312L. Molecular Genetics Laboratory****1 hour**

Laboratory designed to complement BIO 312 lecture. Experiments are designed to demonstrate the repertoire of molecular techniques and concepts that are applied to explore fundamental biological principles. *Must be taken concurrently with BIO 312.*

**315. Principles of Biochemistry****3 hours**

Study of the molecules of living organisms, their interactions in metabolism, and metabolic regulation. Proteins, lipids, carbohydrates, enzymes, and vitamins will be among the molecules examined. *Prerequisites: BIO 111-112 and 251; and CHE 111-112 and 231.*

**315L. Principles of Biochemistry Laboratory****1 hour**

Experiments and exercises designed to demonstrate the basic methods and concepts of modern experimental biochemistry. *Must be taken concurrently with BIO 315.*

**316. Principles of Physiology****3 hours**

Comprehensive, in-depth examination of the basic principles and methods of human physiology. Emphasis will be placed on the structural-functional relationships of the body's organ systems. *Prerequisites: BIO 111-112, 251, and 312; and CHE 111-112 and 231.*

**316L. Principles of Physiology Laboratory****1 hour**

Exercises are designed to illustrate how the human body works, as well as to enhance one's ability to think and reason scientifically. The student will utilize the scientific method in compiling and handling quantitative data while developing skills in utilizing instruments for making physiologic measurements. *Must be taken concurrently with BIO 316.*

**317. Principles of Neurobiology****3 hours**

This class is a broad overview of the nervous system. It will be divided into three parts. The first section covers cellular and molecular neurobiology and examines the physiology of nerve transmission, including the electrical properties of neurons. The second part addresses the function of the sensory and motor systems, which allow us to perceive and manipulate the world around us. The third part of the class focuses on behavioral and clinical neurobiology, including discussions of learning and memory, mood, emotion and consciousness. *Prerequisites: BIO 111-112 and 251 or consent of instructor.*

**BIO/CSC 318. Introduction to DNA Microarray Analysis****4 hours**

This course is composed of lecture and laboratory components. The lectures will review the basics of DNA microarray analysis and its application. In the laboratory, students will conduct complete DNA microarray experiments including preparing, analyzing and interpreting microarrays. The course will also demonstrate how to use data from microarray analysis to group genes based on an algorithm of gene expression profiles and gene function using bioinformatics computational programs.

*Prerequisite: BIO 312 or BIO 350 and MATH 120, all with a grade of C or better.*

**320. Ecology****3 hours**

Comprehensive introduction to the science of ecology, the study of interactions between organisms and their environment. All major areas of ecology are considered in depth, including environmental limiting factors on plants and animals; population growth and demography; evolutionary ecology; interactions between organisms, such as competition, predation and mutualism, community and ecosystem ecology; and global systems ecology.

*Prerequisites: BIO 111-112.*

**320L. Ecology Laboratory****1 hour**

Designed to acquaint students with modern experimental techniques in ecology and requires that students use observation and data evaluation skills in analyzing natural ecological processes. *Must be taken concurrently with BIO 320.*

**321-322. Special Topics in Biology****1 hour**

Designed to acquaint the student with various tools involved in critical thinking, inquiry and problem-solving that should aid in his attempt to maximize speed of review and learning necessary for success on the MCAT, DAT, and GRE. A comprehensive review of biology, chemistry, physics, and mathematics is included. *Prerequisite: Consent of instructor.*

**330. Introduction to Epidemiology****3 hours**

A study of the distribution and determinants of health-related states and events in populations with a view toward identifying the etiology of diseases. Includes fundamental strategies for epidemiological research, the framework for assessing valid statistical associations and making judgments of causality, measures of disease frequency and association, detailed discussions of the various types of study designs, analysis and interpretation of epidemiological data, and methods for the evaluation and control of chance, bias and confounding in assessing the presence of a valid statistical association.

**340. Introduction to Biostatistics****3 hours**

Designed for applications of statistics in the biomedical and health sciences. Introduces parametric and nonparametric statistical methodology, including descriptive measures, elementary probability, estimation and hypothesis testing, correlation, regression, and single factor analysis of variance. Underlying theory is empirically demonstrated utilizing biomedical applications. Computer-based statistical analysis is used throughout.

**350. Principles of Bioinformatics****3 hours**

Course covers most areas of bioinformatics used in understanding modern biological data, including pair-wise sequence alignments, multiple sequence alignments, basic concepts in probability and statistics as applied to bioinformatics, phylogenetic trees based on sequence alignments, basic genomics and gene finding, protein structure classification and comparison, and an introduction to microarray analysis. It provides a firm foundation in the use of the computer programs and databases central to the analysis of biological data using approaches based on the use of bioinformatics. *Prerequisite: BIO 111 or 113 with a grade of C or better or consent of the Bioinformatics Program director.*

**381. Biological Research** **2 hours**  
Laboratory biological research under the direction of a faculty member. Designed for the student who is seriously interested in investigating a problem in biology. *Prerequisite: Introduction to Research (BIO 213) or consent of the departmental chairperson.*

**382. Biological Research** **3 hours**  
Designed for the student who desires to continue an investigation that was initiated in BIO 381. *Prerequisite: BIO 381.*

**425. Senior Seminar** **1 hour**  
Capstone experience that provides an opportunity for students to demonstrate a knowledge of the primary concepts and techniques of modern biology in critically analyzing a paper from the primary literature. A second objective is to teach students how to present a seminar based on a research article. *Prerequisite: Senior standing or consent of the departmental chairperson.*

**427. Animal Histology** **4 hours**  
Tissues of vertebrates; microscopic techniques. *Prerequisite: BIO 251.*

**450. Public Health Science Seminar and Practicum** **3 hours**  
Designed to provide students with (1) a forum for discussion and critical analysis of contemporary health service issues and (2) a practical experience in a health service agency. A major research project is required of all students enrolled. *Prerequisite: BIO 240.*

**451. Cellular Genetics** **3 hours**  
Discusses mechanisms of differentiation and eukaryotic gene expression. In addition to the lectures by the instructor, seminars based on articles from scientific journals will be presented by students. *Prerequisites: BIO 111-112, 212, and 315.*

**461. Advanced Topics in Biochemistry** **3 hours**  
Special topics in biochemical research concerning selected areas of biochemistry dealt with in BIO 315. In addition to lectures by the instructor, seminars based on articles from scientific journals will be presented by students. *Prerequisites: BIO 251, 312, and 315; and CHE 231-232.*

**471. Principles of Animal Development** **3 hours**  
Description of the key events in early development and their regulation. Topics include gametogenesis and fertilization; morphogenetic movements and establishment of three germ layers; gene control of determination and differentiation; inductive interactions; and intercellular adhesion and morphogenesis. *Prerequisites: BIO 111-112, 312, and 315.*

**477. Invertebrate and Vertebrate Comparative Anatomy****3 hours**

Comprehensive introduction to the diversity of animals. Emphasis is placed on comparative morphology and the relationships between form and function. Trends in physiology, development and ecology will be examined to inform an evaluation of adaptation and evolutionary relationships. *Prerequisites: BIO 111-112.*

**477L. Invertebrate and Vertebrate Comparative Anatomy Laboratory****1 hour**

Work, including dissections, with both live and preserved specimens will be conducted to observe the characteristics of a broad range of protista and animals. *Must be taken concurrently with BIO 477. Prerequisites: BIO 111-112.*

**497. Environmental Studies****3 hours**

Addresses current environmental problems and research on such problems. Topics include population growth, air and water quality, water resources, energy resources, food production, natural resources and waste disposal, and global climate change. *Prerequisite: BIO 101, or BIO 111-112, or BIO 113, or permission of instructor.*

**497L. Environmental Studies Laboratory**

Designed to acquaint students with modern experimental techniques in environmental studies. This course requires that students use observation and data evaluation skills to analyze environmental processes and problems *Must be taken concurrently with BIO 497.*

## COURSE PREREQUISITES FOR MAJORS

<b>Course Number</b>	<b>Course Name</b>	<b>Prerequisite(s)</b>
BIO 101	Biological Science for Non-Majors	none
BIO 111-112	General Biology	none
BIO 113	Comprehensive Biology	none
BIO 123	Mind and Brain	none
BIO 201	Intermediate Biology Seminar	BIO 111-112
BIO 213	Introduction to Biological Research	Consent of instructor
BIO 220	Plant Sciences	BIO 111-112
BIO 220L	Plant Sciences Laboratory	none
BIO 240	Introduction to Public Health Science	none
BIO 251	Cell Biology	BIO 111-112
BIO 251L	Cell Biology Laboratory	Must be taken with BIO 251
BIO 312	Molecular Genetics	BIO 111-112 and CHE 111
BIO 312L	Molecular Genetics Laboratory	Must be taken with BIO 312

<b>Course Number</b>	<b>Course Name</b>	<b>Prerequisite(s)</b>
BIO 315	Principles of Biochemistry	BIO 111-112 and BIO 251; CHE 11-112 and CHE 231
BIO 315L	Principles of Biochemistry Laboratory	Must be taken with BIO 315
BIO 316	Principles of Physiology	BIO 111-112, BIO 251 and BIO 312; CHE 111-112 and CHE 231
BIO 316L	Principles of Physiology Laboratory	Must be taken with BIO 316
BIO 317	Principles of Neurobiology	BIO 111-112 and BIO 251 or consent of instructor
BIO/CSC 318	Introduction to DNA Microarray Analysis	BIO 312 OR BIO 350 and MTH 120, all with a C or better
BIO 320	Ecology	BIO 111-112
BIO 320L	Ecology Laboratory	Must be taken with BIO 320
BIO 321-322	Special Topics in Biology	Consent of instructor
BIO 330	Introduction to Epidemiology	none
BIO 340	Introduction to Biostatistics	none
BIO 381	Biological Research	BIO 213 or consent of department chairperson
BIO 382	Biological Research	BIO 381

<b>Course Number</b>	<b>Course Name</b>	<b>Prerequisite(s)</b>
BIO 425	Senior Seminar	Senior standing or consent of department chairperson
BIO 427	Animal Histology	BIO 251
BIO 450	Public Health Science Seminar and Practicum	BIO 240
BIO 451	Cellular Genetics	BIO 111-112, BIO 212 and BIO 315
BIO 461	Advanced Topics in Biochemistry	BIO 251, BIO 312, and BIO 315; CHE 231-232
BIO 471	Principles of Animal Development	BIO 111-112, BIO 312 and BIO 315
BIO 477	Invertebrate and Vertebrate Comparative Anatomy	BIO 111-112
BIO 477L	Invertebrate and Vertebrate Comparative Anatomy Laboratory	Must be taken with BIO 447; BIO 111-112
BIO 497	Environmental Biology	BIO 320 or consent of instructor

## THE GENERAL EDUCATION CORE CURRICULUM

The General Education Core Curriculum consists of 53 semester hours, and is designed to provide educational experiences in the humanities, natural and physical sciences, mathematics, and social sciences, plus some early experience in the area of the student's chosen major.

### ***English Composition***

*All students must satisfy the General Education core curriculum requirement in composition by completing one of the following selections:*

ENG 101            English Composition  
    *and*  
ENG 102            English Composition  
*(two-semester sequence)*  
    *or*  
ENG 103            English Composition  
*(one-semester course)*

#### **NOTES:**

- *A student may satisfy the English Composition requirement by completing ENG 103. Only students who successfully pass the English Placement examination will be permitted to enroll in ENG 103. The student who fulfills the English Composition requirement with ENG 103 is awarded only 3 semester hours.*
- *A grade of "C" or above is required for successful completion of ENG 101-102 or ENG 103.*
- *Students who are placed into ENG100/w200 must pass with a grade of "C" or above before completing ENG 101-102.*

### ***Literature***

ENG 250    World Literature

*NOTE: For students who have already successfully completed either ENG 251 or ENG 252 this will substitute for ENG 250.*

### ***History***

HIS 111    World History: Topical Approaches

HIS 112    World History: Topical Approaches

*NOTE: A grade of "D" or above is required to complete HIS 111 and HIS 112. Students who place into REA 098 must complete this course with a grade of "C" or above before completing HIS 111-112.*

## **Mathematics**

*All Students must satisfy the General Education core curriculum requirement in mathematics by completing two math courses.*

MTH 100    College Algebra

MTH 120    Pre-calculus

### **NOTES:**

- *A grade of “C” or above is required for successful completion of MTH 100.*
- *A grade of “C” or above is required for successful completion of MTH 120, but with approval by Department Chair of Mathematics, a grade of “D” or above is required for successful completion of MTH 120.*
- *Students who are placed into MTH 090 must pass with a grade of “C” or above before completing MTH 100- 110 or MTH 100-120.*

*All additional sequences must be approved by the Mathematics department.*

## **Modern Foreign Language**

*All Students must satisfy the College’s Foreign Language Placement Exam prior to enrollment and placement into the following:*

MFL 201 and 202 (French & Spanish)

Placement into German, Italian, Japanese, etc. requires a meeting with the Department Chair of Modern Foreign Languages.

*NOTE: Students who are placed into MFL 101 or 102 must pass with a grade of “D-” or above before completing MFL 201 and 202. Students may pass MFL 201 and 202 with a “D-” or above.*

## ***Humanities***

*Students will take four courses as follows: Introduction to Religion (REL 201); Survey of Visual Arts (ART 110); either Introduction to Philosophy (PHI 201) or Philosophical Ethics (PHI 302); and one of the music courses in the list below. Students who take these courses as General Education electives must pass with a “D” or better. Students who take these courses as a core also in the Major must pass with a “C” or better.*

MUS111	Masterpieces of Music
MUS 116	The Oral Tradition in African American Folk Music
MUS 114	African American Music: Composers and Performers
MUS 203	Introduction to Church Music
MUS 310	History of Jazz
MUS 404	Survey of African American Music

## ***Social Sciences***

*Students must complete two courses from among those listed below. Psychology majors must take two non-psychology social science courses to fulfill this requirement.*

ECO 201	Principles of Economics (Macro)
ECO 202	Principles of Economics (Micro)
PSC 251	National Government
PSC 252	State and Local Government
PSC 228	Comparative Politics
PSC 285	Introduction to International Relations
UST 261	Introduction to Urban Studies

UST 262	Introduction to Urban Studies
SOC 101	Introduction to Sociology
SOC 103	Social Problems
SOC 102	Cultural Anthropology
SOC 215	Criminology
SOC 255	The Family
SOC 156	Men in Society
SOC 259	Women in Society
PSY 101	Introduction to Psychology as a Social Science
PSY 260	Psychology of the African American Experience
PSY 287	Developmental Psychology

**Science**

*Students pursuing a B.S. degree must complete **two** introductory courses from two different science departments. Students in mathematics, biology, chemistry, physics, computer science or engineering must select two courses from departments other than their major department.*

PHY 151-152	General Physics
CHEM 111-112	Inorganic Chemistry

## ***Health and Physical Education***

*Students must complete two of the courses listed below. Students must have the Chairperson's approval to enroll in HPED 155 or HPED 156.*

*Students who take these courses as General Education electives must pass with a "D" or better. Students who take these courses as a core also in the Major must pass with a "C" or better. See Department chairs for the exceptions.*

HPED 151	Aquatics and Fitness
HPED 152	Badminton and Fitness
HPED 153	Basketball and Fitness
HPED 154	Tennis and Fitness
HPED 155	Fitness for the Non-Traditional Student
HPED 156	Individualized Fitness for the Non-traditional Student
HPED 157	Weight Training and Fitness

## ***Reading***

*Students' SAT or ACT reading scores may place them into the following:*

REA 098 and 099,  
*or*  
REA 099  
REA 100 (*is an elective*)

*Students must pass with a grade of "C" or above.*

## ***Freshman Orientation***

Freshmen must earn a P or "pass" grade in each semester of this two-semester (EDU 151-152) orientation to academic and social life at Morehouse.

### ***Crown Forum***

Students must earn a P or “pass” grade in Freshman Assembly (EDU 153-154); Sophomore Assembly (EDU 251-252); and Junior Assembly (EDU 353-354). In order to earn a “P” in an assembly, students must attend a minimum of six (6) Crown Forum events.

Crown Forum is a series of special events and presentations that celebrate the great heritage and traditions of Morehouse College; bond students to each other and to a common humanity; heighten sensibility to students’ spiritual and inner selves; increase appreciation of the aesthetics; and sharpen intellectual and critical faculties.

### ***Computer Literacy and Information Fluency***

Each student must demonstrate competency in the basic use of computers by passing (1) a required departmental course, if your major is Business and Economics, Chemistry, Computer Science, Music, Psychology or Sociology; (2) CSC 101; or (3) General Education’s Computer Literacy and Information Fluency Test.

### ***Oral Communication Effectiveness***

*Students may take one of the courses listed below in order to satisfy the oral communication effectiveness requirement.*

ENG 350          Effective College Communication

ENG 351          Professional Communication

### ***Writing Requirement***

*All students will complete two writing intensive courses within their major programs.*

## DEPARTMENTAL POLICY ON CHEATING

The Department of Biology has adopted the following policy on cheating. Cheating is a serious matter and will be treated accordingly. This policy is to serve as a preventative measure by informing the students of the consequences of this breach in academic and ethical responsibility. Below is a list of violations that will be penalized. This list presents examples of behaviors that the faculty consider to be violations and is in no way intended to be exhaustive.

The next section of this statement lists the penalties that may be enforced if cheating occurs. In the last section, the procedure for imposing these penalties is explained. This policy will be strictly adhered to by the faculty. Therefore, it is necessary that you read it carefully.

### VIOLATIONS

Cheating refers to performing any act that involves intentionally defrauding or violating the rules of your environment. Cheating in the Biology Department may entail:

1. Presenting someone else's work as your own.
2. Presenting the same piece of work for two different courses without special arrangements from the instructors.
3. Plagiarism - copying the ideas, thoughts or language of another's work without proper identification of the paraphrased or quoted material.
4. Falsification of data, references or any other material, in a research paper.
5. Looking at another student's paper during an examination.
6. Talking to anyone other than the instructor during an exam.
7. Looking at any material (i.e. notes, textbooks, cell phones, or computers) during an exam without the permission of the instructor.
8. Presenting original material (i.e. journal articles, pages from a book) as your own.
9. Illegally obtaining tests or other class material.
10. Refusal to turn in your test paper at the end of the exam.

## **PENALTIES**

If caught cheating, you may encounter one or more of the following penalties.

1. You may receive a zero on the exam or project on which the violation occurred.
2. You may receive an F in the course in which the cheating occurred.
3. You may be referred to the Dean of Student Affairs for additional sanctions.
4. You may be required to change majors.

## **PROCEDURE**

1. The instructor will inform the student (verbally) of the violation as soon as possible. (If possible, within one week of detection of the violation).
2. The instructor will then have the option of giving the student a zero on the examination or project or may choose one of the three other penalties listed above.
3. If one of the three remaining penalties is chosen, the instructor will notify in writing, the student, and the chairperson of the department of the violation and the action taken by the instructor. This will be done within two weeks of the detection of the violation.
4. Documentation of cheating will be turned over to the Dean of Student Affairs for additional sanctions.

## **CLASS ATTENDANCE POLICY**

Class attendance is required of all students at Morehouse College. Each student is allowed as many unexcused absences as credit hours for the course. A student is expected to attend all classes and not absent himself without adequate cause. It is the responsibility of the student to make up scheduled work missed because of officially excused class absences. Absences from unannounced tests and other assignments may be made up at the discretion of the instructor.

Instructors are expected to outline their attendance requirements at the beginning of the semester and to include these requirements in the course syllabus issued to the students. They are required to maintain attendance records on all students, and at the request of the Senior Vice President for Academic Affairs, report any student who exceeds the maximum number of unexcused absences. Students who exceed the maximum number of unexcused absences may receive a failing grade in the course.

## ACADEMIC ADVISEMENT POLICY

### **What is Advising?**

Advising is about more than clearance for registration. Advising is a dynamic relationship between a student and advisor. At the center is a shared responsibility for a coherent education plan that incorporates personal, social, academic and career considerations. Advising focuses on helping students identify life goals, acquire skills and attitudes that promote intellectual growth, and become academically successful. Advising supports the principles and goals of a liberal education as the foundation of a bachelor's degree. We do this by teaching you how your educational experience equips you with broad knowledge, transferable skills and a strong sense of values, ethics and civic engagement.

### **What Students can Expect from Academic Advisors**

#### **Advisors are:**

- Familiar with rules and regulations
- Experienced with designing balanced course loads
- Here to listen to students' concerns and respect individual student values and choices
- Experts in creating educational and professional objectives that suit the students' demonstrated abilities and interests

#### **Advisors will:**

- Encourage and guide students as they define and develop realistic goals
- Monitor and accurately document students' progress toward meeting their goals
- Assist students in gaining decision-making skills
- Maintain confidentiality
- Provide accurate information about general education and major requirements
- Refer students to specialized campus services and resources
- Assist with course selection and registration

## What Advisors Expect from Students

### Students are expected to:

- Plan ahead and schedule an advising appointment at least twice a semester
- Come in early-when first experiencing difficulty
- Access and read one's email daily
- Be open and willing to consider advice from advisors
- Be respectful of advisors time and call to cancel or reschedule an appointment
- Silence any electronic devices while meeting with advisors
- Take notes during the advising meeting and keep a written record of sessions
- Be prepared with questions and ideas for possible future coursework, internships, study abroad etc.
- Accept responsibility for one's decisions and actions

The Division of Science and Mathematics has an advisor that is here to work with you. Both the Biology Department faculty and the Division advisor are here to assist you with organizing your thoughts and planning for your post-Morehouse future. You should talk with them about the various options and opportunities available during the academic year, summers and after graduation. These include preparing for your post-graduate education, internships, jobs, careers, etc.

Once you turn your official declaration of major form in to Ms. Morris you will be assigned a faculty advisor. If you wish to change advisors you should talk with the chair of the department (Dr. Cooke) and he will assign you a new advisor.

Poor planning on your part does not necessitate an emergency on your advisor's part. Also, it is important to remember that after you have met with your advisor you *cannot* change your schedule.

## BIOLOGY MAJORS GRADUATION POLICY

All students **MUST** have a “C” or higher in all required biology courses  
**NO** appeals for course substitutions or other remedies will be considered by the  
department chair for **ANY** student lacking the “C” or better grade. **THERE WILL  
BE NO EXCEPTIONS.**

**Students should make course selections and graduation plans accordingly.**

## GRADUATE/PROFESSIONAL SCHOOL INFORMATION

### Medical School

A major in Biology is not the study of medicine nor is it a requirement for Medical School entry. Major in Biology because you are interested in the study of life processes.

Speak to your academic advisor and to Ajit Samarasinghe, Director of the Office of Health Professions (OHP), to learn about the academic preparation you must have for successful entry to medical schools. Apply to a summer pre-medical program to learn more about actually being successful in medical school. Spend a summer working in a hospital or shadowing a working physician. How will you know if you want to be a physician if you have no idea what the work is like?

### Graduate School

Advanced study in biology can lead to a Masters degree or a PhD degree in a more narrowly defined sub-area of biology. Typically, advanced degrees focus on research in a given area. Students pursue advanced degrees to prepare for academic careers (research and teaching), as well as careers in private industry and government.

### When should you start your preparation for graduate/professional school?

**FRESHMAN YEAR** - Start by obtaining a high grade point average (GPA) (at least 3.0 or higher). Begin to look into special programs such as MBRS RISE, NIMH-COR, (National Institute of Mental Health-Career Opportunities in Research Education and Training) - or NIGMS-MARC/U\*STAR (National Institute of General Medical Sciences – Minority Access to Research Careers/Undergraduate Student Training in Academic Research), or the Minority Biomedical Research Support grant to gain research experience.

**SOPHOMORE YEAR** - Continue to maintain a high GPA. "Build up" your resume through summer internships, volunteer work in related fields, and research experience. Begin preparing for the Medical College Admissions Test (MCAT).

**JUNIOR YEAR** - Start looking seriously into the various areas of biology and the different graduate/medical schools. Be sure to attend the annual graduate/professional school recruitment day program. Send off for information on the requirements for graduate schools. You should also begin preparing for the Graduate Record Examination (GRE). Take the MCAT during the second semester of your junior year. Watch for special summer programs. (Try to use the summer to "build up" your resume).

***SENIOR YEAR*** - The first semester of your senior year should be devoted to maintaining your high GPA, but at this time, you should also begin submitting applications to the different graduate schools. If you have not taken the GRE by now, do so. By the second semester of your senior year you should be waiting for acceptance letters or making plans to move on to your graduate institution.

NOTE:

Information on the various graduate schools may be obtained online, from the library or the placement office. These sources will also provide information on fee waivers for admission applications as well as financial aid opportunities.

In addition, students should utilize the Research Careers Office in Nabrit/Mapp/McBay Hall, Room 107. The RCO's goal is to increase the number of Morehouse graduates pursuing research careers and completing graduate programs. This office provides a variety of support including: a Research Careers Club, GRE Preparation, counseling, recruitment opportunities, and a vast source of information on graduate schools, summer programs, and research opportunities.

## DEPARTMENTAL ORGANIZATIONS

### Beta Kappa Chi Scientific Honors Society

This is a national organization devoted to the advancement and promotion of scholarship in science. Membership is open to science majors who maintain a better than average rank in scholarship. The Alpha Beta Chapter was organized at Morehouse in 1946. The society meets monthly and often presents to the public scholars of distinction.

## DEPARTMENTAL HONORS

Senior Biology majors wishing to graduate with **Departmental Honors** must meet the following requirements:

1. Student must have a minimum 3.0 overall GPA.
2. Student must receive a “B” or better in all biology courses taken.
3. Student must conduct a scholarly research project under the guidance of one of the departmental faculty members. This project must result in a paper written in standard APA format (senior thesis) and defended before the department faculty in a seminar. In cases where the thesis adviser is at another institution, students must have a co-sponsor from the Morehouse Department of Biology faculty. Application deadlines and detailed guidelines are available from the chairperson. The requirements for honors in biology are still under review by the faculty and are subject to change in subsequent years.

## RESEARCH OPPORTUNITIES

Students majoring in Biology who plan to pursue the Ph.D. in biology or another science discipline are encouraged to become actively engaged in science research and to take part in one of several federally sponsored research training programs open to students majoring in biology. These include the Public Health Sciences Institute; the Minority Biomedical Research Support Program- Research Initiative for Scientific Enhancement Program (MBRS-RISE); the Historically Black Colleges and Universities-Undergraduate Program (HBCU-UP); the Hopps Scholars Program; the Ronald E. McNair Post-Baccalaureate Achievement Program; the National Institute of Mental Health-Career Opportunities in Research Education and Training (NIMH-COR) - Honors Undergraduate Research Training Program; and the National Institute of General Medical Sciences-Minority Access to Research Careers/Undergraduate Student Training in Academic Research Program (NIGMS-MARC/U\*STAR). Several of these programs provide research training starting in the freshman year. Two programs starting in the junior year are the NIMH-COR and NIGMS-MARC/U\*STAR Programs. These honors research-training programs provide juniors and seniors with advanced research training opportunities.

Additional opportunities for research participation are available through the neuroscience curriculum at Morehouse as well as the Center for Behavioral Neuroscience. The latter program involves all of the AUC schools, Georgia State University and Emory University and provides multidisciplinary research opportunities in the behavioral neurosciences (*www.cbn-atl.org*).

Other research opportunities are available through individual faculty conducting research. Students interested in any of the above programs or in conducting research with individual faculty should consult their advisor for additional information.

## **FINANCIAL AID**

You should complete a Financial Aid Form (FAF) administered by the College Scholarship Service by January 30 in the spring and September 1 in the fall. This form will determine your financial need, the difference between your education costs such as tuition, fees, room and board, books, personal expenses and transportation and the amount, which the student and his family can pay. There are several financial aid programs open to students. These include: institutional and federal programs; campus-based programs, such as the Supplemental Educational Opportunity Grant (SEOG), College Work-Study (CWS) and the National Direct Student Loan (NDSL); non-campus based programs, such as the Pell (Basic) Grant, Guaranteed Student Loan (GSL) and Auxiliary Loan Programs; and state programs, such as the Georgia Student Incentive Grants and the Georgia Tuition Equalization Grants. Look in your college catalog to find out about eligibility requirements and deadlines for these grants.

**WORKSHEET  
BIOLOGY MAJOR REQUIREMENTS**

**Name:**  
**Advisor:**  
**Degree:**

**COURSES REQUIRED FOR BIOLOGY DEGREE**

<b>Course Number</b>	<b>Name of Course</b>	<b>Credit Hours</b>	<b>Semester Completed</b>	<b>Grade</b>
<b>BIO 111</b>	<b>General Biology</b>	<b>4</b>		
<b>BIO 112</b>	<b>General Biology</b>	<b>4</b>		
<b>BIO 316</b>	<b>Principles of Physiology</b>	<b>3</b>		
<b>BIO 251</b>	<b>Cell Biology</b>	<b>3</b>		
<b>Lab</b>	<b>Cell Biology/Physiology</b>	<b>1</b>		
<b>BIO 312</b>	<b>Molecular Genetics</b>	<b>3</b>		
<b>BIO 315</b>	<b>Principles of Biochemistry</b>	<b>3</b>		
<b>Lab</b>	<b>Genetics/Biochemistry</b>	<b>1</b>		
<b>BIO 320</b>	<b>Ecology</b>	<b>3</b>		
<b>BIO 220</b>	<b>Plant Sciences</b>	<b>3</b>		
<b>Lab</b>	<b>Ecology/Plant Sciences</b>	<b>1</b>		
<b>BIO 425</b>	<b>Senior Seminar</b>	<b>1</b>		

## BIOLOGY ELECTIVES

Course Number	Name of Course	Credit Hours	Semester Completed	Grade
1.*		3		
2.				
3.				

\*Only 1 is required

## ADDITIONAL COURSES REQUIRED

Course Number	Name of Course	Credit Hours	Semester Completed	Grade
CHE 111	Elementary Inorganic Chemistry	4		
CHEM 112	Elementary Inorganic Chemistry	4		
CHE 231	Elementary Organic Chemistry	4		
CHE 232	Elementary Organic Chemistry	4		
MTH 161	Calculus I	4		
MTH 162	Calculus II	4		
PHY 151	General Physics I	4		
PHY 152	General Physics II	4		
ENG 350 or 351	Speech	3		

## GENERAL EDUCATION CORE COURES REQUIRED

<b>Course Number</b>	<b>Name of Course</b>	<b>Credit Hours</b>	<b>Semester Completed</b>	<b>Grade</b>
<b>EDU</b>	<b>Crown Forum (8 courses)</b>	<b>0</b>		
<b>ENG 101</b>	<b>English Composition</b>	<b>3</b>		
<b>ENG 102</b>	<b>English Composition</b>	<b>3</b>		
<b>ENG 250</b>	<b>World Literature</b>	<b>3</b>		
<b>HIS 111</b>	<b>World History</b>	<b>3</b>		
<b>HIS 112</b>	<b>World History</b>	<b>3</b>		
<b>MFL 201</b>	<b>Foreign Language</b>	<b>3</b>		
<b>MFL 202</b>	<b>Foreign Language</b>	<b>3</b>		
<b>ART 110</b>	<b>Art</b>	<b>3</b>		
<b>MUS</b>	<b>Music</b>	<b>3</b>		
<b>REL 201</b>	<b>Religion</b>	<b>3</b>		
<b>PHIL 201 or 302</b>	<b>Philosophy</b>	<b>3</b>		
<b>SOC SCI</b>	<b>Social Science</b>	<b>3</b>		
<b>SOC SCI</b>	<b>Social Science</b>	<b>3</b>		
<b>HPED</b>	<b>Physical Education</b>	<b>1</b>		
<b>HPED</b>	<b>Physical Education</b>	<b>1</b>		