

FACILITIES

The Biology Department is located on the first two floors of McCreary Hall and second floor of the new 86,000 square feet Science Center. Three laboratories for introductory biology courses, state-of-the-art environmental chambers, student/faculty research laboratories, and animal facilities are located on the ground level of McCreary Hall. In addition, there are laboratories with specialized facilities and equipment for Plant Studies (including an herbarium). Bowen Auditorium, seating 124, and Darrah Auditorium, seating 60, are multimedia classrooms. Close to the building are two greenhouses (one of which adjoins the new Science Center) used for botany classes, as well as for student and faculty research.

The main floor of McCreary houses the suite of departmental offices, faculty office/research suites, conference room, a multimedia classroom, a seminar-study room, and most upperclass laboratories (Animal Behavior, Vertebrate and Invertebrate Zoology, Limnology, Ecology, Microbiology, and Parasitology). An Electron Microscopy laboratory houses a Zeiss 109 transmission electron microscope, a JEOL 5200 scanning electron microscope (SEM) and related equipment for specimen preparation. The SEM is also equipped with a digital scanning generator with laser printer and data storage packages. In addition, a well-equipped darkroom, and a stockroom-preparation room with autoclave, media preparation facilities, cold room, and other facilities are also located on this floor, including a computer room! The third floor of McCreary houses the Psychology Department and includes an animal facility for mammals.

The offices and research/teaching laboratories for Biology faculty who are members of the Biochemistry/Molecular Biology program are located on the second floor of the new Science Center adjoining McCreary Hall. Teaching laboratories for the Cell Biology, Genetics, Bioinformatics, Neurobiology, Molecular Genetics, and Animal Physiology courses are located in the new facilities. Various courses are taught in multimedia lecture rooms and seminar rooms in the Science Center. New media preparation room with autoclave, radiation room, walk-in environmental chamber, and a room for an epifluorescence microscope and digital imaging system exist for both teaching and student/faculty collaborative research. Laboratories are fully equipped to conduct contemporary research in molecular biology, biochemistry, and neurobiology. A teaching laboratory and research room are available for the Neuroscience program.

CURRICULUM

Requirements for the Biology Major

The Biology curriculum at Gettysburg College emphasizes a knowledge of biological concepts and principles and, at the same time, provides opportunities for students to specialize in areas of their interest. Nonetheless, a core of courses is necessary in order to build an interrelated body of knowledge. The understanding of biology will develop most successfully if knowledge derived from one course is applied in others. It is a strength of the curriculum that it meets both the goals of a liberal arts education and the needs for post-graduate study and careers.

The Biology Department offers a Bachelor of Arts and a Bachelor of Science degree.

Curriculum for the Bachelor of Science Degree in Biology

Graduation from Gettysburg College with a Bachelor of Science (B.S.) degree in Biology will require the following:

1. Ten courses in Biology
 - a. A core sequence of four courses
 - 1) Biology 111 – Ecology and Evolution
 - 2) Biology 112 – Form and Function
 - 3) Biology 211 – Genetics
 - 4) Biology 212 – Cell Biology
 - b. Six additional Biology courses. Courses are grouped into three categories (below). Students must elect at least one course each from categories 1, 2, and 3. The remaining 3 courses may be elected from any of the categories. Other electives are Biology 260 and Biology 460 or 461 (Individualized Study: Research).
 - 1) Cellular/Molecular
 - Biology 200 – Physiology of Plant Adaptations
 - Biology 215 – Electron Microscopy
 - Biology 230 – Microbiology
 - Biology 235 – Neurobiology
 - Biology 251 – Introduction to Bioinformatics
 - Biology 320 – Developmental Biology
 - Biology 332 – Immunobiology
 - Biology 334 – Biochemistry 2

Biology 340 – Comparative Animal Physiology
Biology 351 – Molecular Genetics

2) Organismal

Biology 202 – Structural Plant Development
Biology 204 – Biology of Flowering Plants
Biology 217 – Evolutionary Survey of the Plant Kingdom
Biology 218 – Algae and Fungi
Biology 223 – Parasitology
Biology 224 – Vertebrate Zoology
Biology 227 – Invertebrate Zoology

3) Population/Community

Biology 205 – Ecology
Biology 225 – Animal Behavior
Biology 306 – Marine Ecology
Biology 307 – Limnology
Biology 314 – Evolution
ES 211 – Introduction to Environmental Science: Principles of Ecology
ES 350 – Coastal Ecology of Maine

2. Five courses in cognate departments.

- a. Chemistry 107 (or 105) – Chemical Structure and Bonding
- b. Chemistry 108 – Chemical Reactivity
- c. A mathematics course elected from the following list:
 - 1) Biology 260 – Biostatistics (unless elected to complete the Biology course requirement)
 - 2) Mathematics 105-106 – Calculus with Precalculus (counts as one course)
 - 3) Mathematics 111 – Calculus I
 - 4) Mathematics 112 – Calculus II
 - 5) Mathematics 107 – Applied Statistics
 - 6) Mathematics 205/Psychology 205 – Introduction to Statistics

- d. Two additional courses elected from the following list:
- 1) Chemistry 203 – Organic Chemistry I
 - 2) Chemistry 204 – Organic Chemistry II
 - 3) Computer Science 111 – Computer Science I
 - 4) Environmental Sciences 223 – Earth Systems Science
 - 5) Physics 103 (or 111) – Elementary Physics I
 - 6) Physics 104 (or 112) – Elementary Physics II
 - 7) Psychology 236 – Brain and Behavior
 - 8) Psychology 237 – Psychopharmacology
- e. Students applying to some graduate programs are required to complete two years of chemistry, one year of physics, and one course in mathematics. Any Biology major completing this coursework will be required to complete only nine biology courses.
3. Capstone Experience is fulfilled by Bio 307, 314, 320, 334, 340, 351, 460, or 461.
4. Interdisciplinary/Course Cluster is fulfilled by the successful completion of Chemistry 108 and Biology 212.

Curriculum for the Bachelor of Arts Degree in Biology

Graduation from Gettysburg College with a Bachelor of Arts (B.A.) degree in Biology will require the following:

1. Nine courses in Biology
 - a. A core sequence of four courses
 - 1) Biology 111 – Ecology and Evolution
 - 2) Biology 112 – Form and Function
 - 3) Biology 211 – Genetics
 - 4) Biology 212 – Cell Biology
 - b. Five additional Biology courses. Courses are grouped into three categories (below). Students must elect at least one course each from categories 1, 2, and 3. The remaining 2 courses may be elected from any of the categories. Other electives are Biology 260 and Biology 460 or 461 (Individualized Study: Research).
 - 1) Cellular/Molecular
 - Biology 200 – Physiology of Plant Adaptations
 - Biology 215 – Electron Microscopy
 - Biology 230 – Microbiology
 - Biology 235 – Neurobiology
 - Biology 251 – Introduction to Bioinformatics
 - Biology 320 – Developmental Biology
 - Biology 332 – Immunobiology
 - Biology 334 – Biochemistry 2
 - Biology 340 – Comparative Animal Physiology
 - Biology 351 – Molecular Genetics
 - 2) Organismal
 - Biology 202 – Structural Plant Development
 - Biology 204 – Biology of Flowering Plants
 - Biology 217 – Evolutionary Survey of the Plant Kingdom
 - Biology 218 – Algae and Fungi
 - Biology 223 – Parasitology
 - Biology 224 – Vertebrate Zoology
 - Biology 227 – Invertebrate Zoology

3) Population/Community

Biology 205 – Ecology

Biology 225 – Animal Behavior

Biology 306 – Marine Ecology

Biology 307 – Limnology

Biology 314 – Evolution

ES 211 – Introduction to Environmental Science:
Principles of Ecology

ES 350 – Coastal Ecology of Maine

2. Four courses in cognate departments.

a. Chemistry 107 (or 105) – Chemical Structure and Bonding

b. Chemistry 108 – Chemical Reactivity

c. A mathematics course elected from the following list:

1) Biology 260 – Biostatistics (unless elected to complete the
Biology course requirement)

2) Mathematics 105-106 – Calculus with Precalculus
(counts as one course)

3) Mathematics 111 – Calculus I

4) Mathematics 112 – Calculus II

5) Mathematics 107 – Applied Statistics

6) Mathematics 205/Psychology 205 – Introduction to
Statistics

d. One additional course elected from the following list:

1) Chemistry 203 – Organic Chemistry I

2) Chemistry 204 – Organic Chemistry II

3) Computer Science 111 – Computer Science I

4) Environmental Sciences 223 – Earth Systems Science

5) Physics 103 (or 111) – Elementary Physics I

6) Physics 104 (or 112) – Elementary Physics II

7) Psychology 236 – Brain and Behavior

8) Psychology 237 – Psychopharmacology

3. Capstone Experience is fulfilled by Bio 307, 314, 320, 334, 340, 351, 460, or 461.
4. Interdisciplinary/Course Cluster is fulfilled by the successful completion of Chemistry 108 and Biology 212.

All potential majors normally take Biology 111 and 112 during their first year. Enrollment in Chemistry 107 (or 105) and 108 along with Biology 111 and 112 is strongly recommended. Courses in Genetics and Cell Biology, which rely on a knowledge of chemistry, are taken in the Sophomore or Junior year after Chemistry 107 (or 105) and 108 are completed. By the time a student is a junior or senior, he or she is equipped with Chemistry, Genetics, and Cell Biology. At this stage, the student can more fully appreciate courses in cellular and organismal physiology, as well as individualized research projects.

Students who successfully pass the Princeton Advanced Placement Examination (Level 4 or 5) may receive credit for one or two Biology 100-level courses as general elective credit toward graduation (but not as substitute for Biology 101, Biology 111, or Biology 112). AP credit does not fulfill the Multiple Inquiries requirement in the laboratory science for graduation. Most students who wish to major in Biology forego AP credit and enroll in Biology 111/112. Decisions on the course of action appropriate for any particular student are made in the Fall of the first year in consultation with the student's academic advisor.

First Year Courses

Fall	Spring
Ecology and Evolution (Biology 111)	Form and Function in Living Organisms (Biology 112)

Prospective Biology majors are strongly encouraged to take Chemistry (Chemistry 105 or 107-108) along with Biology 111-112 during the first year. In consultation with the academic advisor, a student may choose to postpone chemistry or math until the sophomore year. The remaining courses in the first year may be English 101, First Year Seminar (FYS) 100, electives, or graduation requirements. A student with a foreign language background should take that department's exam for advanced placement.

Some possible First Year fall term schedules are:

Bio 111	Bio 111	Bio 111
Chem 107 or 105	Chem 107 or 105	Math 105 or 111
Eng 101 or FYS 100	Eng 101 or FYS 100	FYS 100 or Eng 101
Math 111 or 105	Foreign Language	Graduation Requirement

Many second semester courses are continuations of those started in the fall (Biology 112, Chemistry 108, and foreign language, for example). Second semester courses are selected in November, in consultation with the student's academic advisor.

Sophomore Level Courses

Fall	Spring
Genetics (211)	Cell Biology (212)

Students who have completed Chemistry 107 (or 105) and 108 in their First year are expected to take Genetics and Cell Biology. This will give students greater flexibility in scheduling advanced courses during their Junior and Senior years as well as facilitating study abroad. These two courses require Chemistry 107 (or 105) and 108 as a prerequisite. If a student does not take Chemistry during the first year, Chem 107 (or 105) and 108 should be taken as a sophomore. The Genetics/Cell Biology sequence will then be taken in the junior year.

Junior Level Courses

Fall	Spring
Physiology of Plant Adaptations (200)	Structural Plant Development (202)
Electron Microscopy (215)	Biology of Flowering Plants (204)
Evolutionary Survey of the Plant Kingdom (217)	Electron Microscopy (215)
Parasitology (223)	Algae and Fungi (218)
Animal Behavior (225)	Vertebrate Zoology (224)
Ecology (205)	Invertebrate Zoology (227)
	Microbiology (230)
	Biostatistics (260)
	Bioinformatics (251)
	Neurobiology (235)

Any of these courses may be taken during the junior year. (Any 200-level course may be taken during the senior year and the sophomore year if chemistry was postponed in the first year.) **In addition, the courses below may be taken during the junior year if the necessary prerequisite courses have been completed.**

Senior Level Courses

Fall	Spring
Limnology (307)	Marine Ecology (306)
Developmental Biology (320)	Evolution (314)
Immunobiology (332)	Biochemistry (334)
Molecular Genetics (351)	Individualized Study Research (460)
Individualized Study Research (460)	
Comparative Animal Physiology (340)	

In consultation with an advisor, the student should select a combination of courses that (1) provides the necessary prerequisites for upper level courses, (2) satisfies his or her interests and curiosity, and (3) prepares him or her for particular professional goals.

Preparation for Graduate Studies

The following guidelines may be helpful in constructing the Biology major. They may be valuable in preparation for graduate or professional school, secondary school teaching, or laboratory work. The course listings under each heading are suggestions only. It is neither essential or desirable to take all of them.

1. **Graduate work in Botany** would be directed toward one of the following areas: Anatomy/Morphology, Taxonomy and Systematics, Ecology, Physiology, Mycology, Phycology, Pathology, Cytology-Cytogenetics, Plant Development, or Molecular Genetics:

Evolutionary Survey of the Plant Kingdom	Biology of Flowering Plants
Structural Plant Development	Ecology
Physiology of Plant Adaptations	Biostatistics
Biology of Algae and Fungi	Evolution
	Electron Microscopy
	Microbiology
	Biochemistry

2. **Graduate work in Zoology** would be directed toward one of the following areas: Morphology, Physiology, Ecology, Systematics, or Animal Behavior:

Comp. Animal Physiology	Invertebrate Zoology
Ecology	Vertebrate Zoology
Evolution	Animal Behavior
Parasitology	Biostatistics
Developmental Biology	Limnology
Electron Microscopy	Marine Ecology
	Neurobiology

3. **Graduate work in Molecular and Cell Biology:**

- Immunobiology
- Developmental Biology
- Electron Microscopy
- Molecular Genetics
- Biostatistics
- Bioinformatics
- Biochemistry (in the Chemistry Department)
- Comparative Animal Physiology
- Microbiology
- Neurobiology

4. **Careers in Medicine, Dentistry, or Veterinary Medicine:**
 - Microbiology
 - Parasitology
 - Neurobiology
 - Developmental Biology
 - Comparative Animal Physiology
 - Immunobiology
 - Molecular Genetics
 - Biochemistry (in the Chemistry Department)

5. **Secondary School Science Teaching:**
 - Ecology
 - Vertebrate Zoology
 - Invertebrate Zoology
 - Evolutionary Survey of the Plant Kingdom
 - Biology of Flowering Plants
 - Biology of Algae & Fungi
 - Microbiology
 - Comparative Animal Physiology
 - Evolution
 - Molecular Genetics
 - Biochemistry

6. **Medical, Pharmaceutical, or Laboratory Technology:**
 - Microbiology
 - Comparative Animal Physiology
 - Molecular Genetics
 - Immunobiology
 - Biochemistry (in the Chemistry Department)
 - Electron Microscopy
 - Parasitology
 - Biostatistics
 - Bioinformatics
 - Neurobiology

Biology Minor

A minor in biology is satisfied with Biology 111 (or 101 with a grade of B or better), 112, and any other four courses in the Department which count toward the major (a total of six courses). The only restriction on courses selected for the minor is that any prerequisites for upper-level courses must be met. Consult the most recent *Gettysburg College Catalogue* for such prerequisites.

Individualized Study - Research

Many opportunities are available for student research under the direction of a faculty member. The student chooses an area of special interest and, in consultation with a member of the biology faculty, formulates a research program. Ordinarily, both literature and laboratory or field research are included in the investigation. During the semester in which the work is performed, the student enrolls in Biology 460 (or 461; see below).

Individualized study is generally restricted to juniors and seniors. Individualized study is required as one of the nine Biology courses for the B.S. degree. One credit of individualized study may be applied toward the eight Biology courses required for the B.A., but it is not a requirement. Students may perform the bulk of their research over the summer preceding their junior or senior year, either at Gettysburg College or elsewhere. In this case, credit is applied to the student's Fall transcript. Students who perform their laboratory or fieldwork off-campus under the direction of someone other than a Biology faculty member will enroll in Biology 461, rather than 460. The difference is that 461 is graded S/U; the grade will be determined by the Biology faculty chosen by the student to sponsor the Biology 461.

Students must submit a written prospectus to the supervising faculty member and to the department by the 10th week of the semester *preceding* the term in which the study is to be undertaken. No student will be allowed to register for this course until departmental approval, including the use of vertebrate animals (if any), is obtained. At the end of each academic semester, all students (460 and 461) must make a formal oral presentation of their research to the staff and students.

Projects which require an unusually long period of time to complete satisfactorily may be accomplished in one of two ways. A student may enroll in Biology 453 (Individualized Study - Tutorial) in the semester preceding enrollment in Biology 460. This course does not count toward the minimum number in the major and is graded S/U. In this course, students will study the background to the research problem, learn some basic techniques, and/or conduct preliminary experiments. Alternatively, a student may follow the 460 course with Biology 462. Biology 462 does not count toward the minimum number for the major, but is graded A-F. Biology 462 either may continue the research activity of the 460 project or branch into another area of research. In either case, the student will be required to make only one formal presentation to the department. Further information concerning this process is found in the brochure "*So You Want To Do A 460?*" located in the departmental office area.

Internships

In addition to traditional course offerings in biology, several unique opportunities exist for learning experiences beyond the classroom. Internships have been established with hospitals, veterinarians, private medical practices, the Department of Agriculture in Harrisburg, the Veterinary Diagnostics Laboratory in Harrisburg, the Penn State Fruit Research Laboratory in Biglerville, and a number of universities (Cornell, Carnegie-Mellon, Jefferson, University of Pittsburgh, for example). Students may also develop their own program in consultations with the internship coordinator in the department, or with the Center for Career Development located on Stevens Street.

Students should first register with the Center for Career Development. Application forms are available there and are due in the Department Office by April 15 for fall internships; October 15 for spring internships, and March 15 for summer internships. A catalog of possible internships as well as other directories and binders are available from the Center for Career Development and should be perused prior to the date of application. Applications are reviewed by the department and recommendations are made to the cooperating individual or institution. In most cases, students are expected to spend a minimum of 120 hours per semester actively involved in the internship and may be "on call" for a longer period. Study and reading are frequently an after hours expectation. Most students have found the internships enjoyable and rewarding experiences.

Near the conclusion of the internship, each student submits to the department, via the Internship Coordinator, a scientific report on a special project that was an outgrowth of some particular phase of the program. Grades are compiled from a combination of the supervisor's evaluation, the paper, observations, and interviews. Because of the observational or apprentice-like nature of an internship and the limited faculty involvement, internships are graded Satisfactory/Unsatisfactory (S/U). Only under unusual circumstances will the A-F grade option be permitted. Internships do **NOT** count in the minimum number of courses for the major. Interested students should contact Dr. Cavaliere.

Advising

Every student entering Gettysburg College is assigned a faculty adviser. If an interest in biology is made known upon entrance, the student will, whenever possible, be assigned an adviser from the Biology Department. At the end of the first year, any student who was not assigned an adviser in the Department, and who plans to major in biology, should choose a member of the Biology faculty as his/her major adviser. This is accomplished when completing the "Declaration of Major" form available in the Registrar's Office. The new adviser should be consulted prior to registration for the sophomore year. Upon declaration of the major, students also choose between the B.A. and the B.S. degree.

The function of a major adviser is to meet and consult with a student, guide the student in course selections, assist with academic difficulties, and provide counsel on vocational and other goals. The adviser signs the course of study card prior to registration and any change of study forms during the academic year.

Post Graduate Career Information

The department maintains career files in the seminar/conference room (McCreary 215). Materials from this file are available for browsing and short-term loan. The department also maintains a list of alumni working in the biological sciences whom students might wish to contact for advice and information about careers. Occasional meetings are called during the academic year to discuss methods of choosing and applying to graduate and/or professional schools. Admissions personnel or university faculty from various graduate disciplines are frequently on campus and in the department to discuss career opportunities with biology students. The college also staffs a Career Planning and Advising Office at 51 Stevens Street. Because of the tremendous breadth of career opportunities for which a biology major prepares the student, the resources provided by these professionals of the Career Planning and Advising Office can be expected to exceed those available in the department. It is the responsibility of the student to avail himself or herself of them.

SPECIAL PROGRAMS

Biochemistry and Molecular Biology Major

A major in Biochemistry and Molecular Biology (BMB) consists of 18 courses in Biology, Chemistry, Physics, and Mathematics. While more demanding than the traditional Biology major, the number of courses is fewer than the number required for a double major in Biology and Chemistry.

The BMB major prepares the student for a career in biotechnology or biomedical research (biochemistry, cell and molecular biology, and genetics), and medicine. Most BMB majors complete a senior capstone experience, the Individualized Study research project, in which the student undertakes an original research project in collaboration with a faculty member. (This project is often carried out during the summer after their junior year.)

The program is directed by the chairpersons of the Biology and Chemistry Departments and by a BMB Committee composed of faculty from both departments. Details on the requirements for the BMB major can be found in the *Gettysburg College Catalogue*.

Neuroscience Minor

The field of Neuroscience examines the cellular and physiological interplay between the brain and behavior. It is an interdisciplinary field which melds the natural sciences of physics, chemistry, and biology, with psychology and philosophy. A strong background in neuroscience affords students the proper tools for medical school, as well as for graduate programs in neurobiology, neuro- and cell physiology, neurochemistry, and psychopharmacology. Students in the Neuroscience Minor at Gettysburg are required to take three core courses and three electives covering behavioral and cognitive neuroscience, animal behavior, and evolution. One of the core courses can satisfy a major requirement. For further information regarding the minor, its requirements and electives, visit our web site:

<http://www.gettysburg.edu/academics/neuroscience/index.html>

Environmental Studies and Forestry

In addition to its own Environmental Studies Department (www.gettysburg.edu/academics/env/index-ra.html), the College offers a dual-program with Duke University leading to graduate studies in natural resources and the environment. The student spends three years in residence at Gettysburg and an additional two years at Duke University's Nicholas School of the Environment. Upon successful completion of one year at Duke, the student will earn the Bachelor of Arts degree from Gettysburg College, and upon successfully completing the remaining term, the Master of Forestry or Master of Environmental Management degree from Duke University.

Marine Biology

Gettysburg College offers several new affiliated programs for students who may be interested in pursuing studies in Marine Science. Programs are sponsored through the Department of Biology, the Department of Environmental Studies and the Office of Off Campus Studies. Two particularly popular programs over the years are offered in cooperation with Duke University and the Bermuda Biological Station for Research.

The Bermuda Biological Station for Research (St. George's West, Bermuda) offers courses in biological, chemical and physical oceanography during the summer. Any course taken by a Gettysburg College student may be transferred to Gettysburg with the grade received in the course provided prior approval is granted by the department.

Gettysburg College is one of a limited number of undergraduate institutions affiliated with the Duke University Cooperative Undergraduate Program in the Marine Sciences. The program, offered in both fall and spring semesters at the Duke University Marine Laboratory (Beaufort, North Carolina), is a ten-week semester of courses, seminars and independent investigations. Studies include the physical, chemical,

geological, and biological aspects of the marine environment with emphasis on the ecology of marine organisms. The spring program, appropriate for second semester juniors, or students who have had 3-4 courses in biology, begins in January and extends to the end of April. The student receives the equivalent of five courses, two of which may be used toward the minimum nine required for B.A. in Biology or ten required for B.S. in Biology. The remaining courses will apply toward graduation requirements.

Interested students are urged to contact Dr. Cavaliere in Biology, Dr. Commito in Environmental Studies and/or a representative from the Office of Off Campus Studies for the most current affiliated programs and their various curricula.

Nursing Program

The College has a five-year program under which a student spends three years at Gettysburg and two at the Johns Hopkins University School of Nursing in Baltimore, MD. At the end of the fourth year of study, the student completes requirements for a B.A. degree from Gettysburg; at the end of the fifth year the student will receive a B.S. degree from the Johns Hopkins University. Students interested in this program should contact Dr. Kristin Stuempfle, 717-337-6448, kstuempf@gettysburg.edu.

Optometry Program

The Pennsylvania College of Optometry (PCO) has agreed to provide places in its first year class for Gettysburg students who have successfully completed their undergraduate prerequisites for admission into a 4 year Optometry program. Students who have completed 90 semester hours (about 26-27 courses, see sample curriculum) will be presented before a joint selection committee for recommendation to PCO. Upon successful completion of one year of basic science education at PCO, Gettysburg College will award a baccalaureate degree. Students interested in this program should contact Dr. Kristin Stuempfle, 717-337-6448, kstuempf@gettysburg.edu.

Physical Therapy Program

Allegheny University's Graduate School will offer early acceptance for up to 5 students from Gettysburg who meet the criteria for admission into the entry-level doctoral degree program. Other students who do not meet the early acceptance criteria may also apply and be accepted. Interested students should contact Dr. Kristin Stuempfle, 717-337-6448, kstuempf@gettysburg.edu.

Teacher Education

Students who plan a career in primary or secondary school teaching should complete the Education Program. Completion of this program requires additional coursework above and beyond that required for the Biology major in order to meet all the requirements for teacher certification mandated by the Commonwealth of Pennsylvania. Bachelor of Arts students seeking certification in secondary education must complete Chemistry 203-204 (Organic Chemistry). Interested students should read the "***Handbook for Teacher Education***" published by the Education Department and meet with their advisor and a member of the Education Department to plan their program. Dr. Etheridge is the department's representative on the Teacher Education Committee.

GRADUATE AND PROFESSIONAL SCHOOL

Admission Tests

Admission to graduate and professional schools frequently requires the completion of a standardized examination. Examples include the Graduate Record Examination (GRE) for graduate school, the Medical College Admission Tests (MCAT), and the Dental Admission Test (DAT). Students should be aware of their program's examination requirements before applying, and should schedule this examination at the appropriate time. Most examinations are offered several times a year. Examination schedules and information on applying are available from Center for Career Development and the Health Professions Advisor, Dr. Stuempfle.

Premedical Preparation

Students considering a career in medicine, veterinary medicine, or dentistry are advised to schedule their courses carefully, not only to meet the admission requirements of the professional schools, but also to allow for other career options in the event their original choices cannot be realized. Most students who seek recommendation for admission into medical schools major in either Biology or Chemistry; however, the requirements can be met by a major in most other departments with careful planning. A student considering application to medical, dental, or veterinary school immediately after graduation, should have completed courses in Introductory Biology, Inorganic Chemistry, Organic Chemistry, and Physics by the end of the junior year. Students should also be aware of the following concerns in selecting courses in preparation for medical school:

1. The Medical College Admission Test (MCAT) consists of 4 sections: Verbal Reasoning, Physical Science (including physics and inorganic chemistry), Writing Sample, and Biological Sciences (including biology and organic chemistry). The test has few objective knowledge questions. Most of the science questions are interpretations of written passages or figures. These questions will assume some knowledge of the relevant scientific principles, but in general reading skills will be more important.
2. The content of courses which must be taken by the first and second year medical student is based on, or duplicates, material which is contained in certain undergraduate courses offered in biology. These courses are Cell Biology, Genetics, Comparative Animal Physiology, Microbiology, Molecular Genetics, Developmental Biology, and Biochemistry. A background in these areas may enable a student to approach medical school courses with more confidence. On the other hand, students should realize that the primary goal of the Biology Department is to provide an

integrated biology major. Furthermore, the time at Gettysburg will probably be the last opportunity for a student to take interesting, non-medically oriented courses.

3. Some of the biology internships afford special opportunities for the premedical student. These internships may be served at hospitals, laboratories, or other clinical facilities which give the student an opportunity to work in an area related to career plans.

Health Professions Committee

The Health Professions Committee (HPC) assists and advises students considering a profession in one of the many medical fields. Beginning during the first year orientation program, members of the commission hold periodic meetings with interested students to acquaint them with the requirements of the various medical schools and admission procedures. Members of the committee are also available to discuss alternative careers in such fields as hospital management, public health, optometry, podiatry, and numerous other health related fields. Recommendations of students for medical, dental and veterinary schools are made only by HPC, after an interview with each applicant.

HPC maintains a website at:

www.gettysburg.edu/academics/health_professions/index.html

BIOLOGY AWARDS

1. **Departmental Honors in Biology.** Seniors who have maintained a high average in their course work in Biology and who have demonstrated exceptional interest and creativity in the field of Biology will receive Departmental Honors and be awarded a certificate of merit. This recognition is noted on the official College transcript.
2. **William C. and Helen H. Darrah Award*.**
An award presented annually to a senior student who has demonstrated a keen interest in Biology and has given time and energy to the Department beyond normal academic work.
3. **Betty M. Barnes Memorial Award*.** An award presented annually to a female senior student of high academic ability preparing for a career in Biology or Medicine.
4. **Dr. George W. Stoner Award.** The income from a fund is awarded to a worthy male senior student (in Biology or Chemistry) accepted by a recognized medical college.

*These awards include an honorarium plus recognition on a plaque in the Departmental reception area.

FACULTY

A. RALPH CAVALIERE, Charles H. Graff Professor of Biology, completed his undergraduate and Master's work at Arizona State University and received his Ph.D degree in Botany from Duke University. His teaching areas include Electron Microscopy, Physiology of Plant Adaptations, and the Biology of Algae and Fungi. His research interests include terrestrial fungi and the marine algae of Bermuda.

VÉRONIQUE DELESALLE, Professor of Biology and Environmental Studies, received her Bachelor and Master of Science degrees from McGill University in Montreal, and her doctorate in Ecology and Evolutionary Biology from the University of Arizona. She has held a postdoctoral fellowship at Ohio University. She teaches Ecology and Evolution. Her current research interests are in the area of plant reproductive ecology.

KAY ETHERIDGE, Associate Professor of Biology, pursued her undergraduate and Master's work at Auburn University and Ph.D. from the University of Florida. She teaches Comparative Animal Physiology. Her research interests include the role of thyroid hormones in the regulation of metabolism, and effects of melatonin on tissue growth.

PETER FONG, Associate Professor of Biology, received his undergraduate education at the University of California, Berkeley. He received his Master's degree from San Francisco State University and his Ph.D. from the University of California, Santa Cruz. He was a postdoctoral fellow at Wayne State University. He teaches Invertebrate Zoology and Limnology. His research interests focus on the reproductive biology, physiology and ecology of marine and freshwater invertebrates, including worms, crustaceans, and clams, and snails.

SHERMAN S. HENDRIX, Professor of Biology, is a graduate of Gettysburg College, receiving his Master's degree from Florida State University and Ph.D. from the University of Maryland. He teaches Parasitology, Microbiology, and Electron Microscopy. His research interests include ecology, systematics, and ultrastructure of platyhelminth parasites of marine and freshwater fish and mussels, as well as microbial ecology.

KAZUO HIRAIZUMI, Associate Professor of Biology and Chairman, received his B.S. from Stanford University and his Ph.D. from North Carolina State University. He was a postdoctoral fellow at the National Institute of Environmental and Health Sciences. He teaches Biostatistics and Genetics. His major research interests include population and evolutionary genetics of gene regulation, biochemical genetics of digestive enzymes, and biochemistry of catecholamines.

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