

Biology Student Handbook

2008-2009

34th Edition



**Department of Biology
School of Science**

The College of New Jersey

Prepared by
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INTRODUCTION

This handbook is designed to help you, as a biology major, to gain the most from your experience at The College of New Jersey (TCNJ). This handbook will acquaint you with procedures, opportunities and services that exist at TCNJ and within the Department of Biology.

The Biology Handbook supplements, but does not replace *The College of New Jersey Undergraduate Bulletin*, *The College of New Jersey Student Handbook* and the Biology Web Page www.tcnj.edu/~biology/index.html.

Building abbreviations as found on your schedule:

AH	Armstrong
BB	Business Building
BI	Biology Building
BL	Bliss Hall
FH	Forcina Hall
HH	Holman Hall
KH	Kendall Hall
LH	Paul Loser Hall
MB	Music Building
SB	Social Sciences Building
SCP	Science Complex - Physics
SCC	Science Complex - Chemistry
TH	Travers Hall
WH	Wolfe Hall

*The Faculty of the Department of Biology at
The College of New Jersey sincerely welcomes you, and hopes
that your college experience will be rewarding and illuminating!*

LIBERAL LEARNING BIOLOGY CURRICULUM

The complete curriculum requirements include selections from each of the following categories:

I. Liberal Learning

A. Intellectual and Scholarly Growth

1. First-year Seminar Program (FSP) course
2. WRI 102 (if required) plus a second writing intensive course (Ecology and Field Biology) and a fourth year writing intensive course in the major
3. Second language, intermediate competency, met by completing the third introductory second language course(103) or testing out of it
4. Information literacy met by showing proficiency through an on-line process

B. Civic Responsibilities

1. Met by completing a course in the major or liberal learning or through an approved program or equivalent sustained experience.

C. Broad Sectors of Human Inquiry

1. Option A is met either by completing a designated interdisciplinary concentration (six courses) or second major.
2. Option B allows the student to create his own concentration or major.
3. Option C (Breadth Distribution) is met by completing three courses in each broad sector, with at least one from each domain (nine courses total)
 - Arts and Humanities
 - a. Literary, Visual and Performing Arts
 - b. World Views and Ways of Knowing
 - Social Sciences and Quantitative Reasoning
 - a. Behavioral, Social and Cultural Perspectives
 - b. Social Change in Historical Perspective
 - Natural Science and Quantitative Reasoning
 - a. Natural Science
 - b. Quantitative reasoning

II. Biology Core Courses

BIO 099	Biology Freshman Seminar
BIO 185	Themes in Biology
BIO 211	Biology of the Eukaryotic Cell
BIO 221	Ecology and Field Biology
BIO 231	Genetics
BIO 498 (half course)	Biology Seminar

III. Biology – Required Support Courses

CHEM 201 & 202	General Chemistry I & II (satisfies Option C – Natural Science, above)
CHEM 331 & 332	Organic Chemistry I & II
PHY 201	General Physics (premeds need Physics II)
MAT 127	Calculus A <i>with one other math course</i> (as outlined in program planner) (satisfies Option C – Quantitative Reasoning, above)

IV. Free Electives

Suggested Distribution of Courses (BIOA)

FRESHMAN YEAR

Themes in Biology
 General Chemistry I and II
 Biology Freshman Seminar
 Writing 102
 Electives or Calculus A*
 Foreign Language
 FSP
 Eukaryotic Cell Biology
**if language requirement satisfied*

SOPHOMORE YEAR

Ecology and Field Biology
 Genetics
 Organic Chemistry I & II
 Calculus A
 Foreign Language
 Second Math course

COURSE DESCRIPTIONS

Biology Freshman Seminar

(BIO 099) (Fall semester)

This course provides an orientation to The College of New Jersey and to the Biology Department and its programs. This course is graded pass/fail.

Themes in Biology

(BIO 185) (every semester)

An inquiry-based introduction to the scientific process and a focused examination of the concepts that weave through four major themes in biology: Structure and Function, Bioenergetics, Continuity of Life, and Evolution.

Biology of the Eukaryotic Cell

(BIO 211) (every semester) *Prerequisites:* BIO 185 The essential macromolecular and cellular components of living organisms are discussed in this single instructor lecture and recitation course. The structural and functional characteristics of eukaryotic cells are described.

Ecology and Field Biology

(BIO 221) (every semester) *Prerequisites:* BIO 185 and CHE 201-202

As an introduction to modern ecology this course explores the interactions that determine the distribution, abundance and function of organisms. Populations and species are examined both theoretically and practically within an evolutionary context. Topics covered include physiological ecology, optimization theory, natural selection, population biology, species interactions, community relationships and ecosystem dynamics. Laboratory and field activities emphasize qualitative and experimental approaches to the study of ecology. This course serves as the second writing requirement for the Liberal Learning requirements.

Genetics

(BIO 231) (every semester) *Prerequisites:* BIO 185; CHE 201 & 202 or permission of instructor.

This course introduces the major concepts serving as the basis of genetically inherited variation including the nature, distribution, and expression of such information in representative plants and animals. Emphasis is placed on experimental analysis essential to the acquisition of information in this field. Labs will emphasize analytical approaches used in genetic studies.

Biology Senior Seminar

(BIO 498) (every semester) 0.5 Units *Prerequisites:* completion of the biology core curriculum.

Discussions of topics that relate to a unifying theme provide the student with an appreciation and understanding of aspects of current biological research and thought. Study will be directed to the primary and secondary literature of the topic. The theme reflects the interest of the instructor presenting the seminar; however, the topics and discussion are the product of student and instructor interaction. This seminar meets once a week. Each student typically makes two to three presentations and participates in the discussion of all others. There is a required writing component.

Biology Options

In order to graduate as a Biology Liberal Arts (BioA) major, you must have completed **5** units of Biology **option courses**, one of which must be an “Organismal course” selected from among the following: BIO 312, 315, 332, 341, 342, 343, 350, 411, and 465. (BioTs need only 3 options.) Additionally, one must be a 400 level biology option with a writing component. Biology Option courses are **in addition to** the Biology Core courses. The options include most of the 300 and 400 level Biology courses. The options do not typically include the Biology nursing courses and the Biology Anatomy and Physiology course; however, occasionally exceptions can be made in consultation with the Biology Departmental Chair. The Biology Department at The College of New Jersey offers numerous cataloged subject options. These courses cover the areas of *microscopic anatomy, evolution, physiology, plant science, invertebrate biology, comparative vertebrate anatomy, developmental biology, human anatomy and physiology, microbiology, biology of fungi, virology, immunology, advanced molecular and cellular biology, environmental studies, oceanography, biometry, physiological ecology, neurobiology and behavior, and neurobiology*. A number of courses at the New Jersey Marine Consortium can also be used as options. The options increase your expertise in given areas of biology. To get the maximum benefit from your options, you must choose carefully.

Yet another way to fulfill up to two units of biology option courses is through one or more of the following **research opportunities**:

Research

- Independent Study BIO 493 and/or
- Honors Independent Study BIO 494
- Internship BIO 399
- Faculty-Student Research

Independent research is a superb and highly recommended way to acquire a foundation in Biology by pursuing original research under the direction of experienced faculty. It is an unparalleled opportunity to apply course-acquired knowledge and get first-hand experience with laboratory techniques and scientific research methods under expert supervision. *Appendix I* lists faculty research interests and academic services. Inquire directly with the Instructor whose research area is of interest to you.

NOTE: Any member of the TCNJ Honors Program should consider BIO 494 instead of BIO 493 (see Dr. Fangboner).

Independent Research in Biology Guidelines (see also *Appendix III* for grading guidelines)

Purpose: To provide the student with an experience in conducting research in the laboratory and/or the field.

Academic:

Independent research in Biology is open to any upper-class student who has a minimum 2.5 cumulative average in science courses and overall.

Advisement:

The student should obtain a list of the research interests of the faculty from Appendix I, the Biology Web Page, or directly from faculty members. The student should discuss sponsorship with the appropriate faculty member at least one semester prior to when he or she plans to register for independent research. Acceptance of the student by a faculty member (mentor) will be based on the availability of the mentor's time, resources and facilities.

Application and Proposal:

An Independent Study Enrollment Form (obtained from either Records and Registration or the Biology office) should be completed by the student, signed appropriately and submitted to the Registrar. The student can register for up to 2 courses of research or independent study as biology option credit.

Pre-Laboratory Preparation:

In conjunction with the mentor, the student will develop a research proposal outlining the objectives and methods involved in his or her study. This is submitted as part of the application/contract (see above) and must be in to the Registrar no later than the end of the first week of the semester in which independent research is credited (or earlier at the discretion of the mentor). The student might be asked to accompany the proposal/contract with an introductory literature review. A copy of the proposal/application/contract is to be filed with the Independent Research Coordinator, mentor, Biology Office and Registrar. No credit will be granted for this phase of the project.

Laboratory and/or Field Research:

The student is responsible for the completion of the outlined objectives as specified in the research proposal. It is expected that a student will spend a minimum of 3 hours per week in research time *for each* semester hour of credit.

Final Report and Seminar:

Upon completion of the research project, the student will present a poster to the Biology Department. A poster presentation will occur during the last three weeks of the spring semester of the year in which the project is completed. Work completed during the summer may be presented orally or by poster in the fall semester. Before the grade is awarded, the student will submit a final report to his or her mentor, with a copy to the department. Independent research students are expected to attend all departmental seminars.

Contact Dr. Ray Fangboner, coordinator for BIO 494, Biology Building, Room 117, ext. 2462 for further details.

Internship Opportunities

A number of local pharmaceutical and biotech companies, as well as universities and ecological field stations throughout the country offer undergraduate summer research opportunities that qualify for academic internship credit. In most cases students must apply to and be accepted into these programs. The Office of Career Services maintains a list of some internship opportunities (Register on **LionsPro**); another extensive list of opportunities is linked to the Biology home page. The Office of Career Services Internship opportunities are usually not done for Biology option credit. From time to time corporations contact the department faculty directly requesting nomination of students for their research internships. Students interested in obtaining academic credit (BIO 397) for internship experiences should contact Dr. Klug and discuss this possibility.

Internship credit involves application of intellectual and laboratory research skills acquired in previous course work to an investigation project at a site off campus. Emphasis is on an efficiently conducted research project. Once completed, emphasis shifts to effective communication of scientific work. The research typically is taken as two courses, where the research is distributed in the two semesters after the summer in which the research experience is taken.

Internships may be paid or unpaid. Most positions are found as summer employment, but research may also occur during either fall or spring semesters. Undergraduate summer research programs at colleges and universities throughout the country qualify for internship credit at TCNJ. Contact Dr. Klug for clarification. Most often, academic credit is earned during the academic year even though the research may occur in the summer. Up to 2 credit units may count as Biology Options. The internship position and experience must meet the following criteria:

1. The student must have applied for and obtained acceptance into a suitable research program. Approval of the program by Dr. Klug is required.
2. The student must have at least a 2.5 GPA in the sciences and must have at least sophomore status, or have permission from Dr. Klug.
3. The student must provide progress reports, and present a poster in the fall semester. A paper in proper scientific format is also required.

PREPARATION TO TEACH BIOLOGY

Traditional Undergraduate Track (Biology Secondary Education Major - BioT)

The Biology Secondary Education major follows a program with a science/math component very similar to that of the Liberal Arts major. The professional education courses will require that you plan your schedule carefully to avoid conflicts with science courses. *Student Teaching* is a full-time commitment occurring during the fall or spring semester of your senior year, at which time you should not take other courses in liberal studies, math or science.

Permission to student-teach as a biology major must be obtained from the Department of Biology Chairperson and the Department of Secondary Science Education Student Teacher Coordinator, Dr. Gary Lipton, BI 240, after meeting the following requirements:

1. All courses prescribed by the College and the Biology Department through the junior year must be satisfactorily completed. Consult **The College of New Jersey Bulletin for 2008-2009** and the appropriate **Program Planner**.
2. A minimum of 4 courses in the area of biology must be completed by the end of the junior year with a minimum overall cumulative GPA of 2.0 in biology, chemistry, physics, geology and astronomy courses taken at TCNJ. The student will need an average of C- or better in your biology core (Themes in Biology, Ecology and Field Biology, Biology of the Eukaryotic Cell, Genetics and Biological Seminar). For transfer students, at least two units of the courses must be taken at The College of New Jersey.
3. The student must achieve a minimum total cumulative average of 2.75 in the overall college program.

The Senior Biology Secondary Education student must successfully complete the Biology Secondary Education program, work for one year in a school and achieve a satisfactory score on the National Teacher's Examination (NTE) in Biology before the teaching certification will be issued.

Post Baccalaureate Methods for New Jersey Certification

(Becoming a teacher after obtaining a non-education BS/BA degree)

- **Alternate Route:** Contact the Bureau of Teacher Preparation and Certification (609) 292-2070. TCNJ is one of the training centers. Contact Dr. Anthony Evangelisto, Forcina Hall room 373, Department of Educational Administration and Secondary Education, telephone ext. 2403 for more information.
- **MAT** (Master of Arts in Teaching) *Secondary Education and the MAT Program Elementary Education*. Contact TCNJ Department of Education, Dr. Stuart Carroll or Dr. Anthony Conte, extension 2252 (ask for Carol Tamasi).

ACADEMIC OPPORTUNITIES AND SERVICES

Today's competition for places in graduate school, professional school and the job market is very intense. Each student must prepare for this competition. The following variety of excellent facilities and enrichment opportunities are available to students to assist in this preparation.

Electron Microscopy Facility

The Department of Biology has an electron microscopy facility that includes a confocal microscope, a fluorescence microscope, a transmission and a scanning microscope. All of the light microscopes have digital imaging capabilities. In addition, the facility has a digital negative scanner, digital image processing, a high-resolution printer, a complete darkroom, as well as a variety of ancillary instrumentation including two ultramicrotomes. Independent research students enable the department to offer BIO 467 Electron Microscopy for Biologists. The enrollment in this course is limited to twelve students annually.

Marine Science Consortium

The College of New Jersey is one of 24 academic institutions taking part in the New Jersey Marine Sciences Consortium. The Consortium offers courses at its headquarters located at Sandy Hook in Monmouth County. This affiliation provides our students with an excellent opportunity to take courses in the marine sciences during the summer months for biology option credit. These courses offer the student extensive field experience in many aspects of marine life and ecology. There are also courses that provide the student with skills in scuba diving. These can expand a liberal learning education and lead to a life-long avocation. Furthermore, the members of the consortium are engaged in extensive research studies on the various bays and estuaries in New Jersey. Students can gain valuable research experience by participating in one of the many research programs. For further information, contact Dr. Dennis Shevlin, Biology Building, Room 130, ext. 2246.

Research Opportunities Off-Campus

A number of universities, research institutions and corporations offer research opportunities for undergraduate students, both during the academic year and during the summer, which provide excellent opportunities for gaining research experience. For many of these research positions, you can earn academic credit.

For more information, visit our "Research Opportunities" page at www.tcnj.edu/~biology/opportunities/index.html and see *Biology Options* in this handbook. Please note that the application deadlines for many of the summer programs are as early as January and February. For further information, contact Dr. Donald Lovett, Biology Building, Room 129, ext. 2876.

Minors

A minor is a secondary concentration of courses in a specific area. A minor may be used to augment abilities being developed in your major, to prepare for a non-related area with good career possibilities, or simply to pursue a hobby interest. Hobby interests are favorably looked upon by Admissions Officers of graduate schools and by personnel officers in industry since these interests tend to round out a student's personality.

Regardless of your reason for considering a minor, it is essential that you begin to plan early in your college career. The best way to begin is to see your advisor and provide as much information as possible about your interests and aspirations so that you can get a personalized reading of potential opportunities.

A minor consists of a select series of 5 courses. Half of the minor must be completed at TCNJ. Consult the most recent bulletin to determine what minors exist at TCNJ and see the minor program planners.

Science Related Minors

Biology majors frequently minor in *Chemistry*. Three of the five required course for the Chemistry minor are part of the Biology major program. Therefore two further courses complete the minor. Much of the technical and professional work in biology is focused on the application of chemistry to living systems. The Chemistry minor is valuable for employment.

Physics minors are becoming extremely valuable. Biophysics is a rapidly growing area of biology. Physics related techniques are used extensively in physiology, molecular biology and in many areas of medical research.

Mathematics related Areas

Two minors, one in *Statistics* and the other in *Computer Science*, offer the Biology major a fabulous opportunity to ride the crest of the new era of Data Processing and Bioinformatics. These minors provide you with tools essential to interpret and handle massive quantities of data. There are companies who maintain literature reference banks in the area of the sciences. A Biology major with a Computer Science minor would have an edge in this age of BioInformatics.

Social Science / Business Related Areas

If you were expecting to enter areas of scientific administration, sales, personnel, marketing or management, a background including a minor in *Psychology*, *Sociology*, *Media and Communication* or *Marketing* would be of value.

Humanities and the Arts

Two of our Biology majors who graduated with a minor in *English* secured employment in large pharmaceutical companies as science copywriters. Occasionally a student considers a career in medical illustration. Application to graduate programs requires either an art minor or major. An *Art* minor can also be of value if the student has an interest in science illustration and advertising. Graphics and advertising art techniques combined with your Biology major would be of value in pharmaceutical supply house sales, basic research publications, and grant development.

The above are only suggestions. See your advisor for a personal tailoring of your program.

Double Majors

It is possible for Liberal Arts Biology majors to develop a second major from a wide choice of areas. You would have a primary major, Biology, which would be on your record and would give you scheduling privileges. Your second major would be selected and then would be developed using your electives and the liberal learning course distribution within your primary major. To elect a second major, a student must apply to, and be accepted by, the department of the second major. There is a form titled "Second Major" that will need to be filled out and signed by the chairperson of your second major. A Secondary Education student would need to go well beyond the 32 courses required for graduation in order to complete a second major. Leave one of your primary major classes untaken until the semester your second major is completed.

HONORS PROGRAMS

College-Wide Honors Program

The Honors Program is designed for students seeking maximum intellectual challenge and broad learning experiences. Courses exist in many disciplines, including art, philosophy, anthropology, economics, history, chemistry, literature and sociology. Emphasis is on critical, creative and analytical thinking, cultural heritage and global perspectives. Admission is by application, and is open to TCNJ students with a cumulative grade point average of 3.4, who have completed 12 sh and present two letters of recommendation; although most students enter the Honors Program as incoming freshmen. Transfer students must have completed 45 sh. All of the courses meet liberal learning requirements. Completion requires five units of honors courses, at least three of which must be outside the major; of the five units, one must be philosophy or religion, and one must meet the College's Global requirement. The student must meet the three semester college foreign language proficiency requirement by course credit, proficiency examination or high school equivalency. The student also needs to maintain a 3.0 grade point average in Honors courses and a 3.0 overall grade point average. To apply, or receive further information, see the Honors Coordinator, Green Hall 109, 609-771-2034.

For further details relative to the Biology major, see Dr. Fangboner, Biology Building, Room 117, ext. 2462.

Departmental Honors Program

The Departmental Honors Program provides advanced research experiences and recognition of outstanding achievement.

To Be Eligible – The Biology major must have at least 8 units earned at TCNJ, including 3 units of Biology courses. The student should have an overall grade point average of 3.3 or better, and a science grade point average of 3.5 or better. It is anticipated that the applicant will be at least a second semester sophomore at the time of application. The department will consider applications from transfer students or students with exceptional circumstances who do not meet the precise eligibility requirements, but do, in consideration of the departmental Honors Committee, meet the spirit of the requirements.

Application will be by written request to the Biology Department Honors Advisor, Dr. Ray Fangboner, Biology Building, Room 117, extension 2462.

The application will include a proposed research project the merits of which will be reviewed by an Honors Review Committee consisting of two faculty chosen by the applicant, the Honors Advisor and the Departmental Chairperson.

Completing the Program - Acceptance into the Departmental Honors Program does not guarantee receiving honors acknowledgment. It must be earned by successful completion by the student of the following:

1. Completion of the Biology major with an overall GPA of 3.3 and a Science GPA of 3.5 or better including at least 4 units in biology courses completed at The College of New Jersey.
2. Completion of a 3 unit Independent Research Project under the direction of a Biology faculty member (BIO 494 for those enrolled in the College Wide Honors Program, BIO 493 for those not so enrolled). This laboratory project will include an initial literature search and the preparation of a formal research proposal. The research, normally completed over a three semester period of time, will culminate with an oral (and poster) presentation and a written thesis that is presented in a form acceptable to a scientific journal. For completion of Departmental Honors, the Honors Review Committee must judge the initial proposal and the final thesis "Honors Quality."

Certification - Students who have completed the above will be certified by the Department of Biology to graduate "With Departmental Honors in Biology." The Registrar will be notified.

TUTORING (GIVING AND RECEIVING)

Obtaining the Services of a Tutor

The transition from high school to college presents many new challenges to first-year students. Even the most successful high school students find the content or pace of college classes demanding. Sometimes, the difficulty can be resolved by consulting the instructor, but other times the problem may need regular, on-going assistance provided by the Tutoring Center.

Through a variety of programs, The Center's administrators and peer tutors help students appraise areas of difficulty and develop appropriate learning strategies to master needed content and skills. These programs include:

- Supplemental Assistance groups in selected courses
- Study Groups facilitated by tutors
- Single-session Writing Conferences at any stage of an assignment
- Online Writing Lab (OWL) for internet writing resources and email assistance with specific writing questions: <http://owl.department.tcnj.edu>
- Tutoring, by-appointment, for course content
- Drop-in tutoring in the Center for some math or science courses

The Tutoring Center is located in 145 Forcina Hall and is open Monday-Friday during the daytime and on selected evenings as posted early in the semester. Information about services and schedules is available on the Tutoring Center web site: <http://www.tcnj.edu/~tutoring>

Students may decide to request tutoring assistance on their own or they may be referred to the Tutoring Center by a professor. Students either go to the Center and fill out an application form or apply by email through the Center website <http://www.tcnj.edu/~tutoring>. When a space with a tutor becomes available, the student will be notified by the staff. Tutoring services are, however, dependent on availability of tutors so requests made early in the semester are more easily filled.

Participation in tutoring is completely voluntary. However, for appointment tutoring, weekly attendance is required to retain a permanent tutor.

Becoming a Tutor

If you enjoy sharing your knowledge with others, consider becoming a tutor for the Tutoring Center. Working as a tutor carries several benefits. Foremost, it is a valuable learning experience that tutors often say helps their own learning as much as it helps other students master challenging content and skills. In short, it's a great way to consolidate past learning as you progress through college; for example, student-tutors preparing for GRE and MCAT exams have reported that their tutoring work has helped them stay "current" in their knowledge of first- and second-year course content. In addition, tutoring offers an hourly salary, enhances work skills, and contributes to experience for a resume.

If you have the ability to communicate and relate well with others, you have two of the major qualifications. Further requirements include:

1. A 3.0 overall cumulative grade point average
2. A 3.0 average in the area in which you plan to tutor. (Note: Your tutoring subject is not restricted to biology)
3. Completion of at least two (2) semesters of coursework at TCNJ
4. Three faculty references, one of which must be from a faculty member in the area in which you plan to tutor. *For example, if you plan to tutor biology, one letter would be from a member of the Department of Biology; but the other two may come from any department (including biology). It is recommended, but not required, that one of your references be from your academic advisor.*
5. Ability to tutor in two (2) or more courses
6. Ability to work both Fall and Spring semesters for 5-10 hours per week

The Tutoring Center begins recruitment of new tutors in February for the following academic year. Announcements are posted throughout campus. If a student's application is in order and there is a need for tutors in her/his chosen area, an in-person interview with one or both of the Center supervisors will be arranged. Students who are accepted to become tutors are required to take a one-credit course during their first semester as tutors, or two courses if they plan to tutor writing. These courses, IDS 291 and 292 (Techniques of Tutoring I and II) provide training for effective tutoring and carry elective credit.

For further information, contact the Tutoring Center, 145 Forcina Hall, ext. 3325, or go to the web site at <http://www.tcnj.edu/~tutoring>

ADVISEMENT AND PREPARATION FOR FUTURE SCHOOLING AND CAREER SELECTION

Faculty Advisement

Your College Seminar instructor will serve as your advisor through your first registration period. During the fall semester of your freshman year you will be assigned a permanent advisor whose name will appear on TESS. Your advisor will follow you through the rest of your college experience at The College of New Jersey. Your advisor will aid you in planning your academic future based on your aims and goals. He or she will aid in your course planning and with many of your academic problems, helping you to find your way through the procedures, making helpful referrals and attempting to personalize your academic endeavors. Be sure to bring your program planner with you for each meeting with your advisor. (NOTE: *BioM, BioP and BioT students should see Shevlin, Fangboner and Lipton, respectively, early in their first semester.*)

Graduate School Advisory Committee

Chair: Dr. Marcia O'Connell, Biology Building, Room 202

The Graduate School Advisory Committee provides information and guidance to students interested in attending graduate school at both the Masters and Ph.D. levels. The committee's advice supplements that provided by your biology advisor and both should be consulted. Students interested in graduate work should consult members of the GSAC for advice on topics such as taking standardized tests (e.g., GREs), fulfilling requirements, and the like.

Since the application process for graduate studies is very different for different fields, the advisory committee cannot provide advice in all fields. For example, in ecology, to be accepted in to a Ph.D. program a student must be associated with a professor in that program, while in molecular biology a student is usually not expected to be associated with a professor before being accepted. Therefore, students interested in graduate work should consult not only the committee, but also any and all faculty members who may be able to provide additional information. Individual faculty need to be asked to write letters of recommendation. Unlike medical schools, graduate schools do not accept composite letters.

If you are interested in graduate school, be sure to watch for announcements in the fall for the graduate school informational meeting of the Biological Society which is attended by members of the Graduate School Advisory Committee and the "How to Get involved in Research" meeting sponsored by Tri-Beta. Remember - it's never too early to start looking ahead!

Medical Careers Advisory Committee

Chair: Dr. Marcia O'Connell, Committee Chairperson, Biology Building, BI 202, ext. 2879

Support: Ms. Helen Kull, Program Assistant, Biology Building, BI 202, ext. 2371

Biology Department Members:

Dr. Ray Fangboner	BI 117	x2462
Dr. Steve Klug	BI 239	x2456
Dr. Sudhir Nayak	BI 126	x2659
Dr. Amanda Norvell	(on sabbatical 08-09)	
Dr. Marcia O'Connell	BI 228	x2879
Dr. Dennis Shevlin	BI 130	x2246

Chemistry Department Members

Dr. Lynn Bradley	SC	x3031
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Psychology Department Members

Dr. Andrew Leynes	SS	x2624
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The Medical Careers Advisory Committee provides information and guidance, as well as recommendations, to students interested in professional schools. Information on admission policies, enrollments, requirements, financial aid, interview questions and curricula is available. The service also provides information concerning the steadily growing group of health professions. The Medical Careers web site is www.tcnj.edu/~biology/career/medadvisory.html

To obtain the best service from the Medical Careers Advisory Committee, the student is advised to make inquiries as early in his or her college career as possible, even as early as freshman year. Your entry into a health professional school is dependent on a number of factors. These include *entry examination test scores* (DAT, MCAT, etc.), *undergraduate science and overall science/math grade point averages*, a good showing at the med school *interview*, and strong *letters of recommendation*. In the case of pre-med and often for the pre-dental there will be a composite letter from the Medical Careers Advisory Committee. Non-curricular matters will impact on your application also. Will you have the skills needed to gain entry into a professional school of your choice? Consult the Medical Careers Advisory Committee members, and do so now!

There is a **Junior Level MCAT preparatory course** scheduled for 2008-2009. It runs for about twenty-one weeks (on Saturdays 9-noon), the first ten weeks in the fall and the first eleven weeks in the spring. This extracurricular course will cost about \$250/year. Contact Dr. Shevlin (shevlin@tcnj.edu) for further information.

Pre-medical and Allied Health preparation

In preparation for application to Medical, Dental, Pharmacy, Veterinary, Physician Assistant, Podiatry, Optometry, Chiropractic, Physical Therapy, Occupational Therapy, Public Health, etc. programs, the student should consult as soon as possible with members of the Medical Careers Advisory Committee for current information and advisement. The student should also consult individual professional school catalogs and web pages to learn the entrance requirements as well as the specialties of the professional programs.

Medical, Dental, Veterinary and Podiatry

The Biology major planning to apply to Medical, Dental, Veterinary or Podiatry schools should complete the Biology Liberal Learning curriculum by choosing one or two psychology courses in partial fulfillment of the Behavioral, Social and Cultural Perspective. The Biology Options recommended highly are Comparative Vertebrate Anatomy (BIO 332), and Microscopic Anatomy and Techniques (BIO 413).

Do not make your academic decisions based on what you think will "look good" on your professional school application. For example, if you like languages or music or art, pursue these now. As a medical, dental, podiatric, or veterinary student, you will not have the opportunity to formally explore such areas of interest later on. You would be well advised to consider voluntary service and other evidences of altruism, as well as opportunities to "shadow" physicians at work.

Physical Therapy

PT bound students should learn what undergraduate courses are required for entry into the particular doctorate program they intend to pursue. Admissions criteria vary significantly from school to school. Write for catalogues, visit websites, and talk to admission officers. The competition for admission to PT programs is stiff. In general, beyond the Biology Liberal Learning curriculum, Human Anatomy and Physiology I and II (BIO 241-242) can be taken as Biology Options. Ask the Biology Chair to permit these courses to become biology option units. Also, you need to seek employment or volunteer in one or more Physical Therapy settings in order for your application to be considered seriously. You will need a strong letter of recommendation from your PT experience Supervisor in addition to your other recommendations. Contact Dr. Fangboner for advisement at each registration and for further information on PT programs, ext. 2462.

Optometry

These schools provide a four-year curriculum leading to a doctoral degree in Optometry (O.D. Degree). The pre-optometry student should also complete the Biology Liberal Arts curriculum. Students should take General Physics I&II (**not** Principles of Physics), Microbiology (as a Biology major), Introduction to Psychology and Statistics (MATH 115). There are differences in admissions criteria among Optometry schools, so it is imperative that you learn what each school requires. An Optometry bound student should have clear evidence in his/her academic record of superior communication skills. We have a 7-year articulation program with S.U.N.Y State College of Optometry. Qualified entering freshmen, enrolled freshman and sophomores can apply to be accepted into the program. If interested, see Dr. Fangboner for further information.

Chiropractic, Physician Assistant, Public Health

Students interested in Chiropractic, Physician Assistant, Public Health and other allied health careers should learn about admission criteria and employment opportunities. Each program has its own admission criteria. For further information, contact Dr. Fangboner, ext. 2462.

Biomedical Engineering

If interested in either the bioelectrical or biomechanical aspects of biomedical engineering, contact Dr. Ray Fangboner for further information. Take MAT 386 (Calculus "C") as early in your academic career as possible. There is also a program in Biomedical Engineering offered through the School of Engineering; please contact Dr. Martha Stella for details and information on that program.

Always plan early. You are encouraged to seek frequent advice from the Medical Careers Advisory Committee members found in the Department of Biology (Drs. O'Connell, Fangboner, Nayak, Shevlin and Klug). The health profession environment is changing rapidly. You should also be familiar with the entrance requirements of the institutions to which you are applying and be guided by them.

Early Admissions for MD and Optometry Programs

Seven Year Articulation Program (BioM program)

Seven Year BS/MD Program (with UMDNJ – NJ Medical School at Newark) UMDNJ-NJ Medical School at Newark and TCNJ have a formal articulation agreement by which talented high school applicants to TCNJ may be accepted to both UMDNJ and TCNJ as freshmen. BioM majors spend three years at TCNJ and four at NJMS, completing both the BS and MD degrees. The student in this program must maintain a 3.5 GPA overall and in the sciences each semester at TCNJ (with B's or better in each of the required introductory science courses) and complete the Medical College Admission Test (MCAT) in order to be retained in the program. There is no minimum MCAT score required, but it is advisable to score 27 or better.

Seven Year BS/OD (Optometry or BioP Program)

The State College of Optometry (S.U.N.Y.) in Manhattan and TCNJ have a formal articulation program similar to that with the NJ Medical School. Enrolled Biology freshmen and sophomores may be considered for admission to the program if they can finish the program within three years of entering TCNJ. They must have a 3.2 GPA overall, and in the required pre-optometry coursework, pass reasonable interview standards and achieve a 320 or better on the Optometry Aptitude Test (OAT). The first year at S.U.N.Y. double counts as the last year of TCNJ's undergraduate education. The BS degree is awarded by TCNJ after the first year at S.U.N.Y. is successfully completed.

To increase your success, please consider that employers, graduate schools, and professional schools often look to see whether a student has developed additional skills or has had other experiences outside of the classroom. The following opportunities exist:

1. **Research Experience** – Independent research projects and formal internship programs through TCNJ provide rich learning opportunities. There also are many other programs outside of the college for undergraduate students. Most (but not all) run during the summer. See the Department's web page (www.tcnj.edu/~biology/opportunities/index.html) for research opportunities. There is also a file of opportunities in the Biology Office. Most of these programs provide housing and meals; many offer a stipend, some offer college credit (have it approved before you take the course).
2. **Internships** – Many corporations and hospitals offer interesting programs for undergraduates. Register with LionsPro, TCNJ's on-campus recruitment program, to explore these opportunities. Some opportunities provide stipends or salaries. You can apply for credit for some of the programs through Dr. Klug.
3. **Volunteering** – many hospitals, veterinary clinics, youth camps and non-profit organizations actively seek volunteers to assist in their programs. Although many of these opportunities do not pay a wage, they can provide valuable experience and references.
4. **International (or National) Exchange** – doing an exchange semester off-campus has lasting value. Visit Global Programs in Green Hall, ext. 2596 for further information.

Scholarships and Fellowships

Students can obtain financial support for their undergraduate, graduate, or professional school studies through a variety of scholarships and fellowships. Some awards also provide opportunities for research, or clinical experience.

Places to Look: see *Departmental Awards*, and the departmental scholarship and fellowship webpage (www.tcnj.edu/~biology/opportunities/index.html). Look also at the College's webpage on competitive scholarships. Students should pay particular attention to the application requirements and deadlines.

The Office of Career Services also provides a variety of programs and resources to assist students planning for graduate and professional school. Each fall a graduate and professional school program is offered to provide information on graduate programs and financial aid. Employers, graduate schools, and professional schools often look to see whether a student has developed additional skills or has had other experiences outside of the classroom.

Career Advisement and Job Acquisition

Career Services, Nevolia Ogletree, Assistant Director of Career Services Forcina 158, ext. 2161

The Office of Career Services assists students with career decision-making and job searching. Career Services provides the following:

1. Assistance in choosing an academic major
2. Assistance in identifying career options
3. Resume writing and interviewing skill development
4. Assistance in obtaining internships, summer jobs, campus employment and part-time positions
5. Small group workshops on topics including "Interview Skills", "Effective Resume and Cover Letter Writing", "Job Search Strategies" and "Internship Opportunities" throughout the academic year.
6. A career library containing career literature, occupational information, job vacancies, internship opportunities and graduate school information
7. On-Campus Recruitment-interviews with private and public employers
8. SIGI-PLUS, a computerized guidance system that assesses your interests, skill and values to provide a personalized list of career options
9. Two career fairs, annually, held in the Brower Student Center, Room 202. **Fall Career and Internship Day has usually been held in early November, while Spring Career and Internship Day has been held in late March or early April.**
10. Graduate School advisement and related testing information (e.g. GRE, GMAT, LSAT, MCAT)
11. Graduate and Professional School Admissions Forum, Date TBA
12. TCNJ internship program: An on-going program securing over 250 internship opportunities for students during the academic year and summers.

Students may receive assistance with career planning beginning in the first year and continuing through graduation and beyond. Counselors are available to meet with you to discuss your plans. Your active participation in the programs and services ensures a smooth transition into your chosen career. To schedule an individual counseling appointment with a career counselor, call 771-2161.

The Office of Career Services provides a variety of special programs and services to assist you in obtaining employment. If you would like to earn money working on campus while attending school, visit Career Services (web site: www.tcnj.edu/~career) to inquire about Student Employment and campus jobs. Early in your senior year, you should register to participate in this program which brings employers to campus, who recruit graduating seniors for full-time employment after graduation. Seniors are also encouraged to attend job fairs and join MonsterTrak (www.monstertrak.com) by submitting their resume on-line and utilizing web accessible database of job listings. The Career Resource Library also contains literature on traditional career fields and a variety of employers. In addition, the Biology Opportunities page (www.tcnj.edu/~biology/opportunities/index.html) links to some job listings.

Visit the Office of Career Services for assistance in clarifying and pursuing exciting career opportunities that match your academic major and personal attributes. Should you have any questions pertaining to your career, do not hesitate to contact the Office of Career Services.

Some career counseling services are also provided by the Psychological Counseling Services Office at the Wellness Center, located in Eickhoff Hall, Room 107, www.tcnj.edu/~wellness/psych. The Psychological Counseling Services staff provides other counseling options along with career counseling, including individual and group counseling, with the opportunity to address personal and emotional problems that may interfere with your academic work. All services are free and confidential.

DEPARTMENTAL SOCIETIES AND AWARDS

Biological Society

Advisor: Dr. Sudhir Nayak, BI 126, x2659

The Biological Society is an organization open to all TCNJ students and faculty who have an interest in biology. The Society sponsors seminars given by The College of New Jersey faculty, and by individuals invited from other academic institutions, government and industry. The society also sponsors films, student services, picnics, and field trips.

American Medical Students Association (AMSA)

Advisor: Dr. Dennis Shevlin, BI 130, x2246

TCNJ has a chapter of this national organization, the goals of which are to provide information to pre-medical students about the preparation for and the nature of medical training. AMSA provides a national data base and a set of contacts for pre-medical students. Our local chapter sponsors premedical advisement workshops, admissions seminars, financial aid presentations, and lectures by physicians in training and practice, and visits to local medical schools. Information and advisement for students interested in dentistry, optometry, physical therapy and other health fields are offered by AMSA and the Biological Society as well as by the Medical Careers Advisory Committee faculty.

Minority Association of Pre-Health Students (MAPS)

Advisor: Dr. Sudhir Nayak, BI 126, x2659

TCNJ's Chapter of MAPS (also a national organization) is to provide under-represented students interested in the medical field with adequate knowledge, skills, and experiences that are both prerequisite and affiliated with the requirements necessary for admission into medical schools. MAPS also provides pre-health information to all interested students. The organization offers to its members the following activities: panels of medical students and doctors, access to regional and/or national conferences, medical school trips, mentorship through medical students, shadowing with doctors, facilitating access to community service and more. TCNJ MAPS endeavors to educate our members, the campus community, and when possible the surrounding community on issues related to the medical field and health care in minority communities and elsewhere through Health Fairs and Conferences, such as, Health Disparities Outreach Fairs, Pre-health conferences, and Health Professional School Admissions Fairs.

AZ/BS-MD Club

Advisor: Dr. Dennis Shevlin, BI 130, x2246

AZ (formerly "Alpha Zeta," but not a Greek organization) is a student organization consisting of the participants in the Seven-Year Articulation Program with UMDNJ- New Jersey Medical School. It is designed to help with the transition to medical school, and provides support, information and social networking opportunities for its members.

Beta Beta Beta

Advisor: Dr. Donald Lovett BI 129, x2876

"Tri Beta" is the local chapter of the national biology honorary society and an active service organization making a major contribution to the campus and Ewing community.

Biology Awards

There are several Biology Awards given each year to deserving senior majors. A committee of faculty uses the criteria of academic merit, research and service to the department to select honorees. It is anticipated that the awards in 2008 will be limited to seniors. The awards may include the following: (1) *Joseph Vena Award*, (2) *Wyeth Co. Award for Excellence in Biology*, (3) *Al Eble Senior Award*, and (4) *Alumni Senior Award*, (5) *Uyhazi Award*.

Applications are given to nominated students.

DEPARTMENTAL POLICIES

Transfer Credit

Courses required for the major, but taken elsewhere will fulfill Biology requirements only if a grade of "C" or better is earned. ***Remember that you may take no more than three units of your senior year away from the TCNJ campus.*** In general, the amount of transfer credit that may be applied to the major (or a minor) should not exceed 50% of the total coursework. The chairperson of the Department of Biology must approve a course taken at another campus before the course is taken.

Retention Requirement

To be retained as a BIOA or BIOT major within the Department of Biology, the student must have a minimum cumulative science GPA of 2.0 in three science (and all) courses required by the major by the end of the fourth semester. The required core courses must average a 1.67 or better, and the student must be making appropriate progress towards graduation.

Current Graduation Requirements

To graduate, the BIOA student must have a minimum cumulative GPA of 2.0; a minimum cumulative GPA of 2.0 in all science courses taken at TCNJ; and a minimum cumulative GPA of 1.67 in the biology core courses: *Themes in Biology, Biology of the Eukaryotic Cell, Ecology and Field Biology, Genetics and Biological Seminar.*

Student Grievance Procedures within the Department of Biology

Students are directed to consult the College-wide Academic Integrity Policy found on the TCNJ Student Handbook web site. The Department of Biology subscribes to this policy. It is hoped that the student's relations with the faculty and staff within the department will be smooth; however, a grievance may develop. The student should seek satisfaction employing the following procedures *in the order listed*:

1. The student and the involved faculty or staff member should attempt to resolve the conflict.
2. If the student is not satisfied with the decision arrived at in Step 1, he or she should lodge a complaint with the chairperson of the department. The student and the involved faculty member will be invited to meet with the chairperson within 30 days of the complaint being filed (summertime is discounted). If, however, the chairperson is the focus of the grievance, the student should skip this step and proceed to Step 3.
3. If a reasonable solution cannot be reached by both the student and the faculty member (after Steps 1 and 2), then the student may file a formal, written grievance with the chairperson of the department. If the chairperson is involved, then the student should file the complaint with the chairperson of the Student Advisement Recruitment and Retention Committee.
4. This grievance will then be heard by the Departmental Student Grievance Committee which will consist of no less than three faculty members (one of whom will be the Chairperson unless this individual is involved in Step 1) and one Biology major. This hearing will be scheduled within 30 days of the request for committee hearing. These proceedings will be conducted in the presence of both the involved student and the faculty member. If the decision reached by the Student Grievance Committee is still felt to be unsatisfactory to the student, then the student may appeal this decision to the School of Science Student Complaint Committee (see College Student Handbook).
5. The statute of limitations on filing student appeals shall be one semester following the end of the semester in which the incident occurred.

APPENDIX I

Roster of Faculty, 2008 - 2009

Dr. James Bricker, Ph.D. S.U.N.Y. at Buffalo

Teaching responsibilities: Laboratory Techniques in Biotechnology, Microbiology, Advances of Molecular Biology, and Senior Biology Seminar.

Research Interests and Academic Services:

1. Isolating DNA from shed snake skins to develop a genetic and molecular picture of the corn snake (*Elaphe gutata*) population.
2. Tracing the molecular genetic history of white tailed deer in New Jersey area.
3. Using the above data to manage the corn snake, an endangered species.
4. Obtaining and analyzing DNA from museum specimens for use in research.
5. Advisor for Graduate Studies Advisory Committee
6. Advisor TCNJ Fencing Club
7. Computing liaison for Information Management

Dr. Curt Elderkin, Ph.D. University of Louisiana, Lafayette

Teaching responsibilities: Themes in Biology, Ecology and Field Biology and Evolution.

Research Interests and Academic Services:

1. Population genetics and biogeography of freshwater invertebrates
2. Ecology and conservation of freshwater mussels
3. Evolutionary ecology of freshwater invertebrates
4. Invasive species ecology

Dr. Jeffery T. Erickson, Ph.D. University of North Carolina at Chapel Hill

Teaching responsibilities: Themes in Biology, Biology of the Eukaryotic Cell, Neurobiology, and Senior Biology Seminar.

Research Interests and Academic Services:

1. Developmental respiratory neurobiology
2. Growth factors and sensory neuron development.
3. Genetic determinants of vertebrate breathing behavior.
4. Advisor for Graduate School Advisory Committee

Dr. Ray Fangboner, Ph.D. Purdue University

Teaching responsibilities: Biology Freshman Seminar, Human Form and Function, Comparative Vertebrate Anatomy, and Biological Senior Seminar.

Research Interests and Academic Services:

1. Nerve growth patterns with nerve and organ selectivity in *Xenopus laevis* tadpoles using selective florescent probes.
2. Light and scanning electron microscopic studies of superior oblique and superior rectus muscle regeneration patterns.
3. Medical Careers advisor (specializing in Optometry, Veterinary Medicine, Occupational and Physical Therapy and Physician Assistant and other allied health careers)
4. Departmental Honors Advisor
5. Liaison to S.U.N.Y. Optometry – 7 year articulation program; Advisor to BIOP major.

Dr. Steve Klug, Ph.D. Northwestern University

Teaching responsibilities: Genetics, and Biological Internship and Biological Senior Seminar

Research Interests and Academic Services:

1. The study of the genetic control of development using *Drosophila* oogenesis as a model system.
2. Author of eight editions of *Concepts of Genetics*, used in genetics courses nationally and internationally
3. Author of five editions of *Essentials of Genetics*, used in genetics courses nationally and internationally
4. Author of 1st edition of *Genetics – A Molecular Perspective*, a college-university level textbook

5. Coordinator of the Biology Internship Program
6. Coordinator of the Bristol-Myers Squibb Research Trainee Committee
7. Premedical Advisor
8. Graduate studies advisor
9. Advisor to ECBI and ELBI students

Dr. Gary Lipton, Ph.D. Rutgers University

Teaching responsibilities: Biology Freshman Seminar, Themes in Biology, Introduction to Invertebrates, General Entomology, and Student Teaching supervision.

Research Interests and Academic Services:

1. Biological rhythms of activity and feeding in insects.
2. Morphology of insect nervous systems.
3. Secondary Student Teacher Coordinator, Advisor for the BIOT majors, Independent Study Coordinator

Dr. Donald Lovett, Ph.D. University of Louisiana, Lafayette

Teaching responsibilities: Biology Freshman Seminar, Themes in Biology, Microscopic Anatomy and Techniques, and Electron Microscopy for Biologists.

Research Interests and Academic Services:

1. Anatomy and ultrastructure of the crustacean gill.
2. Mechanisms of osmoregulatory response in the blue crab.
3. Gene expression in crabs
4. Advisor for Graduate School Advisory Committee, Advisor of Beta Beta Beta Honor Society.

Dr. Janet Morrison, Ph.D. S.U.N.Y. at Stony Brook

Teaching responsibilities: Biology Freshman Seminar, Ecology and Field Biology, Biology of Seed Plants, and Plants and People

Research Interests and Academic Services:

1. Ecology and evolution of plant pathogen interactions in natural communities.
2. Ecological mechanisms and community effects of non-native plant invasions.
3. Ecology, conservation, and biodiversity of urban/suburban forests.
4. Botanical evolutionary ecology.
5. Experimental approaches in field ecology.
6. Advisor for the Graduate School Advisory Committee

Dr. Sudhir Nayak, Ph.D. University of Pennsylvania

Teaching responsibilities: Genetics, Genomics and Bioinformatics

Research Interests and Academic Services:

1. Cell fate specification and execution in the nematode (*Caenorhabditis elegans*)
2. Elucidating steps in the evolution of self-fertile hermaphroditism
3. Post-translational control of proteins involved in nematode oogenesis
4. Member of the Genetics Society of America
5. Advisor to MAPS and the Biological Society

Dr. Amanda Norvell, Ph.D. University of Pennsylvania (on sabbatical 2008-2009)

Teaching responsibilities: Themes in Biology, Biology of the Eukaryotic Cell, Molecular Immunology and Human Disease, Advanced Eukaryotic Cell Biology, Biology Senior Seminar

Research Interests and Academic Services:

1. Pattern formation during *Drosophila melanogaster* oogenesis.
2. mRNA localization during oogenesis.
3. Transcription and nuclear export of mRNA
4. Advisor for the Graduate School Advisory Committee, Advisor to MAPS

Dr. Marcia O'Connell, Ph.D. S.U.N.Y. at Stony Brook

Teaching responsibilities: Biology of the Eukaryotic Cell, Genetics, Developmental Biology, and Biological Seminar

Research Interests and Academic Services:

1. Determination and formation of the embryonic axes in vertebrates.
2. Regulations of tissue specific genes in zebra fish embryos.
3. Maternal regulation of polyadenylation.
4. Advisor for the Graduate School Advisory Committee, Advisor to the Biological Society, Chair of Medical Careers Advisory Committee
5. Departmental Chair

Dr. Howard Reinert, Ph.D. Lehigh University

Teaching responsibilities: Ecology and Field Biology, Biometry and Physiological and Behavior Ecology.

Research Interests and Academic Services:

1. Ecology, behavior and physiology of reptiles and amphibians.
2. Habitat selection in snakes.
3. Predator/prey relationships and the foraging behavior of vertebrates.
4. Conservation and management of endangered animal species.
5. Application of molecular biological techniques to ecology and conservation biology.

Dr. Miriam Segura-Totten, Ph.D. Johns Hopkins University School of Medicine

Teaching responsibilities: Themes in Biology, Eukaryotic Cell Biology, Cell Biology of the Nucleus

Research Interests and Academic Services:

1. Study of the functions of nuclear membrane proteins; specifically, the molecular mechanisms of diseases caused by mutations in the coding regions of these proteins.
2. Cell biology of nuclear assembly and disassembly, and the role of the interaction between chromatin and the nuclear membrane during mitosis.

Dr. Dennis Shevlin, Ph.D. University of California at Berkeley

Teaching responsibilities: Themes in Biology, Biology of the Eukaryotic Cell, Oceanography and Biology of Fungi, Senior Biology Seminar

Research Interests and Academic Services:

1. The biology of Ustilaginalean Fungi – systemic assessment and plant host/parasite interactions
2. Coordinator of MCAT preparation course, advisor to Alpha Zeta, advisor to BIOM students and Representative to NJ Marine Science Consortium.
3. Medical Careers Advisor, Advisor to AMSA.

Dr. Keith Pecor, Ph.D. University of Michigan

Teaching responsibilities: Ecology and Field Biology, and Aquatic Biology

Research Interests and Academic Services:

1. Context-dependent behavioral strategies in aquatic systems
2. Reproductive biology of North American crayfish
3. Invasive species biology

Dr. Leeann Thornton, Ph.D. Washington University, St. Louis

Teaching responsibilities: Theme in Biology, Biology of the Seed Plants

Research Interests and Academic Services:

1. The role of plant cytochrome P450 enzymes in hormone inactivation
2. Biological processes that allow plants to perceive and respond to their environment

APPENDIX II

The College of New Jersey's
Professional Education Unit Statement of Policy
for Undergraduate Exit Requirements in Teacher Education Programs

As a result of New Jersey State Department of Education code revisions (Section 6.11-5.1), a cumulative grade point average (GPA) of at least 2.75 is required for students to successfully complete their teacher education program and be recommended for certification and licensure. The requirement becomes effective September 2000 for all candidates entering their junior year.

To help assure that students at The College of New Jersey meet this requirement by graduation ...

1. Admission to **candidacy** in all teacher education programs will require a 2.5 minimum GPA following completion of 60 credits, and
2. Admission to **student teaching** in all teacher education programs will require a 2.75 minimum GPA, also effective as of September 2000.

Exceptions involving admissions will be considered on an individual basis, and granted upon approval of the Chair of the Department offering the program and the Dean of Education.

~Adopted on February 16, 2000 by the Teacher Education Advisory Council.

APPENDIX III

Guidelines for Biology Independent Research

Basic Requirements:

- 1) attendance at laboratory meetings
- 2) maintenance of a laboratory notebook
- 3) attendance at all departmental seminars
- 4) engagement in an average of 15 hours per week of work related to the project
- 5) presentation of a research poster to the department
- 6) submission of a final research paper written in a style suitable for a scientific journal and the final version archived with the department for review.

Performance Rubric

Students will be given a grade of IP until the project is completed. For the final grade, pluses and minuses may be given based upon the level of accomplishment within a grade level. A student that fails to meet the basic requirements and/or does not produce a research paper or poster will not pass.

A Excellent Performance

- Engages in persistent, hard work
- Displays independent intellectual and technical involvement in work
- Has an excellent grasp of technical and theoretical aspects of research
- Makes project his or her own; makes creative contribution to design and analysis of experiments
- Maintains an excellent lab notebook with up-to-date recording, tabulating, and analysis of data
- Displays critical thinking in lab meetings
- Final poster presentation and written research paper are of excellent to outstanding quality

B Good performance

- Engages in persistent, hard work
- Exhibits ability to work independently and demonstrates technical independence
- Delivers a very solid performance and completely reliable and reproducible experimental work
- Gives competent presentations in lab meetings
- Maintains a clear, organized lab notebook
- Final poster presentation and written research paper are of good to very good quality

C Average performance

- Engages in persistent, hard work
- Performance in experimental work is fair to poor
- Demonstrates an ability to work with limited supervision
- Lab notebook is inadequately maintained
- Participation in lab and lab meetings is of low quality
- Final poster presentation and written research paper are of fair quality

D Poor performance

- Performance is inadequate or sloppy
- Displays inability to work without direct supervision
- Has an inadequate grasp of the technical aspects of the work
- Does not maintain an organized research notebook
- Poster and paper are unclear and poorly organized and presented