

**HANDBOOK**  
**Ph.D. PROGRAM IN BIOLOGY**  
**THE CITY UNIVERSITY OF NEW YORK**  
*Revised Spring 2005*

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# HANDBOOK FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN BIOLOGY

*This material has been prepared by student and faculty representatives of the Ph.D. Program in Biology. For official information, please check the current Bulletin and Student Handbook of The Graduate Center and University Center.*

## I. DEGREE REQUIREMENTS

**A. GENERAL STATEMENT** - The Degree of Doctor of Philosophy is awarded for mastery of subject matter and demonstration of research ability. It is awarded in recognition of a candidate's superior attainments and ability in the major field. Students must maintain high levels of academic and research performance to retain matriculated status in a doctoral program. Progress through the requirements will be reviewed regularly by an advisory committee and the appropriate administrative officer or graduate studies committee at the student's campus.

Normally, four or more years of full-time study and research beyond the bachelor's degree are needed to complete a doctoral program. Usually, a student may obtain an M.A. from a local campus during the course of study for the Ph.D. upon the completion of at least 45 graduate credits with an average of "B" or better, the acceptance of a suitable library thesis, and recommendation to the local campus by The Graduate Center and University Center (GC). The degree is awarded at the discretion of the local campus. This degree is referred to as the "en-route" master's. In addition, students who have been "advanced to candidacy" are awarded the Master of Philosophy Degree from the GC upon application.

While the general University requirements and academic regulations for the Ph.D. degree are included in the annually revised *Student Handbook* and the *Bulletin of the Graduate Center* (for your convenience, much of this information is included in this Handbook), the specific requirements for Biology are established by the Biology Executive Committee and are included herein. Any changes instituted after the publication of this Handbook are communicated to students by the minutes of the meetings of the Biology Executive Committee and through memoranda. This Handbook will be updated periodically to include such changes. A student, with the consent of his/her Advisory Committee, may petition the Executive Officer in Biology to modify or waive any specific requirement for the Ph.D. degree. It shall be the responsibility of the student to maintain a current address at the Program Office and to ensure that Program communications have been received.

The Doctoral Program in Biology is operated through the Program Office and the Executive Officer with the advice and consent of the Executive Committee in Biology. Elected and appointed faculty and students comprise the membership of this committee, whose activities follow the Program's Governance document, which is appended to this Handbook (please see Appendix A).

**B. SPECIFIC REQUIREMENTS** - The following paragraphs enumerate the University and Program requirements for the Ph.D.

**1. PROGRAM OF STUDY** - Students must follow an approved program of study designed in consultation with their Advisory Committee. The first year's work will normally include a number of fundamental courses designed to complete a student's basic academic background and prepare him/her for the First Examination. Additional courses relevant to the student's probable research and dissertation area and second-level courses leading to specialization are taken in subsequent years. A record of the student's progress is maintained at the Program Office and is upgraded as milestones are achieved. A copy of the record card is included in Appendix B. A course listing is provided as Appendix D. Students must fulfill the course requirements in one of the following major areas of specialization:

### **ECOLOGY, EVOLUTIONARY BIOLOGY, AND BEHAVIOR (EEB)**

In addition to the regular requirements of the Ph.D. Program in Biology, all EEB students shall meet the following requirements.

#### **Course Requirements for the EEB Subprogram – effective September 1, 2004**

Students are required to take **one course from each of our four areas**. Courses can be chosen from those listed for each area. Substitution of any other course requires advanced permission of the EEB Advisory chair or their designee.

#### **Behavior**

BIOL 72407 Animal Behavior II  
BIOL 72406 Behavior and Evolution

#### **Ecology**

BIOL 76005 Population Ecology  
BIOL 76001 Ecology  
BIOL 76003 Community Ecology

#### **Evolution**

BIOL 70901 Population Genetics  
BIOL 70503 Evolution  
BIOL 70803 Molecular Evolution

#### **Systematics**

BIOL 70603 Principles of Systematics

In addition, students are required to take:

- 1. One graduate lecture and lab statistics course.** This can be fulfilled with either Biostatistics I (BIOL 78201 - lecture and lab) or Mathematical Biology I and II (BIOL 78001 lecture and BIOL 78002 lab).

(The EEB advisory can be petitioned to consider an equivalent graduate course taken during the previous 3 years in fulfilling this requirement.)

**2. One 3-credit graduate seminar course** (Seminar in Evolution BIOL U79001, Seminar in Ecology BIOL 79006, Seminar in Biomathematics BIOL 79008, Seminar in Systematics BIOL 79011, Seminar in Zoogeography BIOL 79012, Seminar in Animal Behavior BIOL 79022). These seminar courses are offered periodically by different campuses and will focus on critical evaluation of papers in the various areas.

Finally, any student who has not taken a **basic genetics course** in the past 5 years will be required to take an undergraduate genetics course at one of the campuses.

Any exceptions to these requirements must be approved by the EEB Advisory Committee.

## **NEUROSCIENCE (NS)**

Students must take the following courses in order to be prepared for the First Examination and to fulfill course and other requirements in order to advance to Level III in a timely manner:

First semester	Animal Behavior Neuroscience I Lab Rotation
Second semester	Animal Behavior Neuroscience II Lab Rotation
Third semester	Advanced courses Molecular Biology or Neuroanatomy Seminars
Fourth semester	Advanced courses Independent Doctoral Research

## **MOLECULAR, CELLULAR, AND DEVELOPMENTAL BIOLOGY (MCD)**

In order to pass the level 1 exam in the MCD subprogram, the material covered in the following courses (or their equivalents) are very strongly recommended:

BIOL 70005	Genetics (lecture)
BIOL 71013	Molecular Biology (lecture)
BIOL 71401	Cell Biology (lecture)
BIOL 75003	Developmental Biology (lecture)

In all cases, a student's particular course of study will be determined in consultation with the Graduate Deputy Chair of the student's home campus (or their designee).

Additionally, it is strongly suggested that all students do three laboratory rotations prior to determining the subject for their thesis work. The Graduate Advisory Committee of a given home campus may, at their discretion, require first year MCD students they support on their campus to do up to three lab rotations. MCD students may elect to do one of their rotations at another CUNY campus other than their home campus.

## **PLANT SCIENCES (PS)**

Doctoral students in Plant Sciences are strongly encouraged to take all the graduate courses taught by Plant Sciences doctoral faculty.

**2. CREDITS, COURSE DISTRIBUTION** - At least 60 credits of approved graduate work, including those in the field of specialization, are required for the degree. Students matriculated for the Ph.D. may take the first 30 credits of course work at the Graduate Center, or at any one of the colleges of the University offering approved graduate course work in the field, or at several institutions depending on the specific program requirements. For information on acceptable courses for the first 30 credits, students should consult their advisers and advisory committee.

Advanced-level courses along with seminars, tutorials, and advanced-study courses as well as courses offered by other Ph.D. Programs (Biochemistry, Earth and Environmental Sciences, Psychology, etc.) complete the menu of offerings from which the students and their advisers may choose. In addition, students may take up to 10 credits of Independent Doctoral Research.

Of the 60 graduate credits required for the degree, not more than nine may be 600-level courses listed in the various college graduate bulletins. The remaining credits must be in U700 and U800 courses. After advancement to candidacy, the candidate must register for U900 Dissertation Supervision, 1 credit, each semester until completion of all requirements for the degree.

a. 600 (1600 and 1700 at City College) level courses are listed in the graduate bulletins of Brooklyn, Hunter, Lehman, Queens, and Staten Island colleges.

b. U700 and U800 level courses ("U" or University courses) are creditable toward the doctoral degree. All currently approved courses are listed in Appendix D. Courses are offered at one or more campuses of the University. Courses listed under the same University number cover substantially similar material at comparable levels. Brief course descriptions will be found in the graduate bulletins of the individual colleges. More specific course descriptions and requirements will be made available before registration each time a course is to be offered. Additional information is available to the student either by writing to or by consulting with the instructor. The prerequisite for admission to all courses is approval by the student's advisory committee. Approval is indicated by the student's adviser or campus deputy chair signing the registration card.

c. One-on-one tutorials (U792), advanced studies (U792.01), colloquia (U791), and research courses (U899) will be graded PASS/FAIL. Letter grades (A, B, C) WILL NOT be utilized and the grade will not be used in computing the GPA (Grade Point Average).

For the purpose of evaluating a student who has applied for the “en-route” M.A., however “Pass” will be computed as a “B.”

d.U900 Dissertation Supervision, 1 credit, is to be taken each semester following advancement to candidacy (please refer to Section VII for additional information) until all requirements for the degree have been met.

e. Interuniversity Cross Registration - The City University of New York is involved in a reciprocal arrangement with several other universities in New York City. In the event that a student and the student's advisory committee agree that it would be beneficial for a student to take a course not offered at CUNY, the mechanism for such an arrangement is available, at Columbia University, Fordham University, New School University, New York University, or Teacher's College. The first and back pages of the application procedure are reproduced in Appendix E.

**3. COLLEGE TEACHING AND FIELD EXPERIENCE** - A minimum of two semesters of college teaching experience are required. In those sub-disciplines of biology where field experience is considered to be particularly appropriate by the student's advisory committee, such experience may be required and may substitute, wholly or in part, for the teaching requirement. Written certification of the teaching done to satisfy this requirement must be submitted prior to Advancement to Candidacy (Please see Appendix V for sample form).

**4. FIRST EXAMINATION** - This examination covers the student's ability to think, synthesize information, and solve problems in one of four areas of biology: Molecular, Cellular, and Developmental Biology; Plant Sciences; Neuroscience; or Ecology, Evolutionary Biology, and Behavior. It should be noted that a student will be deemed not to be making satisfactory progress if 45 credits are accumulated before passing the First Examination. (Please refer to Section V for complete details of this examination.)

**5. FOREIGN LANGUAGE AND RESEARCH TECHNIQUES** - An individual's research mentor and advisory committee with the approval of the Executive Committee may require a student to acquire the functional mastery of computer programming or a working knowledge of a foreign language or languages in which there is a substantial body of literature relevant to the student's research. Should the student be required to develop such skills, the Executive Officer must be notified of this requirement, in writing by the student's mentor, no later than the student's fourth semester.

**6. SECOND EXAMINATION** - Students must demonstrate advanced understanding and research competence in their area of specialization and related fields of biology by passing an oral Second Examination. This examination is administered by an Examination Committee and is to be completed by the end of the fourth semester following the successful completion of the First Examination and after the completion of any language and research technique requirements. Students failing to complete the Second Examination in this prescribed period will not be permitted to register and will be dropped from the Program (see the *Student Handbook* for policies and procedures for appealing withdrawal from the Program). (Please refer to Section VI for complete details of this examination.)

**7. PRESENTATION OF DISSERTATION RESEARCH IN A PUBLIC SEMINAR -**

Prior to the dissertation defense, the student shall present a public seminar focusing on the subject of the dissertation. Certification of this event by a letter to the program office by the campus deputy chair is necessary for the scheduling of the dissertation defense.

#### **8. DOCTORAL RESEARCH: THE DISSERTATION AND DISSERTATION**

**DEFENSE** - With the advice and consent of the student's advisory and Second Examination committees, the research program will be planned and conducted, culminating in an approved and defended dissertation. (Please refer to Section VIII for details of this phase of graduate studies.)

**C. TRANSFER OF CREDIT** - A maximum of 30 acceptable graduate credits taken at institutions outside The City University and the Ph.D. Program may be applied toward the degree, provided the courses were completed with a grade of B or higher within an appropriate period preceding the time of application and are equivalent to comparable courses at The City University. Exceptions to the above regulations may be considered under special circumstances. An evaluation of previously earned credits will usually be made after passing the First Examination.

Please use the form entitled "Advanced Standing Transfer Credit Recommendation" (Appendix F), have it approved by your adviser, and give it to the graduate deputy chair on your campus together with supporting transcripts for transmittal to the Executive Officer for final approval.

**D. RESIDENCE** - At least 30 of the credits required for the degree must be taken in residence at the City University. Doctoral students are expected to spend at least one year in full-time residence at the City University. Full-time residence consists of a schedule of no fewer than 12 credits or the equivalent, as certified by the Executive Officer, for each of two consecutive semesters.

**E. TIME LIMIT** - All requirements for the degree must be completed no later than eight years after matriculation. A student who matriculates after the completion of 30 credits of acceptable work must complete all requirements within seven years. Students unable to comply by completing all requirements within the specified limits must submit an "Extension of Time Limit Form" which must be approved by the Vice President for Student Affairs. (Please see Appendix G for a sample form.)

**F. AUDITING OF COURSES** - When the Executive Officer or graduate adviser recommends it, a full-time graduate student may audit any undergraduate course without credit with the permission of the appropriate undergraduate authority. In addition, students matriculated for the Ph.D. who have passed the Second Examination and have completed formal course requirements for the degree may, with the permission of the appropriate college or university authority, register as auditors in graduate courses.

**G. MAINTENANCE OF MATRICULATION** - In order to preserve continuity of academic experience, a student who is not On Leave must be registered either as:

- a. Attending courses, or

b. Working for research credits (BIOL U899), or

c. Registered for BIOL U900 Dissertation Supervision,  
(1 credit, certified as 12 credits).

**H. WITHDRAWAL** - Written notice of voluntary withdrawal from the Program must be approved by the Executive Officer. (Please see Appendix H for a sample Withdrawal form.) The withdrawal cannot be granted until the student has been cleared by the Director of Financial Aid, the Chief Librarian, the Bursar, and the Assistant Business Manager. To resume doctoral study, a former student must apply to the Program for readmission. A student who applies for readmission must do so in writing (see Appendix C) and pay a fee by the end of the first week in August for the Fall semester and second week in January for the Spring semester.

**I. LEAVE OF ABSENCE** - A student wishing to interrupt doctoral study for one or two semesters may be granted a leave of absence upon application to the Executive Officer. (Please see Appendix I for the sample form and Leave of Absence procedures). The reasons for requesting the leave must be clearly presented, in writing, and approval of the student's advisory committee and graduate studies committee at the local campus indicated. The period of an authorized leave is not included within the time limit for completion of degree requirements. A Leave of Absence form must be approved and signed by the Executive Officer and cannot be granted until the student has been cleared by the Financial Aid Office, the Librarian, the Bursar, and the Assistant Business Manager. Any student subject to induction or recall into military service should consult the appropriate veteran's adviser (the Senior Registrar) before applying for an official leave. An extension of a leave of absence, which will be granted only under unusual circumstances, must be authorized by the Executive Officer.

**IMPORTANT NOTE:** Students who do not comply with requirements of paragraph G and who are not on an officially approved leave are deemed to have left the Program. They will not be permitted to resume their studies unless their application for readmission is approved by an Admissions Committee of the Ph.D. Program in Biology.

**J. "EN-ROUTE" MASTER'S DEGREE** - The award of a master's degree is recommended to a four-year CUNY college by the GC for enrolled doctoral students who have fulfilled certain requirements. Generally these requirements include a minimum of 45 credits with an average grade of B (*in this Program the grade of P is awarded only for work regarded as B or better although it is not counted in the GPA*), passing of the First Examination, and satisfactory completion of a major research paper that has been approved by the mentor. Those seeking an en-route master's should bring their request to the Executive Officer who will initiate the proper application. Please refer to Appendix J for a sample en-route master's degree application. It is important to remember that the final decision regarding the degree rests with the four-year college.

## **II. FINANCIAL ASSISTANCE AVAILABLE TO DOCTORAL MATRICULANTS AT THE CITY UNIVERSITY**

**NOTE:** Circumstances frequently result in changes in the categories of financial assistance, and the student is advised to check the annual edition of the *Student Handbook* or consult the

Financial Aid Office.

Financial assistance is available to GC doctoral students through a program of fellowships, scholarships, traineeships, and assistantships. It is granted on the basis of **both** need and merit, with need determined in accordance with uniform assessment procedures. The awards are available to full time doctoral matriculants through the GC Office of Financial Aid upon nomination by the home campus. The filing offices and deadline dates of these awards are listed in the *Student Handbook* and the *Announcement of Courses*. Those students interested in teaching assistantships should file an application with the chair of the department of the CUNY unit at which they wish to teach. For additional information, applicants for financial assistance who are, or plan to be, CUNY doctoral matriculants are invited to consult with the GC Financial Aid Office.

All students, regardless of whether they anticipate filing for any kind of financial aid, are advised to file a financial aid form once every academic year. (Please refer to sample form in Appendix K.)

**Student Travel and Research Fund Awards** - These awards are funded jointly by The Graduate Center, the Doctoral Students' Council, and the Ph.D. Alumni Association. Reimbursement of up to \$250 (limited to 50% of total costs for presentation at professional conferences, or a maximum of \$200 for conference attendance, research-related travel or dissertation/research materials and supplies) is limited to one per academic year per student. Please refer to Appendix L for a sample application form, details for applying, and information on the scope of the program.

**Herbarium Fellowships for Graduate Study** - Fellowships in systematic botany and related fields are offered by the New York Botanical Garden to students engaged in full-time study in the Ph.D. Program in Biology, with a specialization in plant sciences. Holders of this award are expected to devote half-time to formal graduate study and half-time to research and herbarium assistance. The stipend is at least \$14,000 a year, in addition to tuition and health insurance. Fellowships may be renewed annually, contingent upon satisfactory scholastic progress. Applications and additional information can be obtained from the Administrator of Graduate Studies, New York Botanical Garden, Bronx, NY 10458, Telephone Number (718) 817-8127.

**American Museum of Natural History Doctoral Training Program** - The AMNH Office of Grants and Fellowships accepts applications from students enrolled in doctoral programs at universities with which the museum has a formal affiliation (a museum curator must be serving as the major or co-major adviser). The stipend is based on the range of a Graduate "A" Fellowship for an 11-month appointment for which the student must spend 50% of the time engaged in research or curatorial training at the museum. An additional amount may be paid for tuition and health coverage. Completed applications on the prescribed forms should be returned to the Office of Grants and Fellowships by the specified deadline date. Selection for the one-year appointments will be made on a competitive basis by the admission committee comprised of the curatorial members of the Grants and Fellowship Committee and the Deputy Director of Research. For further information and application please call (212) 769-5467.

**The College of Staten Island (CSI)/ Institute for Basic Research (IBR)/ Center for Developmental Neuroscience (CDN)** - Graduate Fellowships provided by the New York State

Office for Mental Retardation and Developmental Disabilities (OMRDD) are offered to students engaged in full-time study in the Ph.D. Program in Biology, with a specialization in Neuroscience and conducting dissertation research mentored by a faculty member of the Center for Developmental Neuroscience. The stipend is at least \$25,000 per year. Selection for one-year appointments will be made on a competitive basis by an admissions committee of the Center for Developmental Neuroscience, and can be renewed annually for up to 4 years. Applications may be made to the Office of the Center for Developmental Neuroscience, The College of Staten Island, Room 229, Building 6S, 2800 Victory Boulevard, Staten Island, NY 10314, Telephone (718) 982-3950.

### **III. REGISTRATION: CERTIFICATION AND TUITION LEVELS**

**A. CERTIFICATION** - A student who is enrolled for 7 or more credits either for course credit or a combination of course credits and weighted instructional units, is a full-time student and does not have to be certified as such by the department. Students at Level I who register for 7 or more credits will be billed at the full-time tuition rate and considered full-time for administrative purposes. Level I students registered for fewer than 7 credits are billed per credit and considered part-time. Level II and Level III are always full-time status.

The "Student Status Form" (Appendix M) must be completed and submitted to the Executive Officer for processing at each registration. The eligibility for and the amount of various types of financial assistance are dependent upon the classification. The "Student Status Form" must be completed by the student and includes the number of credits enrolled, the teaching or other work commitments that semester, and the amount and nature of any fellowship or assistantship received. The WIUs (weighted instructional units) are completed by the Executive Officer, as is the certification.

**1. Weighted Instructional Units** - The following definitions explain those research and study categories for which a student may receive WIUs.

**a. Teaching activity** - Students engaged in teaching activity relevant to their academic program and supervised by a faculty member may receive three WIUs for a one-fourth time assignment and a maximum of six WIUs for a one-half time or greater assignment.

**b. Nonteaching academic activities** - Students engaged in duties that are related to their academic program and supervised by a faculty member, such as non-dissertation research, clinical activity, grading papers, laboratory assistance, computer programming, etc., may receive one to six WIUs.

**c. Exam preparation** - Students engaged in preparation for a major doctoral examination may receive up to six WIUs. (Maximum of six per examination; may be allowed all in one semester or distributed over two or more semesters.)

**d. Research activity** - Students engaged in research that is relevant to their field and that is prior to advancement to candidacy may receive up to six WIUs.

**e. Dissertation research** - Students who are candidates for the Ph.D. engaged in full-time dissertation research may receive 12 WIUs per semester. Candidates for the Ph.D. who are engaged in half-time dissertation research may receive six WIUs.

**2. Levels** - Students are classified for tuition purposes according to three levels defined as follows:

**a. Level I** - Students who have not yet completed 45 credits, fully earned and evaluated, which may include approved advanced standing transfer credits, and/or have not passed the First Examination.

**b. Level II** - From semester following completion of 45 credits, fully earned and evaluated, and passing the First Examination to advancement to candidacy. Note that once students reach the second level, they must register at full tuition levels; per-credit tuition payment is not permitted.

**c. Level III** - From semester following advancement to candidacy to completion of the degree. N.B.: Level III doctoral students may take additional courses for credit with the payment of an additional per-credit tuition charge. They may audit courses at no charge.

**B. CHANGE OF COURSES IN PLAN OF STUDY** - All doctoral students should meet with their adviser or the graduate deputy chair before each registration period and decide which courses they plan to take. Subsequent program changes require adviser or graduate deputy chair approval. Failure to follow this procedure may compromise the student's eligibility for financial aid or teaching assistantships. The adviser is to notify the deputy chair of the Graduate Division in Biology on the campus of each student's change in plans, and changes should be filed with the Executive Officer.

**C. CHANGES IN REGISTRATION** - Actual registration at GC is conducted by mail with the registration materials being sent to the student from the Program Office. The completed materials are to be properly signed by the adviser or graduate deputy chair and returned to the Program Office. Should circumstances, such as course cancellation, time or date conflicts, etc., necessitate a change in the courses and/or number of credits, the student should discuss the changes with the adviser and notify the graduate deputy chair on the campus and file such changes with the Executive Officer.

#### **IV. ADVISORY COMMITTEE**

**A. FORMATION AND COMPOSITION** - A temporary chair of the advisory committee of a student will be chosen during the student's first semester in residence and will serve as an adviser. Two other members will be selected from available and relevant CUNY biology doctoral faculty to complete the advisory committee in the first year after the student has taken the First Examination. At least one member of the CUNY line doctoral faculty in Biology must serve on the student's committee. (See Section VI B.1. and IX, B.)

**B. DESIGNATION AND FOLLOW-UP** - The student's advisory committee chair will be designated by the graduate deputy chair or Graduate Studies Committee upon admission. It is the student's responsibility to maintain effective, continuous contact with the chair of the committee and members of the committee as appropriate (see IV. A). It is expected that the composition of the committee will change as the student's interests are clarified. Once the student reaches the stage of planning the Second Examination, changes in the composition of the advisory committee should not be made without the prior approval of the graduate deputy chair and the Graduate Studies Committee. All such changes should be made in writing to the faculty members concerned and copies filed with the Executive Officer.

**C. ROLE AND RESPONSIBILITY OF THE ADVISORY COMMITTEE** - Initially it will be the role of the advisory committee to discuss with the students their interests, strengths, and weaknesses, and to decide on how goals should be related to the students' capabilities. The advisory committee should critically evaluate the students' records and recommend which specific courses are to be scheduled, taking into account the nine-credit limitation for 600-level courses. If the student has taken acceptable graduate work in another CUNY program or at another institution, an "Advanced Standing Transfer Credit Recommendation" form should be completed by the student and the advisory committee, and submitted to the local graduate deputy chair for transmittal to the Executive Officer, usually after passing the First Examination.

The chair of the student's advisory committee will advise the student in selecting areas of specialization, choosing appropriate courses, and preparing for the First Examination. As outlined in the following pages, the student's advisory committee plays an essential role in recommendations concerning appropriate courses, the Second Examination, the Thesis Proposal, and the Thesis Defense.

It is necessary for the Executive Officer to have complete and up-to-date information on each doctoral student. Among other uses, these data are valuable for obtaining necessary financial support. The progress of each student is evaluated by the Program Office each semester, and lapses are brought to the attention of the local deputy chair and adviser.

Each semester, students should register for the courses agreed upon with their advisers in accordance with their plan of study. Registration cards and the "Student Status Form" must be approved by the adviser *and submitted to the graduate deputy chair for transmittal to the Executive Officer* as indicated in III. C. above. Any changes in registration for courses or credits must receive approval.

## **V. FIRST EXAMINATION**

**A. PHILOSOPHY OF THE EXAMINATION** - The First Examination tests a graduate student's ability to think, synthesize information, and solve problems in one of four areas of Biology. The academic level of the examination presupposes that a student has had thorough undergraduate training in biology and has had one year of graduate-level training.

**B. AREAS OF THE EXAMINATION** - The student will be examined in one of the following areas:

**Molecular, Cellular, and Developmental Biology:** Examinations may include all relevant subject matter agreed to by the Examination Committee including cell structure, physiology, development, genetics, and biochemistry of prokaryotes and eukaryotes.

**Plant Sciences:** Examinations may include all relevant subject matter agreed to by the Examination Committee including development, physiology, morphology, cytology, anatomy, ecology, taxonomy, and evolution.

**Neuroscience:** Examinations may include all relevant subject matter agreed to by the Examination Committee including areas of neuroscience and behavior; basic vertebrate neuroanatomy and neurocytology; basic neurophysiology (e.g., excitation, conduction, neural transmission); sensory and motor systems; internal control of animal behavior by the nervous system and hormones; learning and memory.

**Ecology, Evolutionary Biology and Behavior:** Examinations may include all relevant subject matter agreed to by the Examination Committee including mechanisms, processes, and patterns of ecology and evolution.

**C. WHEN THE EXAMINATION IS TO BE TAKEN** - The examination is given at the GC. The date of the examination is determined annually. In recent years, the examination has been administered during the middle of August. Students are expected to take this examination after their first year in the program but may take the examination earlier with the permission of their campus advisory committee. Students who do not take this examination at that time will be judged as having failed the examination.

Advisory Committees may consider that there is a valid reason for a student to delay taking this examination. Deferment of the examination may be granted by the Executive Officer in Biology after such a request has been made in writing by the advisory committee and recommended by the local campus Graduate Studies Committee or the graduate deputy chair.

**D. PREPARATION FOR THE FIRST EXAMINATION** - Reading lists and topical outlines for the First Examination and copies of previous examinations are available from the Executive Officer or the local graduate deputy chair (usually by April).

**E. FORMULATION AND GRADING OF THE FIRST EXAMINATION** - For each area there shall be a subcommittee of the Executive Committee comprised of doctoral faculty responsible for the administration of the First Examination. The membership of each committee will be a chair, designated by the Executive Officer upon the recommendation of the Executive Committee and advisory committee chairs, plus at least five other faculty. The faculty members will be recruited from the doctoral faculty at large and must reflect a diversity of research specialties and represent at least three campuses, where possible. In the construction and grading of the examination, the committee may solicit the assistance of other CUNY doctoral faculty.

At least two graders will independently evaluate and comment on each question. In the event that differences in judgment exist that are not readily reconciled, a third grader will be called upon. The performance of each student is individually evaluated by the Executive Committee following recommendation from the subprogram advisory committee.

**F. MECHANICS OF THE EXAMINATION** - Students and their advisory committee will decide together which of the four examination areas is most suitable for the student. The examination will consist of four two-hour sessions distributed over a two-day period. An application form (please see sample form, Appendix N) must be completed and signed by both the student and the local deputy chair, and submitted to the Program Office by May 31.

The First Examination will be graded on a 100-point scale and designed in such a way that a passing grade is a score of 70 or higher. Students who achieve less than a 70 will be permitted one additional opportunity to take and pass any of the four examinations at the next time they are given.

## **VI. SECOND EXAMINATION**

**A. CONTINUATION IN THE DOCTORAL PROGRAM** - The student must demonstrate advanced understanding and research competence in the area of specialization and related fields of biology by passing the Second Examination. The chair of the student's advisory committee serves as the chairperson of the Examination Committee. This examination is to be completed by the end of the fourth semester following the successful completion of the First Examination and after the completion of any language or research techniques requirements. Students failing to complete the Second Examination in this prescribed period will not be permitted to register and will be dropped from the Program. The Executive Officer, or a designee, will remind the student by letter that this obligation is to be fulfilled.

### **B. COMPOSITION OF THE ADVISORY AND SECOND EXAMINATION COMMITTEES -**

1. Within one year of passing the First Examination, the student must select a member of the CUNY doctoral faculty in Biology who is willing to act as an adviser. The student's adviser serves as the chair of the advisory and examination committees. The student's advisory committee consists of an adviser and at least two other members of the CUNY Biology doctoral faculty. At least one member of the advisory committee must be a member of the CUNY line doctoral faculty in Biology. A document signed by the student and the selected adviser and advisory committee members must be submitted to the Program Office to confirm this choice. Before a student takes the Second Examination, it is the responsibility of the student to identify and secure the agreement of an adviser who is a member of the CUNY doctoral faculty willing to serve in that capacity.

2. The student's Second Examination Committee will consist of the above advisory committee and at least two additional examiners from campuses or institutions other than the student's home campus. At least two members of the Second Examination Committee must be members of the CUNY line doctoral faculty in Biology.

### **C. PREPARATION AND PROCEDURES FOR THE SECOND EXAMINATION -**

1. Students must fulfill the language and research techniques requirement, if any, and complete at least 30 credits of course work before taking the Second Examination.

2. The "Application for the Second Examination" form must be completed and submitted to the Executive Officer at least one month prior to the examination date. (Please see Appendix O for a sample application form.)

3. The student prepares a thesis proposal, which as part of the "application" will be distributed to the examiners.

4. The student's advisory committee, in consultation with the student, will:

a. define at least two reasonably restricted and related areas that, in addition to the proposed thesis, are the subject of the examination

b. recommend two examiners from campuses or institutions other than the student's home campus

5. The examination will be oral in form, usually lasting two to three hours.

6. Should any member of the advisory committee be absent from the examination, the Second Examination must be rescheduled. One of the examiners selected as an off-campus examiner may act as a reader for the Second Examination should another be absent due to unforeseen circumstances and with the approval of the Executive Officer.

7. The chair of the advisory committee shall, at the completion of the examination, fill out and forward to the Executive Officer with appropriate signatures, the results of the examination on the form entitled "Report of the Second Examination." (Please see Appendix P for a sample form.)

8. The results of the Second Examination will be one of the following:

**Pass**

We certify that the candidate has passed the Second Examination. We accept the dissertation proposal as presented.

**Pass with minor conditions** (*will allow a student from advancing to Level 3*)

We certify that the candidate has passed the Second Examination. In addition to any other condition we will consider the dissertation proposal acceptable after minor revisions are approved by the Chair [*specify conditions explicitly and procedure and date for fulfilling*].

**Pass with major conditions**(*will not allow a student a student to advance to Level 3*)

We certify that in addition to any other condition, in our judgement, the candidate's dissertation proposal requires major revisions. It must be resubmitted for approval by the Chair and at least two members of the examining committee including the members of the Advisory Committee [*specify conditions explicitly and procedure and date for fulfilling*].

**Fail**

We certify that the candidate has failed the Second Examination, and make the following recommendations [*specify recommendations explicitly*].

## **VII. CERTIFICATE OF CANDIDACY IN PHILOSOPHY AND THE MASTER OF PHILOSOPHY DEGREE**

Students who have fulfilled all the requirements for the degree except those pertaining to the dissertation are eligible to be advanced to candidacy and to receive an "Advancement to Candidacy for the Doctoral Degree" form. (Please see Appendix Q for a sample form.) The student should apply to the Executive Officer in writing. A certificate of candidacy will then be issued by the Registrar. Such students may also receive the Master of Philosophy Degree upon application to the Registrar.

## **VIII. DOCTORAL RESEARCH**

Students may submit up to 10 credits for courses in Doctoral Research (U899). Students may not register for Doctoral Research prior to the semester in which they plan to take the Second Examination. By that time the student must already have fulfilled any language and research techniques requirement.

## **IX. DISSERTATION**

At the time that a student is advanced to candidacy, a document outlining the current dissertation requirements will be sent to the student by the Registrar. The following information is current at the time of the production of this *Handbook* and is included for your information. (Please refer to Appendix R for a copy of the document available during the preparation of this Handbook.)

**A. DISSERTATION PROPOSAL** - The dissertation proposal that has been examined and approved as part of the Second Examination is filed with the Executive Officer. Should there be any substantive changes in the proposed thesis, such changes, approved by the adviser, advisory committee, and deputy chair, should be submitted to the Executive Officer. Changes in, or additions to, the advisory committee considered necessary as the study develops are to be similarly reported. Such changes must first be approved by the entire advisory committee and the graduate deputy chair. The faculty members involved in such changes must be notified in writing.

**B. ADVISORY COMMITTEE MEETINGS** - The graduate student is responsible for arranging regular meetings at least once per year between the student and the entire advisory committee to evaluate the direction taken and progress being made. A progress report of that meeting bearing the date and signatures of the members of the committee will be required before registration for the Fall semester (see Appendix Q).

**C. DRAFT OF THE DISSERTATION** - The dissertation is submitted to the members of the advisory committee in draft form. After the committee approves the draft, it recommends advancement to the Final Examination.

**D. PUBLIC SEMINAR** - A public seminar on the dissertation presented at the GC, a

participating campus, or an affiliated institution prior to the formal defense is a requirement for the degree. Timely announcement of the seminar is to be sent to advisory committee members and all affiliated campuses and institutions as well as the Program Office. A thesis defense will not be scheduled unless this requirement is met.

**E. FINAL EXAMINATION COMMITTEE** - The Final Examination Committee is proposed after consultations among the members of the student's advisory committee. The five-member (minimum) Final Examination Committee shall include the members of the advisory committee (defined in Section VI.B.1) and at least two other specialists, at least one of whom is from an institution outside of The City University of New York and its affiliated institutions (AMNH, IBR, and NYBG). Additional outside specialists may be designated as "readers" and need not be present at the actual defense. At least three members of the Final Examination Committee must be members of the CUNY doctoral faculty. At least two members of the final examination committee must be members of the CUNY line doctoral faculty in Biology. On specific questions regarding committee composition, consult with the Executive Officer, whose decision will be final. The student and/or the adviser will communicate with the proposed participants in the Final Examination to ascertain their willingness to serve and to establish a suitable meeting date. This information is communicated to the Executive Officer for approval at least one month before the scheduled examination date. The invitations to the members of the Final Examination Committee come from the GC Provost. Forms necessary in processing the examination results will be sent to the chair of the Final Examination Committee from the Program Office prior to the date of the examination.

**F. DISTRIBUTION OF DISSERTATION COPIES** - The copies of the dissertation provided to the Final Examination Committee should be printed legibly and in good order, but they need not be in final form. Any clear method of reproduction may be employed.

**G. RESCHEDULING** - If unforeseen circumstances arise (even at the last moment) so that all invited members of the Final Examination Committee are not able to be present, the examination must be rescheduled.

**H. FINAL EXAMINATION REPORT** - The chair of the Examining Committee will record the student's performance in a "Report of Final Examination" (a sample form is included in Appendix S) to the Executive Officer and the Provost. If a dissertation requires at most minor revisions, it must subsequently be approved by the chair. If major revisions are required, the dissertation must be resubmitted to the chair and two members of the Examining Committee for approval before passage of the Final Examination can be recorded. The chair informs the Executive Officer and the Senior Registrar when the revisions have been completed by submitting a "Approval of Revised Dissertation" form. (Please see Appendix T for a sample form.)

**I. UNSATISFACTORY PERFORMANCE** - If the student's performance in the Final Examination is judged unsatisfactory, the student may be reexamined at the discretion of the Executive Committee in Biology and with the approval of the GC Provost.

**J. DISSERTATION SUBMISSION AND CHECKOUT PROCEDURES** - Consult the Dissertation Assistant of the Mina Rees Library before having the final version of the dissertation typed/printed. Prepare at least five copies. While it may be helpful to examine previous dissertations, do not use a previously accepted dissertation as a model on which to base the format of your dissertation because requirements change. The Dissertation Assistant may

refuse to accept the dissertation if it does not conform to the standards established. A student is advised to consult with the Dissertation Assistant early in the process of dissertation preparation.

1. Original typescript and two good photocopies or three photocopies or photo-offset copies (which are clear enough to be duplicable for sale purposes) are to be submitted.

2. All copies must be on white bond paper, at least 20 lb. weight and 25% rag content. Copier or erasable paper is not acceptable.

3. Deposit the three unbound copies of the approved dissertation (all three can be good photocopies) in the Mina Rees Library of The Graduate Center, after having made an appointment with the Dissertation Assistant. Include an abstract (of no more than 350 words) in the body of the dissertation and submit two separate copies of the abstract. Also submit one extra title page and the original signed approval page (no corrections or white-outs permitted).

Additional dissertation copies for personal use may be submitted for binding but only if they are submitted at the same time. (If you have received the degree as a recipient of a federal award, you should inquire about the necessity of securing an extra copy for the agency.)

When the dissertation is deposited, sign an agreement with University Microfilms Inc., authorizing them to reproduce your dissertation on microfilm as a form of publication. This firm will retain the negative microfilm copy and publish the abstract in Dissertation Abstracts.

Permission to deposit printed copies of a published dissertation and for waiver of the microfilming requirement may be granted by the GC Provost.

4. The three copies deposited with the Dissertation Assistant will be bound and distributed as follows: two copies to the Mina Rees Library and the third copy to the Executive Officer.

5. Pay, at the time of final deposit of the dissertation, a \$76.75 microfilming and binding fee and a \$45.00 diploma fee to the GC Bursar. Additional copies will be bound for the student's use for a binding fee of \$6.50 per copy (if the student picks them up) or \$8.00 per copy (if copies are mailed to the student).

If you wish to copyright the dissertation, it will be necessary to pay an additional fee of \$20.00 (includes the copyright registration fee plus the cost of two positive copies to be deposited in the Library of Congress). This decision must be made before depositing the dissertation in the Mina Rees Library. A copyright page (a sample is included in Appendix R) must be included in every copy only if you intend to have it copyrighted.

6. The Ph.D. degree requirements are considered met on the date the dissertation is deposited in the Mina Rees Library and all fees paid. Students delinquent in their accounts with any division of the University will not be granted the degree. The degree is awarded on October 1, February 1, or on the date of the GC's annual commencement. Maintenance of matriculation is required for any semester during which the dissertation has not been deposited in time for the September 1, February 1, or annual commencement date graduation, respectively. If the dissertation has not been deposited by these dates, individual extensions up to the first day of classes may be granted by the GC Provost.

Diplomas will be prepared for distribution only at the University's commencement. At any time after depositing the dissertation, the student may request from the Registrar an interim certificate testifying to the completion of the degree requirements.

**K. EDITORIAL REQUIREMENTS** - Please refer to the "Instructions for Preparing the Ph.D. Dissertation" which will be sent to you by the Registrar at the time of advancement to candidacy.

#### **X. CURRICULUM VITAE AND LETTERS OF RECOMMENDATION**

When students have completed their requirements, they may file a curriculum vitae and request letters of recommendation from the people who know them and their work best, which will be placed on file at the Program Office. At any time in the future, the student may call upon the Program Office to forward copies of these records and the letters to prospective employers. Restrictions regarding the number of requests and/or fees for this service may apply.

#### **XI. ALUMNI INFORMATION**

Upon completion of all requirements, it is requested that individuals complete an "Alumni Information" form (Appendix U). These data are very important for summary information about the Program and permit the ability to maintain contact with our graduates.

The Office of Student Affairs coordinates a dossier service for enrolled students and alumni desiring positions in either academic or other areas of employment. Copies of the dossiers, including reference letters, are mailed out to potential employers upon request. These files are permanently maintained for alumni of The Graduate Center. Because they contain confidential letters of reference, they provide valuable support to the students or alumni seeking positions. (See Ms. Judith Koster; Office of Student Affairs, Room 7302, telephone: 817-7401/02). Listings of part-time positions are available for consultation in the Office of Financial Aid (Room 7301, (212) 817-7460) Ms. Anne Johnson, Work Study Coordinator, is in charge of these listings. Other job listings are available for review in a file in the Office of the Vice President for Student Affairs in Room 7302, (212) 817-7400.

#### **XII. NOTICE OF NONDISCRIMINATION**

The Graduate Center and University Center of The City University of New York is an equal opportunity and affirmative action institution. The GC does not discriminate on the basis of age, gender, sexual orientation, alienage or citizenship, race, color, national or ethnic origin, religion, marital status, veteran status, or disability in its student admissions, employment, access to programs, and administration of educational policies.

The GC is committed to promoting pluralism and diversity and combating racism and bigotry. Concerns, questions, complaints, and suggestions about affirmative action and equal employment may be addressed to any member of the GC Affirmative Action Committee through the Affirmative Action Officer.

The City University of New York prohibits sexual harassment and has instituted policies,

procedures, and educational programs to prevent and address sexual harassment. For more information, please contact the coordinator of the Sexual Harassment Panel and see the *GC Student Handbook*.

Employees and applicants are protected from coercion, intimidation, interference, or discrimination for filing a complaint or assisting in an investigation concerning discrimination or harassment.

## **CONTACTS**

**Affirmative Action Officer:** Rosamond W. Dana, Room 8113; (212) 8117-7282.

**Vice President for Student Affairs:** Matthew G. Schoengood, Room 7301;  
(212) 817-7400

**Coordinator, Sexual Harassment Panel:** Professor Michelle Fine, Room 6304.17;  
(212) 817-8710.

**Ombuds Officer:** Professor Rolf Meyersohn, Room 7313; call for appointments at (212) 817-7191. The Ombuds Officer offers complete confidence to any individual in the GC community in discussing informal as well as formal solutions to any problem.

**Executive Director for Human Resources:** Yosette Jones Johnson, Room 8403.03;  
(212) 817-7700.

Revised by the Biology Executive Committee, March 2, 1998

**HANDBOOK**  
**Ph.D. PROGRAM IN BIOLOGY**  
**THE CITY UNIVERSITY OF NEW YORK**

**TABLE OF APPENDIXES**

- A. Governance of the Ph.D. Program in Biology [Approved May 16, 1996]
- B. Student Record Card
- C. Application for Re-Admission Form
- D. Doctoral Courses
- E. Interuniversity Course Registration
- F. Advanced Standing Transfer Credit Recommendation
- G. Extension of Time Limit Form
- H. Request for Withdrawal Form
- I. Request for Leave of Absence Form
- J. Application for "En-route" Master's Degree
- K. CUNY Student Aid Form (CSAF)
- L. Application for Student Travel and Research Fund Award
- M. Student Status Form
- N. First Examination Application Form
- O. Application for the Second Examination
- P. Results of the Second Examination Form
- Q. Report of Advisory Committee Meeting
- R. Dissertation Procedures and Format Information
- S. Report of Final Examination Form
- T. Approval of Revised Dissertation Form
- U. Alumni Information Form
- V. Teaching Certification Form

**NOTE:** The forms illustrated in this Handbook are samples only, please obtain the proper form the Program Office or from the Graduate Deputy at your campus.

**Appendix A**

**GOVERNANCE  
Ph.D. PROGRAM IN BIOLOGY  
THE CITY UNIVERSITY OF NEW YORK**

**I. PROGRAM STRUCTURE**

The Ph.D. Program in Biology, administered, as described in Section IIA, by an Executive Officer with the advice and consent of an Executive Committee, will be operationally divided into four Subprograms: 1) Molecular, Cellular, and Developmental Biology; 2) Plant Sciences; 3) Physiology and Neuroscience; and 4) Ecology, Evolutionary Biology, and Behavior.

**II. COMMITTEES**

**A. EXECUTIVE COMMITTEE**

The Executive Committee shall be responsible for the establishment and enforcement of policy to guide the operations of the Ph.D. Program in Biology, and shall have the functions shown in Section II A2.

1. Constituents of Committee

a.i. One full-time member of the CUNY doctoral faculty in biology (termed the Graduate Deputy Chair), with vote, from each particular campus either elected by the doctoral faculty at that campus or appointed by the Chair of the campus department. The term of membership on the Executive Committee is three years and shall be concurrent with the term of the respective campus department chair.

a.ii. Campus participation in the Ph.D. Program in Biology is determined by action of the Executive Committee.

a.iii. Subprogram activities will be coordinated by a Subprogram Advisory Committee, the Chair of which will be a voting representative to the Executive Committee. Each member of the doctoral faculty will affiliate with one Subprogram. Under unusual circumstances, faculty may affiliate with more than one Subprogram upon petition to and approval by the Executive Committee.

b. The full-time CUNY faculty members who are Chairs of the Subprogram Advisory Committees, with vote.

c. One matriculated student from each Subprogram elected annually by mail by the students of the Subprogram, with vote.

d. The Executive Officer will vote only in cases of tie votes.

There shall be an Alternate for each campus faculty representative either elected by the doctoral faculty at each campus or appointed by the Department Chair. No campus may appoint a Chair of the Subprogram Advisory Committee as its voting designated campus representative or alternate.

2. Functions of Committee

a. Be responsible for the establishment and enforcement of policy to guide the operations of the Ph.D. Program in Biology.

b. Review and act upon recommendations concerning academic matters generated by the Subprogram Advisory Committees and maintain standards in curriculum and examinations. First Examinations formulated by the First Examination Committee of the Advisory Committees shall be approved by the Executive Committee.

c. Be responsible for matters pertaining to, and the allocation of the annual budget among the participating campuses.

d. Be responsible for all matters pertaining to students, including acting on the recommendations of the Subprogram Advisory Committees in matters involving student status, applications for admission, and cases of disciplinary action.

e. Review and recommend to the Provost nominations for appointment to the Doctoral Faculty. Nominations for doctoral faculty membership may originate at the participating campus, be examined and approved by the appropriate Subprogram Advisory Committee, and then be reviewed by the Executive Committee.

f. Review, approve, and expedite to the appropriate channels all matters involving curriculum; matters of Subprogram development including training grant proposals, advertisement, and student recruitment; programs, lectures, and symposia; and any other form of program enhancement.

g. Form Standing Committees as follows: Faculty Membership; Curriculum and Examination; and Admissions and Awards. Additional subcommittees may be established by the Executive Committee as required. The rules of procedure that pertain to the Executive Committee shall also pertain to these Standing Committees and Subcommittees. The membership of the committees shall be as shown in Section IIB.

### 3. Meetings of the Executive Committee

a. Frequency: The Executive Committee shall meet at least twice each semester. Additional meetings may be called by the Executive Officer or by any three members of the Committee upon written request to the Executive Officer. The Executive Committee shall meet at least once a semester with students matriculated in the program and at least once a year with the program faculty.

b. Quorum: Two thirds of the voting membership shall constitute a quorum.

c. Announcement: An agenda for each meeting will be distributed to the committee members at least one week prior to the meeting. Minutes of the prior meeting will be distributed prior to or accompanying the agenda. Any faculty member or any student may request that an item be placed on the agenda for consideration by the Executive Committee.

d. Special requests: The Executive Committee will consider requests by, or may invite, any faculty member or student to address the Committee on any particular item(s) on the agenda. The Executive Committee, however, shall retain the right to go into executive session by a 2/3 vote of the members present.

e. Minutes: Copies of the approved minutes will be circulated to all faculty and students. Information regarding the Subprograms, in the form of minutes of their Advisory Committee meetings, will be appended.

#### 4. Vacancies

Vacancies on the Executive Committee will be filled by either an appointment by a campus department chair or a special election by the campus doctoral faculty in the event of an faculty representative vacancy, or by a special election of the doctoral students in a Subprogram, or by a special election of a Subprogram Advisory Committee.

#### 5. Student Voting Rights

Student members will have voting rights on the Executive Committees as follows:

a. Students shall vote on matters of policy, but shall not vote on matters of administration.

b. Matters will be designated as policy or administrative by the Executive Officer. If the designation of a matter as policy or administrative is disputed, the dispute will be decided by a vote of 2/3 of the members present and voting.

c. Restricted issues: The voting faculty members will go into separate session on the following matters:

i. Issues concerning individual students, with the exception of disciplinary matters.

ii. Review of the questions and the evaluation of the results of the First Examination.

iii. The voting faculty members may go into separate session by a minimum 2/3 vote of the Executive Committee present and voting unless it infringes upon the student rights of expression.

### **B. FACULTY MEMBERSHIP COMMITTEE**

1. Faculty Membership Committee nominates members of the program's faculty with a view toward including in the doctoral program faculty newly appointed at the colleges and recommended by the Advisory Committee of each Subprogram maintains a roster of potential doctoral faculty appointments, record annually the status of those faculty members currently designated, and review all other actions taken in regard to membership in the doctoral faculty. A roster of doctoral faculty shall be prepared by the Faculty Membership Committee at the start of each academic year for review by the Provost. Committee composition shall be the Subprogram Advisory Committee, including students, acting on nominations of faculty to that Subprogram. Nomination for appointment will be made by the Executive Committee after recommendation by the corresponding Faculty Membership Committee.

2. Criteria for nomination to and continuance on the program doctoral faculty includes:

a. A determination that the faculty member will make a significant contribution relevant to the needs of the program, and

b. Evidence of significant research relevant to the doctoral program, or

c. Evidence of qualification to teach a doctoral course or provide other doctoral level training, or

d. Evidence of qualification to supervise doctoral dissertations or other graduate-level research.

3. Faculty Membership Considerations

a. A member may be removed from the doctoral faculty on the recommendation of the appropriate

Subprogram Advisory Committee(s) (above), but only after the member has been given one year's prior notice of the intention to remove.

b. The faculty member may appeal the decision to remove to the program's Executive Committee, the Provost, and the President.

c. The appointment of full-time CUNY faculty as members of the doctoral faculty (except as in e below) confers full rights and duties.

d. Only members of the doctoral faculty may teach doctoral-level course more than twice or chair dissertation committees.

e. In order to meet emergency needs, an Executive Officer may directly recommend to the Provost appointment of individuals to the doctoral faculty for a period of one semester or one year. Temporary appointments may not be repeated for a cumulative total of more than one academic year (two semesters). Notification of such appointments shall be conveyed to the Faculty Membership committee of the relevant Subprogram and/or the Executive Committee. Temporary appointees do not have voting rights in the program, nor may they be appointed to program committees.

f. Part-time CUNY faculty and faculty or professionals at other institutions may be recommended for adjunct appointment to the doctoral faculty. Their rights and duties with respect to strictly academic activities (e.g., chairing a dissertation committee) are in no way different from those of other doctoral faculty.

### **C. CURRICULUM AND EXAMINATIONS COMMITTEE**

To review curriculum and recommend curriculum proposals for action; to recommend procedures and standards for the conduct of examinations. Committee composition shall be the Subprogram Advisory Committee, including students, acting on curriculum and examinations relevant to that Subprogram. Approval of the First Examination will be made by the Executive Committee after recommendation by the Subprogram Advisory Committee.

### **D. ADMISSIONS AND AWARDS COMMITTEE**

To solicit and review student applications and recommend student admission, nominate students for awards, and recommend actions and procedures to the Executive Committee and to administer these procedures. Committee composition shall be the Subprogram Advisory Committee, including students, acting on admissions and awards relevant to the Subprogram.

### **E. SUBPROGRAM ADVISORY COMMITTEES**

Each Subprogram shall have a Subprogram Advisory Committee composed of six doctoral faculty and three matriculated doctoral students responsible for recommending to the Executive Committee and its appropriate Standing Committees, matters of policy, curriculum, development, and student and faculty membership relevant to that Subprogram. The committee acts as an admissions committee in the admission of new students. This Advisory Committee shall also organize a First Examination Committee responsible for the annual production and administration of the First Examination in each Subprogram.

It is encouraged that each Subprogram Advisory Committee be constituted with faculty representing at least three campuses, and that no more than two faculty represent any one campus. The student representatives should represent as many campuses as possible. The Executive Officer shall be a voting, ex-officio member of each Subprogram Advisory Committee. One full-time CUNY faculty member of the Committee shall be elected Chair by the members of the Committee and will serve as that Subprogram's voting representative to the Executive Committee.

1. Selection of Representatives:

a. Faculty representatives: Doctoral faculty members shall serve three-year terms such that two representatives are selected by the Executive Committee annually. Faculty members may not serve consecutive full terms. At the initial establishment of a Subprogram Advisory Committee, three groups of two faculty will be selected to serve 3, 2, and 1 year terms, respectively. Thereafter, two faculty members and one alternate shall be elected annually. Nominations will be solicited by the Executive Officer for the Executive Committee, and the election of the representatives shall be made by the Executive Committee. Nominations and elections shall be conducted in April with the term of office commencing with the beginning of the Fall semester.

b. Student representatives: Three matriculated doctoral students in good standing shall be elected by the student members of the Executive Committee from nominations of students affiliated with a given Subprogram in consideration of the objectives of campus representation stated above. Nominations will be solicited by the Executive Officer for the Executive Committee from among all matriculated doctoral students registered in each Subprogram. Nominations and elections will be conducted in April, and the term of office will be one year commencing with the Fall semester.

c. Vacancies: Vacancies on a Subprogram Advisory Committee will be filled by the alternate for the remainder of the year and a new alternate appointed by the Executive Committee.

2. Student voting rights: Student members will have voting rights on the Subprogram Advisory Committees as follows:

a. Students shall vote on matters of policy.

b. Restricted issues: The voting faculty members will go into separate session on the following matters:

i. Issues concerning individual students, with the exception of disciplinary matters.

ii. Review of the questions and the evaluation of the results of the First Examination.

iii. The voting faculty members may go into separate session by a minimum 2/3 vote of the Subprogram Advisory Committee present and voting unless it infringes upon the student rights of expression.

3. Standing Committees and Subcommittees:

a. Each Subprogram Advisory Committee shall appoint a First Examination Committee responsible for the formulation, administration, and grading of the First Examination. This Committee will be comprised of faculty affiliated with a given Subprogram selected by its Advisory Committee in collaboration with the Executive Officer. Faculty membership on each Subprogram Advisory Committee does not preclude membership on the First Examination Committee.

b. Subcommittees: Subcommittees may be established by each Subprogram Advisory Committee as required. The same rules of procedure will pertain to subcommittees as those pertaining to each Subprogram Advisory Committee as a whole.

4. Advisory Committee Meetings

a. Frequency: Each Subprogram Advisory Committee shall meet at least twice each semester. Additional meetings may be called by the Chair or by three members of the Committee upon written request to the Chair.

b. Quorum: Five of the nine voting members shall constitute a quorum.

c. Announcement: An agenda for each meeting shall be distributed to the Committee members at least one week prior to the meeting. Minutes of the prior meeting will be distributed prior to or accompanying the agenda. Any faculty member or student may request that an item be placed on the agenda for consideration by the Committee.

d. Minutes: The approved minutes will be forwarded to the Executive Officer for inclusion in the Minutes of the Executive Committee.

### **III. EXECUTIVE OFFICER**

A. The Executive Officer is responsible for administering the affairs of the program in accordance with the Governance document of The Graduate School and University Center, and with the policies established by the program faculty, Graduate Council, and the CUNY Board of Trustees.

B. The Executive Officer shall be appointed by the President for a term not exceeding three years. The President shall actively solicit nominations and counsel from individual members of the Executive Committee, doctoral faculty, and students matriculated in the program concerning this appointment. The Executive Officer may be reappointed.

C. The Executive Officer shall preside at meetings of the program's faculty, Executive Committee, and Faculty Membership committee. The Executive Officer shall have authority to initiate policies and actions concerning the affairs of the program, subject to the powers delegated by the GSUC Governance document to the program's faculty. The Executive Officer shall serve ex officio as a voting member of all program committees.

D. Courses to be offered each semester shall be determined by the Executive Officer after consultation with representative groups of faculty and students and considering Subprogram recommendations. The Executive Officer shall work with chairs of CUNY college departments to assign faculty to teach these courses.

E. The Executive Officer shall work with chairs of CUNY college departments in the Executive Officer's discipline to develop procedures for making new faculty appointments useful both to the college departments and to The Graduate School and University Center. The Executive Officer shall try to ensure that department chairs, in accordance with the policies of The City University of New York, give preference, when recruiting part-time faculty, to qualified students enrolled in the doctoral program.

### **IV. GRADUATE COUNCIL REPRESENTATION**

A. The faculty and students in the program shall elect representatives to the Graduate Council according to the following formula: for each 100 or fewer matriculated students - one faculty and one student representative (e.g., 101 students equates to 2 faculty and 2 students).

B. All members of the doctoral faculty and all matriculated doctoral students of the program are eligible to be elected to the Council. Neither faculty members nor students on leave of absence shall be eligible to serve.

C. Faculty and student representatives shall be elected according to the following procedures.

1. The Executive Committee shall appoint an Election Committee consisting of the Executive Officer, at least

three faculty members, and at least three student members. This committee shall have responsibility for nominations and election procedures.

2. The election shall take place no later than April 1 for service in the subsequent academic year or years. Faculty members shall vote for faculty representatives only; students shall vote for student members only. Students or faculty members on leave of absence shall not vote. The Chair of each Election Committee shall report the election results to the Secretary of Graduate Council no later than April 15.

#### D. Terms of Office and Vacancies

Members of Graduate Council shall be elected for two-year terms. Faculty or student vacancies in the elected membership of Graduate Council shall be filled, for the unexpired term, by the faculty Executive Committee members or student members or student Executive Committee members, respectively. Replacements for members absent for one semester or more shall be named in the same way.

### V. ROBERT'S RULES

The procedures of the Program and Subprogram committees shall be governed by ROBERT'S RULES OF ORDER, NEWLY REVISED, in all cases in which they are applicable and not inconsistent with the Governance document and Graduate Council Bylaws of The Graduate School and University Center

Approved by the Biology Executive Committee, February 5, 1986

Approved by the Graduate Council, May 8, 1986

Revised by the Biology Executive Committee, December 8, 1987

Approved by the Graduate Council, March 10, 1988

Revised by the Biology Executive Committee, March 4, 1996

Approved by the Graduate Council, May 16, 1996

## **APPENDIX D**

600-level graduate courses (1600 and 1700 at City) are listed in the graduate bulletins of the City, Hunter, Brooklyn, Queens, and Lehman Colleges of the University. A maximum of nine credits in such courses may be offered toward the Ph.D. degree.

U700- and U800-level graduate courses (University courses) creditable toward the doctoral degree are listed below. Courses may be offered periodically at one or more units of the University. Courses listed under the same University number cover substantially similar material at comparable levels. For course descriptions consult the several graduate bulletins of the GC and each college of the University. The prerequisite for admission to all courses is prior approval by the student's Advisory Committee. The specific offerings at each campus are listed in the Announcement of Courses issued prior to each semester.

### **ECOLOGY, EVOLUTIONARY BIOLOGY AND BEHAVIOR COURSES:**

- BIOL U700.03 Genetics: Lecture  
30 or 45 hours lecture, 2 or 3 credits
- BIOL U700.04 Genetics: Laboratory  
60 or 90 hours laboratory, 2 or 3 credits
- BIOL U700.05 Genetics: Lecture  
75 hours lecture, 5 credits  
Prerequisite: Undergraduate genetics and molecular biology or biochemistry
- BIOL U700.06 Genetics: Lecture  
45 hours lecture, 3 credits
- BIOL U701.03 Microbial Genetics  
45 hours lecture, 3 credits
- BIOL U701.04 Problems in Microbial Genetics: Laboratory  
90 hours laboratory, 3 credits
- BIOL U702.01 Genetics of Multicellular Organisms, I  
45 hours lecture, 3 credits
- BIOL U702.02 Genetics of Multicellular Organisms, II  
45 hours lecture, 3 credits each semester
- BIOL U703.01, U703.02 Cell Heredity I, II  
45 hours lecture, 3 credits each semester
- BIOL U705.03 Evolution  
30 or 45 hours lecture, 2 or 3 credits
- BIOL U705.04 Evolution: Laboratory  
60 hours laboratory, 2 credits
- BIOL U705.05 The Evolutionary Biology of Vertebrates  
45 hours lecture, 3 credits
- BIOL U705.06 Macroevolution: Patterns of Evolution above the Species Level  
45 hours lecture, 3 credits
- BIOL U705.07 Fossil Record  
45 hours lecture, 3 crs.
- BIOL U706.03 Principles of Systematics (AMNH)  
45 hours lecture plus conferences, 4 credits
- BIOL U706.04 Animal Systematics: Laboratory  
60 or 90 hours laboratory, 2 or 3 credits
- BIOL U706.09 Biological Museology  
45 hours, 3 credits
- BIOL U907.10 Biological Systematics

30 hours lecture plus 60 hours lab, 4 credits

BIOL U706.11 Systematics and Evolution of Insects and Arachnids: Lecture (AMNH)  
2 hours, 2 credits

BIOL U706.12 Systematics and Evolution of Insects and Arachnids: Laboratory (AMNH)  
4 hours, 2 credits

BIOL U707.13 Zoology and Phylogeny of Chordata (Fishes)  
30 hours lecture, 2 credits

BIOL U707.14 Zoology and Phylogeny of Chordata (Fishes)  
60 hours laboratory, 2 credits

BIOL U707.23 Zoology and Phylogeny of Chordata (Reptiles and Amphibians)  
30 hours lecture, 2 credits

BIOL U707.24 Zoology and Phylogeny of Chordata (Reptiles and Amphibians)  
60 hours laboratory, 2 credits

Bio U707.33 Zoology and Phylogeny of Chordata (Mammals)  
30 hours lecture, 2 credits

BIOL U707.34 Zoology and Phylogeny of Chordata (Mammals)  
60 hours laboratory, 2 credits

BIOL U707.35 Functional and Adaptational Biology of the Mammalia  
45 hours, 3 credits  
Prerequisite: U707.33, U707.34

BIOL U707.43 Zoology and Phylogeny of Chordata (Birds)  
30 hours lecture, 2 credits

BIOL U707.44 Zoology and Phylogeny of Chordata (Birds)  
60 hours laboratory, 2 credits

BIOL U708 Biochemical Evolution and Systematics  
45 hours lecture, 3 credits

BIOL U708.03 Molecular Evolution  
45 hours, 3 credits

BIOL U709.01 Population Genetics: Lecture  
45 hours lecture, 3 credits

BIOL U709.02 Population Genetics: Laboratory  
90 hours laboratory, 3 credits

BIOL U709.03 Quantitative Genetics  
45 hours lecture, 3 credits

BIOL U709.07 Behavior Genetics  
30 hours lecture, 120 hours laboratory, 4 credits

BIOL U724.03 Animal Behavior I: Lecture  
45 hours lecture, 3 credits

BIOL U724.04 Biological Basis of Animal Behavior: Laboratory  
90 hours laboratory, 3 credits

BIOL U724.05 Current Issues in Behavioral Ontogeny  
45 hours lecture, 3 credits

BIOL U724.06 Behavior and Evolution  
45 hours lecture, 3 credits

BIOL U724.07 Animal Behavior II  
45 hours, 3 credits

BIOL U725.05 Animal Communication: Lecture  
45 hours lecture, 3 credits

BIOL U728 Field Studies in Animal Behavior  
90 hours fieldwork and conferences, 3 credits

BIOL U731.03 Microbial Ecology: Lecture

30 hours lecture, 2 credits  
 BIOL U731.04 Microbial Ecology:           Laboratory  
     90 hours laboratory, 3 credits  
 BIOL U741.03 Radiation Biology: Lecture  
     30 or 45 hours lecture, 2 or 3 credits  
 BIOL U741.04 Radiation Biology:           Laboratory  
     60 or 90 hours laboratory, 2 or 3 credits  
 BIOL U760.01 Ecology: Lecture  
     45 hours lecture, 3 credits  
 BIOL U760.02 Ecology: Laboratory and Field Study  
     90 hours laboratory, 3 credits  
 BIOL U760.03 Community Ecology: Lecture  
     45 hours lecture, 3 credits  
 BIOL U760.04 Community Ecology: Laboratory  
     90 hours laboratory, 3 credits  
 BIOL U760.05 Population Ecology: Lecture  
     45 hours lecture, 3 credits  
 BIOL U760.06 Population Ecology: Laboratory  
     90 hours laboratory, 3 credits  
 BIOL U760.07 Immunology: Lecture  
     45 hours lecture, 3 credits  
 BIOL U760.08 Immunology: Laboratory  
     90 hours laboratory, 3 credits  
 BIOL U761.01 Marine Plankton Dynamics: Lecture  
     45 hours lecture, 3 credits  
 BIOL U761.02 Marine Plankton Dynamics: Laboratory  
     90 hours laboratory and field trips, 3 credits  
 BIOL U761.03 Marine Benthos: Lecture  
     45 hours lecture, 3 credits  
 BIOL U761.04 Marine Benthos: Laboratory  
     90 hours laboratory and field trips, 3 credits  
 BIOL U761.05 Fishes and Fisheries Biology: Lecture  
     45 hours lecture, 3 credits  
 BIOL U761.06 Fishes and Fisheries Biology: Laboratory  
     90 hours laboratory, 3 credits  
 BIOL U761.07 Marine Microbiology: Lecture  
     45 hours lecture, 3 credits  
 BIOL U761.08 Marine Microbiology: Laboratory  
     90 hours laboratory and field trips, 3 credits  
 BIOL U761.13 Marine Ecology: Lecture  
     30 hours lecture, 2 credits  
 BIOL U761.14 Marine Ecology: Laboratory  
     60 hours laboratory, 2 credits  
 BIOL U762 Physiological Ecology: Lecture  
     45 hours lecture, 3 credits  
 BIOL U762.01 Physiological Ecology: Laboratory  
     90 hours laboratory, 3 credits  
 BIOL U767.01 The Biology of Fishes  
     45 hours lecture, 3 credits  
 BIOL U767.02 The Biology of Fishes

90 hours laboratory, 3 credits  
 BIOL U768.3 World Vegetation  
 45 hours, 3 credits  
 BIOL U772 Biological Electron Microscopy  
 30 hours lecture or demonstration, 90 hours laboratory, 4 credits  
 BIOL U780.01 Mathematical Biology: Lecture  
 30 hours lecture and conferences, 3 credits  
 BIOL U780.02 Mathematical Biology: Laboratory  
 60 or 90 hours laboratory, 2 or 3 credits  
 BIOL U781.01 Advanced Mathematical Biology: Lecture  
 30 hours lecture and conferences, 3 credits  
 BIOL U781.02 Advanced Mathematical Biology: Laboratory  
 60 or 90 hours laboratory, 2 or 3 credits  
 BIOL U782.01 Biostatistics I  
 Lecture/Laboratory 3 hours lecture/6 hours laboratory, 6 credits  
 BIOL U782.02 Biostatistics II  
 Lecture/Laboratory 3 hours lecture/6 hours laboratory, 6 credits  
 BIOL U790.01 Colloquium in Ecology, Evolution, and Behavior  
 15 hours, 1 credit  
 BIOL U790.30 Seminar in Ecology, Evolution, and Behavior  
 15 hours, 1 credit  
 BIOL U808.03 Microevolutionary Processes: Lecture  
 30 or 45 hours lecture, 2 or 3 credits  
 BIOL U808.04 Microevolutionary Processes: Laboratory  
 60 or 90 hours laboratory, 2 or 3 credits  
 BIOL U710.03 Cellular Physiology: Lecture  
 30 or 45 hours lecture, 2 or 3 credits

**NEUROSCIENCE**

BIOL U710.04 Cellular Physiology: Laboratory  
 60 or 90 hours laboratory, 2 or 3 credits  
 BIOL U720.01 Animal Physiology: Lecture  
 45 or 60 hours lecture, 3 or 4 credits  
 BIOL U720.02 Animal Physiology: Laboratory  
 90 hours laboratory, 3 credits  
 BIOL U721.01 Animal Physiology I  
 60 hours, 4 credits  
 BIOL U721.02 Animal Physiology II  
 60 hours, 4 credits  
 BIOL U722.01 Endocrinology: Lecture  
 45 hours lecture, 3 credits  
 BIOL U722.02 Endocrinology: Laboratory  
 90 hours laboratory, 3 credits  
 BIOL U723.01 Neuroscience I: Lecture  
 45 hours lecture plus recitation, 4 credits  
 BIOL U723.02 Neuroscience II: Lecture  
 45 hours lecture plus recitation, 4 credits  
 BIOL U723.03 Neuroscience II: Laboratory  
 120 hours laboratory, 4 credits  
 BIOL U724.01 Comparative Neuroendocrine Mechanisms

45 hours lecture, 3 credits  
 BIOL U724.03 Animal Behavior I: Lecture  
 45 hours lecture, 3 credits  
 BIOL U724.04 Biological Basis of Animal Behavior: Laboratory  
 90 hours laboratory, 3 credits  
 BIOL U724.05 Current Issues in Behavioral Ontogeny  
 45 hours lecture, 3 credits  
 BIOL U724.06 Behavior and Evolution  
 45 hours lecture, 3 credits  
 BIOL U724.07 Animal Behavior II  
 45 hours, 3 credits  
 BIOL U725.03 Sensory Physiology: Lecture  
 45 hours lecture, 3 credits  
 BIOL U725.04 Sensory Physiology: Laboratory  
 90 hours laboratory, 3 credits  
 BIOL U725.05 Animal Communication: Lecture  
 45 hours lecture, 3 credits  
 BIOL U726.03 Comparative Animal Physiology: Lecture  
 30 or 45 hours lecture, 2 or 3 credits  
 BIOL U726.04 Comparative Animal Physiology: Laboratory  
 60 or 90 hours laboratory, 2 or 3 credits  
 BIOL U727.03 Endocrine Cytology: Lecture  
 45 hours lecture, 3 credits  
 BIOL U727.04 Endocrine Cytology: Laboratory  
 60 hours laboratory, 2 credits  
 BIOL U728 Field Studies in Animal Behavior  
 90 hours fieldwork and conferences, 3 credits

**PLANT SCIENCES**

BIOL U706.01 Plant Systematics:           Lecture  
 30 hours lecture, 2 credits  
 BIOL U706.02 Plant Systematics:           Laboratory  
 60 hours laboratory, 2 credits  
 BIOL U706.05 Taxonomy of Vascular Plants: Lecture  
 45 hours lecture, 3 credits  
 BIOL U706.06 Taxonomy of Vascular Plants: Laboratory  
 60 hours laboratory, 2 credits  
 BIOL U706.07 Numerical Systematics: Lecture  
 30 hours lecture, 2 credits  
 BIOL U706.08 Numerical Systematics: Laboratory  
 60 hours laboratory, 2 credits  
 BIOL U710.14 Molecular Biology:           Laboratory  
 15 hours lecture, 90 hours laboratory, 4 credits  
 BIOL U710.15 Molecular Biology: Lecture  
 60 hours, 4 credits  
 BIOL U730.01 Plant Physiology: Lecture  
 30 or 45 hours lecture, 2 or 3 credits  
 BIOL U730.02 Plant Physiology: Laboratory  
 60 or 90 hours laboratory, 2 or 3 credits  
 BIOL U745.01 Phytochemistry: Lecture

30 hours lecture, 2 credits  
 BIOL U745.02 Phytochemistry: Laboratory  
 90 hours laboratory, 3 credits  
 BIOL U752 Plant Morphogenesis: Lecture  
 45 hours lecture, 3 credits  
 BIOL U752.01 Plant Morphogenesis: Laboratory  
 90 hours laboratory, 3 credits  
 BIOL U754.01 Comparative Morphology of Vascular Plants: Lecture  
 30 hours lecture, 2 credits  
 BIOL U754.02 Comparative Morphology of Vascular Plants: Laboratory  
 90 hours laboratory, 3 credits  
 BIOL U764.03 Plant Ecology: Lecture  
 45 hours lecture, 3 credits  
 BIOL U764.04 Plant Ecology: Laboratory  
 90 hours laboratory, 3 credits  
 BIOL U764.05 Economic Botany  
 30 hours lecture, 30 hours laboratory, 3 credits  
 BIOL U765.01 Paleobotany: Lecture  
 30 hours lecture, 2 credits  
 BIOL U765.02 Paleobotany: Laboratory  
 60 hours laboratory, 2 credits  
 BIOL U780.01 Mathematical Biology: Lecture  
 30 hours lecture and conferences, 3 credits  
 BIOL U780.02 Mathematical Biology: Laboratory  
 60 or 90 hours laboratory, 2 or 3 credits

### **MOLECULAR, CELLULAR AND DEVELOPMENTAL BIOLOGY**

BIOL U704 Problems in Nuclear Cytology  
 30 hours lecture, 60 hours laboratory, 4 credits  
 BIOL U708.01 Developmental Genetics: Lecture  
 45 hours lecture, 3 credits  
 BIOL U708.02 Developmental Genetics: Laboratory  
 90 hours laboratory, 3 credits  
 BIOL U710.13 Molecular Biology: Lecture  
 75 hours lecture, 5 credits  
 BIOL U710.16 Molecular Biology: Laboratory  
 90 hours laboratory, 3 credits  
 Bio U711.01 Laboratory Rotation in Cellular, Molecular, and  
 Developmental Biology  
 90 hours, 3 credits  
 BIOL U711.03 Experimental Microbiology: Lecture  
 45 hours lecture, 3 credits  
 BIOL U711.04 Experimental Microbiology: Laboratory  
 90 hours laboratory, 3 credits  
 BIOL U712.03 Comparative Biochemistry: Lecture  
 30 hours lecture plus conferences or 45 hours lecture; 3 credits  
 BIOL U712.04 Comparative Biochemistry: Laboratory  
 60 or 90 hours laboratory, 2 or 3 credits  
 BIOL U713 Biology of Aging  
 45 hours lecture, 3 credits

BIOL U714.01 Cell Biology: Lecture  
 75 hours lecture, 5 credits  
 BIOL U714.02 Cell Biology: Laboratory  
 180 hours laboratory, 6 credits  
 BIOL U714.03 Cell Biology: Lecture  
 30 hours lecture, 2 credits  
 BIOL U714.04 Cell Biology: Laboratory  
 90 hours laboratory, 3 credits  
 BIOL U715 Cell Biology Internship  
 20 hours week, literature assignments and laboratory work, 10 credits  
 BIOL U716 Cells in Culture  
 60 hours laboratory, 15 hours recitation, 3 credits  
 BIOL U717 Bacteriophage  
 45 hours lecture, 3 credits  
 BIOL U717.1 Virology  
 3 hours lecture, 3 credits  
 BIOL U718 Immunology  
 45 or 60 hours, 3 or 4 credits  
 BIOL U719.03 Medical Microbiology and Immunology  
 67.5 hours lecture, 22.5 hours laboratory, 22.5 hours conference, 6 credits      Prerequisite: 718  
 or equivalent and permission of instructor  
 BIOL U740 Introduction to Biophysics  
 45 hours lecture, 3 credits  
 BIOL U740.01 Biophysical Techniques in Physiology  
 90 hours laboratory, 3 credits  
 BIOL U742 Radioisotopes in Biology  
 60 hours lecture, laboratory and demonstrations, 4 credits  
 BIOL U743 Photobiology  
 45 hours lecture, 3 credits  
 BIOL U744 Electrobiolgy  
 45 hours lecture, 3 credits  
 BIOL U747 Structure and Metabolism of Macromolecules  
 30 hours lecture, 30 hours laboratory, 3 credits  
 BIOL U750.03 Developmental Biology: Lecture  
 75 hours lecture, 5 credits  
 BIOL U750.04 Developmental Biology: Laboratory  
 60 or 90 hours laboratory, 2 or 3 credits  
 BIOL U751.01 Special Problems in Developmental Biology: Lecture  
 30 hours lecture, 2 credits  
 Bio U751.02 Special Problems in Developmental Biology: Laboratory  
 60 hours laboratory, 2 credits  
 BIOL U753.03 Molecular Basis of Development: Lecture  
 30 or 45 hours lecture, 2 or 3 credits  
 BIOL U753.04 Molecular Basis of Development: Laboratory  
 90 hours laboratory, 3 credits  
 BIOL U763 Experimental Parasitology: Lecture  
 45 hours lecture, 3 credits  
 BIOL U763.01 Experimental Parasitology: Laboratory  
 90 hours laboratory, 3 credits  
 BIOL U770.03 Cytology: Lecture

30 or 45 hours lecture, 2 or 3 credits  
BIOL U770.04 Cytology: Laboratory  
60 or 90 hours laboratory, 2 or 3 credits  
BIOL U771 Problems in Experimental Cytology  
30 hours lecture, 90 hours laboratory, 5 credits  
BIOL U771.01 Analysis of Mammalian Cells in Tissue Culture  
30 hours lecture, 90 hours laboratory, 5 credits  
BIOL U773.01 Cytogenetics: Lecture  
45 hours lecture, 3 credits  
BIOL U773.02 Cytogenetics: Laboratory  
60 hours laboratory, 2 credits  
BIOL U774 Basic Principles of Cellular Microsurgery and Micromanipulation  
30 hours lecture, 30 hours laboratory, 3 credits  
60 or 90 hours laboratory, 2 or 3 credits  
BIOL U775 Biotechnology of algae  
2 hours lecture, 1 hour discussion, 3 credits

### **Seminars and Special Topics**

BIOL U790.01 Seminar in Evolution  
30 hours plus conferences, 3 credits each semester  
BIOL U790.02 Seminar in Genetics  
30 hours plus conferences, 3 credits each semester  
BIOL U790.03 Seminar in Behavioral Genetics  
30 hours plus conferences, 3 credits each semester  
BIOL U790.04 Seminar in Molecular Genetics  
30 hours plus conferences, 3 credits each semester  
BIOL U790.05 Seminar in Developmental Biology  
30 hours plus conferences, 3 credits each semester  
BIOL U790.06 Seminar in Ecology  
30 hours plus conferences, 3 credits each semester  
BIOL U790.07 Seminar in Cytology  
45 hours, 3 credits each semester  
BIOL U790.08 Seminar in Biomathematics  
30 hours plus conferences, 3 credits each semester  
BIOL U790.09 Seminar in Biophysics  
30 hours plus conferences, 3 credits each semester  
BIOL U790.10 Seminar in Biochemistry  
30 hours plus conferences, 3 credits each semester  
BIOL U790.11 Seminar in Systematics  
45 hours, 3 credits each semester  
BIOL U790.12 Seminar in Zoogeography  
45 hours, 3 credits each semester  
BIOL U790.21 Seminar in Physiology  
45 hours, 3 credits each semester  
BIOL U790.22 Seminar in Animal Behavior  
30 hours plus conferences, 3 credits each semester  
BIOL U790.23 Seminar in Cell Biology  
30 hours plus conferences, 3 credits each semester  
BIOL U790.63 Seminar in Biological Oceanography  
30 hours plus conferences, 3 credits each semester

BIOL U790.64 Seminar in Behavioral Aspects of Ecology  
30 hours plus conferences, 3 credits each semester  
BIOL U790.65 Seminar in Tropical Forest Ecology and Conservation  
45 hours, 3 credits  
BIOL U790.91 Selected Topics in Animal Behavior - Biopsychology  
15 hours, 1 credit  
BIOL U790.93 Seminar in Acoustic Communication in Animals  
30 hours plus conferences, 3 credits each semester  
BIOL U793.01, 793.02, 793.03 Seminar in Special Topics  
30 or 45 hours, 2 or 3 credits each semester

**General**

BIOL U791 Colloquium  
15 or 30 hours each semester, ½ or 1 credit each semester  
BIOL U792 Tutorial  
15, 30, 45, or 60 hours each semester, 1-4 credits each semester  
BIOL U792.01 Advanced Study  
15, 30, 45, or 60 hours each semester, 1-4 credits each semester  
BIOL U794.01 Experimental Biology: Lecture  
30 or 45 hours, 2 or 3 credits each semester  
BIOL U794.02 Experimental Biology: Laboratory  
60 or 90 hours laboratory, 2 or 3 credits each semester  
BIOL U795 Basic Laboratory Techniques for Research  
15 hours lecture, 60 hours laboratory, 3 credits each semester  
BIOL U795.01 Laboratory in Biotechnology  
45 hours, 3 credits  
Bio U899 Independent Doctoral Research  
Credit to be assigned, up to a maximum of 10 credits. *Required of all candidates for the doctorate.*  
BIOL U900 Dissertation Supervision  
1 credit