

Program in Cell and Molecular Biology

Policies and Procedures

I. Director, Committees, and Faculty

A. Faculty

1. Eligibility
 - a. Researchers with Graduate Faculty Status I or II as approved by the Graduate School are eligible for consideration.
 - b. Applicant faculty must be research active.
 - c. Applicant faculty will submit to the Director
 - (1) A current Curriculum Vitae.
 - (2) Documentation from their Department Chair or Head of approval for consideration.
 - d. Applicant faculty will be reviewed for approval by the Program Committee.
2. Program Participation will be based on
 - a. Training of CEMB graduate students.
 - (1) teaching CEMB courses.
 - (2) Teaching courses containing a significant number of CEMB graduate students.
 - (3) Serving on Graduate Advising Committees for CEMB graduate students.
 - b. Serving on CEMB committees.
3. Documentation of Participation
 - a. CEMB faculty will provide the director annual updates on program-related activities every May.
 - (1) Annual updates will be used to prepare the Program's Annual Review.
 - (2) Annual updates will be used to determine the level of activity of each CEMB faculty member.
 - b. CEMB faculty participation will be reviewed by the Program Committee.
 - (1) CEMB faculty determined to be inactive over a 3-year period will be notified.
 - (2) Notified faculty will be allowed to justify further participation or apply for readmission to the CEMB faculty.

B. Program Director

1. The Program Director reports to the Chair of the Interdisciplinary Programs Department (presently also the Asst Dean of the Graduate School).
2. The Director is appointed by the Dean of the Graduate School
 - a. The Dean of the Graduate School will accept nominations from the CEMB faculty.
 - b. Nominated faculty must receive approval from the Deans of the participating Colleges.
 - c. The nominated and approved faculty will be presented to the CEMB faculty for polling.
3. The Director is normally appointed for a three year term.
4. Duties of the Director will include:
 - a. Management of recruitment of graduate students to the program.
 - b. Management of the budget for the program.
 - c. Preparing reports on the activities of the program.
 - d. Scheduling of courses for the program.

C. The Program Committee

1. The Program Committee consists of seven CEMB faculty members.
 - a. The Program Director accepts nominations from CEMB faculty.
 - b. The committee members are elected by general election.
 - c. The committee members must represent at least two of the participating colleges.
 - d. Committee members serve 2 year terms.
 - e. The Committee will select one of its members to serve as Chair of the committee.
2. Duties of the Program Committee
 - a. The Program Committee will review faculty sponsorships and plans for student support, prior to admission of student applicants to the program.
 - b. Recommendations to the Director and approval of CEMB funded assistantships.
 - c. Recommendations to the faculty regarding course and program requirements.
 - d. Review annual student performance reports.

II. Graduate Students

A. Application Materials

1. All applicants must have a B.A. or B.S. in a basic or applied science.
2. All applicants will present Graduate Record Examination scores for the Verbal, Analytical, and Written tests.
3. All applicants must provide three letters of recommendation from faculty, advisors or other persons, qualified to describe the applicant's abilities and potential for success in graduate training.

B. Admission Requirements

1. All applicants must meet minimum requirements of the Graduate School.
2. For admission, a student must have a sponsoring faculty member.
 - a. The applicant will communicate with prospective faculty sponsors to establish an agreement for sponsorship.
 - b. The sponsoring faculty member will communicate a potential thesis project description to the Director and Program Committee, for final approval.

C. Graduate Student Support

1. Any University support, whether as a Graduate Teaching Assistant or as a Graduate Research Assistant, can be arranged within the department of the sponsoring faculty member, or provided by the sponsoring faculty member through grant funds.
2. The CEMB program will provide a limited number of graduate assistantships.
 - a. CEMB funded assistantships will be distributed in an equitable manner to all participating departments and colleges.
 - b. CEMB funded assistantships will be distributed on an annual basis
 - (1) The Program Director will solicit requests for CEMB funded assistantships late in the Fall semesters.
 - (2) Faculty will submit requests in the form of:
 - (a) Identification of an existing student or applicant
 - (b) Existing or planned grants to fund the research and to completely fund the assistantship.
 - (c) An annual budget for part or all of the student RA, including stipend and tuition. Partial RA support should include a listing of available (grant or departmental) cost-sharing funds.
 - (d) Prior CEMB funded RA support to the faculty member.

- (3) The Program Advisory Committee will review all requests for assistantships and make recommendations to the Director.
- c. CEMB funded assistantships will be reviewed for renewal on an annual basis.
 - (1) CEMB faculty with students on CEMB funded assistantships are expected to endeavor to obtain grant support to fully support the assistantship.
 - (2) Typically, CEMB supported assistantships will be for up to two years and renewable. Renewal requests must be made to the Program Advisory Committee during Fall semesters following the procedures outlined in section II.C.2.b.
 - (3) CEMB faculty will provide the Director annual reports on progress of students on CEMB funded assistantships and efforts to move the assistantship to other funding (e.g., grant support). Annual updates and requests for assistantship continuation will include:
 - (a) Publications and presentations for the past year that included the student
 - (b) Coursework and grades for the student's entire tenure in the program
 - (c) A summary of the student's research program progress. This should include candidacy examinations (if applicable), and timeline for degree completion.
 - (d) A listing of Grants submitted and current status of those grants intended to fund the assistantship.
 - (4) The Program Advisory Committee will review and approve continuation of CEMB funded assistantships. This evaluation will take place every year in May or June.

D. Graduate Student Committees

- 1. All students in the program must formulate a Graduate Advising Committee. MS students will also formulate a Graduate Thesis Committee, while Ph.D. students will also formulate a Graduate Dissertation Committee
- 2. Each committee must contain Cell and Molecular Biology faculty representing a minimum of two different academic departments, and if possible two different colleges.
- 3. M.S. Candidates
 - a. Committees will consist of a minimum of 3 Cell and Molecular Biology faculty.
- 4. Ph. D. Candidates
 - a. Committees will consist of a minimum of 4 Cell and Molecular Biology faculty for Ph.D. candidates.
- 5. The Graduate Advising Committee will
 - a. Formulate and approve the student's program of study.
 - b. Administer candidacy examinations as required.
- 6. The Graduate Thesis or Dissertation Committee will
 - a. Administer the thesis (M.S.) or dissertation (Ph.D.) examinations, and student defenses.

E. Program of Study

- 1. Course Requirements
 - a. All candidates for a degree in this program are required to complete CHEM 5813 and CHEM 5843, or their equivalent.

- b. All candidates must enroll every fall and spring semester in the Cell and Molecular Biology designated seminar course (CEMB 5911) or a CEMB approved seminar course.
 - (1) CEMB approved seminar courses are BIOL5001 Cell Socioe/Professional Development, BMEG5801/5811 Graduate Seminar, POSC 5901 Graduate Seminar, and CHEM6011 Biochemistry Seminar
 - (2) Upon successful petition from the students Graduate Advisory Committee to the Director, PAC, and Graduate School, a PhD candidate may register for only one hour of either CEMB700V or for a CEMB approved seminar.
 - c. Cell and Molecular Biology approved courses
 - (1) The program maintains a list of approved courses and publishes that list on the program web site.
 - (2) Faculty can nominate courses for program approval. Nominated courses will be evaluated by the Program Advisory Committee and must be approved by majority vote of the program faculty.
 - (3) CEMB Approved Courses are listed in Appendix 1
2. Grade Requirement
 - a. Students must maintain a minimum graduate Grade Point Average of 3.0 on all graduate course work.
 - b. Any students receiving more than two C grades (regardless of GPA) in graduate courses of 2 hours credit or more may not continue studies to complete a Ph.D. in the program, but may elect to finish the M.S. degree. For grade accounting purposes, grades of D in a graduate course of 2 hours credit or more are equivalent to two (2) C grades.
 - c. Any student who receives an F grade in any graduate course is automatically removed from the program.
 3. Annual Student Progress Reports
 - a. Graduate students will submit progress reports to his/her Graduate Advising Committee
 - b. Graduate students will have annual meetings with their Graduate Advising Committee meeting where the committee will assess progress and determine whether support for the student is recommended for an additional year.
 - c. Faculty will submit written progress reports every spring semester for each of their graduate students. These reports will be sent to the Director of the Program, and to their home department. These reports will use the recommended forms for the home department and those for the Graduate School.
 4. MS students
 - a. Complete a minimum of 24 hours post-baccalaureate in Cell and Molecular Biology course work. Graduate Seminar courses do not count towards the 24 hours.
 - b. At least 18 credit hours are to be taken from the CEMB approved list of courses. Up to 6 credit hours can be taken from other courses. All course work must be approved by the student's Graduate Advising Committee.
 - c. Complete a minimum of 6 hours of thesis research credits.
 5. Ph.D students

- a. Complete a minimum of 24 hours post-baccalaureate in Cell and Molecular Biology course work. Graduate Seminar courses do not count towards the 24 hours.
 - b. At least 18 credit hours are to be taken from the CEMB approved list of courses. Up to 6 credit hours can be taken from other courses. All course work must be approved by the student's Graduate Advising Committee.
 - c. Complete a minimum of 18 hours of dissertation research credits.
 - d. Complete the Candidacy Examination
 - (1) The Candidacy Examination will consist of the writing of an original research proposal using the guidelines for a federally funded post-doctoral fellowship (e.g., NIH, NSF, USDA) and an oral examination over the proposal, related subjects, and general knowledge.
 - (2) Selection of the topic for the research proposal
 - (a) Students will submit three abstracts outlining possible research project topics within the two years in the program. Proposal topics are to be within the field of Cell and Molecular Biology but on subjects distinct from the student's Ph.D. research.
 - (b) The student's Graduate Advising Committee will review these three abstracts and, in consultation with the student, select the topic and format for the research proposal
 - (c) The written and oral portions of the candidacy examination must be completed within the Ph.D. candidate's first 29 months in this program.
 - (d) The written proposal is submitted to the student's Graduate Advising Committee for evaluation and approval or rejection.
 - (1) Students may submit the proposal to their committee a maximum of three times.
 - (2) Students may use outside assistance but not from their major professor or members of their Graduate Advising Committee.
 - (3) Upon completion of an approved proposal the candidate must then pass an oral examination by the student's Graduate Advising Committee covering:
 - i) The proposal, and
 - ii) General knowledge relevant to research in Cell and Molecular Biology.
 - iii) The candidacy oral examination may proceed if one committee member is not in attendance with the provision that the missing member provide comments and an evaluation of the written portion of the examination.
 - iv) Only upon satisfactory completion of the proposal and oral examination, as judged by the student's Graduate Advising Committee, does a student become a candidate for the Ph.D.
 - v) Students who fail to complete the candidacy examination in the allotted time will be removed from the Ph.D. program but may choose to become candidates for the M.S. degree.
6. Thesis/Dissertation Requirement
- a. M.S. Requirements
 - (1) Complete a thesis based on their research.

- (2) Pass a comprehensive oral examination based on the thesis. Examination over and approval of the thesis is by the student's Graduate Advising Committee.
 - (3) Give a public seminar on their thesis work prior to their final defense.
 - b. Ph.D. Requirements
 - (1) Complete an original research-based dissertation which represents a significant contribution to the field of Cell and Molecular Biology.
 - (2) The Ph.D. is granted not only for fulfillment of technical requirements but also for development and possession of critical and creative thought abilities in the areas of Cell and Molecular Biology. Evidence of these abilities is given through the completion of a dissertation.
 - (3) Pass a comprehensive oral examination based on the dissertation. The student's Graduate Advising Committee will evaluate the dissertation and conduct an oral Final Examination of the candidate over the dissertation and any other subject matter deemed appropriate by the committee.
 - (4) Give a public seminar on their dissertation work prior to their final defense.
 - 7. Exceptions to Program of Study
 - a. Exceptions are petitioned to the Program Director
 - (1) Exceptions require detailed justification and must be recommended by the student's major professor and Graduate Advising Committee
 - b. Exceptions must be approved by the Program Director, and the Program Advisory Committee
 - c. Some exceptions may also require approval of the Graduate School or Graduate Council
- III. Program Assessment (Academic Policy Series 1630.10)
- A. Specific goals established for students earning degrees
 - 1. What are we attempting to do for our students?
 - a. Provide graduate students a solid educational foundation in Cell Biology and Molecular Biology.
 - b. Train students how to perform and conduct scientific research in Cell Biology and Molecular Biology.
 - 2. How well are we doing what we are attempting?
 - a. Students must take and pass an oral examination conducted by program faculty.
 - b. This examination is the terminal examination for completion of their degree.
 - c. This examination will be on their research and knowledge base.
 - d. Student placement post-degree is tracked and reported by each faculty member and reported annually. Initial placement of graduating students will be reported to the Program Director. Subsequent changes in employment will be reported as faculty are aware. The Program Director will maintain this listing for reporting purposes.
 - B. Student Assessment
 - 1. A comprehensive, exit examination graded by faculty in the program.
 - 2. Completion of a specific research project and production of a thesis (M.S.) or dissertation (Ph.D.) which is graded by faculty in the program.

AGST 4011 SAS Programming for Agricultural Sciences
AGST 5023 Principles of Experimentation*
AGST 5014/5010L Experimental Design and Laboratory
ANSC 5743L Advanced Analytical Methods in Animal Sciences Laboratory
ANSC 6833 Reproduction in Domestic Animals
BIOL 4303 Plant Physiology
BIOL 4424 Mycology
BIOL 4443 Molecular Virology
BIOL 5703* Mechanisms of Pathogenesis
BIOL 5713* Basic Immunology
BIOL 5734 Protistology
BIOL 5003* Laboratory in Prokaryote Biology
BIOL 5143* Advanced Methods in Microscopy
BIOL 5153 Practical Programming for Biologists
BIOL 5213* Biological Regulation and Subcellular Communication
BIOL 5233* Genomics and Bioinformatics
BIOL 5263* Cellular Physiology
BIOL 5313* Molecular Cell Biology
BIOL 5534 Biochemical Genetics
BIOL 5343 Advanced Immunology
BIOL 5352L Immunology in the Laboratory
BIOL 5404* Comparative Botany
BIOL 5524* Developmental Biology with Laboratory
BIOL 5544/5540L* Comparative Vertebrate Embryology and Laboratory
BIOL5553 Astrobiology
BIOL 5563* Cancer Biology
BIOL 5643* Eukaryote Phylogeny
BIOL 5753* General Virology
BIOL 5873* Microbial Molecular Genetics and Informatics
BMEG 5413 Tissue Engineering
BMEG 5313 Advanced Biomaterials and Biocompatibility
BMEG 5423 Regenerative Medicine
CHEG 5513 Biochemical Engineering Fundamentals
CHEM 4313 Bioanalytical Chemistry**
CHEM 5513 Biochemical Evolution
CHEM 5813 Biochemistry I
CHEM 5843 Biochemistry II
CHEM 6823 Physical Biochemistry
CHEM 6863 Enzymes
CHEM 6873 Molecular Biochemistry
CHEM 6883 Bioenergetics and Biomembranes
CSES 4103 Plant Breeding
CSES 5023 Physiology of Herbicide and Plant Interaction
CSES 5124/5120D Crop Molecular and Physiological Genetics
CSES 5233 Plant Genetic Engineering
CSES 5264 Microbial Ecology

ENTO 5133 Insect Molecular Genetics
ENTO/BIO 6113 Insect Physiology and Molecular Biology
FDSC 5122/5121L Food Microbiology and Laboratory
FDSC 6323 Nutraceuticals and Functional Food
FDSC 6333 Food Protein Chemistry and Functionality
FDSC 6443 Metabolism of Xenobiotics
HORT 5343 Seed Physiology
HORT 6033 Genetic Techniques in Plant Breeding
HORT 602V Horticulture Physiology
PLPA 4333 Biotechnology in Agriculture
PLPA 5603 Plant Pathogenic Fungi
PLPA 6203 Plant Virology
PLPA 6503 Plant Bacteriology
POSC 5313 Domestic Animal Bacteriology
POSC 5873 Molecular Analysis of Foodborne Pathogens
POSC 5923 Brain and Behavior
POSC 5932 Cardiovascular Physiology of Domestic Animals
POSC 5933 Environmental Physiology of Domestic Animals
POSC 5942 Endocrine Physiology of Domestic Animals
POSC 5952 Respiratory Physiology of Domestic Animals
POSC 5962 Gastrointestinal/Digestive Physiology of Domestic Animals
POSC 5972 Renal Physiology of Domestic Animals
PTSC 6203/6200L Laboratory Instrumentation in Plant Science and Laboratory
STAT 4001L Statistics Methods Laboratory
STAT 4003 Statistical Methods

*-these courses are dual listed at the 4000 and 5000 level. Students who took these courses at the 4000 level during their undergraduate career may not repeat them at the 5000 level.

** -these courses have both undergraduate and graduate sections. Students who took the undergraduate section may not repeat them or count them for graduate credit.