

Required Courses for
Graduate Students in the
*Cellular and
Molecular Biology (CMB)*
Research Group

Faculty Affiliated with the CMB Research Group

- Andrew J. Andres
- Michelle M. Elekonich
- Allen G. Gibbs
- Laurel A. Raftery
- Martin R. Schiller
- Qingxi Jeffery Shen
- Frank van Breukelen
- Helen J. Wing

CMB – Required Courses

- BIOL 701 – *Ethics in Scientific Research*
(1 credit)

Students must take this course during their first year in the Program.

- BIOL 794 – *Techniques in Molecular Biology* (3 credits)

CMB – Required Courses

- At least six (6) credits of seminar-style courses, either in BIOL 793C or BIOL 796C, or in any combination of the two.
- BIOL 793C – *Advanced Topics in Life Sciences (Cell and Molecular Biology)* (1-2 credits)
- BIOL 796C – *Graduate Seminar (Cell and Molecular Biology)* (1-2 credits)
- Students may take more than 6 credits, but no more than sixteen (16) credits can apply toward the degree.

CMB – Required Participation

- BIOL 790C – *Research Colloquium in Life Sciences* (1-2 credits)
- Starting in Fall 2010, all CMB students must attend the Colloquium every semester even if not enrolled for credit.
- Each student must also present his/her research in the Colloquium once per academic year.
- Students may register for Biol 790C each semester, but no more than ten (10) credits can apply toward the degree.

CMB – Core Courses

- Master's students must take at least two (2) of the following four core courses; doctoral students must take at least three (3) of the following four core courses.
- BIOL 607 – *Molecular Biology* (3 credits)
- BIOL 625 – *Genomics* (3 credits)
- BIOL 645 – *Cell Physiology* (3 credits)
- CHEM 772 – *Nucleic Acid Chemistry* (3 credits)

CMB – Elective Courses

- Master's students must take at least two (2) of the following elective courses; doctoral students must take at least three (3) of the following elective courses.
- A core course (*i.e.*, BIOL 607, BIOL 625, BIOL 645, CHEM 772) not used to satisfy the core requirements can substitute as an elective course.

CMB – Elective Courses (continued)

- The elective courses to be taken must be approved in advance by the student's Advisory Committee.
- The Advisory Committee may require the student to take certain specific courses, depending on the person's academic background and research objectives.

CMB – Elective Courses (continued)

- BIOL 604 – *Principles of Neurobiology*
(3 credits)
- BIOL 609 – *Virology* (3 credits)
- BIOL 611 – *Molecular Evolution* (3 credits)
- BIOL 626 – *Plant Anatomy* (3 credits)
- BIOL 642 – *Principles of Plant Physiology*
(4 credits)
- BIOL 648 – *Endocrinology* (3 credits)

CMB – Elective Courses (continued)

- BIOL 653 – *Immunology* (3 credits)
- BIOL 664 – *Bacterial Pathogenesis* (3 credits)
- BIOL 666 – *Developmental Biology* (3 credits)
- BIOL 680 – *Introduction to Biological Modeling* (3 credits)
- BIOL 685 – *Microbial Genetics* (3 credits)
- BIOL 689 – *Developmental Genetics* (3 credits)
- BIOL 703 – *Biochemical Genetics* (3 credits)

CMB – Elective Courses (continued)

- BIOL 711 – *Advanced Eukaryotic Genetics*
(3 credits)
- BIOL 714 – *Population Genetics* (3 credits)
- BIOL 730C – *Special Lectures in Life Sciences*
(*Cell and Molecular Biology*) (3 credits)
- BIOL 786 – *Bioenergetics* (3 credits)

CMB – Elective Courses (continued)

- CHEM 770 – *Protein Chemistry* (3 credits)
- CHEM 771 – *Metabolism and Energetics*
(3 credits)
- CHEM 772 – *Nucleic Acid Chemistry*
(3 credits)
- STAT 691 – *Statistics for Scientists I*
(3 credits)
- STAT 692 – *Statistics for Scientists II*
(3 credits)

CMB – Thesis/Dissertation Credits

- Master's students must take six (6) credits of Biol 797 (*Thesis*) in order to graduate. Students may register for more than 6 credits of Biol 797, but only six (6) credits can be applied toward the MS degree.
- Doctoral students must take twelve (12) credits of Biol 799 (*Dissertation*) in order to graduate. Students may register for more than 12 credits, but no more than eighteen (18) can be applied toward the PhD degree.

Additional Graduate Courses

- Master's students must complete 30 credits in the program, and Doctoral students must complete 60. In addition to the above required classes, students may also take the following:
- Biology 789 — *Independent Graduate Study in Life Sciences* (1-3 credits). This class can be used to receive research credit related to a student's thesis or dissertation project prior to taking Biol 797 or Biol 799. Biol 789 can be repeated, but only nine (9) credits can be applied toward an MS or PhD degree.

Additional Graduate Courses (continued)

- Biology 791 – *Research Laboratory Discussions in Life Sciences* (1-2 credits).
With the Advisor's approval, a graduate student can enroll in this class to receive credit for presenting and participating during formal laboratory meetings with his/her Advisor's research group. This course may be repeated, but only 10 credits can apply toward a MS or PhD degree.

Sample Program of Study: CMB Master's Student

Credits

– 3 or 4 600- or 700-level didactic courses	9-12
– BIOL 701 – <i>Ethics in Scientific Research</i>	1
– BIOL 790C – <i>Research Colloquium</i>	4
– BIOL 791 – <i>Research Lab. Discussions</i>	4
– BIOL 793C – <i>Advanced Topics in Life Sciences</i> and/or BIOL 796C – <i>Graduate Seminar</i>	6
– BIOL 789 – <i>Independent Study</i> (“Prethesis”)	3
– <u>BIOL 797 – <i>Thesis</i></u>	<u>6</u>
Total	≥30

Sample Program of Study: CMB Doctoral Student

Credits

– Six 600- or 700-level didactic classes	18
– BIOL 794 – <i>Techniques in Molecular Biology</i>	3
– BIOL 701 – <i>Ethics in Scientific Research</i>	1
– BIOL 790C – <i>Research Colloquium</i>	8
– BIOL 791 – <i>Research Lab. Discussions</i>	8
– BIOL 793C – <i>Advanced Topics in Life Sciences</i> and/or BIOL 796C – <i>Graduate Seminar</i>	8
– BIOL 789 – <i>Independent Study</i>	3
– <u>BIOL 799 – <i>Dissertation</i></u>	<u>12</u>
Total	≥60