# MS Concentration in Animal Molecular and Cellular Biology

Molecular and cellular biology are at the center of life processes including for animals used for production of food, fiber and power. The concentration in animal molecular and cellular biology allows MS students in the life sciences related to animal and veterinary sciences to obtain education in key concepts in molecular and cellular biology, The concentration replaces a stand-alone MS program in Animal Molecular and Cellular Biology that was recently folded into Animal Sciences. Participation in the Animal Molecular and Cellular Biology concentration will allow MS students to have their transcript reflect the nature of their graduate education. Moreover, students pursuing the Animal Molecular and Cellular Biology concentration will participate in other activities sponsored by the Animal Molecular and Cellular Biology faculty (a multi-college group) including presenting their research at an annual research symposium.

*Requirements for entry*

Enrollment in a MS program in any of the graduate programs offering the concentration. These programs are Animal Sciences and Veterinary Medical Sciences.

*Requirements for completion*

Requirements for the MS concentration will include 9 credits, including 6 credits of core courses and 3 other credits from the group of elective courses (or an equivalent course). In addition to the required credits in the core and elective courses, it is expected that students will also successfully complete courses chosen in consultation with the supervisory committee in topics such as statistics, genetics, biochemistry, cell biology, immunology, bioinformatics and other areas. Note that, upon permission from the supervisory committee, other courses may be chosen as electives in lieu of the courses listed as electives here.

**Core courses (6 credits)**

| Course Number | Title | Department | Credit hours | Term Offered | Description |
|---|---|---|---|---|---|
| BCH 5045 | Graduate Survey of Biochemistry | CALS | 4 Letter Grade | Fall | Overview of biochemistry |
| VME 6767 | Issues in Responsible Conduct of Research | Vet Med | 1 S/U | Fall | Research ethics |
| ANS 6936 | Graduate Seminar in Animal Molecular and Cell Biology | Animal Sciences | 1 Letter Grade | Fall/Spring | Seminar in molecular and cellular biology; student presents a seminar or his or her research |

**Elective courses**

ANS 6379L Molecular Techniques in Animal Genetics, 2 credits (Letter Grade)

ANS 6387 Genetic Analyses of Complex Traits in Livestock, 3 credits (Letter Grade)

BCH 5413 Mammalian Molecular Biology and Genetics, 3 credits (Letter Grade)

BSC 6438 R for Functional Genomics, 3 credits (Letter Grade)

BSC 6459 Fundamentals of Bioinformatics, 3 credits (Letter Grade)

GMS 6421 Cell Biology, 4 credits (Letter Grade)

PCB 5065 Advanced Genetics, 4 credits (Letter Grade)

VME 5244 Physiology: Organ Systems, 4 credits (Letter Grade)