

Science and Mathematics Education—SME

- 850 Cell and Molecular Biology**
Summer. 2 credits. RB: Secondary certification in biology, 3 years teaching experience. R: Approval of college. SA: NSC 850
Molecular basis of structure and function of cells. Protein structure and function, cell physiology, metabolic energy and transmission of genetic information.
- 851 Cell and Molecular Biology Laboratory**
Summer. 3 credits. RB: Secondary certification in biology; 3 years teaching experience. R: Approval of college. SA: NSC 851
Generation of laboratory exercises appropriate for secondary students.
- 852 Interdisciplinary Seminar in Biological Science**
Fall, Spring, Summer. 1 credit. RB: Secondary certification in biology; 3 years teaching experience. R: Approval of college. SA: NSC 852
Interrelationships of biological science and technology. Role of society in regulation of research and technological innovations.
- 855 Environmental and Behavioral Biology**
Summer. 3 credits. Spring: Given only at Summer: Given only at W.K. Kellogg Biological Station. RB: Secondary certification in biology; 3 years teaching experience. R: Approval of college. SA: NSC 855
Biotic and abiotic features of lakes, streams, forest ecosystems, and microbial ecosystems.
- 856 Environmental and Behavioral Biology Laboratory**
Summer. 3 credits. Summer: Given only at W.K. Kellogg Biological Station. RB: Secondary certification in biology, 3 years teaching experience. R: Approval of college. SA: NSC 856
Laboratory and field examinations of lake, stream and forest ecosystems.
- 860 Problem Solving Techniques in Physical Science**
Summer. 3 credits. RB: (NSC 861 and NSC 862 and NSC 863) Secondary certification in chemistry or physics or earth science or physical science, 3 years teaching experience. R: Approval of college. SA: NSC 860
Measurement and analysis of chemical, physical, and geological phenomena.
- 861 Chemistry for Teachers**
Summer. 2 credits. RB: Secondary certification in chemistry or physics or earth science or physical science, 3 years teaching experience. R: Approval of college. SA: NSC 861
Intensive lecture and laboratory study of basic chemistry from a modern viewpoint.
- 862 Physics for Teachers**
Summer. 2 credits. RB: Secondary certification in chemistry or physics or earth science or physical science, 3 years teaching experience. R: Approval of college. SA: NSC 862
Intensive lecture and laboratory study of basic physics from a modern viewpoint.
- 863 Earth Science for Teachers**
Summer. 2 credits. RB: Secondary certification in chemistry or physics or earth science or physical science, 3 years teaching experience. R: Approval of college. SA: NSC 863
Intensive lecture and laboratory study of basic earth sciences from a modern viewpoint.
- 864 Interdisciplinary Seminar in Physical Science**
Summer. 2 credits. RB: (NSC 860) R: Approval of college. SA: NSC 864
Interrelationships of the physical sciences. The role of society in regulation of science to technology transfer.
- 870 Teaching College Science**
Spring. 2 credits. RB: One year of graduate study in a biological or physical science. R: Approval of college. SA: NSC 870
Philosophies of education. Ethnic, gender, and cultural issues. Designing a laboratory course. Problems of class size. Instructional technologies. Assessment and evaluation.
- 889 Research for Inservice Teachers**
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 10 credits in all enrollments for this course. RB: Open only to inservice K-12 teachers with baccalaureate degrees. R: Approval of college. SA: NSC 889
Research in faculty laboratories. Oral and written presentations.
- 899 Master's Thesis Research**
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 36 credits in all enrollments for this course. R: Open only to master's students in the College of Natural Science. Approval of college. SA: NSC 899
Master's thesis research.
- 901 Frontiers in Biological Science**
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 36 credits in all enrollments for this course. RB: Secondary certification in chemistry or physics or earth science or physical science or biology, 3 years teaching experience. R: Approval of college. SA: NSC 901
Weekend workshops with research faculty exploring background and latest findings in their area of research.
- 902 Frontiers in Physical Science**
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 40 credits in all enrollments for this course. RB: Open only to students with secondary teacher certification in chemistry or physics or earth science or physical science or biology and 3 years of teaching experience. R: Approval of college. SA: NSC 902
Weekend workshops with research faculty exploring background and latest findings in their area of research.

SMALL ANIMAL CLINICAL SCIENCES SCS

Department of Small Animal Clinical Sciences College of Veterinary Medicine

- 511 Veterinary Radiology**
Fall. 1(1-0) R: Open only to graduate-professional students in College of Veterinary Medicine.
Principles of veterinary radiology, radiation safety, and normal radiologic anatomy.
- 611 Diagnostic Imaging Clerkship**
Fall, Spring, Summer. 3 credits. RB: Completion of semester 5 of the professional veterinary program.
Diagnostic radiography and ultrasound imaging. Radiation safety. Special procedures.
- 612 Problems in Diagnostic Imaging Clerkship**
Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: (SCS 611) Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine.
Advanced diagnostic radiography, ultrasound imaging, and magnetic resonance imaging.
- 613 Diagnostic Ultrasound Clerkship**
Fall, Spring. 3 credits. RB: (SCS 611) Completion of semester 5 of the professional veterinary program. R: Open only to fourth year graduate-professional students in the College of Veterinary Medicine
Principles of ultrasound physics, ultrasound scanning techniques, and interpretation of ultrasound imaging.
- 625 Small Animal General Medicine Clerkship**
Fall, Spring, Summer. 3 credits. RB: Completion of semester 5 of the professional veterinary program. R: Open only to graduate-professional students in College of Veterinary Medicine.
Diagnostic and treatment services for routine and emergency outpatients.
- 626 Small Animal Soft Tissue Surgery Clerkship**
Fall, Spring, Summer. 3 credits. RB: Completion of semester 5 of the professional veterinary program. R: Open only to graduate-professional students in College of Veterinary Medicine.
Diagnosis and preoperative, surgical, and postoperative care of patients requiring routine elective and major soft-tissue surgical procedures.
- 630 Spay/Neuter Clerkship**
Fall, Spring, Summer. 3 credits. RB: (SCS 626 and SCS 648) Completion of semester 5 of the graduate professional veterinary program.
Ovariohysterectomy or orchiectomy. Aspects of pre- and post-operative management and anesthesia.

- 636 Problems in Soft Tissue Surgery Clerkship**
Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: (SCS 626) R: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine.
Soft tissue surgery problems.
- 637 Operative Surgery Clerkship: Instruction and Review**
Fall. 3 credits. RB: Completion of semester 5 of the professional veterinary program. R: Open only to graduate-professional students in the College of Veterinary Medicine. Approval of department.
Participation in the instruction of VM 557 (Operative Surgery), with preparation for the laboratory and discussion after the laboratory. Performance of additional surgical procedures, case discussions, rounds, and anatomy review. Approved independent study project required.
- 640 Cardiology Clerkship**
Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: Completion of semester 5 of the professional veterinary program. R: Open only to graduate-professional students in College of Veterinary Medicine.
Diagnosis and medical, and surgical treatment of small animal thoracic and cardiovascular disorders.
- 641 Ophthalmology Clerkship**
Fall, Spring, Summer. 3 credits. RB: Completion of semester 5 of the professional veterinary program. R: Open only to graduate-professional students in College of Veterinary Medicine.
Ophthalmic evaluation of all species. Diagnosis and medical and surgical treatment of ophthalmic disease.
- 642 Zoo and Wildlife Clerkship**
Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: Completion of semester 5 of the professional veterinary program. R: Open only to graduate-professional students in College of Veterinary Medicine.
Zoo animal and wildlife medicine and surgery.
- 643 Neurology Clerkship**
Fall, Spring, Summer. 3 credits. RB: Completion of semester 5 of the professional veterinary program. R: Open only to graduate-professional students in College of Veterinary Medicine. Not open to students with credit in SCS 666.
Diagnosis and medical and surgical treatment of small animal neurological disorders.
- 644 Dermatology Clerkship**
Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: Completion of semester 5 of the professional veterinary program. R: Open only to graduate-professional students in College of Veterinary Medicine.
Diagnosis and treatment of small animal dermatological disorders.
- 645 Intensive Care Unit Clerkship**
Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: Completion of semester 5 of the professional veterinary program. R: Open only to graduate-professional students in College of Veterinary Medicine. Not open to students with credit in SCS 622.
Intensive care and management of critically ill small animals.
- 646 Small Animal Orthopedic Clerkship**
Fall, Spring, Summer. 3 credits. RB: Completion of semester 5 of the professional veterinary program. R: Open only to graduate-professional students in the College of Veterinary Medicine.
Diagnosis and preoperative, surgical, and postoperative care of patients requiring routine and major orthopedic surgical procedures.
- 647 Small Animal Internal Medicine Clerkship**
Fall, Spring, Summer. 3 credits. RB: Completion of semester 5 of the professional veterinary program. R: Open only to graduate-professional students in the College of Veterinary Medicine.
Diagnosis and therapy for complicated medical cases of small animals.
- 648 Anesthesia Clerkship**
Fall, Spring, Summer. 3 credits. RB: Completion of semester 5 of the professional veterinary program.
Pre-anesthesia evaluation, induction, monitoring, and recovery of small animal patients requiring routine and major surgical procedure.
- 650 Advanced Cardiology**
Spring. 3 credits. RB: (SCS 640) Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine.
Advanced cardiology practice.
- 651 Advanced Comparative Ophthalmology Clerkship**
Spring. 3 credits. RB: (SCS 641) Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Approval of department.
Problem-oriented approach to complex ocular disease processes at the gross and microscopic levels.
- 653 Problems in Neurology Clerkship**
Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: (SCS 643) R: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine.
Neurologic problems.
- 656 Problems in Orthopedic Surgery Clerkship**
Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: (SCS 646) Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine.
Orthopedic surgery problems.
- 657 Problems in Internal Medicine Clerkship**
Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: (SCS 647) Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine.
Internal medicine problems.
- 658 Problems in Anesthesiology Clerkship**
Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: (SCS 648) Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine.
Advanced practice of anesthesiology in the teaching hospital setting.
- 670 Clinical Nutrition for Small Animals**
Spring. 3 credits. RB: Completion of Semester 5 of the graduate-professional program in the College of Veterinary Medicine.
Principles of clinical nutrition and dietetics for dogs and cats: diet evaluation, nutritional assessment, critical care nutrition support, and clinical case evaluations.
- 690 Veterinary Molecular Biology Clerkship**
Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine.
Concepts and techniques of veterinary molecular biology.
- 693 Problems in Small Animal Clinical Sciences Clerkship**
Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine.
Special problems.
- 694 Small Animal Specialty Practice Clerkship**
Fall, Spring, Summer. 3 credits. A student may earn a maximum of 12 credits in all enrollments for this course. RB: Completion of semester 5 of the professional veterinary program. R: Open only to fourth year graduate-professional students in the College of Veterinary Medicine
Supervised, off-campus, specialty practice experience in an assigned veterinary practice or other school of veterinary medicine.
- 695 Emergency and Critical Care Medicine Clerkship**
Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: Completion of semester 5 of the professional veterinary program. R: Open only to graduate-professional students in the College of Veterinary Medicine.
Admission, triage, diagnosis, treatment, and discharge of patients entering an emergency service. Daily instructional rounds.
- 808 Problems in Small Animal Surgery**
Fall, Spring, Summer. 1 to 9 credits. A student may earn a maximum of 15 credits in all enrollments for this course. R: Open only to graduate students in Small Animal Clinical Sciences.

Small Animal Clinical Sciences—SCS

813 Small Animal Seminar

Fall, Spring, Summer. 1(1-0) A student may earn a maximum of 3 credits in all enrollments for this course. R: Open only to graduate students in Small Animal Clinical Sciences.

899 Master's Thesis Research

Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Open only to graduate students in Small Animal Clinical Sciences.

Master's thesis research.

SOCIAL SCIENCE SSC

College of Social Science

101 Preview of Science

Fall. 1 credit. Interdepartmental with Natural Science; Agriculture and Natural Resources; Engineering. Administered by College of Natural Science. R: Approval of college.

Overview of natural sciences. Transitional problems. Communications and computer skills. Problem-solving skills. Diversity and ethics problems in science. Science and society.

192 Environmental Issues Seminar

Fall, Spring. 1 credit. A student may earn a maximum of 4 credits in all enrollments for this course. Interdepartmental with Natural Science; Agriculture and Natural Resources; Engineering; Communication Arts and Sciences. Administered by College of Natural Science. R: Open only to students in the College of Agriculture and Natural Resources or College of Engineering or College of Natural Science or College of Communication Arts and Sciences or College of Social Science. Approval of college.

Environmental issues and problems explored from a variety of perspectives, including legal, scientific, historical, political, socio-economic, and technical points of view.

290 Selected Topics in Social Science

Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.

Topics may cover contemporary, theoretical, or applied issues or interdisciplinary approaches.

291 Introduction to Asian Pacific American Studies

Fall. 1(1-0)

Issues that define the study of Asian Pacific American communities, including Asian Pacific American history, immigration, psychology, literature, family, women's issues, activism politics, and community.

292 Applications in Environmental Studies

Fall. 2(1-2) Interdepartmental with Natural Science; Agriculture and Natural Resources; Engineering; Communication Arts and Sciences. Administered by College of Natural Science. P: (NSC 192) R: Open only to students in the Specialization in Environmental Studies.

Community engagement project. Projects vary depending on student's major and area of environmental interest.

390 Disease in Society: Introduction to Epidemiology and Public Health

Spring. 4(4-0) Interdepartmental with Epidemiology. Administered by Department of Epidemiology.

Human epidemiology and population health issues facing contemporary society. Developed and less-developed settings. Health-related information in the mass media and scholarly publications.

490 Special Topics in Social Science

Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Open only to juniors or seniors or graduate students.

Topics may cover contemporary, theoretical, or applied issues or interdisciplinary approaches.

493 Social Science Internship

Fall, Spring, Summer. 3 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Open only to juniors or seniors in the College of Social Science. Approval of college.

Methods and concepts from social and behavioral sciences applied in career-related settings.

496 Field Study Abroad

Fall, Spring, Summer. 3 to 10 credits. A student may earn a maximum of 16 credits in all enrollments for this course. R: Open only to juniors or seniors. Approval of college.

Study abroad under MSU faculty supervision. Social behavior and processes in selected countries.

499 Directed Research in Interdisciplinary Studies in Social Science (W)

Fall, Spring, Summer. 3 credits. P: Completion of Tier I writing requirement. R: Open only to juniors or seniors in the Interdisciplinary Studies in Social Science major. Approval of college.

Directed individual and small group research under faculty supervision in the student's Interdisciplinary Concentration.

826 International Development and Sustainability

Fall. 3(3-0) Interdepartmental with Resource Development; Anthropology; Political Science; Forestry. Administered by Department of Community, Agriculture, Recreation and Resource Studies.

Environmental, economic, political, legal, management, and cultural components of sustainable development.

828 Food Safety Seminar Series

Fall, Spring. 1(1-0) Interdepartmental with Veterinary Medicine; Agriculture and Natural Resources; Natural Science. Administered by College of Veterinary Medicine. RB: Enrollment in graduate program in related discipline

Selected current topics covering the broad areas of food safety as they relate to production, processing, transport, microbiology, toxicology, and social and human dimensions.

829 Problems in Food Safety

Fall. 1(1-0) Interdepartmental with Veterinary Medicine; Agriculture and Natural Resources; Natural Science. Administered by College of Veterinary Medicine. RB: Enrollment in graduate program in related discipline

In-depth discussion of selected problems in food safety.

890 Special Topics in Social Science

Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 16 credits in all enrollments for this course. R: Open only to graduate students.

Topics may cover contemporary, theoretical, or applied issues or interdisciplinary approaches.

999 Doctoral Dissertation Research

Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 99 credits in all enrollments for this course.

Doctoral dissertation research.

SOCIAL WORK SW

School of Social Work College of Social Science

200 Introduction to Social Work

Fall, Spring. 3(3-0)

Social work practice, ethics, and values, in the context of social welfare policy in the United States.

290 Selected Topics in Social Work

Spring. 2 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.

Topics in social welfare, social policy, service delivery, research, theory, and practice. Basic social worker values and concepts.

310 Human Behavior and Social Environment

Fall. 3(3-0) P: (SOC 100 and PSY 101 and SW 200) and (PSY 200 or PSY 235 or PSY 236 or PSY 239 or PSY 244 or PSY 270 or PSY 280) and (ISB 204 or PSL 101 or PSL 250 or ZOL 341 or PSY 209) R: Open only to juniors or seniors in the School of Social Work.

General systems and ecological theories within the context of lifespan development as applied to social work.

320 Social Work and Social Policy I

Fall. 3(3-0) P: (SW 200 and PLS 100) and (EC 201 or EC 202) R: Open only to juniors or seniors in the School of Social Work.

History of social work and of public policy in welfare, health and civil rights. Roles of social work professionals in policy analysis, implementation and evaluation.

340 Foundations of Social Work Practice

Spring. 3(3-0) P: (SW 310 and SW 320) R: Open only to juniors or seniors in the School of Social Work.

Ethical and philosophical basis for generalist social work practice. Interviewing skills, assessment, and problem solving within an ecological-systems and developmental framework.

420 Social Work and Social Policy II

Fall. 3(3-0) P: (SW 340) R: Open only to juniors or seniors in the School of Social Work.

Application of social welfare policy to social work agencies. Current changes in welfare, health, and civil rights policy and their impact on social work clients. Diversity, social justice, and international policy issues.