

**175. Introduction to Precision Agriculture (3)**

Lecture—2 hours; laboratory/discussion—3 hours. Prerequisite: Agricultural Systems and Environment 21 or the equivalent computer experience. Concepts of precision agriculture. Variability in yield, yield monitors and mapping, remote sensing, variability in plant and soil conditions, global positioning system (GPS), geographic information system (GIS), sensors and actuators, map controlled variable rate application (VRT), socio-economic aspects of precision agriculture.—I. (I.) Upadhyaya

**180. Introduction to Geographic Information Systems (4)**

Lecture—3 hours; laboratory/discussion—3 hours. Prerequisite: Agricultural Management and Rangeland Resources 21 or equivalent familiarity with computers, Agricultural Management and Rangeland Resources 120 or the equivalent, Mathematics 16A. Management and analysis of georeferenced data. Spatial database management and modeling. Applications to agriculture, biological resource management and social sciences. Cartographic modeling. Vector and raster-based geographic information systems. Not open for credit to students who have completed Agricultural Management and Rangeland Resources 132. (Same course as Plant Sciences 180.)—(I.) Plant

**181N. Concepts and Methods in Geographic Information Systems (4)**

Lecture/laboratory—8 hours. Prerequisite: course 180 or Agricultural Management and Rangeland Resources 180 or Landscape Architecture 50 or consent of instructor. Data representation and analysis in geographic information systems (GIS). Creation of spatial data sets from analog and digital sources such as aerial photography and maps; data structures, data management, database design, georeferencing, georectification, surface models, analysis, and spatial data visualization. Offered in alternate years.—II. Plant

**182. Environmental Analysis using GIS (4)**

Lecture—2 hours; laboratory—4 hours. Prerequisite: course 180 or equivalent GIS experience and skills; general biology and/or ecology courses recommended. Ecosystem and landscape modeling with emphasis on hydrology and solute transport. Spatial analysis of environmental risk analysis including ecological risk assessment, natural resource management. Spatial database structures, scripting, data models, and error analysis in GIS. Offered in alternate years.—III. Zhang

**190C. Research Conference for Advanced Undergraduates (1)**

Discussion—1 hour. Prerequisite: consent of instructor. Research conferences for specialized study in applied biological systems technology. May be repeated for credit. (P/NP grading only.)—I, II, III. (I, II, III.)

**192. Internship in Applied Biological Systems Technology (1-5)**

Internship—3-15 hours. Prerequisite: upper division standing; approval of project prior to period of internship. Supervised internship in applied biological systems technology. May be repeated for credit. (P/NP grading only.)

**197T. Tutoring in Applied Biological Systems Technology (1-5)**

Tutorial. Tutoring individual students, leading small voluntary discussion groups, or assisting the instructor in laboratories affiliated with one of the department's regular courses. May be repeated for credit if topic differs. (P/NP grading only.)

**198. Directed Group Study (1-5)**

Prerequisite: consent of instructor. (P/NP grading only.)

**199. Special Study for Advanced Undergraduates (1-5)**

(P/NP grading only.)

**Graduate Courses**

**233. Pest Control Practices (3)**

Lecture—2 hours; laboratory—3 hours. Prerequisite: graduate standing or consent of instructor. Practical and theoretical considerations of pest control systems and techniques. Design, selection, and use of mechanical systems for field, orchard, greenhouse, and vector control use. Biological, legal, and environmental considerations in pest control and pesticide application.—II. Giles

**290C. Graduate Research Conference (1)**

Discussion—1 hour. Prerequisite: consent of instructor. Research problems, progress, and techniques in applied biological systems technology. May be repeated for credit. (S/U grading only.)—I, II, III. (I, II, III.)

**298. Group Study (1-5)**

**299. Research (1-12)**

(S/U grading only.)

**Professional Course**

**317. Teaching Agricultural Mechanics (2)**

Lecture—1 hour; laboratory—3 hours. Prerequisite: a course in physics; 6 units related to agricultural mechanics; enrolled in Agricultural Education Teacher Credential Program. Preparation of the teacher to plan, organize, and conduct an agricultural mechanics program in secondary schools. Development of and presentation of lesson plans and teaching aids. Review of subject matter in metal fabrication, power and machinery and agricultural structures areas.—I. (I.) Perkins

**Applied Computing and Information Systems**

(College of Agricultural and Environmental Sciences)

This minor is for students interested in applying modern computer technology to management problems in agriculture, resource management, and other areas. Course work provides knowledge of the use of information technology and the methodology of applied quantitative and systems analysis. The minor is offered by the Department of Plant Sciences.

**Minor Program Requirements:**

UNITS

**Applied Computing and Information Systems..... 18**

Two or three of the following courses: Plant Sciences 120, 121, Animal Science 128, Engineering: Computer Science 167. (The third course may be taken in substitution for a course from either of the elective groups.) Remainder of the units to be made up of courses in one or both of the following groups.....6-12  
Computer applications, computer assisted analysis in data manipulation:

- Agricultural and Resource Economics 106, 155, Plant Sciences 180, Applied Biological Systems Technology 180, 181, 182, Community and Regional Development 160, Economics 102, Engineering: Computer Science 124, Hydrologic Science 182, International Agricultural Development 170, Statistics 141

Communication and business organization: Agricultural and Resource Economics 112, Community and Regional Development 168, Communication 103, 130, 134, 135, 136, International Agricultural Development 111

**Minor Adviser.** T.F. Famula (*Animal Science*)

**Advising Center** is located in 1220A Plant and Environmental Sciences (530) 752-1715.

**Applied Mathematics (A Graduate Group)**

**Group Office.** 1130 Mathematical Sciences Bldg. (530) 752-8131

[studentservices@math.ucdavis.edu](mailto:studentservices@math.ucdavis.edu); <http://www.math.ucdavis.edu/grad/ggam>

**Faculty.** The Group includes approximately 80 faculty members, of whom about one-third are in the Department of Mathematics. Membership comprises chemists, biologists, physicists, geologists, statisticians, computer scientists, and engineers. Research interests include biology, atmospheric sciences, mechanics, solid and fluid dynamics, optimization and control, theoretical chemistry, computer and engineering sciences, mathematical physics, signal and image processing, harmonic analysis, numerical analysis and nonlinear partial differential equations. A complete list of faculty and their research areas are available on our Web page.

**Graduate Study.** Students prepare for careers where mathematics is applied to problems in the physical and life sciences, engineering, and management. The degree requirements consist of rigorous training in applied mathematics, including course work and a research dissertation under the direction of a member of the Graduate Group in Applied Mathematics. The M.S. degree provides preparation for further study in applied mathematics or an application area, or for a career in industry or public service. The Ph.D. degree provides preparation for a career in research and/or teaching, or in industrial or national research laboratories. For further information, please contact [studentservices@math.ucdavis.edu](mailto:studentservices@math.ucdavis.edu) or (530) 752-8131.

New applicants are admitted to the fall quarter only.

**Preparation.** The program admits qualified students with a bachelor's degree in mathematics, physics, chemistry, engineering, economics, the life sciences and related fields. General and advanced mathematics GRE scores are required, and applicants should display evidence of strong quantitative skills. Undergraduate courses should include calculus (including vector calculus), linear algebra, and ordinary differential equations. Advanced calculus (introduction to real analysis) is strongly recommended. Additional background in probability, partial differential equations, and/or numerical analysis is a plus.

**Graduate Advisers.** Contact the Student Services Office at (530) 752-8131; [studentservices@math.ucdavis.edu](mailto:studentservices@math.ucdavis.edu).

**Courses.** For a list of the courses in applied mathematics and mathematics, see [Mathematics, on page 361](#).

**Applied Physics**

See [Physics, on page 437](#).