232. Political Movements (4)
Seminar—3 hours; term paper. Prerequisite: completion of first-year graduate work recommended. An interdisciplinary approach to political movements of protest, reform, and revolution emphasizing historical comparison and evaluation of major theoretical approaches including world systems, resource mobilization, state and culture, rational choice, moral economy, social class and gender.

239. Problems in African Society and Culture (4)
Seminar—3 hours; term paper. Diachronic analyses of traditional institutions in sub-Saharan Africa.

241. Topics in North American Ethnology (4)
Seminar—3 hours; term paper. Advanced study on current problems in North American ethnography and culture history. May be repeated for credit with consent of instructor.

245. Ethnology of Northern and Central Asia (4)
Seminar—3 hours; term paper. Prerequisite: a reading knowledge of German, Russian, Chinese, or Japanese. Lectures on the culture aboriginally found north of the Caucasus-Korea line. Supervised study of the primary and secondary sources. Work with informants when available.

246. Ethnology of Europe (4)
Seminar—3 hours; term paper. Prerequisite: reading knowledge of a European language other than English. Supervised study of the primary and secondary sources dealing with the ethnography and ethnology of peoples of Europe. Emphasis upon folk, peasant, and minority groups.

248. Topics in Chinese Culture and Society (4)
Seminar—3 hours; term paper. Prerequisite: graduate standing in the social sciences, history, or the humanities. Seminar in topics in the anthropology of Chinese society. Focus on one or more of the following topics: state-society dynamics, family and gender, rural and urban life, social movement, labor politics, and religion and ideology in Chinese society. May be repeated for credit when topics differ.

250. Behavioral Ecology of Primates (4)
Seminar—3 hours; term paper. Prerequisite: course 154A (may be taken concurrently) or the equivalent. Analysis of primate behavior, with emphasis on the role of ecological determinants and consequences of variation in social organization for individuals. Offered in alternate years. —Ishibamoto-Smith

252. Human Evolution Seminar (4)
Seminar—3 hours; term paper. Prerequisite: course 152 or the equivalent; consent of instructor. Study of selected topics in human evolution. Emphasis with wood. Gain experience working with various woods and woodworking tools for specific projects. Principles of operation, equipment adjustment, and troubleshooting of farm tractors and related discipline. Intellectual and practical elements of college teaching in the field of Anthropology, from curriculum design and the syllabus through grading and course evaluations, data collection, and classroom and information technology methods, and problems and rewards of teaching in higher education. Offered in alternate years.

296. Teaching Assistant Training Practicum (1-4)
Prerequisite: graduate standing. May be repeated for credit. (S/U grading only.)—F, W, S.

Applied Behavioral Sciences

See Community and Regional Development, on page 221.

Applied Biological Systems Technology

(College of Agricultural and Environmental Sciences)
Faculty. See under Department of Engineering: Biological and Agricultural, on page 266.

Courses in Applied Biological Systems Technology (ABT)

Lower Division

15. Wood Properties and Fabrication (2)
Lecture—discussion—1 hour; laboratory—3 hours. Study of wood properties and techniques for fabrication with wood. Gain experience working with various woods and woodworking tools for specific applications. (P/NP grading only.) GE credit: QL, QL SE, VL—W. (W.) Shafii

16. Metal Properties and Fabrication (2)
Lecture—1 hour; laboratory—3 hours. Study of metal properties and techniques for fabrication with metal. Physical principles, design considerations, effects of techniques on quality and appearance, and evaluation procedures. Experience in working with metal. (P/NP grading only.) GE credit: QL, QL SE, VL—F, S. (F.) Shafii

17. Plastic Properties and Fabrication (2)
Lecture—1 hour; laboratory—3 hours. Study of the properties of plastic materials and the fundamentals of fabrication techniques. Experience in working with common plastics, with applications to biological systems. (P/NP grading only.) GE credit: QL, QL SE, VL—S. (S.) Shafii

49. Field Equipment Operations (2)
Lecture—1 hour; laboratory—3 hours. Operation, adjustment, and troubleshooting of farm tractors and field equipment. Principles of operation, equipment terminology and uses of tillage, cultivating, thinning, and planting equipment. Typical sequences in cropping practices. (P/NP grading only.) GE credit: QL, QL SE, VL—S. (S.) Shafii
52. Field Equipment Welding (2) Lecture—1 hour; laboratory—3 hours. Prerequisite: course 16 or consent of instructor. Intermediate weld- ing to include hand facing and inert gas welding. Troubleshooting and major repair of field equip- ment. (P/NP grading only.) GE credit: QL, SE, VL.—W. (W.) Shafi

98. Directed Group Study (1-5) Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SE.

99. Special Study for Lower Division Students (1-5) Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SE.

Upper Division

101. Engine Technology (3) Lecture—2 hours; laboratory—3 hours. Prerequisite: upper division standing or consent of instructor. Principles of 2-stroke cycle, 4-stroke cycle gasoline and 4-stroke cycle diesel engine construction and opera- tion. Engine systems, performance, troubleshooting, and overhaul. GE credit: SciEng | QL, SE, VL.—W. (W.) Jenkins, Vougioukas

110L. Experiments in Food Engineering (2) Laboratory—6 hours. Prerequisite: Food Science and Technology 101B (may be taken concurrently). Use of temperature sensors; measurement of thermal conductivity and heat transfer in foods; refrigeration, freezing, concentration and dehydration of foods. GE credit: SciEng | QL, SE, VL, WE.—S. (S.) Born- horst

121. Animal Housing and Environment Management (2) Lecture—2 hours. Prerequisite: Animal Science 1 or 2. Optimal structures and environments for animal growth and comfort; heat and moisture transfer prin- ciples; heating, cooling, ventilating principles and equipment; animal housing design; environmental regulations and waste management practices. Offered in alternate years. GE credit: SciEng | SE.—W. Zhang

142. Equipment and Technology for Small Farms (2) Lecture—1 hour; laboratory—3 hours. Types and characteristics of agricultural equipment and technol- ogies appropriate for small commercial farming. Adjustment and calibration of equipment. Selection of and budgeting for equipment. (Same course as International Agricultural Development 142.) GE credit: SciEng | QL, SE, VL.—S. (S.) Shafi

150. Introduction to Geographic Information Systems (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: Plant Sciences 21 or equivalent with consent of instructor. Priority given to College of Agricultural and Environmental Science majors. Basic concepts, principles and methods of GIS are presented. Data structures, database design, GIS data creation, GPS, and spatial analysis techniques are emphasized. Lab topics include: online data sources, aerial photogra- phy, GPS data input, suitability analysis, carto- graphic design and graphic communication. Not open for credit to students who have completed Applied Biological Systems Technology 180/Plant Sciences 180 or Applied Biological Systems Technology 181N. [Same course as Landscape Architecture 150.] GE credit: SciEng | SE, VL.—F. (F.) Greco, Upadhyaya

161. Water Quality Management for Aquaculture (3) Lecture—3 hours. Prerequisite: Biological Sciences 18, Mathematics 168, Chemistry 28. Basic princi- ples of water chemistry and water treatment pro- cesses as they apply to aquacultural systems. Offered in alternate years. GE credit: SciEng | QL, SE, SL, VL.—W. Hung


165. Irrigation Practices for an Urban Environment (2) Lecture—2 hours. Prerequisite: Physics 1A or 5A. Basic design, installation, and operation principles of irrigation systems for lawns and landscape; golf courses, parks, highways, public buildings, etc. Emphasis on hardware interface with sprinkler and drip/trieble systems. GE credit: SciEng | QL, SE, VL.—W. (W.) Girresi

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 con- sent of instructor. Data representation and analysis in geographic information systems (GIS). Creation of spatial data sets from analog and digital sources such as aerial photographs and satellite images; data struc- tures, data management, database design, georefer- encing, georectification, surface models, analysis, and spatial data visualization. Offered in alternate years. GE credit: SciEng | QL, SE, VL.—W. (W.) Shafi

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 recom- mended. Ecosystem and landscape modeling with emphasis on hydrology and solute transport. Spatial analysis of environmental risk analysis including eco- logical risk assessment, natural resource manage- ment. Spatial data processing, data models, and error analysis in GIS. (Same course as Hydrologic Science 182.) Offered in alternate years. GE credit: SciEng | QL, SE, SL, VL.—S. Hijmans, Zhang

190C. Research Conference for Advanced Undergraduates (1) Discussion—1 hour. Prerequisite: consent of instruc- tor. Research conferences for specialized study in applied biological systems technology. May be repeated for credit. (P/NP grading only.) GE credit: SE.—F, W, S. (F, W, S.)

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 biologi- cal systems technology. May be repeated for credit. (P/NP grading only.) GE credit: SC

197T. Tutoring in Applied Biological Systems Technology (1-5) Tutorial. Prerequisite: consent of instructor; upper division standing. Tutoring individual students, lead- ing small study 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.) GE credit: SE.—F, W, S.

198. Directed Group Study (1-5) Prerequisite: consent of instructor. (P/NP grading only.) GE credit: SE.

199. Special Study for Advanced Undergraduates (1-5) (P/NP grading only.) GE credit: SE.

Graduate

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 sys- tems and techniques. Design, selection, and use of mechanical systems for field, orchard, greenhouse, and vector control, registration, legal, and envi- ronmental considerations in pest control and pesti- cide application. —W. (W.) Giles

289A. Selected Topic in Applied Biological Systems Technology: Agricultural and Natural Resources (1-5) Prerequisite: consent of instructor. Special topic. May be repeated for credit. Offered irregularly.—F. (F.) Shafi

289B. Selected Topics in Applied Biological Systems Technology: Biotechnology (1-5) Prerequisite: consent of instructor. Special topic. May be repeated for credit. Offered irregularly.—F, W, S. (F, W, S.)

289C. Selected Topics in Applied Biological Systems Technology: Biotechnology (1-5) Prerequisite: consent of instructor. Special topic. May be repeated for credit. Offered irregularly.—F, W, S. (F, W, S.)

290C. Graduate Research Conference (1) Discussion—1 hour. Prerequisite: consent of instruc- tor. Research problems, progress, and techniques in applied biological systems technology. May be repeated for credit. (S/U grading only)—F, W, S. (F, W, S.)

298. Group Study (1-5) (S/U grading only)

Professional

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 agricul- tural 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.—F. (F.) Shafi

Applied Computing and Information Systems

[College of Agricultural and Environmental Sciences]

This minor is for students interested in applying mod- ern 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

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.

Resources: 6-12


Minor Adviser: T. R. Famula (Animal Science)