

**931B. Seminar in Instructional Technology: Research and Development**  
(ED 931B.) Winter. 3(3-0) Approval of department.

Analysis and appraisal of selected research studies in instructional technology with attention to purposes, rationales, assumptions, designs, methodologies and findings.

**931C. Seminar in Instructional Technology: Research and Development**  
(ED 931C.) Spring. 3(3-0) Approval of department.

Analysis and appraisal of student's dissertation proposals and reports on surveys of related literature.

**935. Seminar in Principles and Practice of Instructional Consultation**  
(ED 935.) Spring. 3(3-0) CEP 931A, CEP 931B, CEP 410, approval of instructor.

Theoretic framework for consultation with instructional development clients. Case studies, role play simulations, debriefings. Application of the principles and development of consultation strategies and styles.

**939. Policy and Legal Issues in Testing**  
Winter. 3(3-0) CEP 401. Interdepartmental with and administered by the Department of Teacher Education.

Public policy and legal issues concerning the use of standardized testing to make critical decisions about individuals in American public education.

**944C. Counseling Supervision in Urban Settings**  
(ED 917C.) Spring. 3(1-12) May reenroll for a maximum of 9 credits. CEP 844C (12 credits).

Development of supervisory skills in relation to the systemic counseling model with urban settings as a focus. Practice in supervising master's level students in Urban Counseling field experiences.

**948A. Counseling Theories**  
(ED 960.) Fall. 3(3-0) Approval of instructor.

Survey of counseling theories and research with emphasis on current issues which have implications for counseling practice or for counselor education.

**948B. Psychology of Vocational Development**  
(ED 894.) Winter. 3(3-0) Approval of instructor.

Relationship between psychological concepts and vocational development.

**949A. Social Development and Counseling Psychology**  
(ED 960A.) Spring. 3(3-0) Approval of instructor.

Stages of social development as a counseling construct. Developmental tasks appropriate to life phases. Implications of missing or inadequately passing through a developmental stage.

**949B. Learning Foundations of Counseling Psychology**  
(ED 960B.) Fall. 3(3-0) CEP 949A or approval of instructor.

Principles of learning and their application to the counseling process.

**949C. Physiological Measurement in Counseling Psychology**  
(ED 996.) Spring. 3(2-2) CEP 450, approval of department.

Physiological measurement in counseling psychology treatment, training, and research.

**950. Interpersonal Process Recall**  
(ED 814A., 850A.) Fall. 3(3-2) Doctoral candidates in counseling psychology or approval of instructor.

A structured training model designed to teach facilitation of interpersonal communication through learning communication skills, examining interpersonal stress, and self-study of one's own videorecorded behavior. Theory and research issues will be presented.

**951. Group Processes in Counseling Psychology**  
(ED 986.) Spring. 3(3-0) Graduate students.

Didactic-experiential format to explore group dynamics, interpersonal processes within groups, differential effect of various leadership styles, facilitation of group interaction, impact of different theoretical approaches, application to counseling/school settings.

**952. Research in Counseling Psychology**  
(ED 926.) Fall. 3(3-0) CEP 905.

Criticism, interpretation and design of counseling research.

**955. Counseling Pre-Practicum**  
(ED 985.) Spring. 3(0-6) Doctoral status in college counseling or related area and approval of department.

Seminar emphasizing establishing good interpersonal relationships. Self-understanding, an understanding of psychodynamics, and test interpretation as preparation for assuming counseling responsibilities. Approach is didactic and experimental with limited contacts with clients.

**956A. Counseling Practicum I**  
(ED 986A.) Fall, Spring. 3(0-6) CEP 955 or approval of department

Supervised experience working with college students in a counseling relationship. Group discussions, group supervision and observation of counseling interviews, and individual supervision.

**956B. Counseling Practicum II**  
(ED 986B.) Winter. 3(0-6) CEP 956A.

Supervised experience working with college students in a counseling relationship. Group discussions, group supervision and observation of counseling interviews, and individual supervision.

**956C. Counseling Practicum III**  
(ED 986C.) Spring. 3(0-6) CEP 956B.

Supervised experience working with college students in a counseling relationship in the residence halls. Individual supervision, increased client contact hours, and participation in staff activities.

**958B. Laboratory and Field Experience in Counseling Psychology**  
(ED 989.) Fall, Spring. 3(2-4) Students in counseling psychology.

Applied aspects of counseling through case conferences and presentations of cases by representatives of various counseling orientations.

**975A. Field Experience: Special Education Administration Simulation**  
(ED 990A.) Spring. 3(0-9) Approval of instructor.

Supervised graduate practicum in administration of the Special Education program of a simulated school district.

**975B. Field Experience: Special Education Administration**  
(ED 990B.) Fall, Spring. 3 to 12 credits. May reenroll for a maximum of 18 credits. Approval of department.

Supervised graduate practicum or internship in special education administration.

**982. Seminars in Counseling, Educational Psychology and Special Education**  
Fall, Winter, Spring, Summer. 1 to 9 credits. May reenroll for a maximum of 15 credits. Approval of department.

Seminars in the various fields of emphasis in counseling, educational psychology and special education.

**983. Readings and Independent Study in Counseling and Educational Psychology**  
Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 15 credits. Approval of department.

Study on an individual or group basis in the various fields of emphasis.

**984. Laboratory and Field Experience in Counseling and Educational Psychology**  
Fall, Winter, Spring, Summer. 1 to 9 credits. May reenroll for a maximum of 15 credits. Approval of department.

Supervised graduate practicums, observations, internships, and externships in the various areas of emphasis.

**999. Doctoral Dissertation Research**  
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

## CRIMINAL JUSTICE C J

### College of Social Science

**110. Introduction to Criminal Justice**  
Fall, Winter, Spring, Summer. 3(3-0)  
Agencies and processes of criminal justice, emphasizing historical, constitutional (legal), and political considerations. Criminal Justice is also analyzed as a system, with the problems and prospects for change.

**210. Introduction to Forensic Science**  
Spring. 3(3-0) Not open to majors in Criminalistics.  
Nontechnical survey of forensic science and its relationship to the criminal justice system. Evidence and crime scene investigations. Criminalistics, including evidence, serology, pathology, toxicology, questioned documents and expert testimony.

**312. Criminalistics I**  
Fall. 3(0-6) Criminalistics majors.

Criminalistics laboratory techniques. Photography, crime scene recording, reproduction of evidence, latent fingerprints.

## Descriptions — Criminal Justice

### of Courses

#### 313. **Criminalistics II**

Winter. 3(0-6) C J 312, approval of school.

Criminalistics laboratory techniques. Firearms. Hair and fiber identification. Comparative microscopy.

#### 314. **Criminalistics III**

Spring. 3(0-6) C J 313, approval of school.

Criminalistics techniques. Serology. Comparative micrography. Document examination. Forensic chemistry.

#### 315. **Criminal Investigation**

Fall, Winter. 4(4-0) C J 375.

Theory of investigation, crime scene conduct, collection and preservation of physical evidence and methods used in scientific interpretation of evidence.

#### 318. **Crime and the Community**

Fall, Spring. 4(4-0) C J 320.

Interdisciplinary survey of police-criminal justice and community relations. Stresses the community role and responsibility for crime, crime-coping programs, and the need for the improvement of criminal justice processes.

#### 320. **Criminology**

Fall, Winter, Spring, Summer. 4(4-0) SOC 241 or C J 110 or approval of school. Interdepartmental with and administered by the Department of Sociology.

Crime analyzed from sociological perspective: meaning of 'crime,' crime statistics, and measurement, theories of crime causation, crime typologies, e.g., professional organized, violent, sex, white-collar crimes, juvenile delinquency.

#### 330. **Organizational Theory and the Politics of Criminal Justice**

Fall, Spring. 4(4-0) C J 320 or approval of school.

An historic and a comparative overview of the principles of organization used by criminal justice agencies. Current theories and research on organization, with special attention to the impact of politics on system objectives and policy development.

#### 335. **Police Process**

Fall, Winter, Spring, Summer. 4(4-0) C J 110, C J 320.

Functions of law enforcement and the roles of the police in modern society. Study of the police from several perspectives; historical, sociological, psychological, organizational and political.

#### 355. **Juvenile Justice Process**

Fall, Winter, Spring, Summer. 4(4-0) C J 320.

Variables related to the duties and responsibilities of criminal justice practitioners working with delinquents. Prevalent interdisciplinary issues, ideas, principles and assumptions pertaining to delinquency.

#### 365. **Corrections Process**

Fall, Winter, Spring, Summer. 4(4-0) C J 320.

An historical view of the development of methods of offender treatment. Operation of a correctional system. The effect of institutionalization upon individuals. Alternatives to incarceration.

#### 375. **Criminal Law Process**

Fall, Winter, Spring, Summer. 4(4-0) C J 320.

Administration of criminal justice: investigation, detection, arrest, search, seizure, charging, adjudication, sentencing, probation, corrections, parole. Constitutional safeguards and legal controls on official action emphasized.

#### 400H. **Honors Study**

Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 6 credits. Seniors or approval of instructor.

Individually selected programs of supervised group or individual study dealing with some phase of the criminal justice system.

#### 401. **Independent Study**

Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 6 credits. C J 335, C J 355, C J 365, C J 375 or approval of school.

Individual study of the various fields of emphasis in criminal justice, under direct supervision of appropriate faculty member.

#### 409. **Issues in Criminal Justice**

Fall, Winter, Spring, Summer. 3 or 4 credits. May reenroll for a maximum of 15 credits when different topics are taken. C J 335, C J 355, C J 365, C J 375 or approval of school.

Forum for course offerings on special issues in criminal justice, by visiting instructors or regular faculty.

#### 425. **Women in Criminal Justice**

Winter. 3(3-0) C J 320 or SOC 320 or approval of school.

Women as offenders and victims. Women professionals in criminal justice. Literature in criminology and victimology.

#### 432G. **Fundamentals of Traffic Law**

(ED 429K.) Spring. 3(3-0) Interdepartmental with and administered by the Department of Teacher Education.

Nature, function and application of traffic law as it applies to the safe and efficient movement of people and goods in a broadly conceived traffic accident prevention program.

#### 433. **Alcohol: A Social Dilemma**

Winter. 3(3-0) Juniors or approval of school. Interdepartmental with the Department of Educational Administration.

Substance abuse with emphasis on beverage alcohol. Sociological, psychological and medical aspects. Prevention, treatment, rehabilitation.

#### 434. **Police Administration and Management**

Fall, Winter. 4(4-0) C J 335, C J 375.

Principles of organization and management of a police agency. Line and non-line functions, personnel administration, planning, budgeting, goals and control.

#### 435. **Analysis of Police Operations**

Spring. 3(3-0) C J 434 or approval of school.

Analysis of police operations including patrol, criminal investigation, staff services, and traffic enforcement. Measurements of police productivity as related to goals. Principles of management evaluation of police agency organization and administration.

#### 440. **Introduction to Highway Traffic Administration**

Fall. 4(4-0)

Systems approach to highway traffic administration emphasizing the interrelationships among agencies having management responsibilities and their accident prevention and loss reduction countermeasures to combat system failures. Future needs and alternatives.

#### 441. **Police and Court Traffic Administration**

Spring. 4(4-0)

Police and court traffic functions relative to other police and court functions in the criminal justice system. Systems approach to managing traffic accident prevention programs. Weaknesses, future needs and alternatives.

#### 455. **Analysis of Delinquency Programs**

Fall, Winter. 4(4-0) C J 355 or approval of school.

Social organization and administration of delinquency prevention programs, juvenile courts and treatment agencies.

#### 456. **Juvenile Justice Case Analysis**

Spring. 3(3-0) C J 355, C J 455.

The use of actual juvenile delinquent cases to evaluate past and current practices and future needs. The selections of therapeutic techniques and strategies and their application to specific types of clients.

#### 465. **Analysis of Correctional Operations**

Fall, Winter. 4(4-0) C J 335, C J 355, C J 365, C J 375 or approval of school.

A critical analysis of existing institutions and community corrections programs; administrative methods of program implementation and evaluation. Prevalent correctional operational policies. Problems of effecting change.

#### 466. **Correctional Administration and Management**

Spring. 3(3-0) C J 365, C J 375, C J

465.

The application of principles of administration and management to corrections including a systemic examination of the impact of change on the total correctional system and change resistance from both external and internal environments.

#### 472. **Criminal Law**

Fall, Winter. 4(4-0) C J 335, C J 355, C J 365, C J 375 or approval of school.

Analyses and classifications of substantive common law and statutory criminal offenses; defenses and other limitations on criminal capacity.

#### 473. **Evidence and Proof of Crime**

Spring. 3(3-0) C J 375.

Concepts of proof and logic; basic principles and definitions of evidence law; review of criminal investigation; chain of evidence; trial process; presentation and admissibility; constitutional issues.

#### 485. **Security Systems**

Fall. 3(3-0) Majors or approval of school.

Capabilities and limitations of security systems, both public and private, with particular reference to crime and crime-related problems. Interrelationships between security and other criminal justice agencies.

#### 486. **Loss Prevention**

Spring. 4(4-0) Majors or approval of school.

Operation and management of loss prevention (asset protection). Programs in business, industry, government and institutions. Particular attention to theft control (employee dishonesty, shoplifting, etc.) and fire protection.

**490. Criminal Justice Practicum**

Fall, Winter, Spring, Summer. 3 to 12 credits. May reenroll for a maximum of 12 credits. C J 320; majors only.

Planned program of research internship, observation, study, and work in selected criminal justice agencies. Supplements classroom study with participation in criminal justice systems of United States and foreign nations.

**492. Methods of Criminal Justice Research**

Fall, Winter, Spring, Summer. 4(4-0) C J 335, C J 355, C J 365, C J 375 or approval of school.

Elements of scientific perspective; analysis of published reports to illustrate theory interacting with practice. Conceptual frameworks, negotiating access to and collection of data, design choice, analytic techniques, and final reporting.

**493. Planned Change and Innovation in Criminal Justice**

Winter. 3(3-0) C J 492 or approval of school.

The processes by which change occurs. Mechanisms which facilitate change. Utilization of research in planned change. Research as related to administrative decision making.

**801. Independent Study**

Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 6 credits. Majors or approval of school.

Individual research and writing in student's field of interest. Requires approval and direction by professor associated with major field of interest.

**809. Special Issues in Criminal Justice**

Fall, Winter, Spring, Summer. 3 to 5 credits. May reenroll for a maximum of 15 credits when different topics are taken. Majors or approval of school.

Forum for study of issues not given continuous consideration in the graduate program.

**810. Proseminar in Criminal Justice**

Fall. 3(3-0)

Recent literature in criminal justice administration and criminology; current developments and trends. Impact of research on operations in criminal justice.

**811. Design and Analysis in Criminal Justice Research**

Fall. 4(4-0) C J 492.

Application of research methods to criminal justice problems, theory and hypothesis construction, design of survey instruments, logic of data analysis, tabular and descriptive techniques, computer usage in data analysis.

**812. Criminal Justice Management Issues**

Winter. 3(3-0) Majors or approval of school.

Management requirements of the criminal justice process in transition. Problems and innovative concepts of criminal justice system development, decision theory, information needs, planning, personnel and budgeting.

**813. Criminal Justice Personnel Systems Development**

Winter. 3(3-0)

Personnel administration approaches to improvement of criminal justice systems such as personnel administration by objectives, and systems analysis approach to human resource development models consonant with criminal justice systems evolution.

**814. Fiscal Administration in Criminal Justice**

Spring. 3(3-0)

Transition from traditional budgeting to program planning and evaluation budgeting. Implications of treating budgeting as a tool in criminal justice administrative decision making. Practical experience in budget preparation and justification.

**815. Seminar in Criminal Investigation**

Fall. 3(3-0) Majors or approval of school.

Seminar in investigative techniques; criminalistics; case studies; including discussion on quantum of proof in criminal investigations and probative value of physical evidence.

**816. Seminar in Forensic Science**

Winter. 3(3-0) Majors or approval of school.

An investigation of the role of forensic science in the administration of justice; case studies; laboratory techniques; interpretation of proof.

**817. Independent Study in Forensic Science**

Fall, Winter, Spring. 3(0-6) Majors or approval of school.

Directed laboratory work in forensic science.

**818. Social Control, Criminal Justice and Community Relations**

Winter. 3(3-0) C J 318.

Authority and social control, advanced community relations and criminal justice, and socio-political aspects of criminal justice processes. Field study component required.

**820. Crime, Criminal Behavior and Criminology**

Spring. 3(3-0) C J 320.

Classical and contemporary explanations for crime and criminal behavior related to criminal justice. Implications of differing theoretical concerns for the criminal justice system. Advanced criminology.

**822. Historical and Comparative Criminal Justice**

Spring. 3(3-0) Majors or approval of school.

Criminal justice systems are examined on a global basis exclusive of the United States. Emphasis is placed on major different legal philosophies.

**837. Managing Police Organizations**

Winter. 3(3-0) C J 812.

Administrative issues in directing, controlling and coordinating law enforcement agencies at supervisory levels. Applications of socio-behavioral concepts. Fundamental issues in police management.

**838. Assessment of Police Policies and Operations**

Spring. 3(3-0) C J 837.

Critical analysis of recent police policy-related research. Operations research and policy analysis as applied to the deployment of human resources and policing strategies. Efficiency and effectiveness of operational information systems.

**840. Highway Traffic Administration**

Winter. 3(3-0)

The Federal-state-local partnership in highway traffic administration. Laws, standards and policies regulating the accident prevention and loss reduction countermeasures of governmental agencies and private industry. Problems and needs.

**855. Delinquency Prevention and Control**

Fall. 3(3-0)

Evaluation of primary and secondary delinquency prevention, control and treatment programs. Critical analysis of current major hypotheses, recent developments, and contributions by operational and academic sources.

**865. Adult Corrections**

Fall. 3(3-0)

Traditional and contemporary correctional practices. Social, political, economic and organizational factors that determine correctional policies. Current trends in adult corrections.

**866. Adult and Juvenile Correctional Program Management**

Winter. 3(3-0) C J 855 or C J 865.

Planning, organizing and operating adult and juvenile correctional programs on institutional and community levels.

**867. Analysis and Evaluation of Prevention and Correctional Programs**

Spring. 3(3-0)

Analysis and evaluation of research relating to adult and juvenile prevention and correctional programming. Application of research design to program evaluation.

**871. Law of Corrections**

Winter. 4(4-0) Majors or approval of school.

Constitutional limitations and impact of law on correctional practice. Due process, judicial sentencing, probation, prisoners' rights, parole grant, revocation of probation and parole.

**872. Criminal Procedure**

Spring. 4(4-0) A law course.

Criminal procedure as applied to police and courts. Due process, Bill of Rights, right to counsel, search and seizure, confessions, bail, prosecution, guilty pleas, trial.

**880. Planning in Criminal Justice**

Fall. 3(3-0) C J 492.

Models for planning. Empirical basis for organizational planning. Role of planning in operational administration. Assessment of current system capabilities.

**881. Project and Program Implementation**

Winter. 3(3-0) C J 880 or approval of school.

Managerial strategies and factors involved in the effective implementation of projects and programs. Development and use of information and monitoring systems.

**882. Evaluation Research in Criminal Justice**

Spring. 3(3-0) C J 880, C J 881.

The conduct and utilization of evaluative research in projects, programs and agencies. Strategies for conducting, interpreting and utilizing operational research.

**885. Security Management**

Fall. 3(3-0) C J 485 or concurrently, or approval of instructor.

History of and legal bases for protective services. Organization and management of commercial and proprietary security units in business, industry, institutions and government. The systems approach to security.

**Descriptions — Criminal Justice  
of  
Courses**

**890. Practicum**  
Fall, Winter, Spring, Summer. 1(0-4)  
to 6(0-24) Majors or approval of school.  
Planned program of research observation, study  
and work in selected criminal justice agencies.  
Designed to supplement classroom study with  
participation in domestic and foreign criminal  
justice systems.

**892. Quantitative Methods in Criminal  
Justice Research.**  
Winter. 4(4-0) C J 492, C J 811.  
Views the relationship and application of statisti-  
cal techniques to theory building and concept  
construction. Gives an overview of statistical  
methods with an emphasis on those most useful  
for research in criminal justice.

**897. Policy Change Paper**  
Fall, Winter, Spring, Summer. 1 to 4  
credits. May reenroll for a maximum of 4 credits.  
Majors or approval of school.  
Development of plan for significant policy  
change and its implementation in a criminal jus-  
tice agency.

**899. Master's Thesis Research**  
Fall, Winter, Spring, Summer. 1 to 12  
credits. May reenroll for a maximum of 12 cred-  
its. Majors or approval of school.  
Planned research and writing directed by stu-  
dent's thesis committee.

**930. Seminar on Criminal Justice  
Systems**  
Winter. 3(3-0) Graduate students.  
Topical issues on the development, functioning,  
and interrelationships of components of criminal  
justice systems and how systemic coherence can  
be achieved within a democratic society.

**990. Seminar in Criminal Justice and  
Criminology**  
Fall. 3 to 5 credits. Graduate students.  
Analysis of major research contributions to crim-  
inal justice and criminology.

**992. Research Utilization and  
Application in Criminal Justice**  
Spring. 3(3-0) Majors or approval of  
school.  
Substantive and administrative problems of con-  
ducting research and existing attempts to solve  
these. Utilization of research in bringing about  
change in the criminal justice system. Methods  
of maximizing research utility.

**CROP AND SOIL  
SCIENCES CSS**

**College of Agriculture and Natural  
Resources**

**101. Crop Science**  
Fall. 3(3-0)  
Principles of identification, adaptation, man-  
agement, and utilization of field crops for food  
and fiber. Fundamentals of crop management,  
breeding, weed control, crop quality, and tropi-  
cal crops in world agriculture.

**202. Soil and Our Environment**  
Spring. 3(3-0) Not open to students  
with credit in CSS 210. Non-majors only.  
Role of soil in growing plants, water use and  
conservation, nutrient cycling, fertilizers, envi-  
ronmental quality, animal health, food-popula-  
tion dilemma.

**204. Corn and Soybean Production**  
Fall. 2(2-0) CSS 101, CSS 202 or CSS  
210.  
Topics related to increased efficiency in corn and  
soybean production: time of planting; irrigation  
scheduling; fertility; and weed, insect and dis-  
ease control.

**205. Navy Bean and Sugarbeet  
Production**  
Winter. 2(2-0) CSS 101, CSS 202 or  
CSS 210.  
Navy bean and sugarbeet production and mar-  
keting in Michigan. Presentations by specialists  
from within the University and the navy bean  
and sugarbeet industries.

**206. Small Grain Production**  
Winter. 1(1-0) CSS 101, CSS 202 or  
CSS 210.  
Small grain production, use, and marketing in  
Michigan and the world.

**210. Fundamentals of Soil Science**  
Fall, Winter. 4(3-2) CEM 141B. Not  
open to students with credit in CSS 202.  
Nature of soils and their relation to plant  
growth, water regimes, nutrient cycling, ero-  
sion, environmental quality, plant composition,  
animal health and world food production.

**301. Forage Crops**  
Fall. 3(2-2) Sophomores.  
Distribution, morphology, identification, physi-  
ology, management and utilization of forage  
crops for hay silage, and pasture for livestock  
and for soil improvement and conservation.

**318. Turfgrass Management**  
(CSS 418.) Fall. 3(3-0) CSS 210 or con-  
currently.  
Turfgrass management of golf courses, home  
lawns, parks, and athletic fields. Species iden-  
tification and adaptation, routine and specialized  
cultural practices, pest identification and con-  
trol.

**331. Soil Management**  
Winter. 4(4-0) CSS 210.  
Management of soils, drainage, and irrigation,  
organic matter, tillage, rotation, conservation  
practices, soil reaction, lime, fertilizers, and mi-  
cronutrients. Soil management vs. soil con-  
servation. Special study in general crops, horti-  
cultural crops, greenhouse crops, turf and or-  
ganic soils.

**350. Plant and Animal Genetics**  
(CSS 250.) Winter. 5(5-0) Juniors or  
approval of department.  
Fundamentals of modern genetics with particu-  
lar focus on problems and application in agricul-  
ture and natural resources.

**380. Ecology and Physiology of  
Agricultural Plants**  
Spring. 3(3-0) FOR 220 or BOT 301.  
Interrelationships of physiological processes and  
environmental manipulation for higher yield of  
agricultural plants.

**390. Soil Conservation and Land Use**  
Winter. 3(3-0) CSS 210.  
Concepts of soil erosion by water and wind and  
methods for soil conservation including control  
of erosion and sedimentation. Interpretation of  
soil properties for land use decisions.

**402. Principles of Weed Control in Field  
Crops**  
Fall. 4(3-2) CEM 143, BOT 301.  
Principles underlying weed control practices for  
agronomic crops. Factors involved in mechan-  
ical, chemical and biological control and basic  
physiological aspects of herbicide applications.

**406. Crop Improvement and Seed  
Production**  
Winter. 4(3-2)  
Practical methods of crop improvement, seed  
production, storing, cleaning, packing, and dis-  
tribution, seed certification of small grains, leg-  
umes, corn, beans, potatoes, visits to seed  
agencies and seed farms.

**408. Principles of Plant Breeding**  
Winter. 4(3-2) CSS 250. Interdepart-  
mental with the Department of Horticulture.  
Application of genetics and other sciences to  
breeding and improvement of agronomic and  
horticultural crops.

**411. Independent Study**  
Fall, Winter, Spring, Summer. 1 to 4  
credits. May reenroll for a maximum of 8 credits  
if different problem is taken. Approval of de-  
partment.  
Individual work on a field, laboratory or library  
research problem of special interest to the stu-  
dent and supervised by faculty.

**412. Topics in Agronomy**  
Fall, Winter, Spring, Summer. 2(2-0)  
or 3(3-0) May reenroll for a maximum of 9 cred-  
its if different topics are taken. Approval of de-  
partment.  
Topics will be selected from crop production,  
crop physiology, turfgrass management, organic  
soils, turfgrass soils, soil fertility and genetic  
analysis.

**414. Turfgrass Soil Management**  
Fall. 3(2-2) CSS 318.  
Fertility and pH control of turf soils; drainage;  
irrigation programming; cultivation; topdress-  
ing; soil amendments; construction of special-  
ized soils.

**416. Principles of Turfgrass Culture**  
Winter. 3(3-0) CSS 318.  
Growth and development of the turfgrass plant  
as related to turfgrass management practices.

**417. Turfgrass Seminar**  
Fall. 1(2-0) CSS 318.  
Seminars by leaders of the turfgrass industry;  
golf course design and maintenance, specialized  
equipment, and research developments.

**419. Management of Turfgrass Pests**  
Fall. 4(3-2) CSS 318 or concurrently.  
Chemical, biological and cultural methods of  
managing weed, disease, and insect pests of turf-  
grass.

**420. Seminar**  
Winter. 1(1-0) May reenroll for a maxi-  
mum of 4 credits.

**424. Forest Soils**  
Spring. 3(2-3) CSS 210; Juniors or ap-  
proval of department. Forestry majors: FOR  
305, FOR 402, FOR 425, FOR 429 concur-  
rently. Interdepartmental with and adminis-  
tered by the Department of Forestry.  
Interrelationships of forest site and the growth of  
trees. Properties, classification, inventory, pro-  
ductivity and management of forest soils. Effects  
of silvicultural and forest management practices  
on the soil.