

**Description — Genetics
of
Courses**

856. Plant Genetics and Molecular Biology
Spring of even-numbered years. 3(3-0)
 Approval of department and a course in introductory genetics. Interdepartmental with the departments of Biochemistry, and Botany and Plant Pathology. Administered by the Department of Botany and Plant Pathology.
 Recent advances in genetics and molecular biology of higher plants.

880. Special Problems
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 12 credits. Approval of instructor.
 Students with special interests and abilities may study published literature in a selected genetics topic or they may carry on research in the laboratory on a selected subject in collaboration with genetics faculty.

890. Selected Topics in Genetics
Fall, Winter, Spring, Summer. 2 to 5 credits. May reenroll for a maximum of 9 credits. ZOL 441 and approval of instructor.
 Topics will be selected from molecular genetics, physiological genetics, population genetics, quantitative genetics, evolution, radiology and mutagenesis, microbial genetics, somatic cell genetics, behavioral genetics, and human genetics.

999. Doctoral Dissertation Research
Fall, Winter, Spring, Summer. 3 to 12 credits. Majors.
 Research for the doctoral dissertation in genetics.

GEOGRAPHY GEO

College of Social Science

100. People, Location and Environment (S)
Fall, Winter, Spring. 4(4-0) Not open to Geography majors.
 Relationships between people and environments, their spatial consequences and resulting regional structures across the earth's surface.

122. The World of Maps
Fall, Winter, Spring. 3(3-0)
 Discussion of types, practical applications, and sources of maps. Map reading skills.

150. Geography of Selected Current Problems
Fall, Winter, Spring. 2(2-0)
 The geographic perspective is used to examine U.S. and world problems of major concern such as international conflicts, environment quality, spatial change, and economic development.

201. Geography of Culture
Fall, Winter, Spring. 3(3-0)
 A systematic discussion of cultural geography, stressing cultural processes and relationships.

203. Resource Ecology
(IDC 200.) Fall, Winter, Spring, Summer. 3(3-0) Interdepartmental with the departments of Fisheries and Wildlife, Forestry, Resource Development, and Zoology. Administered by the Department of Fisheries and Wildlife.
 Basic concepts of ecology which are the unifying basis for resource management, conservation policy and the analysis of environmental quality. Extensive use of guest lecturers.

204. World Regional Geography (S)
Fall, Winter, Spring, Summer. 4(4-0)
 Human relationships with natural and cultural environments.

206. Physical Geography
Fall, Winter, Spring, Summer. 4(4-0)
 Analysis of weather, climate, landforms, soils, water and biotic factors of the human environment, including its spatial, genetic, and functional interrelationships.

206L. Physical Geography Laboratory
Fall, Winter, Spring. 1(0-2) GEO 206 or concurrently.
 Laboratory study of geographic aspects of map interpretation, aerial photographs, weather, climate, soils, landforms, and vegetation.

213. World Economic Geography
Fall, Winter, Spring, Summer. 4(4-0)
 Emphasis on distribution of natural resources, industries and service activities, stressing factors of location and economic concepts of locational change.

223. Introduction to Cartography
Fall, Spring. 4(2-4)
 Principles and techniques of constructing maps. Mapping methods and mapping decisions emphasized.

224. Remote Sensing: Airphoto Interpretation
Fall, Winter, Spring. 4(2-4) Sophomores.
 Use of aerial photographs in the identification and interpretation of physical and cultural features of the terrestrial environment. Includes principles of photogrammetry, and stresses application and practice.

IDC. Introduction to Contemporary China
For course description, see Interdisciplinary Courses.

IDC. Contemporary Japan
For course description, see Interdisciplinary Courses.

300. North America
Fall, Winter, Spring. 3(3-0)
 Human and physical geography of North America, north of the Mexican border.

309. Geography of Recreation
Winter. 3(3-0)
 Natural and cultural factors influencing the use of space for recreation. Emphasis on recreation land use in the United States and current problems and conflicts.

310. Historical Geography of the United States
Spring. 3(3-0)
 Reconstruction of geographies of the United States as they existed in the past.

315. South America
Spring. 3(3-0) Sophomores or approval of department.
 Regional geography of South America with special attention to contemporary geographic problems.

316. Middle America
Winter. 3(3-0) Sophomores or approval of department.
 Interpretation of physical and cultural environment of Mexico, Central America, and the West Indies. Special attention to contemporary geographic problems.

320. Geography of Population
Fall. 3(3-0)
 Relationship of the size, composition, and distribution of population to geographic variations in the nature of places.

321. Africa
Fall. 3(3-0) Sophomores or approval of department.
 Emphasis on continent south of Sahara: environments, peoples, problems, and potentials.

322. Africa: Contemporary Problems
Spring. 3(3-0) Sophomores or approval of department. GEO 321 recommended.
 Major development problems examined from environmental, historical, economic, and social perspectives.

340. Western Europe
Winter. 3(3-0) Sophomores or approval of department.
 Geographic analysis of physical and human character and resources of Western Europe (Scandinavia, British Isles, Benelux, Germany, France and Switzerland). Emphasis on major problems.

IDC. Contemporary South Asia
For course description, see Interdisciplinary Courses.

342. Eastern and Southern Europe
Spring. 3(3-0) Sophomores or approval of department.
 A geographical analysis of countries of Eastern and Southern Europe with emphasis on economic, political, social and ethnic problems.

351. Weather and Climate
Fall. 3(3-0)
 Non-mathematical treatment of general weather processes and patterns, including surface and middle atmospheric (jet stream) features, with emphasis on the U.S.

360. The Soviet Union
Fall. 3(3-0) Sophomores or approval of department.
 A geographical analysis of the Soviet Union and its inhabitants with emphasis on economic, social, political and ethnic problems.

364. Japan
Fall. 3(3-0)
 Spatial patterns and processes of Japan's physical and human geography, with emphasis on development problems of the nation, especially since 1950.

365. China
Winter. 3(3-0)
 The physical and human geography of China and their relationship to the development problems of the country, with emphasis on the post-1949 period.

400H. Honors Work
Fall, Winter, Spring. 1 to 16 credits. Approval of department.

**Geography — Description
of
Courses**

- 401. The Ghetto**
(UMS 401.) Fall, Spring. 4(4-0) Juniors or approval of department.
Analysis of the ghetto including its spatial organization, structure and distribution of nonwhite and ethnic populations in cities with emphasis on the United States.
- 402. The Geography of the City**
Spring. 3(3-0)
Spatial theories, concepts, and designs of internal urban economic, social, and political structures.
- 403. The American City and Its Region**
Winter. 3(3-0)
The regional system of cities in terms of size, spacing, and functional relationships.
- 407. Michigan**
Fall, Spring. 3(3-0) Sophomores or approval of department.
Selected aspects of the physical and cultural geography of Michigan.
- 408. Canada**
Spring. 3(3-0) Sophomores or approval of department.
An analysis of the physical, economic and cultural patterns of Canada.
- 409. Geography of Transportation**
Fall. 3(3-0)
Analysis of spatial principles of transportation, including theories of interaction, network structures, and the role of transport in space-economy.
- 411. Problems in Geography**
Fall, Winter, Spring, Summer. 1 to 6 credits. Approval of department.
Research on specialized geographic problems.
- 418. Critical Issues in Contemporary Africa (MTC)**
Fall, Spring. 3(3-0) May reenroll for a maximum of 9 credits if different topics are taken. One course on African subject and approval of instructor. Interdepartmental with African Languages and the departments of Anthropology, History, Political Science, and Sociology. Administered by the Department of History.
Four separate multidisciplinary topics will be offered at different times: The Horn of Africa, Southern Africa, Africa and the Americas, Social Impact Studies.
- 424. Advanced Remote Sensing Techniques**
Spring. 4(2-4) GEO 224.
Extraction, analysis, and interpretation of information obtained from remote sensors including conventional, infrared and radar imagery. Introduction to stereo-plotting devices, stressing theories of remote sensing and applications.
- 425. Development of Geographic Thought**
Spring. 3(3-0) Approval of department.
Evolution of geographic thought from antiquity to the present emphasizing developments in 20th century America. Survey of the theory and methodology of contemporary geography.
- 427. Quantitative Methods in Geography**
Fall. 4(4-0) Approval of department.
Basic quantitative techniques used in the analysis and classification of geographic data.
- 429. Landforms of North America**
Winter, Spring. 3(3-0) May reenroll for a maximum of 6 credits. GEO 206, GLG 201 or approval of department.
Study of the surface features of eastern U.S.A. (winter term) and western U.S.A. (spring term).
- 431. Landform Analysis**
Fall. 3(3-0) GEO 206, GLG 201 or approval of department.
A problem approach is utilized to explain classical and contemporary interpretations of the nature of selected landforms, including treatment of related tools and techniques. Option for some field study.
- 432. Biogeography**
Spring. 3(3-0) GEO 206 or approval of department.
Patterns of vegetation, with emphasis on forests of eastern North America. Option for some field study.
- 435. Land Use and Location Theory**
Spring. 3(3-0) GEO 213 or approval of department.
Location principles and theories of economic activities, including methods of regional analysis.
- 436. Microclimatology**
Winter of even-numbered years. 3(3-0) MTH 109 or MTH 111. Interdepartmental with and administered by Agricultural Engineering Technology.
Physical environment in the lower few hundred meters of the atmosphere and within the biosphere.
- 440. Spatial Aspects of Regional Development**
Spring. 3(3-0) GEO 213 or one 300 level regional geography course or approval of department.
Spatial and environmental factors in regional development at national and international scales.
- 446. Production Cartography**
Winter. 4(2-4) GEO 223 or approval of department.
Technical aspects of map and graphics production. Sequencing of procedures. Theoretical and applied aspects of process photography, typography, and proofing.
- 447. Advanced Cartography**
Fall. 4(2-4) GEO 223.
Advanced concepts in mapmaking including statistical surfaces portrayal, quantitative data analysis, classing techniques, and nominal mapping.
- 448. Computer Mapping**
Winter, Spring. 4(2-4) CPS 115.
Programming microcomputers for cartographic manipulation and portrayal of geographic data.
- 449. Computer Uses in Cartography**
Fall. 4(2-4) GEO 223, CPS 112.
Examination of use of various mapping programs and map data bases. Computer use in modern cartography. Includes some programming.
- 451. Synoptic Climatology**
Winter. 3(3-0) GEO 206 or GEO 351 or approval of department.
Relationship between weather, climate, and upper air flow, with emphasis on the climatology of North America.
- 452. Applied Synoptic Climatology**
Spring. 3(3-0) GEO 451
Application of climatological principles to weather map interpretation and forecasting. Analysis of climatological literature.
- 456. Map Design**
Spring. 4(2-4) GEO 446.
Technical and theoretical aspects of designing maps. Topics include color, lettering, content, layout, and the influence of the user.
- 466. Social and Spatial Approaches to Community Service**
Spring. 3(3-0) GEO 201 or S W 205 or approval of department. Interdepartmental with and administered by the School of Social Work.
Analysis of major themes in social service planning: communities and neighborhoods, public policy administration, social service networks, location of public facilities, evaluation and accountability of service systems.
- 470. Geography of Health and Disease**
Fall, Winter. 3(3-0)
Spatio-environmental concepts and the techniques applied to health problems: disease transmission cycles, community nutrition and health-care planning.
- 805. Seminar in Urban Geography**
Spring. 3(3-0) Approval of department.
Selected research topics on the geography of the city.
- 808. Environmental Measurements**
(A E 805, AET 805.) Spring of odd-numbered years. 4(3-3) MTH 109 or MTH 111, STT 422; or approval of department. Interdepartmental with and administered by Agricultural Engineering Technology.
Methods and techniques for accurate measurement and interpretation of environmental parameters. Temperature, humidity, wind and air flow characteristics, radiation, light intensity, gaseous and particulate concentrations in atmospheric microclimates will be discussed.
- 811. Advanced Quantitative Methods in Geography and Planning**
Spring. 4(4-0) Approval of department, GEO 427. Interdepartmental with Urban Planning.
Statistical and mathematical approaches to spatial distributions and areal data.
- 812. Regional Seminar**
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 9 credits. Approval of department.
Selected research topics in regional geography.
- 814. Research Methods in Urban and Regional Analysis**
Winter. 3(3-0) U P 427 or approval of department. Interdepartmental with and administered by Urban Planning.
Basic quantitative techniques used in urban and regional analysis and planning, including statistical, linear, and network methods. Introduction to computer use.
- 815. Application of Research Methods to Planning and Analysis**
Spring. 3(3-0) U P 814. Interdepartmental with and administered by Urban Planning.
Applied techniques used in planning research. Analysis and forecasting of urban population, economic activity, and land use. Analysis of transportation and other community facilities.

**Description — Geography
of
Courses**

- 818. Readings in Geography**
Fall, Winter, Spring, Summer. Variable credit. May reenroll for a maximum of 15 credits. Approval of department.
- 819. Theories of Urban Forms and Structure**
Spring. 3(3-0) Approval of department. Interdepartmental with and administered by Urban Planning.
Idealized urban forms, theories and models in urban form as it relates to function and location of urban activities.
- 825. History and Philosophy of Geography**
Fall. 3(3-0) Approval of department.
Analysis of the monographic and serial literature dealing with the theory and evolution of geographic science.
- 826. Research Design in Geography**
Winter, Spring. 3(3-0) Approval of department.
Formalized approach to research and writing in geography: identification of geographic problems and their relative importance, structuring and stating hypotheses, data acquisitions, and tests for validity.
- 828. Seminar in Recreation Geography**
Spring. 3(3-0) GEO 309 or approval of instructor.
Selected current problems in recreation geography in the U.S. and abroad.
- 834. Seminar in Physical Geography**
Winter, Spring. 3(3-0) May reenroll for a maximum of 9 credits. Approval of department.
Analysis of classical and contemporary problems in physical geography treated as follows: climatology (winter), biogeography (spring), geomorphology (spring).
- 835. Seminar in Location Theory**
Fall. 3(3-0) Approval of department. GEO 435.
Recent developments and research in location analysis and regional science.
- 839. African Research**
(IDC 838.) Fall, Winter, Spring. 2 to 4 credits. May reenroll for a maximum of 8 credits. Graduate standing or approval of instructor. Interdepartmental with African Languages and the departments of Anthropology, Educational Administration, History, Political Science, and Sociology. Administered by the Department of Anthropology.
African-related archival and field research topics and methodologies viewed from perspective of relevant social science and humanistic disciplines associated with the African Studies Center.
- 845. Proseminar in Cartography**
Winter. 3(3-0) Approval of department.
Contemporary cartographic research. Research questions and methods in cartography.
- 846. Seminar in Cartography**
Spring. 3(3-0) May reenroll for a maximum of 12 credits. Approval of department.
Research projects in cartography.
- 850. Advanced Field Techniques**
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 8 credits.
Instruction and practical training in the selection, data-gathering, on-site analysis, and presentation of geographic field problems.
- 870. Seminar in Medical Geography**
Winter. 3(3-0)
Spatio-environmental analysis of selected health problems.
- 899. Master's Thesis Research**
Fall, Winter, Spring, Summer. Variable credit. Approval of department.
- 901. Problems in Cultural Geography**
Fall, Winter, Spring. 1 to 3 credits. May reenroll for a maximum of 6 credits. Approval of department.
Special research problems.
- 902. Problems in Physical Geography**
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 6 credits.
Supervised research in specific topics of physical geography.
- 910. Problems in Historical Geography**
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 6 credits. Approval of department.
Special research problems in historical geography.
- 912. Independent Study in Regional Geography**
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 15 credits. Approval of department.
Individual studies in regional geography.
- 918. Problems in Geography**
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 9 credits. Approval of department.
Research on specific geographical problems.
- 926. Theory and Methodology in Geography**
Spring. 3(3-0) GEO 826.
Theoretical and methodological issues embedded in current geographic research.
- 934. Problems in Population**
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 9 credits. Approval of department.
Special research problems.
- 999. Doctoral Dissertation Research**
Fall, Winter, Spring, Summer. Variable credit. Approval of department.
- Landscape Architecture L A**
- 100. Introduction to Landscape Architecture**
Fall, Spring. 3(3-0)
Environmental design concepts, orientation to landscape architecture, objectives and aspects of public and private professional practice, and scope and types of landscape development projects.
- 110. Fundamentals of Design**
Fall, Spring. 4(2-4)
Analysis and application of elements and principles of design in two and three dimensional expressions to abstract and spatial design compositions for environmental requirements.
- 120. Graphic Communication I**
Fall. 4(2-4)
Technical skills for graphic communication, freehand, mechanical drafting and lettering, sketching and perspective drawing; use of graphic symbols, diagrams, matrices and charts; rendering media, techniques, presentation and reproduction methods.
- 201. Site Planning**
Winter. 3(2-2)
Elements, principles and concepts for site development, including use area organization, orientation and siting of buildings, circulation and parking systems, spatial definitions, and detail design considerations.
- 221. Graphic Communication II**
(L A 321.) Spring. 4(1-6) L A 120.
Development of proficiency in landscape delineation and rendering techniques, including specialized media and formats for visual presentations of design concepts, analyses and perceptions.
- 233. Site Construction**
(L A 333.) Winter. 4(2-4) L A 120.
Materials and methods for construction of landscape developments, including details, layouts, construction drawings, specifications and cost estimating procedures.
- 240. Landscape Design Methods**
Winter. 4(2-4) L A 120.
Considerations and techniques of landscape design, including natural, cultural and perceptual inventories, site and program analyses, development of design concepts, with verbal and graphic expressions. Field trips required.
- 243. Basic Site Design**
(341.) Spring. 4(2-4) L A 120, L A 201, L A 240, L A 233.
Applications of site planning theory and landscape design methods to representative site development projects involving buildings, use areas, land, water and plant forms, with verbal and graphic expressions. Field trips required.
- 253. Planting Design Theory**
(L A 250., L A 350.) Spring. 3(3-0) L A 110, L A 201, or approval of department.
Principles of plant compositions, plant environments and spatial definitions in the use of plant materials for modifying landscapes. Field trips required.
- 330. Landform Design**
(L A 230.) Fall. 3(2-2) L A 201, L A 340L concurrently or approval of department.
Elements and principles of site grading, relief visualization, contour interpretation, land form units, surface drainage, slope calculations, and earthwork quantity determinations.
- 332. Site Engineering**
Winter. 4(2-4) L A 330.
Principles and procedures for design of site development systems, horizontal and vertical road alignments, storm and sanitary sewers, site utilities and computer applications for preparation of site construction drawings.
- 340. Site Design Theory**
Fall. 2(2-0) L A 243; L A 340L concurrently. L A 330, L A 353, or approval of department.
Advanced theory of site design; the design of complex perceptual spatial and scale experiences through the integration of spatial arrangements, use configurations and built site systems.

340L. Site Design Studio II

Fall. 3(0-6) L A 243; L A 340 concurrently, L A 330, L A 353.

Advanced application of landscape design theory involving the integration of increasingly complex site systems, use configurations and activity types.

342. Recreation Site Design

Winter. 4(2-4) L A 340L.

Ecological and cultural considerations, resource characteristics, activity requirements, recreation systems and site design standards; with applications of design process to representative recreation site developments, parks and special use areas.

346. Housing Site Design

Spring. 4(2-4) L A 342 or approval of department.

Application of site planning principles and landscape design methods to representative site development projects, with emphasis on housing requirements and opportunities.

348. Community Projects Design

Spring. 4(2-4) L A 346.

Application of site planning principles and landscape design methods to comprehensive site development projects, with emphasis on public and institutional requirements and opportunities.

Approved through Winter 1987.

353. Planting Plans

Fall. 3(2-2) HRT 212; L A 340L concurrently; approval of department.

Principles and procedures for selection and arrangement of plant materials for specific uses, including climate modification, spatial definition, circulation control, and soil and water conservation, as expressed by planting plans and specifications.

370. History of Environmental Development

Spring. 3(3-0)

Significant natural conditions and cultural events which have influenced attempts to organize and design the physical environment, as expressed in historic landscape development styles and movements.

390. Landscape Architecture Field Studies

Fall, Winter, Spring. 2 to 4 credits. May reenroll for a maximum of 8 credits. Approval of school.

Field trips to contemporary and historical site and regional zones within or outside the United States. Prior and post study required.

400H. Landscape Architecture Honors Course

Fall, Winter, Spring, Summer. 4 credits. May reenroll for a maximum of 12 credits. Juniors, approval of department.

Individual study of advanced nature in four landscape architecture topic areas: landscape design, site engineering, history, and professional practice. Extensive readings and term paper required.

401. Environmental Land Planning

Fall. 3(3-0)

Principles and methods of ecologically based land planning, stressing management and natural resources in relationship to growth and development; includes current environmental planning and development at local and state levels.

403. Urban Design Theory

Winter. 3(3-0)

Concepts and procedures for the organization, design and development of public and private urban forms and spaces, including survey of urban elements, cultural, ecological and aesthetic considerations, and interdisciplinary collaboration.

423. Professional Graphics

Winter of even-numbered years. 4(1-6) L A 221.

Applications of advanced sketching, perspective and rendering techniques for typical professional presentations, including prints, reproductions, photography and multi-media audio-visual communications.

437. Design Implementation

Spring. 4(1-6) L A 448, U P 410, L A 480.

Preparation of a complete package of contract documents including the use of computer technology for a representative site development project including typical construction drawings, specifications and cost estimates.

444. Regional Landscape Design

Fall. 4(1-6) L A 346 or approval of department; L A 401 concurrently.

Application of theories and methods of environmental land planning to problems of land use, resource conservation and environmental protection utilizing a project format and multidisciplinary team approach.

448. Project Design

Winter. 4(1-6) L A 403 concurrently; L A 444, L A 480 or approval of department.

Application of site design theory to complex site development projects involving interaction between human activities, site characteristics, and end uses.

471. History of Landscape Architecture

Spring. 3(3-0)

Environmental design concepts and projects from 1850 to the present time, with emphasis on the development of the profession and practice of landscape architecture in the United States.

480. Professional Practice

Fall. 4(3-2) Senior majors, L A 444 concurrently.

Principles and procedures of professional office practice, including ethics, client relations, registration, inter-professional collaboration, project management and marketing of professional services.

483. Landscape Architecture Seminar

Spring of odd-numbered years. 3(2-2) Landscape Architecture majors.

Research presentation and discussion of significant current issues, trends, events and opportunities relating to contemporary theories and practices of landscape architecture.

489. Landscape Architecture Internship

Fall, Winter, Spring, Summer. 2(0-8) or 3(0-12) or 4(0-16) May reenroll for a maximum of 8 credits. Juniors, approval of school.

Supervised experience in approved public agencies and professional offices. Bi-weekly conferences.

490. Special Problems

Fall, Winter, Spring, Summer. 2 to 5 credits. May reenroll for a maximum of 12 credits. Approval of school.

Investigation, for advanced undergraduate students in landscape architecture, developed from special interest areas.

Urban Planning

U P

200. Introduction to Urban Planning

Fall, Winter. 3(3-0)

The field of urban planning. Development of cities and roles cities have played. Role of the urban planner, with current and emerging roles in planning. Problems facing cities today.

231. Evolution of Urban Communities (S)

Fall, Spring, Summer. 4(4-0)

Forces which promoted urban development and shaped urban areas throughout human history. Relationships of these continuing influences to current urban concerns. Historical bases of cultural factors in contemporary urbanism.

335. Power, Policy, and the Metropolis (UMS 335.) Winter. 4(4-0) Juniors.

Critical issues in power and decision making at a local level. Issues in central cities, suburbs, and metropolitan regions. Stresses the interaction between policy and social and economic forces.

341. Urban Planning Methods of Analysis

Fall. 3(3-0) Juniors in urban planning or approval of school.

Types of urban planning variables and methods of application to planning studies. Study design for basic planning investigations, and technique of investigation.

342. Research Methods in Planning

Winter. 4(4-0) U P 341.

Methods for investigation and analysis of urban phenomena; models, data and techniques used in mathematical, graphical and logical analysis.

351. Spatial Design

Winter, Spring. 4(2-4) U P 200; L A 120 or BCM 215.

Urban community functional physical elements at various scales. Laboratory work on planning problems related to human activity flow, terrain and structures, including land subdivision design.

352. Urban Design Problems

Spring. 4(0-8) U P 351.

Application of the physical design processes from the scale of individual element groupings to complete community units in a two and three dimensional context.

363. Comprehensive Planning Process

Winter. 3(3-0) U P 233.

Theory and application of coordinated planning for urban development, including policies and development plan formulation, programming, evaluation, review and revision of policies and plans.

400. Urban Development and Planning

Fall. 3(3-0) Credit may not be earned in U P 233 and U P 400. Juniors. Not open to majors in Urban Planning.

Planning as a governmental function in a democratic society. Powers and responsibilities for guiding urban growth and change. Processes of planning and its implementation. Development regulations and public facilities planning.

**Description — Geography
of
Courses**

- 410. Computer Applications in Planning and Landscape Architecture**
Winter. 3(2-2) CPS 115, approval of department.
Computers in planning and landscape micro-computers and interactive terminals. Application of various programs and software: simulation models, scheduling techniques, project assessment and management, spread sheets, data base management, word processing.
- 431. Housing: Developing Societies**
Fall. 3(3-0)
Housing programs relative to public policy, urban development, population characteristics and change, financing, land and tenancy issues. Projects as examples of public and private initiatives. Comparative analyses of housing systems.
- 432. Housing: Industrialized Societies**
(RES 465.) Winter. 4(4-0) Juniors. Interdepartmental with the Department of Human Environment and Design.
Comparison of urban housing policies in selected countries, such as Great Britain, Italy, Poland, the Soviet Union, the Scandinavian countries, the United States, and the Federal Republic of Germany.
- 433. Housing: United States**
Spring. 3(3-0)
Interdisciplinary approach to housing as a societal institution; cultural, physical and economic characteristics of housing; housing problems, governmental policies and assisted housing programs. Future developments, policy alternatives and needs.
- 442. Foundations of Urban Policy**
(UMS 432.) Fall. 4(4-0) Juniors.
Historical and political foundations of contemporary urban policy, stressing federal policies from public housing to general revenue sharing. Role of power and influence in policymaking process.
- 443. Urban Policy Analysis**
(UMS 433.) Winter. 4(4-0) U P 342 or approval of school.
The nature of contemporary American urban public policy. The institutions and processes that affect urban policy. Theory and methodology of public policy analysis relating to select urban issues.
- 450. Social Planning**
Winter. 3(2-2) U P 363, U P 400 or graduate students.
Definition of Social Planning. Techniques for identifying problems of resource access, and survey of attributes and skills necessary to improve delivery and participation. Field work with neighborhood organizations and planning agencies. Field trips required.
- 460. Planning Practice**
Spring. 3(3-0) Senior urban planning major or U P 400.
Administration of urban planning in relationship to governmental operations, other professions and the public. Emphasis on staff functions and responsibilities, consultant practice, and professional ethics.
- 461A. Comprehensive Planning**
Winter. 4(0-8) U P 363.
Collection, analysis and synthesis of planning information for an established urban area and region. Formulation of comprehensive physical development policies and plans, and implementation programs.
- 461B. Comprehensive Planning**
Spring. 4(0-8) U P 461A.
Continuation of U P 461A.
- 462. Fiscal Planning**
(362.) Winter. 3(3-0) U P 363 or U P 400 or approval of school.
Analysis of costs associated with plan implementation, redevelopment, and preservation. Relationship between the budgeting process and the fiscal implications of planning.
- 472. Urban Development Regulation**
Winter. 3(3-0) Seniors.
Public and private regulations basic to regulations influencing urban development; state enabling legislation and regulations, local ordinances, especially for zoning and subdivision regulations.
- 473. Urban Development Programs**
Spring. 4(2-4) U P 461B, U P 472.
Current governmental programs affecting urban development and renewal, grants process, proposal preparation. Application of appropriate programs to laboratory community as parts of comprehensive planning implementation strategy.
- 489. Internship in Urban Planning**
Fall, Winter, Spring, Summer. 2(0-8) or 3(0-12) or 4(0-16) May reenroll for a maximum of 8 credits. Senior majors; approval of school.
Individual experience in approved agencies and departments in the Lansing area.
- 490. Independent Studies in Urban Planning**
Fall, Winter, Spring, Summer. 2 credits. May reenroll for a maximum of 4 credits. Senior majors, approval of school.
- 800. Special Problems**
Fall, Winter, Spring, Summer. 2 to 6 credits. May reenroll for maximum of 6 credits. Approval of school.
- 803. Contemporary Urban Politics, Policy and Planning**
Winter. 3(3-0) Approval of school.
The contemporary roles of public urban policy, and relationships among selected key areas of urban policy and urban planning.
- 808. Background of Urban Development Planning**
Fall. 3(3-0)
American urban development from 1620 to the present, including shifts in technology and social forces that influenced development patterns. Problems faced by the professional planner are emphasized.
- 811. Advanced Quantitative Methods in Geography and Planning**
Spring. 4(4-0) Approval of department, GEO 427. Interdepartmental with and administered by the Department of Geography.
Statistical and mathematical approaches to spatial distributions and areal data.
- 814. Research Methods in Urban and Regional Analysis**
Winter. 3(3-0) U P 427 or approval of school. Interdepartmental with the Department of Geography.
Basic quantitative techniques used in urban and regional analysis and planning, including statistical, linear, and network methods. Introduction to computer use.
- 815. Application of Research Methods to Planning and Analysis**
Spring. 3(3-0) U P 814. Interdepartmental with the Department of Geography.
Applied techniques used in planning research. Analysis and forecasting of urban population, economic activity, and land use. Analysis of transportation and other community facilities.
- 816. The Planning Process**
Fall. 3(3-0)
Basic research and survey methods, and procedures used by the professional planner in developing a comprehensive plan.
- 818. Planning Process Theory**
Winter. 3(3-0) Approval of school.
Planning as a decision-making process, methods for defining goals in public and private planning programs, role of planning in public policy, formulation, planning for positive human-environment relationships.
- 819. Theories of Urban Forms and Structure**
Spring. 3(3-0) Approval of school. Interdepartmental with the Department of Geography.
Idealized urban forms, theories and models in urban form as it relates to function and location of urban activities.
- 824. Legal Bases for Planning**
Winter. 3(3-0) U P 473; approval of school.
Analysis of legislation pertinent to planning, emphasis upon legislation for city and regional planning bodies and creation of special authorities with general planning responsibilities.
- 828. Planning Presentation Techniques**
Fall. 3(1-4) Approval of school.
Communication skills utilized by planners to present policy proposals to governmental decision makers and citizens. Speaking, writing, and small group leadership is integrated with essential planning graphic skills.
- 830. Development Project Evaluation**
Spring. 3(2-2) Approval of school.
Planning evaluation methods and processes employed in the review of urban development proposals and projects, site plans, and public policies.
- 834. Planning Practicum I: Field Studies**
Fall. 3(0-6) Completion of the first year MUP Core Program or approval of school.
Field experience in the collection, analysis, and synthesis of information by individual students or student groups, to develop solutions to specific urban problems.
- 835. Planning Practicum II: Plan Making and Implementation**
Winter. 3(0-6) U P 834.
Based on study and research done in U P 834, the preparation of plans appropriate to the study area and subject. The design of statutory measures and administrative policies for implementation.
- 836. Introduction to Design**
Winter. 3(0-6) U P 828 or approval of school.
Studio course emphasizing the role of planning in shaping the process of urban growth and development, and the role of physical form and structure in influencing cultural patterns.

842. An International Comparative Study of Urban Planning
Winter of odd-numbered years. 3(3-0)

Urban growth patterns; types, roles and design theory of new cities; techniques and organization for urban growth; selection of subject areas will be made according to the class composition.

850. Housing Program Planning
Spring of even-numbered years. 4(2-4)
Approval of school.

Regulation, stimulation, salvage, and replacement of housing through public policy and administrative procedures. Increasing role of private initiative as partner to public action through conservation, rehabilitation, and redevelopment practices. Evaluation of trends and needs; analysis of case studies.

858. Urban Land Policy and Regulation
Spring of odd-numbered years. 4(2-4)
Approval of school.

Public land use policy and legislation, and implementing governmental actions. Land use controls exercised by several levels of government. Field work in development and application of land use control instruments.

862. Development Planning and Administration
Spring of odd-numbered years. 4(2-4)
Approval of school.

Measurement of urban obsolescence and deterioration with accompanying analysis of symptoms and causes for a selected community. Comprehensive plan for urban renewal and development objectives will be developed and one or more project areas will be studied and processed in accordance with most effective techniques and administrative procedures. Emphasis to be placed on the objective of unified, revitalized community development.

889. Internship in Urban Planning
Fall, Winter, Spring, Summer. 2(0-8) or 3(0-12) or 4(0-16) *May reenroll for a maximum of 8 credits. Graduate students in Urban Planning; approval of school.*

Individual experience in approved agencies and departments in the Lansing area.

897. Special Topics in Urban Planning
Fall, Spring. 2 to 4 credits. May reenroll for a maximum of 6 credits if different topic is taken.

Issues pertaining to urban planning as they arise out of current research, planning practice or the interplay of national issues and urban problems.

898. Master's Research
Fall, Winter, Spring, Summer. 2 or 3 credits. Approval of school.

The research component of the Plan B option for the MUP degree.

899. Master's Thesis Research
Fall, Winter, Spring, Summer. Variable credit. May reenroll for a maximum of 15 credits. Approval of school.

GEOLOGICAL SCIENCES
College of Natural Science

Geology **GLG**

200. Geology of Human Environment (N)

Fall, Winter, Spring, Summer. 3(3-0)
Not open to Geology majors. Credit will be given in only one of the following: GLG 200, GLG 201, GLG 306.

An exploration of social philosophical and political events which require a geological viewpoint for resolution. The application of geologic and social/historical information will also reinforce the concept of the scientific method.

200L. Laboratory—Geology of Our Environment
Fall, Winter, Spring, Summer. 1(0-3)
GLG 200 or concurrently.

Laboratory study of geologic processes associated with environmental hazards. Emphasis placed on land-use planning, applying geologic criteria to evaluate land potentials.

201. Earth Processes
Fall, Winter, Spring. 4(4-2) *Credit will be given for only one of the following: GLG 200, GLG 201, GLG 306.*

Physical processes concerning evolution of Earth and its environments. Conservation and interaction of energy and matter through time. Laboratory stresses interpretation of process through studies of geologic data.

202. Evolution of the Earth
Fall, Winter, Spring. 4(4-2) *GLG 200; or GLG 201; or GLG 306.*

The history of the earth based on geological, chemical, and paleobiological evidence; the evolution of organic life.

205. Oceanology—The Marine Environment
Fall. 3(3-0)

Physical oceanography, including origin, hydrologic, chemical, geological properties; and environmental quality of the oceans. Human-sea interactions are emphasized including resource utilization and pollution.

282. Energy Resources of the Earth
Winter. 3(3-0)

World energy resources of petroleum, coal, and atomic fuel. Social, political, economic and environmental problems of fuels.

300. Solar System Geology
Winter. 4(4-0) *AST 119 or AST 217 or AST 229; GLG 200 or GLG 201.*

The origin, relationships, make-up and features of the bodies in the solar system emphasizing recent space exploration results and developing theories.

302. Vertebrate Life of the Past
Fall. 3(3-0) *One course in a physical or biological science or Juniors. Interdepartmental with the Department of Zoology.*

Fossil vertebrates from fish to humans.

304. Geology of Michigan
Fall. 3(3-0) *GLG 200 or GLG 201 and/or GLG 202; or approval or department.*

A historical accounting of the physical, historical and economic geology of Michigan and its environs; a course designed for students seeking an overall picture of the rather unique Michigan geological environment.

306. Engineering Geology
Fall, Spring. 3(3-2) *Credit will be given for only one of the following: GLG 200, GLG 201, GLG 306. Sophomore Engineering students.*

Fundamental principles of geology as applied to civil engineering practice. Minerals and rocks, aerial photographs, topographic and areal geologic maps and geologic cross sections studied in laboratory. Source of geologic literature and maps.

307. Geology Central Appalachians
Winter. 1(0-2) *GLG 200, or GLG 201, or GLG 202, or concurrently.*

General geology of the Central Appalachians. A preparatory course for GLG 308. Field excursions—Central Appalachians during spring vacation.

308. Field Excursion—Central Appalachians
Spring. 2 or 3 credits. GLG 307.

Training in stratigraphic, sedimentological, paleontologic, and structural principles as applied to field methods.

321. Mineralogy
Fall. 5(4-4) *One term of chemistry.*

Basics of crystallography, crystallography, and crystal chemistry. The classification, occurrence, composition and identification of minerals. Mineral genesis.

323. Introduction to Optical Mineralogy
Winter. 1(0-3) *GLG 321.*

Basic principles underlying the use of the polarizing microscope. Recognition and understanding fundamental optical properties. Identification of minerals and texture in thin sections of rocks.

327. Introduction to Geochemistry
Winter. 3(3-0) *CEM 152, GLG 321.*

Geochemical evolution of the universe, solar system, earth. Application of crystal field theory and thermodynamics to the solution of geological problems. Factors affecting the distribution of elements on earth. Principles of isotope geology.

335. Fossil Plants, Their History and Paleocology
Spring. 3(3-0) *One course in geology or botany or biology or approval of department. Interdepartmental with the Department of Botany and Plant Pathology.*

History of plants through geologic time; their form and evolution; how and where found, identified and reconstructed; their use in determining ancient geographic patterns, paleoenvironments, paleoclimates and community structure. Field trip.

337. The Fossil Record of Organic Evolution
Spring. 3(3-0) *One course in a natural science; Juniors. Interdepartmental with the Department of Zoology.*

The direct evidence for organic evolution in the fossil record. Evolution of life from prebiological systems to humans. Impact of fossil discoveries on human thought.

338. Principles of Paleontology
Fall. 4(3-3) *GLG 202.*

Geological and biological principles of paleontology, and uses of paleontological data in historical geology, stratigraphy, evolutionary biology, and biogeography. One required week-end field trip.