3350:505 Geographic Information Systems (3 Credits)
Introduction to the principles and concepts underlying geographic information systems (GIS) and their application in professional practice and academic research. Laboratory.

3350:507 Advanced Geographic Information Systems (3 Credits)
Prerequisite: 3350:505 or permission. Advanced instruction in the theory and application of geographic information systems (GIS) including hands-on experience with both raster and vector GIS. Laboratory.

3350:509 Archaeogeophysical Survey (3 Credits)
Prerequisite: permission. Advanced instruction in subsurface geophysical survey techniques in archaeology. Emphasis on magnetic gradiometry and electrical resistivity techniques, image processing and geological and archaeological interpretation.

3350:515 Environmental Planning (3 Credits)
Scientific and technical principles for decision-making in planning, with emphasis on soils, land use, and water quality issues. Data sources and methods of site evaluation.

3350:520 Urban Geography (3 Credits)
Spatial structure of urban systems; interaction between cities; internal structure of cities. Perspectives on urban change; contemporary urban geographic problems; urban and regional planning issues.

3350:522 Transportation Systems Planning (3 Credits)
Study and analysis of transportation systems from a geographic perspective. Emphasis on transportation problems and issues, elements of transportation planning.

3350:524 Military Geography (3 Credits)
Influence of physical and human geography on military operations and military history. Role played by geography in international conflicts.

3350:532 Land Use Planning Law (3 Credits)
Acquaint student with past and present approaches to land use control in the United States and examine the political, economic, social and legal forces which have shaped existing land-use legislation.

3350:533 Practical Approaches to Planning (3 Credits)
Role of geographic investigation in city, regional and resource planning.

3350:537 Planning Analysis & Projection Methods (3 Credits)
Introduction to the primary analytic techniques for small-area demographic and economic analysis and projection.

3350:538 Land Use Planning Methods (3 Credits)
Application of GIS and other computer-based tools to the preparation, implementation and evaluation of comprehensive land use plans.

3350:539 History of Urban Design & Planning (3 Credits)
Origins of human settlements and planning from the perspective of urban design and related societal trends. Comparison of world regional and historical urban forms. Experience in ‘reading’ settlements as visual landscapes.

3350:540 Cartography (3 Credits)
Theoretical and practical applications of cartographic principles used to design and produce maps for research reports, public presentations, publication, and other professional uses.

3350:541 Global Positioning Systems (GPS) (1 Credit)
Fundamentals of Global Positioning System (GPS), with emphasis on geographic and planning activities. Includes hands-on exercises.

3350:542 Cartographic Theory & Design (3 Credits)
Prerequisite: 3350:540 or permission of instructor. Principles and techniques of thematic mapping. Stresses maps as communication tools. Examines principal thematic mapping techniques and means of presenting quantitative and qualitative data. Laboratory.

3350:543 Urban Applications in GIS (3 Credits)
Prerequisite: 3350:505 or permission. Applications of GIS in the urban context, including methods used for analysis of population density gradients, migration, and accessibility.

3350:544 Applications in Cartography & Geographic Information Systems (3 Credits)
Prerequisites: 3350:505 and 3350:540 or permission. Application of analytic and presentation techniques from cartography and geographic information systems to practical problems in geography and planning. Laboratory.

3350:545 GIS Database Design (3 Credits)
Prerequisite: 3350:505 or permission. Introduction to theory and concepts of geographic data modeling, geodatabase design, and topology. Emphasis on current practices and methodologies in geography and planning.

3350:546 GIS Programming and Customization (3 Credits)
Prerequisites: 3350:505 or permission. Introduction to use of scripting languages for customizing the interface and extending the functionality of desktop GIS software.

3350:547 Remote Sensing (3 Credits)
Concepts, systems, and methods of applying aerial photography, satellite imagery, and other remote-sensing data for analyzing geographic, geological, and other earth phenomena.

3350:549 Advanced Remote Sensing (3 Credits)
Prerequisite: 3350:547 or permission. Current research in remote sensing. Applications in study of human cultural and biophysical environment. Practice in planning, design, execution and interpretation of remote sensing studies. (Laboratory.)

3350:550 Development Planning (3 Credits)
A study of planning concepts and techniques for developing countries, including growth and development, planning agencies, regional inequities and alternative approaches.

3350:560 Political Geography (3 Credits)
Principles and theory in contemporary domestic and international political geographies. Emphasis on the changing local and global patterns of electoral politics, security, and diplomacy.

3350:581 Research Methods in Geography & Planning (3 Credits)
Investigation of library and archive resources. Emphasis on development of professional writing skills.

3350:583 Spatial Analysis (3 Credits)
Analysis of mapped statistical surfaces. Principles for use of map as model for statistical evidence, prediction, hypothesis testing.

3350:589 Special Topics in Geography (1-3 Credits)
(May be repeated) Selected topics of interest in geography.

3350:590 Workshop in Geography (1-3 Credits)
(May be repeated for a total of six credits) Group studies of special topics in geography.

3350:595 Soil & Water Field Studies (3 Credits)
Properties, origins and uses of major soil and water regime landscapes. Stresses relationships between soil and the hydrological cycle, urbanization, suburbanization and agriculture. Field trips required.
3350:596 Field Research Methods (3 Credits)
Field work enabling student to become competent in collecting, organizing and analysis of data while carrying out field research projects. Field trips required.

3350:597 Regional Field Studies (1-3 Credits)
Off-campus intensive study of geographic features of a region or regions through direct observations and travel using appropriate field study methods. (repeatable up to 6 credits)

3350:600 Seminar in Geography and Planning (3 Credits)
(May be repeated for a maximum of six credits each) Prerequisite: permission. Investigation and analysis of selected topics in particular fields of geography. Specialization indicated by second portion of title.

3350:601 Seminar in Geography and Planning (3 Credits)
(May be repeated for a maximum of six credits each) Prerequisite: permission. Investigation and analysis of selected topics in particular fields of geography. Specialization indicated by second portion of title.

3350:630 Planning Theory (3 Credits)
Introduction to the political, institutional and ethical foundations and procedural theories of urban and regional planning.

3350:631 Facilities Planning (3 Credits)
Study of need, process and limitation of urban facilities planning.

3350:633 Comparative Planning (3 Credits)
A survey of national, regional and local planning implementation measures in use in the developed world. Particular attention will be given to the planning experiences of European nations and their impact on American planning theory and practice.

3350:680 Advanced Spatial Analysis (3 Credits)
Prerequisite: 3350:583 or permission. Advanced concepts and methodologies in geographic research. Emphasis on quantitative revolution in geographical analysis including multivariate procedures as factor, discriminant and economical analysis, and multidimensional scaling.

3350:685 Planning Internship (3 Credits)
Prerequisite: permission. Individual experience in selected planning agencies for supervised performance in professional planning work. (May be repeated but only 3 credits may be applied to total credit hours needed for degree requirements.) Credit/Non-Credit.

3350:687 History of Geographic Thought (3 Credits)
Critical review of major developments in geographic concepts from ancient times to present.

3350:695 Graduate Colloquium (1 Credit)
(May be repeated for a maximum of four credits.) Lecture series on topics of interest in geography and planning, by academic and non-academic professionals for both faculty and students. Does not satisfy degree requirements. Credit/noncredit.

3350:698 Individual Reading & Research (1-3 Credits)
(May be repeated for a total of six credits) Prerequisite: permission of instructor. Intensive investigation of selected topics under guidance of faculty member.

3350:699 Thesis Research (1-6 Credits)
Independent and original work toward a thesis.