GEOGRAPHY (GEOG)

GEOG 500: Introduction to Geographic Research

1-3 Credits/Maximum of 3

No description.

GEOG 501A: Research Perspectives in Physical Geography

1 Credits

This course presents contemporary perspectives on Physical Geography, emphasizing the major issues and integrative themes of the sub-discipline. GEOG 501A Research Perspectives in Physical Geography (1)The contemporary study of Physical Geography unites all sub areas of Earth's physical environment--biogeography and ecology, climatology, and geomorphology--according to the following cross-cutting themes: water and mass in the environment; energy; scale and scale interactions; systems approach; and historical perspective. These themes are emphasized in each of the seven lectures comprising 501A, through discussion of theory (e.g., feedback processes) and application (e.g., vegetation-soil-cloud-precipitation interactions). Beyond the topical treatment of Physical Geography, the course covers the role of instrumentation and measurement as well as numerical modeling (statistical, dynamical) in the systems approach to studying landscape processes. The role of cross-scale spatial interactions (micro-meso-macro) in the flows of mass and energy at and near the Earth's surface are presented, along with the statistical techniques for extracting those scale interactions (e.g., Artificial Neural Networks, Self-Organizing Maps). The temporal perspective on landscape processes involves particularly the role of humans in rapidly modifying--both intentionally and inadvertently--the transfers of energy and mass through land-cover modifications (e.g., deforestation/afforestation, urbanization) and atmospheric impacts. The course aims are achieved through lectures, and by student readings of two or three seminal papers per week and a half-term paper. Although GEOG 501A is a stand-alone course, it dovetails with the three other new graduate-level courses proposed in Geography (Nature-Society, Human Geography, Geographic Information Science).

GEOG 501B: Research Perspectives in Human Geography

1 Credits

This course presents contemporary perspectives on Human Geography, emphasizing the major issues and integrative themes of the sub-discipline. GEOG 501BGEOG 501B Research Perspectives in Human Geography (1) The contemporary study of Human Geography reflects the heritage of place-based analysis that was typically regional geography and the space-based (yet often placed-grounded) work of those that seek to explore spatial patterns associated with various economic, political, social and cultural processes. These patterns and processes are explored at a variety of scales, from the local through regional and global, and each sub-discipline has its own ways of operationalizing the emphases on place and space. The extent to which practitioners draw on theories from cognate disciplines in the social sciences and humanities often colors recent research in the subfields and confirms the ongoing subdivisions rather than point towards a singular integrated field of human geography.The course aims are achieved through lectures, and by student readings of two or three seminal papers per week and a half-term paper. Although GEOG 501B is a stand-along course, it dovetails with the three other new graduate-level courses proposed in Geography (Nature-Society, Physical Geography, and Geographic Information Science).

GEOG 501C: Research Perspectives in Human-Environment Geography

1 Credits

Contemporary perspectives on Human-Environment Geography, emphasizing major issues and integrative themes of the sub-discipline.

GEOG 501D: Research Perspectives in GIScience

1 Credits

This course presents contemporary perspectives on Geographic Information Science, emphasizing the major issues and integrative themes of the sub- discipline. GEOG 501D Research Perspectives in GIScience (1)The field of GIScience concerns the investigation of the properties of data and information relating to Earth, the creation of information from observational facts, how information is transferred from one person to another, and optimal means for making that transfer, in both natural and artificial systems. GIScience is also concerned with the individual, organizational and societal effects of generating and providing this information. GIScience has its own body of theory focused on geographic scale, geographic representation, spatial information, and systems for the capture and use of spatial data. This theory draws heavily from a variety of other disciplines beyond Geography, including: computer science, information science and technology, cognitive science, graphic design, statistics, geodesy, and geometry. This course introduces these various underpinnings, with a focus on current research themes and directions within an integrative framework. The objective is to help graduate students become familiar with GIScience research, specifically: the major intellectual foundations of GIScience, the current state of the field, and the ongoing researcher agenda. The course aims are achieved through a combination of lectures, discussion of 2-3 seminal papers per week, and a half-term paper. Although GEOG 501D is a stand-alone course, it dovetails with the 3 other graduate-level courses proposed in Geography (Physical, Nature-Society, and Human).

GEOG 502: Research Scholarship in Geography

3 Credits

Learning the craft of scholarly research in geography. GEOG 502 Research Scholarship in Geography (3)Graduate students are expected to make a significant research contribution as part of the requirements for a MS or Doctoral degree in Geography. The Research Scholarship in Geography course provides students with a basic understanding of the craft of scholarly geographic research. It does so by setting research into a tradition of commonalties that shape expectations (e.g., disciplinary and federal IRB ethics standards; ideas of academic freedom and responsibility) and by focusing on the mechanics of key steps in the research process (identifying problems, developing questions and proposals, designing programs of research, executing a systematic program of research, responding to criticism and to opportunities, preparing and delivering oral presentations, and writing and publishing research reports). The course emphasizes important skills in developing research proposals, seeking research funding, writing manuscripts, giving presentations, and publishing research results.

Prerequisite: GEOG 500

GEOG 508: Feminist Methodology

3 Credits

The objective of this course is to examine feminist approaches to traditional research methodologies. The objective of this course is to examine feminist critiques of traditional research. The course will examine the animated and contentious debates among feminist scholars about what constitutes a feminist method. Although there is no single feminist method, this diverse academic community is searching for techniques consistent with their convictions as feminists. For this reason, the course will distinguish between methods, as tools for research, and methodology, as theory about the research process. The course reviews methods such as ethnography, interviewing, oral history, discourse analysis, visual analysis, and mixed method approaches. Cross Listings : GEOG 508 will be added as a cross-listed course.

Cross-listed with: WMNST 508

GEOG 510: Seminar in Physical Geography

3 Credits/Maximum of 18

Analysis of current literature in physical geography focusing on theoretical and methodological debates. GEOG 510 Seminar in Physical Geography (3 per semester/maximum of 18) This seminar explores current issues in physical geography. The focus for each offering of this advanced seminar is on a specific theme of current importance. Recent developments and ongoing research issues within that topic are explored in-depth. Topic examples include, but are not limited to: synoptic climatology and climate dynamics, the cryosphere, remote sensing, ecological biogeography and ecosystem dynamics, landscape and restoration ecology, wetlands ecology and management, and coastal and inland hazards.

Prerequisite: GEOG 454 , GEOG 455

GEOG 520: Seminar in Human Geography

3 Credits/Maximum of 18

Analysis of current literature in human geography focusing on theoretical and methodological debates.

GEOG 530: Human-Environment Seminar

3 Credits/Maximum of 18

Theory and method in human-environment interaction subfields; may be re-taken when topics vary; readings, discussions, research.

GEOG 550: Wetlands Ecology and Management

3 Credits

Recommended Preparations: One course in ecological or hydrological sciences. This course explores the diversity, complexity, ecological functions, conservation, and cultural values of freshwater and coastal wetlands through interdisciplinary discussions, readings, projects, and field trips. Learning Outcomes: Students successfully completing this course will gain an understanding about the ecology, management, and conservation of freshwater and coastal wetlands. They will be able to classify different wetland types using multiple methods, understand the breadth of wetland functions, and become familiar with laws, regulations, and approaches to conserve wetlands.

GEOG 560: Seminar in Geographic Information Science

3 Credits/Maximum of 18

Geographic information science problems/theory, e.g. GIS, cartography, remote sensing, spatial analysis, modeling.

GEOG 565: Selected Topics in Geographic Information Science

3 Credits

Examination of geographic information science topics: GIS, cartography, remote sensing, spatial analysis, modeling, spatial cognition, geospatial semantics, geovisualization.

GEOG 571: Intelligence Analysis, Cultural Geography, and Homeland Security

3 Credits

The application of cultural geography in the intelligence analysis and synthesis process by identifying prominent threats to civil security. GEOG 571 Intelligence Analysis, Cultural Geography, and Homeland Security (3) This course examines and illuminates the relationships between cultural geography, civil security and the stability of the existing world order. It rests firmly upon the application of the tools of spatial analysis that are at the heart of the discipline of geography, and is designed to help students develop the analytical processes that will lead to enlightened syntheses (intelligence products) about the connections associated with cultural differences and current internal and external threats to the security of the American homeland. It also is designed to encourage students to examine the impacts of cultural differences on the stability of the existing world order. The overarching objective of this course is to help successful students develop the knowledge, comprehension, and skills needed to effectively analyze current geospatial realities and, through the prism of cultural geography, create a rational predictive synthesis (intelligence summary) about potential human threats to the security of the nation.

GEOG 583: Geospatial System Analysis and Design

3 Credits

Systematic approach to requirements acquisition, specification, design and implementation of geospatial information systems. GEOG 583

Prerequisite: GEOG 484

GEOG 585: Open Web Mapping

3 Credits

Design, development, and implementation of web mapping applications using OGC standards and open source software. GEOG 585 Open Web Mapping (3)The geospatial industry has developed a culture of open standards and specifications by which both data and mapping tools can be made interoperable. Web Mapping requires the detailed application of a thorough theoretical understanding of these standards, as well as a working knowledge of how these standards are realized through recent information technology advances in web services and middleware. The course gives students the theoretical base from which they can go on to design, develop, and implement custom web mapping applications using open standards and open source software. On completion of the course, students will be able to build and deploy a complete web mapping solution including selecting the spatial data, the server and client software. Students will be able to determine which type of mapping

server is required for their needs and to explain why choosing an open standard based solution is better than a proprietary solution. The course will cover a variety of open source software packages for web mapping and will provide pointers to commercial solutions where appropriate. Open Web Mapping is designed specifically for adult professionals. The course will be broken down into ten lessons. Each lesson will take one week to complete and requires a minimum of 8-12 hours of student activity each week, totaling approximately 120 hours of activity. Topics to be covered in each lesson include: Lesson 1 Open Web Mapping Framework International Methods Lesson 2 Web Map Servers (WMS) basics Understanding the structure of a WMS request Understanding the structure of a WMS response Lesson 3 Web Feature Server (WFS) basics Understanding the structure of a WFS request Understanding the structure of a WFS response Lesson 4 Introduction to XML XML and web mapping XML schemas Lesson 5 Styling maps with WMS and Styled Layer Description (SLD) Cascading Web Map Servers Lesson 6 Geographic Markup Language (GML) Application Schemas and Profiles Lesson 7 Advanced WFS Gazettteers Other specialist applications of WFS Lesson 8 Building a web mapping applications Deploying a WMS Deploying a WFS Lesson 9 Building a thin web mapping client Client/ Server techniques Web mapping libraries and customizing them Lesson 10 The future of web mapping

Prerequisite: GEOG 485

GEOG 586: Geographical Information Analysis

3 Credits

Choosing and applying analytical methods for geospatial data, including point pattern analysis, interpolation, surface analysis, overlay analysis, and spatial autocorrelation. GEOG 586

Prerequisite: GEOG 485 or GEOG 486 or GEOG 487

GEOG 587: Conservation GIS

3 Credits

Conservation GIS applies geospatial problem solving to ecological research and resource management issues to enhance conservation planning.

Prerequisite: GEOG 487

GEOG 589: Emerging Trends in Remote Sensing

3 Credits

Highlights emerging theoretical and methodological trends in high-performance remote sensing for geospatial analysis through discussion and laboratory experiences.

Prerequisite: GEOG 480, GEOG 883

GEOG 590: Colloquium

1-3 Credits/Maximum of 3

Continuing seminars which consist of a series of individual lectures by faculty, students, or outside speakers.

GEOG 591: GIS for Health Analysis

3 Credits

Applications and theory in geographic information systems for analyzing the geographic dimensions of human health.

Prerequisite: GEOG 484

GEOG 594: **SPECIAL TOPICS**

1-3 Credits/Maximum of 3

GEOG 594A: Culminating Experiences in Geospatial Intelligence

1-3 Credits/Maximum of 3

Culminating experiences in current professional and ethical problems facing the geospatial intelligence professional.

Prerequisite: GEOG 882 , GEOG 883 , GEOG 884 , GEOG 885 , or equivalent courses

GEOG 594B: Geospatial Intelligence Capstone Experience

2 Credits

This course brings together the concepts from the geospatial intelligence program and reinforces the standards of professionalism applicable to geospatial intelligence analysis. The aim is to enhance the student's understanding of the role of geospatial intelligence, develop individual competencies, reinforce professional concepts, and improve geospatial analytical techniques and methods. Students explore and critically analyze a current topic of interest and apply geospatial technical tools, concepts, and theories learned in previous coursework. Students prepare and deliver a formal presentation of the results of their geospatial intelligence capstone research project.

Prerequisite: GEOG 594A

GEOG 596: Individual Studies

1-9 Credits/Maximum of 9

Creative projects, including nonthesis research, which are supervised on an individual basis and which fall outside the scope of formal courses.

GEOG 596D: Independent Study/Engaged Scholarship

4 Credits/Maximum of 999

A supervised off-campus, non-group instruction with a geospatial education focus. The instruction may include individual field experience, employment, or internship (paid or unpaid).

GEOG 597: Special Topics

1-9 Credits/Maximum of 9

Formal courses given on a topical or special interest subject which may be offered infrequently; several different topics may be taught in one year or term.

GEOG 597A: **SPECIAL TOPICS**

6.00 Credits

GEOG 597I: **SPECIAL TOPICS**

3 Credits

GEOG 600: Thesis Research

1-15 Credits/Maximum of 999

No description.

GEOG 601: Ph.D. Dissertation Full-Time

0 Credits/Maximum of 999

No description.

GEOG 602: Supervised Experience in College Teaching

1-3 Credits/Maximum of 6

Theoretical and practical aspects of undergraduate instruction in geography.

Prerequisite: concurrent status as graduate teaching assistant

GEOG 603: Foreign Academic Experience

1-12 Credits/Maximum of 12

Foreign study and/or research constituting progress toward the degree at a foreign university.

GEOG 610: Thesis Research Off Campus

1-15 Credits/Maximum of 999

No description.

GEOG 611: Ph.D. Dissertation Part-Time

0 Credits/Maximum of 999

No description.

GEOG 850: Location Intelligence for Business

3 Credits

In business, the application of maps and mapping technology ranges from a long-standing presence (commercial real estate, retail, and logistics) to nascent analytical applications across different industries. The momentum for commercial applications that encompass GIS, geospatial intelligence (GEOINT) technologies, and geospatial intelligence analysis is growing. In businesses, geospatial attributes are being combined with enterprise-wide databases. GIS and GEOINT tools and methodologies can now be folded into the more mainstream information technology (IT) applications of business intelligence (BI) to formulate location intelligence (LI) applications, products, and services. This course explores and applies the key geospatial intelligence principles involved in site selection, market analysis, risk and crisis management, and logistics, providing opportunities for students to solve those problems with contemporary geospatial tools and datasets. This course provides a foundation for spatial thinking and analysis in commercial settings, and experience with contemporary mapping and analysis tools for professional applications of location intelligence.

Recommended Preparations: GEOG 482

GEOG 855: Spatial Data Analytics for Transportation

3 Credits

This course explores the spatial data science and technology associated with the transportation industry. This interdisciplinary field is often referred to as GIS-T. There is a natural synergy between GIS and transportation, which has resulted in a number of specialized techniques and a wide variety of GIS-T applications. To appreciate the value GIS brings to the transportation industry, students need to have some understanding of the business of transportation and the challenges and problems those in the industry face. Consequently, they will learn about a number of subdisciplines within transportation and examine how GIS has been applied to each. Students will also explore some of the key organizations in the transportation industry who use GIS and learn firsthand from transportation professionals, representing a variety of specialized fields, about the role GIS plays for them. Throughout the course, students will study GIS concepts and techniques which are fundamental to transportation, such as transportation networks and linear referencing systems. In addition, they will have the opportunity to explore a number of GIS applications and tools related to transportation. Due to the overall breadth of the transportation industry, the course will focus primarily on the largest application areas: highway and mass transit. We will, however, examine other significant modes, including aviation, maritime, pedestrian, and bike transit. Furthermore, while much of the course content is oriented around the U.S. transportation industry, students will also look at GIS-T applications and trends in other parts of the world.

Recommended Preparations: GEOG 482

GEOG 858: Spatial Data Science for Emergency Management

3 Credits

Geospatial perspectives and technologies have a major role to play in planning for and responding to emergencies. As is true with other analytical paradigms, geospatial systems and technologies - from aerial mapping techniques to data acquisition - are changing rapidly. Emergency management is also changing quickly as the frequency and magnitude of crises and disasters are increasing, and more and more people and places are being impacted. GEOG 858 helps students develop proficiency in the theoretical, analytical, and technical perspectives required to support all stages of emergency (crisis or disaster) management activities with geospatial solutions, ranging from small-scale emergency management efforts to large-scale disasters and humanitarian crises. Topics covered in GEOG 858 will include advancements in geospatial data collection, geospatial data processing and analysis capabilities, unmanned aerial systems (UAS), geospatial artificial intelligence (geoAI), volunteered geographic information (VGI), geospatially-oriented social media, and others.

Recommended Preparations: GEOG 483

GEOG 861: The Earth is Round and Maps are Flat: Working with Spatial Reference Systems in GIS

3 Credits

The course explores three important topics related to georeferenced data: Datums, map projections, and grid systems. Accurate coordinates are the key to successful manipulation in a geographic information system (GIS). The course begins with a detailed look at datums and the role they play in mathematically describing the Earth¿s shape and size, defining exact Earth coordinates, and establishing the height of a point above mean sea level. Map projections are examined next. These formula-based entities are implemented as algorithms in GIS, remote sensing, and other kinds of mapping and spatial analysis software that systematically take Earth¿s coordinates and convert them to a planar environment. Grid systems conclude this course with a discussion of their utility when carrying out accurate measurement activities on maps. Collectively, this course provides the theoretical underpinnings and applied knowledge necessary to understand and effectively work with the wide range of available datums, map projections, and coordinate systems that are available today.

RECOMMENDED PREPARATIONS: GEOG 483

GEOG 862: GPS and GNSS for Geospatial Professionals

3 Credits

Cultivates a working knowledge of current and future capabilities of GPS and the emerging Global Navigation Satellite System. GEOG 862 GPS Modernization for Geospatial Professionals (1)Topic: The Global Positioning System (GPS) includes a constellation of earth-orbiting satellites that broadcast their locations in space and time, a network of ground control stations, and military and civilian receivers that calculate ground positions by trilaterating satellite positions. Geospatial professionals need to posses a working knowledge of current and future GPS capabilities because GPS positioning is so prevalent in geographic information systems (GIS) applications in government, industry, and academia. GPS has always been a dual use system, military and civilian. From the beginning, GPS signals have been available with no direct user fees. GPS is used now in all of transportation-aviation, maritime, railroad, highway and mass transit. Satellite positions also plays critical roles in telecommunications, land surveying, law enforcement, emergency response, precision agriculture, mining, finance, and scientific research. It controls computer networks, air traffic, power grids, and so on. As the scope of GPS has expanded, the system continues to evolve. Course Objectives: GEOG 862 provides students with an opportunity to develop an in-depth understanding of the Global Positioning System that exceeds the basic awareness that is cultivated in prerequisite courses. For example, while it is useful to know that a minimum of 24 GPS satellites ensure 24-hour worldwide GPS coverage, it is equally important to understand why there are more than the minimum on orbit. Students in GEOG 862 learn that redundancy is necessary in a system upon which much of the U.S. economy now depends. Society's reliance on satellite positioning mandates GPS modernization. Student Activities: The course consists of four weekly lessons. Each lesson will require a minimum of 8-12 hours of activity. Lessons will include weekly lectures (via synchronous Web conference and/or streaming video), threaded discussion, readings, two quizzes and two writing assignments about concepts and tools in GPS Modernization. These assignments are designed to help students progress towards successfully completing the objectives for this course. * Class Participation: Individual participation via online discussion. Students will be encouraged to post and respond to questions and comments in online discussions forums. *Quizzes: There will be a mid-course quiz at the end of Week 2 and a final quiz at the end of Week 4 to test the students' comprehension of class materials and other reading as required. *Papers: There are two writing assignments in this course. The first falls after Week 1 and asks students to prepare a 1200 word paper on one topic covered in "Basic GPS," The first lesson. The second falls after Week 3 and asks the students to prepare a 1200 word paper on one topic covered in either Week 2 or Week 3.

GEOG 863: Web Application Development for the Geospatial Professional

3 Credits

The Internet has greatly extended the reach of GIS beyond the desktop. Geospatial technology vendors and the open-source community have devised web service protocols and web mapping application programming interfaces (APIs) so that third-party developers can create their own applications for use on web-enabled devices. These applications serve a wide array of purposes, including place and way finding, data dissemination, and data collection. For example, tabular crime data published on a city¿s website can be combined with base data layers such as municipal boundaries and roads to produce a map that is valuable for both the city¿s police department and its citizens. This course focuses on how geospatial professionals can create such applications using industry-relevant geospatial APIs. Students will build applications using current and emerging web technologies. Topics covered will include the implementation of 2D maps and 3D scenes, understanding API documentation, layer discovery and visualization, user interface development, data querying, and geoprocessing.

Prerequisite: GEOG 485

GEOG 864: Professionalism and Ethics in Geographic Information Science and Technology

3 Credits

Professional practice and ethics in the Geographic Information Science and Technology (GIS&T, a.k.a. geospatial) field requires being both competent in one¿s work and reflective about its legal and ethical implications. Certified GIS&T professionals are required to affirm their commitment to legal and ethical practice. Fulfilling such commitments requires the ability to recognize and analyze legal and ethical problems and to act with integrity. In this course students investigate the nature of professions generally and the characteristics of the professions that occupy the GIS&T field in particular. Students gain awareness of pertinent legal and ethical issues and hone their moral reasoning skills through methodical analyses of case studies in relation to the GIS Code of Ethics and Rules of Conduct. Assignments include readings, case study analyses, interactive discussions, practitioner interviews and preparation of original case studies.

GEOG 865: Cloud and Server GIS

3 Credits

Theory and practical applications of using cloud computing and server resources to solve geospatial problems. GEOG 865 Cloud and Server GIS (3) This course teaches students to use cloud and server GIS resources to solve problems for which geospatial data is an integral element. Students will evaluate and implement systems using three cloud service models; infrastructure services, platform services, and software services. The course involves both lab exercises and critical reading and writing

for infrastructure, platform, and software service models. This course presents common methodologies for setting up cloud services for creating maps, to customize cloud services for managing spatial data, and to invoke cloud services for processing spatial data. This course challenges students to apply critical thinking and technical skills to evaluate and develop successful cloud GIS projects. Written assignments focus on helping students improve their ability to explain and execute cloud GIS projects. A semester-long project involves creating a working cloud GIS project, including public presentation of results.

Prerequisite: GEOG 484

GEOG 868: Spatial Database Management for the Geospatial Professional

3 Credits

This course helps students learn how to create, maintain, and retrieve data from a spatially-enabled database. Access to accurate data is the cornerstone on which all successful professional geospatial organizations are built. The data stewards who maintain an organization's information systems therefore have a crucial role to play. The course begins by introducing relational database theories and structures that are common in both geographic and non-geographic contexts (e.g., Structured Query Language and database design). It then focuses on the special considerations involved in the management of a spatial database by demonstrating two commonly utilized professional approaches

Prerequisite: GEOG 484

GEOG 871: Geospatial Technology Project Management

3 Credits

In this course, students take a critical look at geospatial project management. Project management is a broad discipline that encompasses both technical methods such as system design and analysis, and interpersonal factors that affect professional relationships. Project management is also a discipline that has matured outside of, but can be incorporated into, geospatial technology.

Prerequisite: GEOG 583

GEOG 882: Geographic Foundations of Geospatial Intelligence

3 Credits

Orientation to the geographic foundations of geospatial intelligence and its applications in national security, international relief work, and disaster management. GEOG 882 Geographic Foundations of Geospatial Intelligence (3)Topic: Geospatial intelligence (GEOINT) leverages geographic information science and technology (including cartography, geographic information systems, remote sensing, and global positioning systems) with intelligence tradecraft to develop intelligence products that support national security, disaster response, and international relief efforts. Course Objectives: GEOG 882 is designed to challenge current and aspiring GEOINT professionals to be more than technicians. Students who successfully complete GEOG 882 will appreciate that while geospatial technologies are useful in revealing what, who, and where, and to some extent how events are taking place, they are less useful in explaining why events occur, or what response is most appropriate. Students will learn that the political, cultural, historical, and economic perspectives of human geography are needed to put GEOINT analyses in context. The course will also challenge students to approach analyses critically, to consider alternative viewpoints and explanations, and to question their own assumptions. Student Activities: The course consists of 12 lessons that will span either the 15-week semester or the combined 12-week summer sessions. Each lesson will require approximately 10 hours of student activity. Student activity will include viewing and responding to recorded instructor lectures (delivered by digital video and audio), readings from textbooks or selected library resources, five quizzes on readings, four asynchronous online discussion forums, three reflection papers, and a collaborative role-playing simulation that provides a capstone experience.

GEOG 883: Remote Sensing Image Analysis and Applications

3 Credits

GEOG 883 focuses on the use of medium and high resolution remotely-sensed imagery and elevation data in geospatial applications. This course assumes that students have prior knowledge in the basics of remote sensing, mapping, and GIS, and that they have prior experience with commonly used geospatial software. In GEOG 883, students will develop mastery of the tools and techniques used to display, process, and analyze remotely sensed data. Upon completion of GEOG 883 students will be able to develop analytical workflows to derive products and extract information from remotely sensed data for a broad range of applications using both pixel-based and object-based approaches. GEOG 883 Remote Sensing for the Geospatial Intelligence Professional (3)Topic: Geospatial intelligence (GEOINT) leverages geographic information science and technology (including cartography, geographic information systems, remote sensing, and global positioning systems) with intelligence tradecraft to develop intelligence products that support national security, disaster response, and international relief efforts. Course Objectives: GEOG 883 cultivates students' knowledge of the capabilities and limitations of digital remote sensing instruments, processing systems, and derived data products. It helps students master basic skills needed to leverage these data sources and information products in the context of geospatial intelligence tradecraft. Student Activities: The course consists of eight lessons and one capstone group project that will span either the 15-week semester or the combined 12-week summer sessions. Each lesson will require approximately 10 hours of student activity. Student activities will include reading lesson text, online quizzes, and discussions about the ways in which remote sensing sciences is applied to geospatial intelligence analysis.

Prerequisite: GEOG 480

GEOG 884: Geographic Information Systems for the Geospatial Intelligence Professional

3 Credits

How geographic information systems facilitate data analysis and communication to address common geographic problems faced by the geospatial intelligence professional. GEOG 884 Geographic Information Systems for the Geospatial Intelligence Professional (3)Topic: Geospatial intelligence (GEOINT) leverages geographic information science and technology (including cartography), geographic information systems, remote sensing, and global positioning systems) with intelligence tradecraft to develop intelligence products that support national security, disaster response, and international relief efforts. The objectives and concepts are drawn from the University Consortium for Geographic Information Sciences's GIS&T Body of Knowledge (2006). Course Objectives: GEOG 884 cultivates in students the knowledge of the capabilities and limitations of geographic information systems (GIS) and the skills needed to realize their potential in the context of the geospatial intelligence tradecraft. Student Activities: The course consists of seven

project assignments that will span either the 15 week semester or the combined 12-week summer sessions. Each assignment will require 16-24 hours of student activity. Assignments will include readings, online quizzes about the readings, projects involving the GIS workflow development and implementation in the context of realistic scenarios, discussions about the benefits and limitations of GIS for geospatial intelligence analysis, and reflections about the relevance of course activities to students' professional experiences.

Prerequisite: GEOG 882

GEOG 885: Advanced Analytic Methods in Geospatial Intelligence

3 Credits

Prepares current and aspiring geospatial intelligence professionals to apply and interpret results of non-quantitative analysis and modeling techniques.

Prerequisite: GEOG 882

GEOG 892: Geospatial Applications of Unmanned Aerial Systems

3 Credits

Introduces theory and methods for operating an unmanned aerial system for geospatial data acquisition and analysis.

Prerequisite: GEOG 480

GEOG 897: Special Topics

1-9 Credits/Maximum of 9

Formal courses given on a topical or special interest subject.