American Public University System

The Ultimate Advantage is an Educated Mind

School of Security and Global Studies
INTL627
Advance Geospatial Analysis
Credit Hours: 3
Length of Course: 8 Weeks
Prerequisite: INTL500

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Instructor Information

Instructor Name: APUS Faculty

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Course Description (Catalog)

INTL627 (3 credit hours)

This course will focus on advanced capabilities of geospatial analytic techniques and how those techniques aid in decision making in various operational environments. This course will provide a study of geospatial collections and teach the application of theory and practical utilization of

analytical tools, techniques and procedures (TTP). Students will be exposed to and are expected to develop an understanding of emerging technology, trends and intelligence applications within the discipline of geospatial intelligence. The course will focus on geospatial concepts, techniques, and maximize focus in geospatial in support of emergencies, national and human disasters, and national security environments.

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Course Scope

As a research seminar, this course focuses on specialized area knowledge and sources in the field. Students will conduct research in preparation for the Capstone project in the Graduate program and will complete a research design statement, a literature review, and a final research paper.

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Course Objectives

After successfully completing this course, you will be able to:

CO-1: Assess the means multiple collections are leveraged during the conduct of intelligence analysis to produce finished geospatial intelligence

CO-2: Critique analytical judgments on a broad spectrum of problems

CO-3: Integrate support provided to various customer requirements

CO-4: Differentiate data analysis and communication to address common geographic events

CO-5: Use structured analytic techniques to problem solve through application of acquired knowledge and critical thinking skills

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Course Delivery Method

This course, delivered via distance learning, will enable students to complete academic work in a flexible manner, completely online. Course materials and access to an online learning

management system will be available to each student. Online assignments are due by Sunday at 11:55 pm ET and include all written assignments, examinations, and research papers submitted for grading. Weekly Forum questions (accomplished in groups in a Forum) require an initial response by Thursday at 11:55 pm ET, with all other required responses due by Sunday at 11:55 pm ET. The assigned faculty will support the students throughout this eight-week course.

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Course Resources

Required Course Textbooks

	No Textbook required, all readings available under "Lessons"	

Required Readings

Other readings are available electronically within the classroom.

Additional Resources and Web Sites

Videos and web sites are available within the classroom and through the university electronic library.

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Evaluation Procedures

The course grade is based on the following assessments:

Discussion Forums – 30 percent

Discussion questions will be provided and posts should reflect an assimilation of the readings and respond to the assigned topic(s). Students are required to provide a substantive initial post by Thursday at 11:55 pm ET and respond to two or more classmates by Sunday 11:55 pm ET.

Forum posts are graded on timeliness, relevance, knowledge of the weekly readings, and the quality of original ideas.

Research Question, Purpose Statement, and Citation Format Exercise – 20 percent

The components of this assignment include a research question and a purpose and design statement. It must contain at least 8 sources, at least 6 of which must be peer-reviewed. The specific research question should relate to a topic covered in the course. Length: 8 pp.

Literature Review—20 percent

This document contains an annotated summary of the major sources that will be used in the research paper, all of which must be peer-reviewed articles or scholarly texts. Students will identify the source, offer a short synopsis of its main argument, and offer a statement of relevance to the research project. Length: 8 pp.

Final Paper—30 percent

This is the final paper assignment of the course. It must contain citations in formal style as well as a bibliography. Length: 15 pp.

ASSIGNMENT	Percentage
Assignment # 1 – Case Study	20 percent
Assignment #2 - Collection Proposal	20 percent
Forum Discussions	30 percent
Final Assessment – Collection Plan	30 percent
TOTAL	100 percent

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8 – Week Course Outline

Please see the Student Handbook to reference the University's grading scale.

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Week	Topic	Learning Objectives	Readings	Assignments
1	Introductions & Data versus Information	LO-1: Synthesize the use of structure vs. unstructured data analysis CO-1: Assess the means multiple collections are leveraged during the conduct of intelligence analysis to produce finished geospatial intelligence CO-4: Differentiate data analysis and communication to address common geographic events	Specific readings *Explaining Big data (Video) (*Hagan) Big Data and Advance Analytics, p. 1 - 38 *(Hagan) Oracle – Big Data, Cloud Computing, Spatial Databases (ppt) *Oracle – The Coming Revolution in Revenue Management, p. 1 – 25 *(Zikopoulos) What is Big Data? (Video) (Cohn) Learning Structure in Unstructured document Databases (ppt) (Chen, et al) Keyword Search on Structured and Semi Structured Data (ppt)	Week One Forum ***Discussion Forum 1: Introductions*** Due Thursday 11:55pm; Responses due Sunday 11:55pm (all times EDT) Lesson Notes Weekly Readings

			(Rickman) Geospatial Unstructured Data (ppt) (Jonas) Structured Data: Traditional vs. Open Source: Big Data, New (video)	
2	Open Source Resources	LO-2: Demonstrate the use of Open Source Resources in intelligence analysis CO-1: Assess the means multiple collections are leveraged during the conduct of intelligence analysis to produce finished geospatial intelligence CO-3: Integrate support provided to various customer requirements	Specific readings *NATO OSINT Handbook, Vol 1 – Open Source Intelligence Handbook, p. 1 – 57 *NATO OSINT Reader – NATO Open Source Intelligence Reader (Skim book) * (Lee, 2009) NGA Magnifies the Value of Open Source GEOINT * Open Source and Geospatial Information on the Net (Videos & Article) *(Mitchell, XXXX) An Introduction to Open Source Geospatial Tools, p. 1 – 6 * Open Source in the National System for Geo Spatial	Week Two Forum ***Discussion Forum 2:*** Due Thursday 11:55pm; Responses due Sunday 11:55pm Lesson Notes Weekly Readings

			Intelligence (Video) *OSINT & GEOINT Blog Spot	
3	GEOINT Capabilities	LO-3: Evaluate how GEOINT capability could be used to support various scenarios CO-1: Assess the means multiple collections are leveraged during the conduct of intelligence analysis to produce finished geospatial intelligence CO-4: Differentiate data analysis and communication to address common geographic events	Specific readings *UNOOSA Team, 2012) Applying geoinformation to Disaster and Risk Management Impact *(Beaulieu, 2012) Data Management Capabilities (ppt) (Beaulieu, 2011) InnoVision: Taking GEOINT Science and Technology to the Next Level *(Oertel, Lorenz, & Halle, 2012) Detection and Monitoring of Wildfires by a Constellation of Small Satellites with Infrared Sensor Systems *(2010) Emerging Sensors & Platforms (video) *(Mar/Apr 2005) Pathfinder – the Geospatial Intelligence	Week Three Forum: ***Discussion Forum 3:*** Due Thursday 11:55pm; Responses due Sunday 11:55pm Lesson Notes Weekly Readings

			Magazine Articles: - (Waters) Perspectives on Support to Warfighter, p. 6 - 7 - (Hurlburt) NGA Assists in Tsunami Disaster Relief & Recovery, p. 8 – 12 - (Andersen) "Reachback" Capability Makes a Difference in Iraq, p. 13 – 15 - (Cooke) NGA Support Teams Stand with Warfighter, p. 17 – 19 -(Klumb) Searching for Undergrounds with a High-Tech ToolKit, p. 20 – 21 -(Fugate) Custom Imagery Meets Special Needs -(Park) Imagery Analysts Take Action for Prepare CENTCOM for Conflict -(Johnson) Real-Time Targeting with	

			Gridlock -(Cubarney) 21st Century: Enterprise 'Thrust' Give NGA Direction *Visualization: LIDAR Fusion GEOINT (Video) *Visualization of Baltimore Waterfront & London Factory (Video) *(Parker, 2012) WorldDEM – Reaching New Heights	
4	GEOINT Fusion	LO-4: Examine how GEOINT Multi-INTs are used to support various customer requirements CO- 1 : Assess the means multiple collections are leveraged during the conduct of intelligence analysis to produce finished	Specific readings *(Barrowman, 2011) Geospatial Intelligence – The New Intelligence Discipline, p. 1-6 *(Lebrun, 2011) All-Source Information Management and Integration for Improved Collective Intelligence Production, p. 1 – 31 *All Source Integration (ppt)	Week Four Forum ***Discussion Forum 4:*** Due Thursday 11:55pm; Responses due Sunday 11:55pm. Lesson Notes Weekly Readings

		geospatial intelligence CO-3: Integrate support provided to various customer requirements	*Emerging Areas of Geospatial Intelligence, Chp 3, p. 35 – 52 *(July – Sept, 2009) Military Intelligence Professional Bulletin -(Conway, et al) Leading the Way in Geospatial Intelligence, p. 9 – 16 -GBS: What It Is, What It Does, & Why You Should Care, p. 17 -(Custer) Always Out front, p. 2 -(Cummins) Startup of the GEOINT Foundry Tactical FMV Production Cause, p. 24 -(Christina) Targeting at the Battalion Level: What the Combat Too should know, p. 29 – 32 -(Draeger) Take Advantage of OSINT, p. 39 – 44 Signal Magazine (Oct, 2006): *	

			(Ackerman) Geospatial Intelligence Grows with Conflicts, New Allies *(Major) Ground Truth: Empowering the Warfighter with GEOINT *IT Law Wiki *MASINT/AGI Node *(Ireson, 2012) GEOINT: The Foundation for All Intelligence *(Smith, 2004) Multi-Fusion, p. 1-7 - Take Advantage of OSINT, p. 39 -(Cromer, et al) Leading the Way in Geospatial Intelligence, p. 9 – 16 *(2010, Mar/Apr) Pathfinder – A Network of Support Forward and Direct, - Prioritization of hard Problems and Recommendations, Image Data Fusion	

			Across Space, Time, Spectrum & Scale, p. 7 - (Mike K) Agency Team Delivers GEOINT to Africa, p. 12 – 13 - (Robert B.) NGA Liaison Strengthens Space operations, p. 14 -15 -(Lundin) COCOM Support Teams Exemplify Future of NSTS, p. 16 -18 - (Krasnow) Support Teams Essential to Haiti Earthquake Response, p. 3 -(Colby) Electronic Readers Promise Digital Flight Information Publications, p. 6 – 7 -(Nick W. & Mike C.) GEOINT keeps Transcom Moving, p. 8 – 9 (Damien K.) Medical Intelligence Relies on Teamwork, p. 10 -11	

5	Geo Data Mining (Text Mining)	LO-5: Organize Geo Data Mining concepts to solve intelligence problems CO-1: Assess the means multiple collections are leveraged during the conduct of intelligence analysis to produce finished geospatial intelligence CO-5: Use structured analytic techniques to problem solve through application of acquired knowledge and critical thinking skills	Specific readings *Data Mining Concepts * Data Mining: Concepts and Techniques Mining Time-series *(Hays, et al) Estimating Geographic Information form a Single Image, p. 1- 8 *GEO Name Search *Name Entity Tutorial *(Leidner) Toponym Resolution, Applications of Spatial Grounding of Place Names *Natural Language Processing *(Allan) Text Classification and Name Entities for New Event Detection, p. 1-8	Week Five Forum: ***Discussion Forum 5:*** Due Sunday 11:55pm Lesson Notes Weekly Readings
6	Geospatial concepts (Critical Thinking)	LO-6: Integrate Geospatial techniques to address	Specific readings *(Hannah, etal) A Review of Data	Week Six Forum: Assignment

		common geographic events CO-2: Critique analytical judgments on a broad spectrum of problems CO-5: Use structured analytic techniques to problem solve through application of acquired knowledge and critical thinking skills	Fusion Models & Architectures, p. 1 – 27 *Decision Making made Easy with Mind Maps (Video) *(Efros) Estimating Geographic, p. 1 – 8 *Four Steps of Geospatial Intelligence Preparation of the Environment *(Shahabi) GeoDec: Enabling Geospatial Decision Making *(de Smith, etal) Geospatial Analysis * Geospatial Analysis: A Comprehensive guide to Principles, Techniques and Software Tools * Geospatial narrative * Geospatial Rapid Assessment * How to Mind Map	***Assignment 1: Case Study*** Due Sunday 11:55pm ***Discussion Forum 6:*** Due Thursday 11:55pm; Responses due Sunday 11:55pm Lesson Notes Weekly Readings

7	Geo Data	LO-7: Use Geo data analysis to address common geographic events CO-4: Differentiate data analysis and communication to address common geographic events CO-5: Use structured analytic techniques to problem solve through application of acquired knowledge and critical thinking skills	Specific readings *The Geocoding Advantage: Best Practices for Managing Customer & Locations-based Data in Telecommunications, p. 1 – 8 *ArcGIS Resource Center *GEONAMES *Value of Geographical Info (Video) *Geographic Names Information System (GNIS) *U.S. Gazetteer *Encyclopedia of GIS, p. 583 – 596 *(de Smith, etal) Geospatial Analysis – A Comprehensive Guide	Week Seven Forum: Assignment ***Assignment 2: Collection Proposal*** Due Sunday 11:55pm ***Discussion Forum7:*** Due Thursday 11:55pm; responses due Sunday 11:55pm Lesson Notes Weekly Readings
8	GEOINT Specialized Products	LO-8: Examine various GEOINT specialize products capabilities to	Specific readings *Full Motion (Video) *GEOINT Standard the Basic Part 2 (ppt)	Week Eight Forum

		produce finished geospatial intelligence CO-3: Integrate support provided to various customer requirements CO-4: Differentiate data analysis and communication to address common geographic events	*Geospatial Intelligence Forum (10-6, p. 1-32) (Articles below included) - Global Geospatial Intelligence (GGI) Standard Products, p. 1 -2 -Global Imagery Integrated Into Cloud-Based Content System, p. 15 -Partnership Offers Wide Area Airborne Persistent Surveillance -Integrated Solution Processes Imagery for 3-D Databases, p. 25 -ESRI, Microsoft Ally for Disaster Response Management -Camera Module Provides Military-grade Geotagging -Automated Support System Tracks Wildfire Response, p. 26 -GEOINT Package offers full spectrum of Mapping Analysis, p. 14 -Cloud-Based System Offers on-Demand Visual Intelligence -Afghanistan	Assignment ***Final Assessment: Collection Plan*** Due Sunday 11:55pm ***Discussion Forum 8:*** Due Thursday 11:55pm; Responses due Sunday 11:55pm

			mapped with Hyperspectral Imaging -Application Indexes maps and Images by Areas of Interest -Visualization Tracks historic Twister, p. 26 *GIF (11-2), p. 1 - 30 *GIS Brochure, p. 1 – 12 *Global geospatial Products *Harris Motion, Imagery, GEOINT, Multi-INT Fused *Interactive Table for Collaborative Decision Making with Geospatial Data *JP 2-03 Geospatial Intelligence In Joint Operations *GEOINT LIDAR (video) *LIDAR Wet Areas Mapping (Video) *Pathfinder -1-0 Publication *Using Hyperspectral Sensing for Intelligence Gathering (Video) *3D Visualization & Exploitation (Video) *Creating the Innovation Advantage GEOINT	

			Motion Imagery Multi-INT	

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Policies

Please see the Student Handbook to reference all University policies. Quick links to frequently asked question about policies are listed below.

Drop/Withdrawal Policy
Plagiarism Policy
Extension Process and Policy
Disability Accommodations

Citation and Reference Style

Attention Please: Students will follow the Turabian/Chicago Style as the sole citation and reference style used in written work submitted as part of coursework to the University.
See http://www.apus.edu/Online-Library/tutorials/chicago.htm.

Late Assignments

Students are expected to submit classroom assignments by the posted due date and to complete the course according to the published class schedule. As adults, students, and working professionals, I understand you must manage competing demands on your time. Should you need additional time to complete an assignment, please contact me before the due date so we can discuss the situation and determine an acceptable resolution. Routine submission of late assignments is unacceptable and may result in points deducted from your final course grade.

Netiquette

Online universities promote the advancement of knowledge through positive and constructive debate – both inside and outside the classroom. Forums on the Internet, however, can occasionally degenerate into needless insults and "flaming." Such activity and the loss of good manners are not acceptable in a university setting – basic academic rules of good behavior and proper "Netiquette" must persist. Remember that you are in a place for the rewards and

excitement of learning which does not include descent to personal attacks or student attempts to stifle the Forum of others.

- **Technology Limitations:** While you should feel free to explore the full-range of creative composition in your formal papers, keep e-mail layouts simple. The Sakai classroom may not fully support MIME or HTML encoded messages, which means that bold face, italics, underlining, and a variety of color-coding or other visual effects will not translate in your e-mail messages.
- **Humor Note:** Despite the best of intentions, jokes and especially satire can easily get lost or taken seriously. If you feel the need for humor, you may wish to add "emoticons" to help alert your readers: ;-), :), ☺

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Online Library

The Online Library is available to enrolled students and faculty from inside the electronic campus. This is your starting point for access to online books, subscription periodicals, and Web resources that are designed to support your classes and generally not available through search engines on the open Web. In addition, the Online Library provides access to special learning resources, which the University has contracted to assist with your studies. Questions can be directed to **librarian@apus.edu**.

- ***Charles Town Library and Inter Library Loan:*** The University maintains a special library with a limited number of supporting volumes, collection of our professors' publication, and services to search and borrow research books and articles from other libraries.
- ***Electronic Books:*** You can use the online library to uncover and download over 50,000 titles, which have been scanned and made available in electronic format.
- ***Electronic Journals:*** The University provides access to over 12,000 journals, which are available in electronic form and only through limited subscription services.

Request a Library Guide for your course (http://apus.libguides.com/index.php)
The AMU/APU Library Guides provide access to collections of trusted sites on the Open Web and licensed resources on the Deep Web. The following are specially tailored for academic research at APUS:

- Program Portals contain topical and methodological resources to help launch general research in the degree program. To locate, search by department name, or navigate by school.
- Course Lib-Guides narrow the focus to relevant resources for the corresponding course. To locate, search by class code (e.g., SOCI111), or class name.

If a guide you need is not available yet, please email the APUS Library: librarian@apus.edu.

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Turnitin.com

Faculty require assignments be submitted to Turnitin.com. Turnitin.com will analyze a paper and report instances of potential plagiarism for the student to edit before submitting it for a grade. The instructor will post information in the classroom on student procedures.

Selected Bibliography

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