BOR 4302/ISSA 4302:  
Space Imagery and Technology

Course Description/Overview

From the Course Catalog:
This capstone course of the Cybersecurity Track discusses the use of space-based assets to support the Homeland Security effort. Included are the limitations of the technologies, available commercial technologies, and the discussion of the legal, moral, and political issues surrounding the use of these technologies in a democratic society. Students will design and present a project as part of this course.

Additional information:
As would be expected, the majority of information on specific capabilities of space based and aerial observation assets is either highly classified by associated governments, or closely held proprietary information of private corporations. Much of the material presented in this course comes from interpolation of signature analysis based on public information. We do our best with the information available to us. This course attempts to provide enough information to students so they can grasp the fundamental capabilities and limitations of signature collection assets, the political, legal, and moral ramifications of governments collecting this data, and the potential vulnerabilities of these assets and data to compromise.

Required materials (i.e. textbooks, software, etc.)

National Security Intelligence  
Author: Johnson, Loch K.  
ISBN: 9780745649405  
Copyright Year: 2012  
Publisher: Polity Press

Technical Collection of Intelligence  
Author: Clark, Robert M.  
ISBN: 9781604265644  
Copyright Year: 2011  
Publisher: Congressional Quarterly Press

Prerequisites

There are no prerequisites for this course, however, students are expected to have some background in cyber security to be able to succeed in this course.

Technical skills required for this course

As with all online courses, students must be able to operate a computer and have the necessary technical skills to navigate around a web page. Additional technical skills are not a prerequisite for this course, however, your computer must meet certain minimum requirements to operate Blackboard.

Time spent on this course

The time needed for adequate study and understanding of the course material, as well as discussion posts and critical thinking for all exercises and papers, amounts to between six and ten hours per week.

A number of videos are included in this course. Students should plan on watching videos and taking notes on the materials so they can better understand the processes by which space imagery functions.

The time a student spends studying for the mid-term exam will vary depending upon the student's understanding and comprehension of the reading assignments and materials associated with the first 4 lessons.

Goals, Objectives, and Outcomes
Course Goals

The material included in this course is intended to provide students with general knowledge of the capabilities and limitations of space based and aerial data collection assets. The controversy over pervasive surveillance of citizens, and targeting of people in other countries are a continuing problem that students will be able to address when they complete this course. Students will be able to collect open source information from space based and aerial assets and conduct an analysis of the imagery.

Course Objectives

Objectives focus on content and skills that are important within the course. Objectives can be thought of as inputs into the course.

**Objective One:**
Critical thinking is key to conducting a signature analysis. This course builds critical thinking skills.

**Objective Two:**
After the mid-term over the specifics of signatures, collection history, and capabilities, students will shift their focus to analysis and policies. Teaching the concept that technological development drives policy is a core objective of this course.

**Objective Three:**
Being able to effectively gather data, analyze that data, and provide an appropriate technical and critical written analysis is a core objective of this course.

**Objective Four:**
Being able to read, comprehend, and critically analyze the communications of others is essential in today's world. Therefore, participation in the discussion boards is an essential component of this course.

Learning Outcomes

When you finish this course you should be able to:

- **Knowledge and comprehension:** identify and recognize various space imagery technical devices and the signatures associated with their ability to collect signatures.
- **Application and analysis:** demonstrate the ability to analyze signature collection capabilities and apply them to current issues.
- **Synthesis and evaluation:** evaluate and critique the ideas of others based on your own synthesis of the presented materials.

Student learning outcomes will be assessed through a combination of written assignments and active participation in the cohort discussions established through discussion board questions each week.

Method of Assessing Outcomes

- Student learning outcomes will be assessed through a combination of written assignments and active participation in the cohort discussions established through weekly discussion board questions.
- Additionally, comprehension of technical components of space imagery will be assessed through a mid-term exam.
- A comprehensive web artifact will summarize what you have learned and will provide you an artifact to keep after the course is over. Details are available in the Lesson 8 module.

**Grading Policies**

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percent of Grade</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussion Board</td>
<td>35%</td>
<td>As per COURSE SCHEDULE</td>
</tr>
<tr>
<td>Mid Term Exam</td>
<td>30%</td>
<td>As per COURSE SCHEDULE</td>
</tr>
</tbody>
</table>
Grades
Angelo State University employs a letter grade system. Grades in this course are determined on a percentage scale:

- A = 90 – 100%
- B = 80 – 89%
- C = 70 – 79%
- D = 60 - 69%
- F = 59 % and below.

This Course Ends on Friday of Week 8.
Keep this in mind when we come to the last lessons.

Course Organization:

Lesson 1:
Introduction, the history of utilizing space to collect signatures, remote sensing, and the electromagnetic spectrum.

Lesson 2:
Film images, Radiometry, and Digital Imagery.

Lesson 3:
Infrared, RADAR, and SAR collection platforms and capabilities.

Lesson 4:
RF and non-EM Signature Collection

Lesson 5:
Cyber espionage, covert action, and the morality of individual choice versus national policy are considered. Mid-Term Exam as per COURSE SCHEDULE

Lesson 6:
Preventing abuse of all encompassing imagery.

Lesson 7:
Analyzing imagery.

Lesson 8:
Course wrap-up.

The instructor reserves the right to modify the syllabus during the semester as needed.

Administration

Communication
Students are expected to participate regularly through the course discussion forum. Students may receive occasional emails from the course instructor and are expected to respond promptly. Asynchronous communication (i.e. face-to-face or "real-time" communication is not required for this course, however, your professor is available for a phone conversation or face to face during the published office hours, or during other times with prior arrangement. Please do NOT use Blackboard messenger/email as a means of communication.

Attendance
This is an online course and attendance is not taken. However, failure to participate or communicate on the part of a student will result in an appropriate reduction of your grade and possibly in your failure of this course. Students are expected to complete assignments and participate in the discussion boards by the scheduled dates.

Late Work
This is an 8-week course. There is insufficient time in a short semester for students to delay completion of assignments. Therefore late work will not be accepted. If your assignments are not submitted by the posted deadline, you will receive a zero for that assignment. [Individual faculty may modify this policy in cases of student extremis. Contact me ahead of time if something comes up.]

Incomplete

From the ASU Catalog:
The grade “I” is given when the student is unable to complete the course because of illness or personal misfortune. An “I” that is not removed before the end of the next long semester automatically becomes an “F”. Students will be allowed one year to remove a grade of “I” before it automatically becomes an “F”. To graduate from ASU, a student must complete all “I”s.

The University policy on grades of “Incomplete” is that the deficiency in performance must be addressed satisfactorily by the end of the next long (16 week) semester or the grade automatically becomes an “F”. Grades of "Incomplete" will only be awarded to students who have demonstrated sufficient progress to earn the opportunity to complete the course outside of the normal course duration. The award of an "Incomplete" will only be made in rare circumstances, with the concurrence of the student and the professor on what specific tasks remain and when they are due for the grade to be changed to a higher grade. The determination of the need to award an "Incomplete" is entirely up to the professor’s personal judgment.

Add/Drop dates

Schedule Changes

University Policies

Academic Integrity
Angelo State University expects its students to maintain complete honesty and integrity in their academic pursuits. Students are responsible for understanding and complying with the University Academic Honor Code and the ASU Student Handbook.

Accommodations for Disability

ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA), and subsequent legislation.

Student Affairs is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability, and it is the student’s responsibility to initiate such a request by emailing studentservices@angelo.edu, or by contacting:

Office of Student Affairs
University Center, Suite 112
325-942-2047 Office
325-942-2211 FAX

Student absence for religious holidays

A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence.