

**STUDENT WARNING:** This course syllabus is from a previous semester archive and serves only as a preparatory reference. Please use this syllabus as a reference only until the professor opens the classroom and you have access to the updated course syllabus. Please do NOT purchase any books or start any work based on this syllabus; this syllabus may NOT be the one that your individual instructor uses for a course that has not yet started. If you need to verify course textbooks, please refer to the online course description through your student portal. This syllabus is proprietary material of APUS.

# SPST504

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## Course Summary

**Course :** SPST504 **Title :** Remote Sensing Satellites

**Length of Course :** 8 **Faculty :**

**Prerequisites :** SPST500, SPST501 **Credit Hours**

: 3

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## Description

### Course Description:

CORE COURSE: Earth orbiting remote sensing satellites play a key role in the lives of human beings. This course is a study of the major components of contemporary remote sensing satellites, the various methods of remote sensing capability, and the advantages and disadvantages of each method. Course topics also include study of remote sensing orbits, launch vehicles, and technology. IT IS HIGHLY RECOMMENDED THAT YOU HAVE PREVIOUSLY COMPLETED COLLEGE ALGEBRA BEFORE TAKING THIS COURSE. (Prerequisites: SPST500 and SPST501) **Course Scope:**

At the end of this course, you will have a firm understanding of the key factors involved in remote sensing, including collection, processing and basic analysis of both active and passive remote sensing systems.

## Objectives

Upon completion of this course, the student will be able to:

CO-1: Describe *in situ*, remote data collection, and the remote sensing process.

- CO-2: Describe the types of resolution and associated remote sensing applications
- CO-3: Describe electromagnetic radiation to include energy transfer mechanisms, how it is generated and transported through space, and how it interacts with the atmosphere and the terrain.
- CO-4: Describe the history and of remote sensing from the invention of photography to today.
- CO-5: Describe aerial photography to include vantage points, cameras, filters, and film.
- CO-6: Describe the various methods of image interpretation.
- CO-7: Describe the methods used to extract quantitative information from aerial photography and vertical remote sensor data.
- CO-8: Demonstrate ability to calculate data relative to remote sensing.
- CO-9: Describe multispectral remote sensing and sensor systems.

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CO-10: Describe infrared remote sensing and sensor systems.

CO-11: Describe active and passive microwave remote sensing and sensor systems.

CO-12: Describe LIDAR remote sensing.

CO-13: Describe remote sensing of vegetation to include BDRF and the temporal phenological cycle of vegetation.

CO-14: Describe remote sensing of water to include methods to monitor surface temperature, precipitation, aerosols, clouds, water vapor, and snow.

CO-15: Describe remote sensing of the urban landscape, land use, and land cover.

CO-16: Describe remote sensing of the soils, minerals, and geomorphology. CO-17: Report on remote sensing applications.

## Outline

### Week 1:

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Topic(s)

Remote Sensing of the Environment

Electromagnetic Radiation Principles

History of Aerial Photography and Aerial Platforms

Course Objective(s)

1-4

Readings

Campbell and Wynne, Chapters 1,2

Assignment(s)

Discussion Topic #1

(Due end of Week 1)

## Week 2:

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Topic(s)

Aerial Photography

Elements of Visual Image Interpretation

Photogrammetry

Course Objective(s)

5-8

Readings

Campbell and Wynne, Chapters 3,4,5

Assignment(s)

Discussion Topic #2

(Due end of Week 2)

Exam #1 (Covers Chapters 1-2; Due end of Week 2 **Week**

**3:**

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Topic(s)

Multispectral Remote Sensing Systems

Thermal Infrared Remote Sensing

Course Objective(s)

9-10

Readings

Campbell and Wynne, Chapters 6,9

Assignment(s)

Discussion Topic #3

(Due end of Week 3)

Exam #2 (Covers Chapters 3-5 Due end of Week 3)

Short Paper Assignment (Due end of Week 3) **Week**

**4:**

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Topic(s)

Active and Passive Microwave Remote Sensing

## LIDAR Remote Sensing

### Course Objective(s)

11-12

### Readings

Campbell and Wynne, Chapters 7,8

### Assignment(s)

Discussion Topic #4

Exam #3 (Covers Chapters 6, 9; Due end of Week 4) **Week**

**5:**

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### Topic(s)

Remote Sensing of Vegetation

Remote Sensing of Water

### Course Objective(s)

13-14

### Readings

Campbell and Wynne, Chapters 17, 19

### Assignment(s)

Discussion Topic #5

(Due end of Week 5)

Exam #4 (Covers Chapters 7-8; Due end of Week 5)

**Week 6:**

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### Topic(s)

Remote Sensing the Urban Landscape

Remote Sensing of Soils, Minerals, and Geomorphology

### Course Objective(s)

15-16

### Readings

Campbell and Wynne, Chapters 18,20

Assignment(s)

Discussion Topic #6

(Due end of Week 6)

GIS Paper Assignment (Due end of Week 6) **Week**

**7:**

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Topic(s)

Remote Sensing Research

Course Objective(s)

17

Readings

Review Previously Read Material

Assignment(s)

Discussion Topic #7

Exam #5 (Covers Chapters 17-20; Due end of Week 7)

**Week 8:**

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Topic(s)

Remote Sensing Research

Course Objective(s)

17

Readings

Review Previously Read Material

Assignment(s)

Discussion Topic #8

Research Paper Assignment (Due end of Week 8)

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## Evaluation

Grades for this course will be based on the following grading instruments. You must complete all assigned tasks in order to pass the course.

## Exams

The five (open book) exams are worth a total of 35% of your course grade and will test your knowledge of the terms and concepts covered in the textbook. Each exam consists of multiple choice and fill-in the blank questions. You will have 2 hours to complete each exam. Although open book, it is literally impossible to pass the exams without having completed the assigned readings.

## Discussion Postings

Eight times throughout the course, discussion items will be posted within the Discussion area of the classroom. Your responses must be in YOUR OWN WORDS (no quotes), well written and grammatically correct. Your responses will clearly show whether you have read assigned classroom readings (listed in this syllabus). Opinions are always welcome... However, postings providing only opinions will be graded accordingly! You must also comment on two other student posts.

## Short Paper

This assignment is worth 5% of your course grade. Details can be found in the assignments area. The 2 page paper will be due at the end of Week 3 and is worth 5% of your total course grade. Your paper must be at least 2 pages of written material; you can use illustrations, graphs, charts, etc. but the written portion of your paper must be at least 2 pages. Chicago style must be used and be sure to cite ALL facts/sources as you use them!

## GIS Paper

This assignment is worth 20% of your course grade. Details can be found in the assignments area. The 7 page paper will be due at the end of Week 6 and is worth 20% of your total course grade. Your paper must be at least 7 pages of written material; you can use illustrations, graphs, charts, etc. but the written portion of your paper must be at least 7 pages. Chicago style must be used and be sure to cite ALL facts/sources as you use them!

## Research Paper

Details on the research paper are posted in the assignments area. The 15 page paper will be due at the end of Week 8 and is worth 30% of your total course grade. Your paper must be at least 15 pages of written material; you can use illustrations, graphs, charts, etc. but the written portion of your paper must be at least 15 pages. Chicago style must be used and be sure to cite ALL facts/sources as you use them!

All assignments in this course are given to you prior to the due date. The “due date” for all assignments is the week in which the assignment is due. For the purposes of this course, a “**week**” is defined as the time period between Monday–Sunday. The **first week** begins on the first day of the semester and ends at 11:59 PM EST the following **Sunday**.

## **Grading:**

<b>Name</b>	<b>Grade %</b>
Discussions	10.00 %

Week 1: Introduce Yourself	1.25 %
Week 2: Black and White Film	1.25 %

Week 3: Aircraft Mission Requirements	1.25 %
Week 4: Remote Sensing in the News	1.25 %
Week 5: Radar Imagery	1.25 %
Week 6: Sun Angle Azimuth	1.25 %
Week 7: Educational Goals	1.25 %
Week 8: Research Paper Summary	1.25 %
<b>Research Paper</b>	<b>30.00 %</b>

Research Paper (Due end of Week 8) 30.00 %

<b>Writing Assignments</b>	<b>25.00 %</b>
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Short Paper (Due end of Week 3) 5.00 %

GIS Paper (Due end of Week 6) 20.00 %

<b>Exams</b>	<b>35.00 %</b>
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Exam #1 (Due end of Week 2) 7.00 %

Exam #2 (Due end of Week 3) 7.00 %

Exam #3 (Due end of Week 4) 7.00 %

Exam #4 (Due end of Week 5) 7.00 %

Exam #5 (Due end of Week 7) 7.00 %

## Materials

**Book Title:** Introduction to Remote Sensing, 5<sup>th</sup> edition **Author:** Cambpell, James B. and Wynne, Randolph H.

**Publication Info:** The Guildford Press

**ISBN:** 978-1-60918-176-5

**Available in Classroom from APUS Library**

## Course Guidelines

### Citation and Reference Style

- Attention Please: Students will follow the APA Format as the sole citation and reference style used in written work submitted as part of coursework to the University. Assignments completed in a narrative essay or composition format must follow the citation style cited in the APA Format.



## Tutoring

- [Tutor.com](#) offers online homework help and learning resources by connecting students to certified tutors for one-on-one help. AMU and APU students are eligible for 10 free hours\* of tutoring provided by APUS. Tutors are available 24/7 unless otherwise noted. Tutor.com also has a SkillCenter Resource Library offering educational resources, worksheets, videos, websites and career help. Accessing these resources does not count against tutoring hours and is also available 24/7. Please visit the APUS Library and search for 'Tutor' to create an account.

## Late Assignments

- The University encourages all work to be completed according to the course schedule. The University Late Work Policy can be found in the Student Handbook [here](#).

## Turn It In

- Faculty may 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. In some

cases professors may require students to use Turnitin.com. This is automatically processed through the Assignments area of the course.

## Academic Dishonesty

- Academic Dishonesty incorporates more than plagiarism, which is using the work of others without citation. Academic dishonesty includes any use of content purchased or retrieved from web services such as CourseHero.com. Additionally, allowing your work to be placed on such web services is academic dishonesty, as it is enabling the dishonesty of others. The copy and pasting of content from any web page, without citation as a direct quote, is academic dishonesty. When in doubt, do not copy/paste, and always cite.

## Submission Guidelines

- Some assignments may have very specific requirements for formatting (such as font, margins, etc) and submission file type (such as .docx, .pdf, etc) See the assignment instructions for details. In general, standard file types such as those associated with Microsoft Office are preferred, unless otherwise specified.

## Disclaimer Statement

- Course content may vary from the outline to meet the needs of this particular group.

## Communicating on the Discussion

- Discussions are the heart of the interaction in this course. The more engaged and lively the exchanges, the more interesting and fun the course will be. Only substantive comments will receive credit. Although there is a final posting time after which the instructor will grade comments, it is not sufficient to wait until the last day to contribute your comments/questions on the discussion. The purpose of the discussions is to actively participate in an on-going discussion about the assigned content.
- “Substantive” means comments that contribute something new and hopefully important to the discussion. Thus a message that simply says “I agree” is not substantive. A

substantive comment contributes a new idea or perspective, a good follow-up question to a point made, offers a response to a question, provides an example or illustration of a key point, points out an inconsistency in an argument, etc.

- As a class, if we run into conflicting view points, we must respect each individual's own opinion. Hateful and hurtful comments towards other individuals, students, groups, peoples, and/or societies will not be tolerated.

### **Identity Verification & Live Proctoring**

- Faculty may require students to provide proof of identity when submitting assignments or completing assessments in this course. Verification may be in the form of a photograph and/or video of the student's face together with a valid photo ID, depending on the assignment format.

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- Faculty may require live proctoring when completing assessments in this course. Proctoring may include identity verification and continuous monitoring of the student by webcam and microphone during testing.

## **University Policies**

### [Student Handbook](#)

- [Drop/Withdrawal policy](#)
- [Extension Requests](#)
- [Academic Probation](#)
- [Appeals](#)
- [Disability Accommodations](#)

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