GGS756-001 Fall 2019
Physical Principles of Remote Sensing

Course Information
Title: GGS756-001 Physical Principles of Remote Sensing
CRN: 82106
Time: Tuesday 4:30 - 7:10 PM
Classroom: Hanover Hall L002
Instructor: Dr. John Qu
Telephone: (703) 993-3958
Office: Exploratory Hall, Room 2412
Office Hour: Stop by 1:30-3: & 3:30 PM on Tuesdays or make appointment

Course Description
This course is designed to give students with limited Earth science satellite remote sensing background a thorough introduction to gather the basic concepts and fundamentals of physical principles of remote sensing. The main emphasis of this course is on the basic physical and mathematical principles underlying the satellite remote sensing techniques, including radiometric and geometric information, satellite orbit and geo-location simulation, science algorithm designing, atmosphere corrections, and in situ measurements in support of remote sensing. In addition, this class will provide a focus on the NASA current and future Earth Observing System (EOS) instruments, such as the Moderate Resolution Imaging Spectroradiometer (MODIS), NOAA JPSS Visible Infrared Imaging Radiometer Suite (VIIRS), and USGS Landsat missions. These students will understand not only what satellite remote sensing systems do, but also how they work. This course aims to provide students all-inclusive overview of the state of the art in physical principles of remote sensing not only for monitoring global and regional atmosphere, ocean and land surface, but also for detecting local targets, such as, urban and suburban areas.

Schedule

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<tr>
<th>Week one (08/27)</th>
<th>Introduction to Earth science satellite remote sensing</th>
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<tr>
<td>Week two (09/03)</td>
<td>Physical fundamentals of remote sensing</td>
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<tr>
<td>Week three (09/10)</td>
<td>Top atmospheric solar radiation</td>
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## Final project
EOS, JPSS or NPP, Landsat related topics and focusing on physical principles of satellite remote sensing.

## Grading
- Midterm 30%
- Homework 20%
- Final Project 50%

\[(A=90-100, \ B=80-89, \ C=70-79, \ D=60-69, \ F=<60)\]

## Prerequisite
Permission of the instructor

## Required Textbook: None

## Reference Books and Documents
6. Some EOS, JPSS, and NPP Algorithm Theoretical Basis Documents (ATBDs) will be used during this class.

## Useful Links

http://estc.gmu.edu/Course/GGS756-19/
1. NASA Earth Observing System
2. Selected EOS instrument ATBDs
3. NASA Visible Earth
4. NASA/GSFC MODIS Direct readout
5. NASA Remote Sensing Tutorial
6. NPP Web Page
7. JPSS Web Page
8. NASA AERONET (AErosol RObotic NETwork) program
9. MODIS Rapid Response System
10. USGS Landsat website