

# GEOGRAPHY 9418A

## Remote Sensing Digital Image Analysis

### Course Outline: Fall 2024

#### 1. Course Information

##### 1.1. Classroom Location:

Thursdays - 2:30-4:30pm, starting September 12, 2024

##### 1.2. Contact Information:

Instructor: Dr. Jinfei Wang

Email: [jfwang@uwo.ca](mailto:jfwang@uwo.ca)

#### 2. Calendar Description

##### 2.1. Course Description

An in-depth study of current algorithms in remote sensing digital image processing and analysis. Topics may vary depending on students' interests, such as hyperspectral data analysis, textural analysis, object-oriented classification, polarimetry SAR radar data processing and analysis, change detection, structural pattern recognition and integration with GIS.

Antirequisite(s):

Prerequisite(s): Must have taken at least one remote sensing course and have enough remote sensing knowledge and image processing skills, or with instructor's permission. Please feel free to contact me if you have questions.

Prerequisite checking is the student's responsibility

#### 3. Course Objectives

In this course, each student is required to complete a literature review and a remote sensing research project. A journal paper format is followed. The objective is to be familiar with the current remote sensing research, and learn how to conduct literature review, collect and analyze remotely sensed data, be familiar with remote sensing image analysis software, and present research results.

#### 4. Methods of Evaluation

|  |     |                    |
|--|-----|--------------------|
| Class participation, including attendance, discussions | 10% | on going           |
| Abstract and literature review presentation(ppt)       | 10% | 09/30/2024         |
| Methodology, software and data analysis (ppt)          | 10% | 10/21/2024         |
| Oral presentation (ppt)                                | 20% | 11/28/2024         |
| Full paper (Word format)                               | 50% | 12/05/2024         |
| Reading week   |     | 10/14 – 10/18/2024 |

## 5. Tentative Schedule

### Step 1: Selection of a topic and literature review

Select a research topic. Included in the presentation: an *abstract* or summary of the paper you propose for this course (around 500 words).

*Presentation* of your proposed research and literature review. Submit your ppt file, including a list of references.

#### The abstract should include the following:

- Paper Title
- Author Name(s)
- Institutional affiliation(s)
- Complete mailing Address
- Phone, Fax, and E-mail for all authors and presenters
- Describe the research question(s), main objectives, study area, methods to be used and anticipated results.
- 3 - 5 key words.

The literature review should provide background and current development in the proposed research area: What has been done? What needs to be done? Has someone done the exact same as you proposed? What is new and innovative with your proposed research? It should be a critical review, not just to describe who did what. Remember to cite references in your presentation and include a reference list. Submit your literature review presentation in ppt to OWL.

### Step 2: Data collection

Data collection for your project involves two tasks: Collection of remotely sensed data and ground truth data.

In class discussion (show and tell) of collected data.

### Step 3: Methodology, software and Data Analysis Presentation

Demo of the software, presentation of methodology, data analysis and image processing of your project.

- Submit your ppt presentation for the data analysis to OWL.

### Step 4: Oral presentation

**Oral presentation (20 minutes):**

- Submit your ppt presentation file to OWL.

### Step 5: Full paper

**For the full paper, you may follow the format from one of the international remote sensing journals**

For example:

The journal "Remote Sensing":

<https://www.mdpi.com/journal/remotesensing/instructions>

or

The journal "IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing":  
<https://ieeexplore.ieee.org/xpl/aboutJournal.jsp?punumber=4609443>

- Submit your term paper in WORD format to OWL.

## 6. University Policy Regarding Illness

### 6.1. Illness

Please visit the link to the university policy for more information.

<http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryId=1&SelectedCalendar=Live&ArchiveID=-> Page 12

If you feel that you have a medical or personal concern that is interfering with your work, you should contact your Instructor, Graduate Program Administrator, Supervisor, or SGPS.

### 6.2. Attendance

It is expected that students will attend all classes and discussions/presentations.

## 7. Academic Offences

The statement: "Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

[http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/scholastic\\_discipline\\_grad.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf) Additionally, A) If written work will be assigned in the course and plagiarism-

checking software might be used, the following statement to this effect must be included in the course outline: "All required papers may be subject to submission for textual similarity review to the commercial plagiarism-detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>)."

Please refer to the [Western webpage on the use of AI](#) such as ChatGPT.

Within this course, students are permitted to use AI tools exclusively for information gathering and preliminary research purposes. These tools are intended to enhance the learning experience by providing access to diverse information sources. However, it is essential that students critically evaluate the obtained information, exercise independent thinking, and engage in original research to synthesize and develop their own ideas, arguments and perspectives. The use of AI tools can serve as a starting point for exploring a topic, with students expected to uphold academic integrity by appropriately attributing all sources of information and avoiding plagiarism. Essays, written assignments and/or lab reports should reflect the student's own

thoughts and independent written work. Students should also generate their own figures (e.g., graphs, diagrams) rather than using AI generated ones. By adhering to these guidelines, students contribute to a responsible and effective learning environment that promotes critical thinking, independent inquiry and all them to produce original written contributions. The same principles also apply to the use of translation software to support the writing the essays and other written assessments.

## **8. Mental Health**

If you or someone you know is experiencing distress, there are several resources here at Western to assist you. Please visit Western's [Health and Wellness website](#) for more information on mental health resources.

## **9. Support Services**

[Western's Support Services](#)  
[Student Development Centre](#)

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at [https://www.uwo.ca/health/student\\_support/survivor\\_support/get-help.html](https://www.uwo.ca/health/student_support/survivor_support/get-help.html) .

To connect with a case manager or set up an appointment, please contact [support@uwo.ca](mailto:support@uwo.ca).