WILLIAM RAINEY HARPER COLLEGE
BUSINESS AND SOCIAL SCIENCE DIVISION
GENERAL COURSE OUTLINE

Course Prefix	Course Number	Course Title	Lec-Lab	Semester Hours
GEG	154	INTRODUCTION TO REMOTE SENSING	(2 - 2)	3

COURSE DESCRIPTION

Provides an introduction to remote sensing of the Earth. Topics include the physical principles upon which remote sensing is based, history and future directions, sensors and their characteristics, image data sources, and image classification, interpretation and analysis techniques, and the integration of workflow outputs into GIS (Geographic Information Systems).

Prerequisite: GEG 150 with a grade of "C" or better.

TOPICAL OUTLINE

I. Understanding Remote Sensing
    A. Concepts and applications
    B. Sensor and data types
    C. History and future directions
II. Physical Foundations of Remote Sensing
    A. Electromagnetic spectrum
    B. Active and passive remote sensing
    C. Obtaining and viewing remotely sensed data
III. Elements of Photogrammetry
    A. Foundational concepts
    B. Aerial imagery interpretation
    C. Rectification and orthorectification
IV. Satellites and Sensor Platforms
    A. System chracteristics
    B. Data acquisition and processing
V. Remote Sensing and Image Classification
    A. Unsupervised classification
    B. Supervised classification
VI. Remote Sensing Workflows
    A. Data acquisition and preprocessing
    B. Application of classification methods
    C. Accuracy assessment
    D. Ground truthing
    E. Integration of workflow outputs into GIS

METHODS OF PRESENTATION

1. Lecture
2. Cooperative learning
3. Discussion
4. Hands-on lab exercises

STUDENT OUTCOMES: *(The student should…)*

1. describe the history, current state, and future of remote sensing.
2. understand the basic concepts of physics which underlie remote sensing, such as the electromagnetic spectrum.

3. apply fundamental concepts of photogrammetry to aerial photo interpretation and image rectification.
4. select the appropriate data set for different remote sensing applications based on spectral, temporal, radiometric and spatial resolution.
5. describe characteristics of passive and active remote sensing systems (such as multispectral, LiDAR and Radar).
6. perform basic remote sensing workflows to solve problems, such as acquiring data, extracting features, detecting change, creating composite images, and classifying images.
7. apply accuracy assessment methods and ground truthing to the results of remote sensing workflows.
8. interpret, analyze and summarize results of a remote sensing workflow.
9. integrate remote sensing outputs into GIS systems for analysis and presentation.

METHODS OF EVALUATION

Grades are based on demonstrated proficiency in subject matter. Proficiency is determined from:
1. Completion of laboratory exercises
2. Passing exams
3. Completion of various homework assignments
4. Completion of a remote sensing project

TEXTBOOK & INSTRUCTIONAL MATERIALS

Lillesand, Kiefer, Chipman, Remote Sensing and Image Interpretation, 7th ed., Wiley, 2015

Prepared by: Mukila Maitha
Fall, 2017