

Spring 2017
ESPM 3031 & 5031
Tuesdays 1:55-2:45 (Skok 35)
Wednesday 1:55-3:50 (Skok 35)

Applied Global Positioning Systems for Geographic Information Systems (Applied GPS for GIS)

This course will cover the principles and fundamentals of GPS and the use of GPS units in the field. ESPM 3031 will focus on juniors and seniors, and 5031 on graduate students.

Prerequisites will be junior (3031) or graduate (5031) standing, plus familiarity with desktop computer use; an introductory course in GIS is recommended. The course will meet twice each week. Additional time may be required to complete field exercises.

Lecture topics will focus on GPS/GNSS system principles, fundamentals, operations and techniques to improve accuracy. Datums, Projections and Coordinate Systems will be covered. Differential correction and accuracy assessments will be discussed and applied in laboratory exercises. Both code phase and carrier phase GPS will be used in the class and field exercises. Seven different types of GPS/field data collection equipment will be studied in the classroom and used in the field. In addition to traditional GPS handheld units, students will work with Nexus tablets and Juno3 based GPS equipment. Students will be transferring field data to and from desktop systems and develop skills integrating GPS data with GIS applications.

Students will complete 13 GPS lab exercises and 2 data collection/location homework assignments. There will be a final project integrating concepts from the entire course.

Students registered in ESPM 5031 will also complete special Graduate level applied GPS/GNSS project.

Grading will be A-F; 66% labs/homework, 8% Final Project, 26% Section Tests

3 Credits – 3 hours per week (lecture and field/laboratory)

Instructor:

Andrew C. Jenks,
Department of Forest Resources
Office: 215 Green Hall
Telephone: 651-387-9600
Email: ajenks@umn.edu

Spring 2017 Week by Week Activities

Week/Dates	Classroom	Field/Lab
Week 1 - 1/17/17, 1/18/17	Course introduction, syllabus-GPS basics	Compass, formats, & ArcGIS/GPS exercise; Homework 1 (due after Week 3), Geocaching (on-going) (Intro GIS-LAB "Independent Study" if needed)
Week 2 - 1/24/17, 1/25/17	GPS basics continued, coordinates, projection & datum (Garmin Lab)	Rec/Grade lab practice and collect points, Start on-going Data collection project (duration 7 weeks)
Week 3 - 1/31/17, 2/1/17	Map Reading, GPS & Maps (Garmin Lab)	DNR Software, NAV exercise, tracks/points collect and transfer exercise
Week 4 - 2/7/17, 2/8/17	Differential GPS Concepts (Garmin Lab)	Recreation /GIS grade accuracy control exercise
Week 5 - 2/14/17, 2/15/17	GIS Grade Equipment basics (Trimble Juno Lab)	GIS/Grade lab practice and collect points, lines and polygons. 2nd Homework (Home control points; due Week 10)
Week 6 - 2/21/17, 2/22/17	GIS/Grade Software (Trimble Juno Lab)	Transfer data and differential correction
Week 7 - 2/28/17, 3/1/17	GIS/Grade Software -2	Transfer data and differential correction; Bluetooth receivers
Week 8 - 3/7/17, 3/8/17	Data Dictionaries (Trimble)	Create & use data dictionaries-Trimble
Week 9 - 3/13/17-3/16/17	SPRING BREAK	
Week 10 - 3/21/17, 3/22/17	Accuracy/NSSDA	Field accuracy Lab
Week 11 - 3/28/17, 3/29/17	Test – Classroom	Field Test
Week 12 - 4/4/17, 4/5/17	High accuracy GPS (GCP) UAS Ground Control Points - Basics & Practice (Trimble)	Design & implement GCPs; includes geotagging & UAS processing
Week 13 - 4/11/17, 4/12/17	Field Data Form Design &Collection /ArcGIS Collect	AGO basics & geodatabase development in ArcMap creating & deploying forms for Collect
Week 14 - 4/18/17, 4/19/17	Field Data Form Design & Collection/ Open Data Kit (ODK) Lab	Create & deploy data collection form (ODK)
Week 15 - 4/25/17, 4/26/17	Field Data Form Design &Collection/Trimble Terraflex	Design, create & deploy Terraflex forms for field data collection.
Week 16 - 5/2/17, 5/3/17	Final Project due (by 5/6/17)	Use Terrasync, Terraflex, Collect or ODK for Final Project