

**Course Objectives/Course Outline**  
**Spokane Community College**

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**Course Title:** Global Positioning Systems

**Prefix and Course Number:** NATRS 230

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**Course Learning Outcomes:**

**By the end of this course, a student should be able to:**

- Determine the latitude and longitude as well as UTM coordinates for a point on a map.
- Plot a point on a map using latitude and longitude as well as UTM coordinates
- Explain what a datum is and its importance to GPS.
- Describe how GPS is used in the student's major field.
- Explain how the GPS works and its limitations
- Set up a GPS receiver
- Complete a visibility (curtain) diagram
- Plan a GPS survey session
- Select the proper survey style.
- Collect and store static and kinematic surveys
- Differentially correct GPS survey files
- Map final GPS survey results using GPS and GIS software
- Understand and apply coordinate geometry to GPS surveys
- Locate points in the field using RTKS
- Complete a complex project demonstrating the above skills.

**Course Outline:**

I. Mapping concepts – "Review"

- A. Datums, Projections and Scale
- B. Latitude and Longitude
- C. UTM
- D. State Plane Coordinates
- E. Determining Coordinates
- F. Plotting Coordinates

II. GPS Surveying

- A. Introduction
  - 1. Basic concepts
  - 2. Applications
- B. Global Positioning System Concepts
  - 1. Parts
- C. Setting up a receiver
  - 1. Map Datum
  - 2. Coordinates
  - 3. Units
- D. Planning a Session
  - 1. Visibility (Curtain) Diagrams
  - 2. PDOP: Definition, Determination, Optimum
  - 3. Planning Using Software
- E. Receiving and Analyzing Surveying Files
  - 1. Types of surveys
  - 2. Base Station versus Rover files

3. Using Recreational Grade Receivers
4. Setting up the Receiver
5. Collecting the Data
6. Downloading the Data
7. Differential Corrections
  - a. Real-time
  - b. Post Processing
8. Mapping
9. Elevations and contour mapping
10. Adding other data

### III. Navigating Using Waypoints

- A. Inputting Waypoints
- B. Setting up a Route
- C. Following a Receiver to a Point

### IV. Coordinate Geometry (COGO)

- A. Length and Direction
- B. Finding new Coordinates
- C. Finding intermediate coordinates
- D. COGO Applications
- E. RTKS