

**Master Syllabus**  
***Department of Geography***

**GEOG 240: Map Reading and Graphics**

**Course Description**

The study of qualitative and quantitative data presented in graphic form within geographic units. Involves learning various coordinate systems for specifying location, identifying various map forms, identifying various methods of map construction, interpretation of shape, area, direction and distance as represented by the various forms, and learning the various datums used in conventional mapping. (3 credit hours).

Prerequisites: None.

**Course Objectives**

The objective of the course is to teach students to recognize and interpret a variety of map forms including the choropleth, flow map, proportional symbol map, isopleth and cartogram. Emphasis is given to the study of map projection techniques used for distortion avoidance as spherical coordinates are mapped onto a two-dimensional surface. Students learn to use coordinate systems for location identification and distance calculation. They learn to specify scale and to calculate area as well as read updated direction from maps.

The specific aims of the course are to (1) learn to recognize a variety of map forms, (2) learn to recognize distortion resulting from the various projection processes (3) learn to specify location using various coordinate systems including the Geographic Coordinate System, the Universal Transverse Mercator Coordinate System, the State Plane Coordinate System, and the Geographical Reference System, (4) learn to use time in the calculation of longitude, (5) learn to use the Geographic Coordinate System in the calculation of distance (6) learn to construct and interpret topographic lines, (7) learn to construct topographic profiles, (8) and learn to use the declination diagram in the specification of direction.

**Course Rationale**

Map reading is a skill essential for correct extraction of spatial information from a map. Map reading skills involve correct interpretation of area, shape, direction, and distance as presented through the variety of projection techniques. Students will become familiar with projection techniques and the variety of map types that result. They will learn a variety of coordinate systems derived to specify location and enable distance calculation. This material will equip students with the fundamentals of map interpretation as required in the practice of geography in general and for other coursework such as GEOG 340, Cartography. Geography 240 is required of all geography majors and

partially fulfills elective requirements for students in the Social Sciences Education major.

### Course Content and Format

Students will be presented content material in a lecture style and classroom exercises designed to encourage active engagement with each topic. The following shows an example of a potential outline of topics for this course, with time allotment for each topic at the discretion of the instructor:

- I. History of mapping and mapping in history
- II. Kinds of maps
  - A. General purpose/multi-purpose maps
  - B. Single-purpose/thematic maps
  - C. Qualitative and quantitative maps
  - D. Mental maps
  - E. Map products on the web
- III. Geodesy and georeferencing
  - A. Earth-sun relations
  - B. Datums
  - C. Triangulation
  - D. The Geographic Coordinate System
- IV. Time and maps
  - A. Changing the name of the day of the week
  - B. The calendar
  - C. Time and longitude
  - D. Military and civilian time designations
- V. Scale and area
- VI. Map projections
  - A. The concept of projection
  - B. Attributes of the map
  - C. Developable surface, perspective, aspect, and case
  - D. Properties preserved
  - E. Naming the commonly used projections
- VII. Other coordinate systems of importance
  - A. UTM
  - B. GEOREF
  - C. State Plane Coordinate System
  - D. GPS
- VIII. Land partitioning systems
  - A. US Plane Land Survey System
  - B. Creating custom brushes

- IX. Direction
  - A. Magnetic pole
  - B. Compass variation
  - C. The three norths
  - D. Time in direction calculation
- X. Landform representation; topography
  - A. Drawing topographic lines
  - B. Terrain profiles
- XI. Data sources; the US Census

### **Textbook Suggestions**

Slocum, Terry A., McMaster, Robert B., Kessler, Fritz C. and Howard, Hugh H. 2009: *Thematic Cartography and Geographic Visualization*, 3<sup>rd</sup> Ed. Upper Saddle River, NJ: Pearson Prentice Hall.

A variety of articles in the public domain are made available. Sources include the USGS, NOAA, and other governmental organizations.

### **Methods for Evaluating Student Performance:**

Forms of evaluation include examinations and class exercises covering each topic. Fifty percent of the grade will come from the class exercises and fifty percent from the examinations.

### **Evaluation of the Course**

Student evaluation of the course using university (and departmental) course evaluation forms.