

Discipline: Agriculture	Sub-discipline: Mechanized Agriculture
General Course Title: <b>Surveying</b>	Min. Units: <b>3 Semester</b>
Proposed Suffix: <b>L</b>	
<p>Course Description:  Selection, care and use of tapes and levels; field observations, note taking and office computations; use of surveying instruments and equipment for land measurement and mapping; practice in differential, profile, and contour leveling; building foundation layout; public lands surveying, legal descriptions, horizontal angles and cost evaluations. Laboratory required.</p>	
Required Prerequisites or Co-Requisites <sup>1</sup>	
Advisories/Recommended Preparation <sup>2</sup>	
<p>Course Objectives: <i>At the conclusion of this course, the student should be able to:</i></p> <ul style="list-style-type: none"> <li>• Select, care for, check, adjust, and use in the field: surveying engineer's tapes, plumb bobs, surveyor's pins, stakes, levels, leveling rods, compasses, range poles, and other field surveying equipment</li> <li>• Calculate land areas, cubic yards of dirt moved, cost efficiency and similar mathematical problems</li> <li>• Evaluate and define land descriptions</li> <li>• Conduct accurate field observations and keep complete field notes</li> <li>• Perform necessary office computations incident to field surveying jobs</li> <li>• Analyze surveying data and plot contours and profiles</li> <li>• Perform team duties to accomplish skill development in standard surveying techniques</li> <li>• Evaluate the use of current laser technology on surveying operations</li> <li>• Demonstrate ability to communicate and work cooperatively with others</li> </ul>	
<p>Course Content:</p> <ol style="list-style-type: none"> <li>1. Introduction to field surveying <ol style="list-style-type: none"> <li>a. Surveying in general</li> <li>b. Theory of measurements</li> <li>c. Field notes</li> <li>d. Office computations</li> </ol> </li> <li>2. Linear measurements <ol style="list-style-type: none"> <li>a. Methods used</li> <li>b. Taping and chaining</li> <li>c. Instruments</li> <li>d. Pacing</li> </ol> </li> <li>3. Layout work with an engineer's tape <ol style="list-style-type: none"> <li>a. Taping over level terrain</li> <li>b. Taping sloping distances</li> <li>c. Construction of right angle-3, 4, 5 method</li> <li>d. Erection of perpendicular to a line-cord method</li> <li>e. Triangles-right angle</li> <li>f. Building foundations and squares</li> <li>g. Parallelograms, trapezoids, and rectangles</li> <li>h. Determining inaccessible distances, and passing obstructions with a tape</li> </ol> </li> </ol> <p><b>Surveying (Content Continued)</b></p>	

<sup>1</sup> Prerequisite or co-requisite course need to be validated at the CCC level in accordance with Title 5 regulations; co-requisites for CCCs are the linked courses that must be taken at the same time as the primary or target course.

<sup>2</sup> Advisories or recommended preparation will not require validation but are recommendations to be considered by the student prior to enrolling.

4. Area measurement by taping calculation of acreage
  - a. Triangulation
  - b. Rectangles, squares
  - c. Parallelograms, trapezoids
  - d. Regular curved boundaries
  - e. Irregular curved boundaries
  
5. Selection, operation, use, care and adjustment of surveying instruments and leveling rods
  - a. Theory of leveling
  - b. Type of leveling methods used
  - c. Dumpy levels
  - d. Philadelphia rods, direct reading rods
  - e. Field notes
  - f. Signals, hand
  
6. Field applications of leveling instruments and equipment
  - a. Differential leveling (cross-sectional)
  - b. Using turning points
  - c. Determination of average elevation
  - d. Grades, slopes
  - e. Determination of volume of cuts and fills
  - f. Profile leveling–drains, trenches, ditches
  - g. Direction–bearings, angles
  - h. Traversing
  - i. Prolonged lines
  - j. Determining length of inaccessible lines and passing obstacles
  
7. Boundary surveys–location of properties
  - a. Metes and bounds
  - b. Block and lot (subdivisions)
  - c. Townships, sections, and ranges
  - d. Titles, grants, deeds, recording
  
8. Surveys of public lands
  - a. Background history and development of system
  - b. Initial points
  - c. Principal meridians
  - d. Base lines
  - e. Standard parallels (correction lines)
  - f. Guide meridians
  - g. Townships
  - h. Sections
  - i. Subdivision of sections
  - j. Descriptions
  - k. Corners–witness, lost, obliterated, meander
  
9. County surveyor’s office
  - a. Responsibilities and duties of the office
  - b. Records kept
  - c. Authority and liability of licensed surveyors

Laboratory Activities: Individual Laboratory Activities are designed to support course objectives.

Methods of Evaluation: Lecture  
Comprehensive Quizzes and Exams  
Written Critical Thinking Scenarios

Methods of Evaluation: Laboratory  
Laboratory Skill Validation by Observation  
Laboratory Reports

Problem Analysis and Solution Research and Term Papers	Diagnostics and Problem Solving Laboratory Skill Practicum Certification Exams
Typical Textbooks, Manuals, or Other Support Materials <u>Elementary Surveying, Wolf</u>	
<b>Statewide Articulation: CPSLO-AE 237, CPP-AE 232/L, UCD-ECI 10, other universities as lower division elective</b>	
FDRG Lead Signature:	Date:
Mark E. Bender, PhD CSU Stanislaus	
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