

University of Wyoming

Land Surveying Courses and Descriptions

ENTK 2500. Computer Aided Drafting I. 3. Computer Aided Drafting (CAD) is used extensively in this class to produce 2-D drawings conforming to the drafting standards. Emphasis is placed on using CAD to draw objects and subsequently create multi-view drawings in good form. In good form means to properly present and annotate the drawings dependent on the drawings context. Architectural, civil, mechanical, electrical, and welding drawings have some discipline unique symbols which are briefly covered. **Note:** This class is offered by the Northern Wyoming Community College District, aka Sheridan College.

ES 1061 - Engineering Problem Solving with Spreadsheets

1 credit hour

An introduction to engineering problem solving through the use of computer spreadsheets. Topics include functions, referencing, conditional statements, graphs, trendlines and iterative solvers.

Prerequisite: MATH 1400 or MATH 1450 or ACT Math Score of 25 or Math Placement Exam score of 4.

LS 2010 (CE 2072) - Engineering Surveying Lecture

2 Credit Hours

Principles of measurements of distances, elevation and angles. Basic error theory in measurement and calculations. Basic principles of surveying and map making.

Prerequisites: A working knowledge of algebra and trigonometry.

LS 2020 (CE 2090) - GPS for Land Surveyors

4 Credit Hours

From fundamental theory to practical application and advanced technologies, this class covers all aspects of GPS needed to understand and use GPS as a land surveyor including the basics of GPS technology, common hardware, surveying methods, survey design, planning and observing, real-time kinematics and DGPS.

Prerequisite: LS 2400.

LS 2100 (CE 2076) - Records Research for Surveyors

3 Credit Hours

Introduced to the public, quasi-public, and private depositories of recorded and non-recorded documents that establish land ownership boundaries, easement boundaries, and land use rights and restrictions in both the Public Land Survey System and the Colonial States. Assignments will require work to be conducted during depositories' normal business hours.

Prerequisites: none.

LS 2110 (CE 2050) – Real Property Law

Covers all major areas of real property law, including the nature of real property, types of ownership, real estate contracts, title and insurance, financing, landlord and tenant, land use, environmental law and regulation. An understanding of real property law is fundamental to understanding boundary law.

Prerequisites: none.

LS 2400 (CE 2089) – Basic Geodesy for Today’s Land Surveyor

2 Credit Hours

The history of geodesy including measurement techniques, coordinate systems, ellipsoids, and datums is reviewed. The modern geodetic and Cartesian coordinates systems, as well as the differences between grid and ground coordinates systems, and the current geodetic and Cartesian coordinate systems available today are discussed.

Prerequisites: CE 2070 or LS 2010.

LS 2410 (CE 2083) – GIS in Surveying

3 Credit Hours

Covers the basic concepts of geographic information systems, the methods and software used to implement them, and their applications to surveying and analysis of other surveying problems.

Prerequisites: CE 2070 or LS 2010, and ES 1060 or ES 1061.

LS 3100 (CE 2088) – Real Property Descriptions

2 Credit Hours

Historical and current issues for land description writing and usage for the practicing surveyor. Relationship between written descriptions and field survey data, interpreting old descriptions and the structure principles of description.

Prerequisite: CE 2070 or LS 2010, and LS 2100 and LS 2110.

LS 3110 (CE 3750) – Boundary Evidence

2 Credit Hours

A practical and working guide to understanding survey evidence and the laws of boundary location for efficient, accurate boundary determination. This material aids in the elimination of errors in location of land boundaries. The surveyor's liability and statutes of limitations are explored in depth. Also included are discussions of the surveyor's role in court.

Prerequisite: CE 2070 or LS 2010, and LS 2110.

LS 3120 (CE 3740) – Boundary Principles

2 Credit Hours

This course in boundary law addresses the fundamental principles of real property as applied to land surveying and related professions. Discussion and applications center on practical situations and concepts commonly encountered while conducting boundary surveys and the determination of the extent of ownership rights. Students explore the scope of the surveyors' judiciary role in real property ownership.

Prerequisite: CE 2070 or LS 2010, and LS 2100 and LS 2110.

LS 3130 (CE 2085) – Public Land Surveys

3 Credit Hours

Basic fundamentals of the Public Land Survey System (PLSS), dependent and independent resurveys, survey plats, "bono fide rights", riparian boundaries, non-rectangular entities, corner evidence and the role of the modern day surveyor.

Prerequisite: CE 2070 or LS 2010, and LS 2110.

LS 3200 (CE 3710) – Route Surveying

3 Credit Hours

Principles of route location and design. The theory of circular, parabolic and spiral curves; highway and railway geometric design; area and volumes of earthwork; and mass diagrams.

Prerequisite: CE 2070 or LS 2010, and ES 1060 or ES 1061.

LS 3210 (CE 3720) – Advanced Surveying

4 Credit Hours

Advanced topics in surveying computations and procedures, including traverse error analysis, topographic surveying, mapping, astronomical observations, coordinate geometry applications, introduction to geodesy, state plane coordinates and concepts of least squares analysis of survey adjustments.

Prerequisite: CE 2070 or LS 2010.

LS 3250 (CE 3760) - Applied Least Squares Adjustments

4 Credit Hours

The use of applied statistics in land surveying, error propagation in polygon and link traverses, discussion of positional tolerances and an introduction to least squares adjustments using StarNet and VectorNT software.

LS 3500 - GPS Theory Instrumentation

3 Credit Hours

The fundamental theories of GPS, geodesy, GPS receivers, GNSS, and GPS modernization will be reviewed; while the new topics of post processing of GPS vectors, the use of applied statistics in data analysis, error propagation, and network least squares adjustments using observation equations of GPS vectors will be introduced and covered. Several remote labs will be conducted covering the use of OPUS, RTK GPS, and static GPS. The use of VectorNT (parametric least squares adjustment) software will be taught and used throughout the course.

LS 3300 (CE 2074) - Ethics for the Professional Surveyor

1 Credit Hour

Introduction to the common ethical and moral issues facing professional surveyors in modern practice.

Prerequisite: One of LS 3110, LS 3120, or LS 3130.

LS 3400 (CE 4750) – Remote Sensing/Photogrammetry for Surveyors

3 Credit Hours.

Procedures and methods used for deriving metric information from photographs, analog processes for using aerial photographs in production of topographic maps, flight planning, and cost estimation in aerial mapping work. Introduction to photocoordinate measurement devices and their calibration. Mathematics of modern photogrammetry.

LS 3500 – Land Subdivision and Platting

3 Credit Hours.

The intention of this course is to expose the student to the principles of subdividing lands, both public and private, including boundary computation and analysis, ranging from lot splits to aliquot sectional breakdowns and a basic introduction to the platting process.

LS 4130 (CE 4740) – Advanced Public Lands

4 Credit Hours

Advanced topics in situations and problems in the Public Land Survey system, with discussion of major court cases involving everyday applications to surveyors. 1975 BLM casebook and other sources of survey reference.

Prerequisites: LS 3120 and LS 3130.

LS 4500 - Hydrographic Surveying

3 Credit Hours

The use of applied hydrographic surveying techniques with a focus on single beam sounders for underwater mapping projects. Discussions will include lectures on Underwater Acoustics, Speed of Sound, Transducers, the Sonar Equation, Single Beam Echo Sounders, Multi-Beam Echo Sounders, Other Methods of Determining Depths, Tides, Vessels, and Basic Seamanship. The basics of Hypack software will be taught and used throughout the course. Prerequisite: LS 2400 and LS 2020