LAND SURVEYING/GEOMATICS-AS

Program Overview

Associate of Science - Land Surveying/Geomatics

Student Learning Outcomes

Graduates with an AS in Land Surveying/Geomatics will be able to:

- Proficiently apply sound measurement methods, mathematics, science, and surveying tools to collect, analyze, edit, and present spatial information in professional applications.
- Demonstrate competency in the fundamentals and applications of land surveying and the acquisition and management of spatial data.
- Enter the Bachelor of Applied Science in Land Surveying/Geomatics program or technical geospatial employment.

General Education Requirements

Communications and Expressions

Written Communications (one course required)

ENG 100 Composition-Enhanced **5 Credits**

Allows students to fulfill their first semester of English while completing the remediation process. Designed for students who did not place into ENG 101 on the placement test/writing sample, but did not score so low that they need ENG 95. Allows a student to refine specific skill deficiencies while completing the first semester of freshman composition (ENG 100 is equivalent to ENG 101). Students will have additional Academic Success Center requirements. Although it is a five-credit course, it does not replace ENG 102. After successful completion of ENG 100, a student must take ENG 102 to complete the general education requirement.

ENG 101 Composition I **3 Credits**

Critical reading and writing of the expository essay. Emphasizes pre-writing, strategies for organization, and revision.

Oral Communications (one course required)

COM 113 Fund Speech Communication **3 Credits**

Principles and theories of speech communication. Participation in public speaking and interpersonal communication activities.

THTR 221 Oral Interpretation **3 Credits**

Introduction to and practice of oral interpretation of literary and dramatic works from Shakespeare to contemporary writers and poets.

Evidenced-Based Communications

ENG 102 Composition II **3 Credits**

Continuation of English 101. Emphasizes writing from sources, argument, the investigative paper, and research techniques.

Fine Arts (one course required)

ART 100 Visual Foundations **3 Credits**

A beginning art class that includes a survey of art and the basic components of design. The class explores visual concepts as they relate to the history of art through class presentations, discussions, and a variety of media. Students should plan for three hours of studio work outside the class.

ART 101 Drawing I **3 Credits**

A disciplined foundation in drawing concepts based on visual observation skills.

ART 107 Design Fundmntls I (2-D) **3 Credits**

Explores the fundamentals of design using various media focusing on 2-D design.

ENG 205 Intro to Creative Writing **3 Credits**

A creative writing course designed to introduce students to the production of fiction and poetry.

MUS 101 Music Fundamentals **3 Credits**

Notation, terminology, intervals, and scales. Designed to furnish a foundation for musicianship. Recommended for teachers in public schools and all others desiring a basic music background.

THTR 100 Introduction to Theatre **3 Credits**

A survey of the basic principles, facts, and theories providing an understanding of the art of theatre. Course also includes a special focus on the practical technical aspects of the theatre and on live theatre experiences.

THTR 105 Introduction to Acting I **3 Credits**

Examines acting fundamentals and focuses on development of vocal, physical, and creative tools to be used on stage.

THTR 121 Stage Makeup **3 Credits**

This course focuses on the history of makeup and basic approaches to applying make-up for the stage and screen. Make-up supplies will be studied, as well as techniques for corrective, old-age, character, stylized, and special effects makeup.

THTR 204 Theatre Technology I **3 Credits**

Lecture and discussion encompassing the philosophy and techniques of technical theatre.

WELD 200 Metal Art **3 Credits**

This course is designed to give the student the basic understanding of two dimensional 2D and three-dimensional 3D metal art. Also covered in this course we will discuss different Cutting, Welding and metal finishing techniques that are used in this discipline as it relates to metal art.

Logical and Scientific Reasoning

Mathematical Reasoning

STAT 152 Intro to Statistics **3 Credits**

Includes descriptive statistics, probability models, random variables, statistical estimation and hypothesis testing, linear regression analysis, and other topics. Designed to show the dependence of statistics on probability. It is recommended that students have completed prerequisites within two years of enrolling in this course.

Scientific Reasoning (one course required): Choose from the courses listed below or any AST, BIOL, CHEM, ENV, GEOL, or PHYS

ANTH 102 Physical Anthropology **3 Credits**

Introduction to the study of how humans, Homo sapiens, have emerged as a species and come to dominate the planet by examining processes of human biological and cultural evolution. Topics include inheritance, the emergence of primates, fossil hominids, the development of technology, and biological variability among modern humans. Satisfies general education science.

GEOG 103 Physical Geog Earth Environmnt **3 Credits**

Physical elements of the earth's natural features and their significance to man. Topics include earth form and motion, landforms, weather, climate, vegetation, and soils. Four laboratory experiences required.

NUTR 121 Human Nutrition **3 Credits**

An introductory nutrition course for the beginning student. Course will center on the major nutrients and their roles in maintaining good health. Students will learn to recognize well-balanced diets and acquire shopping tips and preparation techniques for optimum utilization of food dollars. Class includes four required labs.

Scientific Data Interpretation (one course required)

PHYS 151 Gen Physics I **4 Credits**

Primarily for students in arts and science. Topics include kinematics, energy and momentum conservation, rotational dynamics, thermodynamics, fluids, harmonic motion, and sound. Laboratory experiments illustrate many of these fundamental principles.

PHYS 180 Physics Scientist/Engr I **4 Credits**

A comprehensive, calculus-based physics course designed for advanced science and engineering students. Consists of intensive word problem solving covering topics of kinematics, vectors, forces, energy, momentum, rotation, angular momentum, equilibrium, elasticity, gravity, fluids, and oscillations. Lab included.

Human Societies and Experience

American Constitutions and Institutions: HIST 101 and 102 or PSC 101

HIST 101 U.S. History to 1877 **3 Credits**

Survey of U.S. political, social, economic, diplomatic, and cultural development from colonial times through Reconstruction. When taken with HIST 102 satisfies the GBC General Education American Constitutions and Institutions Requirement. HIST 101 and 102 need not be taken sequentially. Either class may be taken alone.

HIST 102 U.S. History Since 1877 **3 Credits**

Survey of U.S. political, social, economic, diplomatic, and cultural development from 1877 to the present. Course satisfies the Nevada Constitution Requirement. When taken with HIST 101 satisfies the GBC General Education American Constitutions and Institutions Requirement. Can be used to satisfy the Nevada Constitution Requirement for out-of-state transfer students who have previously satisfied the United States Constitution Requirement. HIST 101 and 102 need not be taken sequentially. Either class may be taken alone.

PSC 101 Intro American Politics **3 Credits**

A survey of United States, national, state, and local governments with emphasis on the cultural aspects of the governing process. Satisfies the legislative requirement for the United States and Nevada Constitutions.

Structure of Societies (one course required)

ANTH 101 Intro Cultural Anthropology **3 Credits**

Study of human cultures across the globe through examination of the basic principles underlying the organization of societies and the ways anthropologists analyze various parts of culture. Students will become familiar with the glue that holds all groups of people together, and how that glue can divide groups of people in profound ways.

CRJ 104 Intro to Admin of Justice **3 Credits**

American criminal justice system, its development, components, and processes. Includes consideration of crime and criminal justice as a formal area of study.

CRJ 270 Intro to Criminology **3 Credits**

Examines how society interacts with crime and delinquency through the use of the criminal justice system. Studies effective interaction and communication between the general public and members of the criminal justice system. Emphasizes the understanding of criminal behavior from a sociological and psychological perspective.

ECON 102 Prin of Microeconomics **3 Credits**

Study of the causes and effects of individuals' choices among alternative uses of scarce resources. Topics include supply and demand analysis, price determination, theories of various market structures, competition and coordination, labor, the role of profit and interest, and government involvement in the economy.

ECON 103 Principles of Macroeconomics **3 Credits**

Basic price and quantity relationships, study of monetary systems and policy, inflation, production and growth, recession, unemployment, fiscal policy, supply and demand perspectives, international exchange, and governmental-market relationships.

GEOG 106 Intro to Cultural Geography **3 Credits**

Analyze the culture regions of the world including physical settings and cultural patterns including language, settlements, socioeconomic patterns, and historical patterns.

HMS 200 Ethics in Human Services **3 Credits**

Real life applications for personal and professional boundaries, beliefs, ethics, values, morals, and codes of conduct in human relationships using ethical decision-making, problem-solving, and critical-thinking activities are emphasized. This course may be repeated up to three times for continuing education credit. (Check with individual licensing boards prior to registering).

PSY 101 Gen Psychology **3 Credits**

Survey of the discipline introducing psychological theories, research methods, and principles of behavior.

PSY 208 Psy of Human Relations **3 Credits**

Explores the relationships between human beings and assists in the development of interpersonal communication skills which can be used personally and professionally.

SOC 101 Prin of Sociology **3 Credits**

Sociological principles underlying the development, structure, and function of culture including society, human groups, personality formation, and social change.

Humanities (one course required)

ART 160 Art Appreciation **3 Credits**
Introduction to the visual arts, illustrating the place of art in its social and cultural setting.

ENG 203 Intro to Literary Study **3 Credits**
Introduction to the elements of fiction, poetry, and drama used in the analysis of literature.

ENG 223 Themes of Literature **3 Credits**
Themes and ideas significant in literature.

FIS 100 Introduction to Film **3 Credits**
Introduction to the historical development of film as art. Considers the development of cinematic techniques (i.e., cinematography, editing, sound, etc.), cinematic genres (i.e., the western, romantic comedy, etc.) and narrative elements (i.e., plot, character, conflict, etc.) as exemplified by the work of major American and international directors.

FREN 111 First Year French I **3-4 Credits**
Development of language skills through practice in listening, speaking, reading, writing, and structural analysis. Language practice required.

FREN 112 First Year French II **3-4 Credits**
A continuation of FREN 111. Language practice required.

HIST 208 World History I **3 Credits**
Survey of world civilizations to 1600. Examines societies, cultures, and issues relative to Africa, the Americas, Asia, Europe, the Middle East and Oceania.

HIST 209 World History II **3 Credits**
Survey of world civilizations since 1600. Examines historical societies, cultures, and issues relative to Africa, the Americas, Asia, Europe, the Middle East, and Oceania.

HUM 101 Intro to Humanities I **3 Credits**
An introduction to humanities through a study of seven major arts including film, drama, music, literature, painting, sculpture, and architecture. Each of these arts is considered from the perspective of historical development, the elements used in creating works of art, meaning and form, and criticism and critical evaluation.

HUM 210 Communicating Diversity **3 Credits**
Communicating Diversity is a lower division course designed to familiarize students with the fundamentals of diversity and how those are expressed through communication. Students will develop a deep understanding of the way in which we communicate race, gender, class, sexual orientation, nationality, religion, and physical/mental ability and how it impacts our daily lives. This course will take an intersectional approach to understanding diversity and seek communication strategies for inclusivity. Emphasis will be placed on defining and developing the critical thinking skills necessary to push past oppression,

marginalization, and other issues centralized around diverse populations. Students will be encouraged to investigate and discover diversity issues, solutions, and concepts at the local and global level using case studies, current events, and other significant moments in history.

MUS 121 Music Appreciation **3 Credits**
The historical and cultural background of music and origins to the twentieth century.

PHIL 101 Intro to Philosophy **3 Credits**
Basic problems in different areas of philosophy such as ethics, political theory, metaphysics, and epistemology.

PHIL 102 Critical Thinking **3 Credits**
Covers non-symbolic introduction to logical thinking in everyday life, law, politics, science, advertising; common fallacies; and the uses of language, including techniques of persuasion.

PHIL 135 Introduction to Ethics **3 Credits**
Introduction to Ethics: critical introduction to classical and modern ethical theories such as utilitarianism, deontology, and virtue ethics. Emphasis throughout on applying the theories in various contexts such as social, political, or interpersonal. The ultimate goal will be to allow students to clarify their own thinking and positions on important ethical issues confronting society today.

SPAN 111 First Year Spanish I **3 Credits**
Development of language skills through practice in listening, speaking, reading, writing, and structural analysis. Language practice required.

SPAN 112 First Yr Spanish II **3 Credits**
A continuation of SPAN 111. Language practice required.

SPAN 211 Second Year Spanish I **3 Credits**
Considers structural review, conversation and writing, and readings in modern literature.

Technological Proficiency

GIS 109 Intro Geogrphc Info Syst **3 Credits**

An introduction to Geographic Information Systems (GIS) covering the basic concepts. Principles of cartography and spatial analysis are presented. The intent is to prepare the student for advanced training using specific GIS software.

Foundations

Mathematics

MATH 181 Calculus I **4 Credits**
The fundamental concepts of analytic geometry and calculus functions, graphs, limits, derivatives, integrals, and certain applications. It is recommended that students have completed prerequisites within two years of enrolling in this course.

Science (one course required)

BIOL 190 Intro Cell/Molecular Biology **4 Credits**

Structure and function of cells. Major molecules of life; composition and physiology of cellular organelles; cell metabolism, reproduction, motility, and gene function of both plant and animal cells. Required for biology majors. Concurrent enrollment in a corresponding lab section is required for this course.

BIOL 191 Intro Organismal Biology **4 Credits**

The study of the evolution, ecology, and diversity of life, both past and present. Required for biology majors, but will partially satisfy the science requirement for all associate's degrees. Concurrent enrollment in a corresponding lab section is required for this course.

BIOL 223 Human Anatomy & Physiology I **4 Credits**

The morphology and physiology of cells, tissues, and the integumentary, skeletal, muscular, and nervous systems in a laboratory and lecture class. Designed for all life science majors but specifically for students in allied health programs. Concurrent enrollment in a corresponding lab section is required for this course.

BIOL 224 Anatomy & Physiology II **4 Credits**

A continuation of Biology 223 with consideration of the circulatory, respiratory, digestive, excretory, endocrine, and reproductive systems; increased emphasis on body chemistry. Concurrent enrollment in a corresponding lab section is required for this course.

BIOL 251 General Microbiology **4 Credits**

A laboratory and lecture course emphasizing taxonomy, morphology, physiology, infectious diseases, and ecology of microorganisms in addition to skills in aseptic procedures, isolation, and identification. Open to all life science majors and allied health majors.

CHEM 121 General Chemistry I **4 Credits**

Fundamentals of chemistry including reaction stoichiometry, atomic structure, chemical bonding, molecular structure, states of matter, and thermochemistry.

CHEM 122 General Chemistry II **4 Credits**
Fundamentals of chemistry including solutions, kinetics, equilibria, thermodynamics, electrochemistry, nuclear chemistry, and properties of inorganic and organic compounds. Also, introduction to qualitative analysis.

GEOL 101 Exploring Planet Earth 3-4 Credits

Fundamental principles of geology including tectonic and surficial processes, oceans, atmosphere, environmental applications, and resources. Includes a laboratory component.

GEOL 102 Earth/Life Through Time 4 Credits

The history of the earth and life as they have evolved together through time: plate tectonics, the physical landscape, and the biosphere. Includes laboratory for evaluating rocks, fossils, and the age of events.

PHYS 151 Gen Physics I 4 Credits

Primarily for students in arts and science. Topics include kinematics, energy and momentum conservation, rotational dynamics, thermodynamics, fluids, harmonic motion, and sound. Laboratory experiments illustrate many of these fundamental principles.

PHYS 152 Gen Physics II 4 Credits

A continuation of PHYS 151. Topics include electrostatics, circuits, magnetism, induction, AC circuits, electronics, light optics, special relativity, and an introduction in quantum theory. Lab included.

PHYS 180 Physics Scientist/Engr I 4 Credits

A comprehensive, calculus-based physics course designed for advanced science and engineering students. Consists of intensive word problem solving covering topics of kinematics, vectors, forces, energy, momentum, rotation, angular momentum, equilibrium, elasticity, gravity, fluids, and oscillations. Lab included.

PHYS 181 Physics Scientist/Engr II 4 Credits

A calculus-based investigation of thermodynamic laws, kinetic theory, electric charge, field, potential, current, dielectrics, circuit elements, magnetic fields and materials, electromagnetic oscillations. Lab included.

Program Requirements: Students must provide own laboratory mentor for SUR 280 and SUR 281

CADD 121 CAD for Land Surveyors 3 Credits

The use of computer-aided drafting (CAD) software to create survey plats and topographic maps. The first ten weeks of instruction will focus on learning basic CAD commands. The remaining five weeks will focus on the production of typical survey plats and topographic maps.

SUR 280 Fundamentals Geomatics I 4 Credits

A comprehensive study of angle measurement systems, taping, the traverse, differential leveling, profile leveling, plan and profile sheet, the circular curve, the vertical curve, the USGS 7.5 minute map, and elementary topographic mapping. The application of statistics to surveying, the assumptions underlying surveying on the plane, and reference surfaces are stressed in this course. In the laboratory portion of the course, students will make survey measurements, maintain a field book, and adjust survey data as appropriate. Weekly laboratory reports using the measured data to compute a survey product are required. Lecture+Lab: 3+3. Four semester hours.

SUR 281 Fundamentals Geomatics II 4 Credits

A comprehensive study of the construction and calibration of the modern total station, instrument errors, face positions, survey astronomy, control leveling, calibration of the EDMI, large-scale topographic mapping, and the use of the data collector. In the laboratory portion of this course, students will apply the fundamental principles underlying total station instrument errors, EDMI calibration, astronomic observations for azimuth and large-scale topographic mapping. Weekly laboratory reports using measured data to compute a survey product are required. Lecture+Lab: 3+3. Four semester hours.

SUR 290 Intro Urban Development 4 Credits

An introduction to the process of land development and construction layout. An emphasis is placed on those Nevada State Statutes that define the duties of the Professional Land Surveyor in the subdivision of land. The laboratory portion of the course provides practical exercises involving Topographic Mapping, ALTA/ACSM Title Surveys, Standards of Practice, Elevation Certificates, and Subdivision Design. Lecture+Lab: 3+3. Four semester hours.

Scientific Requirement (one course required): Choose from the courses listed below or any AST, BIOL, CHEM, ENV, GEOL, or PHYS

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NUTR 121 Human Nutrition 3 Credits

An introductory nutrition course for the beginning student. Course will center on the major nutrients and their roles in maintaining good health. Students will learn to recognize well-balanced diets and acquire shopping tips and preparation techniques for optimum utilization of food dollars. Class includes four required labs.

Suggested Course Sequence

1st Semester - Fall

Course	Credits
PSC 101	3
ENG 100 or 101	3-5
Fine Arts*	3
Scientific Reasoning*	3
STAT 152	3
TOTAL	15-17

*Choose with advisor

2nd Semester - Spring

Course	Credits
ENG 102	3
Humanities*	3
GIS 109	3
COM 113	3
Scientific Requirement*	3
TOTAL	15

*Choose with advisor

3rd Semester - Fall

Course	Credits
CADD 121	3
MATH 181	4
Scientific Data Interpretation*	4
SUR 280	4
TOTAL	15

*Choose with advisor

4th Semester - Spring

Course	Credits
Structure of Societies*	3
Foundations: Science	4
SUR 280	4
SUR 290	4
TOTAL	15

*Choose with advisor