

GEOSCIENCES-AS

Program Overview

Associate of Science - Geosciences (Pattern of Study)

Student Learning Outcomes

The geosciences pattern of study is for students planning on transferring to a college or university that offers a bachelor's degree in geology or a related field of science. With careful selection of electives for the AS degree, students may also find opportunities for employment as technicians within the mining industry, environmental consulting firms, or some state and federal agencies. To best prepare for transfer of this degree to a bachelor's program, students should first visit with the geosciences faculty advisor at GBC, then work to create a schedule in coordination with the catalog requirements of the college into which the student wishes to transfer. The proper selection of classes will affect the efficiency of how well the degree will transfer, or how well it will assist in obtaining employment.

Upon completion of the program, students will earn an AS degree and the ability to:

- Describe the fundamental principles of the Geosciences.
- Transfer to a four-year program in the physical or earth sciences or work as a technician in jobs requiring geosciences technicians.

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.

Evidence-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: Choose from the courses listed below or any higher-level math course (MATH 389 excluded)

MATH 126 Precalculus I 3 Credits
A third course in algebra that stresses polynomial, quadratic, rational, exponential, and logarithmic functions, including their graphs and applications; complex numbers; systems of equations; and basic operations with matrices and determinants, including Cramer's rule. It is recommended that students have completed prerequisites within two years of enrolling in this course.

MATH 126E Precalculus I Expanded 3 Credits
Precalculus I Expanded with Co-requisite support: Includes equations, relations, functions, graphing; polynomial, rational, exponential, logarithmic, and circular functions with applications; coordinate geometry of lines and conics; analytic trigonometry; matrices and determinants; and binomial theorem. It is recommended that students have completed prerequisites within two years of enrolling in this course.

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.

MATH 182 Calculus II 4 Credits
A continuation of MATH 181. The course covers transcendental functions, methods of integration, conic sections, infinite sequences and series, and first-order differential equations. It is recommended that students have completed prerequisites within two years of enrolling in this course.

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

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.

Scientific Data Interpretation

CHEM 121 General Chemistry I 4 Credits
Fundamentals of chemistry including reaction stoichiometry, atomic structure, chemical bonding, molecular structure, states of matter, and thermochemistry.

Human Societies and Experience

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.		
American Constitutions and Institutions HIST 101 and HIST 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.		
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 (one course required): Choose from the courses listed below or any higher-level math course (MATH 389 excluded). Minimum 5 total credits required.

MATH 127 Precalculus II 3 Credits
Topics include circular functions, their graphs, and applications; trigonometric identities and equations; conic sections; vectors; sequences and mathematical induction. It is recommended that students have completed prerequisites within two years of enrolling in this course.

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.

Science

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.

Program Requirements

Chemistry Requirement**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.

Physics Requirement (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.

Additional Physics Requirement (one course required)**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 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.

Electives (A minimum of nine credits is 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.

ENGR 100 Intro to Engineering Design**3 Credits**

This course is an overview of engineering practices and provides exposure to the engineers working environment. Introduces engineering design, professional ethics, project planning, prototype fabrication, engineering creativity, and overview of engineering disciplines. Student groups carry out a semester-long design project while learning to be a part of an engineering team.

ENV 100 Humans and the Environment**3 Credits**

Introduction to the relationship of man and his environment. Current thinking and research concerning the impact of industrialization and urbanization on environmental quality, including the population explosion; the potential decline of the affluent society by the depletion of natural resources; the pollution of air, land surface, and water; and the public agencies and policies designed to solve environmental problems.

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.

Suggested Course Sequence**1st Semester - Fall**

Course	Credits
CHEM 121	4
Written Communications*	3-5
GEOL 101	4
Mathematics*	3-4
TOTAL	14-17

2nd Semester - Spring

Course	Credits
CHEM 122	4
ENG 102	3
GEOL 102	4
Foundations: Mathematics*	2-4
Oral Communications*	3
TOTAL	16-18

*Choose with advisor

3rd Semester - Fall

Course	Credits
PHYS 151 or 180	4
Program Elective*	3-4
Humanities*	3
Structure of Societies*	3
GIS 109	3
TOTAL	16-17

*Choose with advisor

4th Semester - Spring

Course	Credits
Fine Arts*	3
PHYS 152 or 181	4
American Constitutions*	3-6
Program Electives*	3-4
Program Electives*	3
TOTAL	16-20

*Choose with advisor