

**GEOG 120 Introduction to Geographic Information Systems and GIS Software (4)**

3 hours lecture - 3 hours laboratory

**Recommended preparation:** GEOG 100 and CSIT 105**Transfer acceptability:** CSU; UC

An introduction to the mapping sciences with a primary focus on Geographic Information Systems (GIS). Covers the trends, history, structure, application, hardware and software, and basic operations of GIS in order to provide a foundation for the use of GIS software. Related geographic technologies to be examined include mapping, aerial and satellite imagery, and Global Positioning Systems (GPS). The lab portion will provide introductory training in the use of ArcGIS software including identifying, evaluating, and inputting spatial data, developing and using raster and vector data sets, converting data from one form to another, and applying programming with GIS software.

**GEOG 125 California Geology and Geography (3)**

3 hours lecture

**Note:** Cross listed as GEOL 125**Transfer acceptability:** CSU; UC

Emphasizes the physical geographic and geologic factors that have combined to form the varied landscapes of California. Climate and vegetation patterns, as well as the various geomorphic processes will be studied.

**GEOG 132 Database Management and Data Acquisition (4)**

4 hours lecture

**Prerequisite:** A minimum grade of 'C' in GEOG 120, or concurrent enrollment in GEOG 120**Transfer acceptability:** CSU

Course provides students with knowledge and practical experience in the fundamentals of database management, and the acquisition, conversion, and creation of spatial data within Geographic Information Systems (GIS). Topics to include strategic design, querying, modeling techniques, data appropriateness and accuracy, hardware and software requirements, conversion of digital data, creating digital data using digitizers, scanners and Global Positioning Systems (GPS), and utilization of remote sensing, photogrammetry, and web-based data. This course provides hands-on experience with database management and data acquisition using ArcGIS software.

**GEOG 134 GIS Applications and Programming (2)**

4 hours lecture/laboratory

**Prerequisite:** A minimum grade of 'C' in GEOG 120**Transfer acceptability:** CSU

Course provides students with advanced knowledge and practical experience in developing Geographic Information Systems (GIS) applications. Students will learn the fundamentals of GIS and database programming, as well as the customization of GIS applications. The lab portion of this course provides hands-on experience with GIS programming using Visual Basic for Applications (VBA), data management using geodatabases, and applications development using ArcObjects.

**GEOG 136 Intermediate ArcGIS: GIS Analysis (2)**

4 hours lecture/laboratory

**Prerequisite:** A minimum grade of 'C' in GEOG 120**Transfer acceptability:** CSU

Course will focus on performing complex operations using the ArcGIS software. Students will gain hands-on experience in advanced querying operations, Spatial Analyst and Network Analyst, coordinate geometry, ArcGIS ModelBuilder, and the application of ArcGIS in a variety of disciplines.

**GEOG 138 GIS Internship (2)**

6 hours laboratory

**Prerequisite:** A minimum grade of 'C' in GEOG 120**Transfer acceptability:** CSU

The Geographic Information Systems (GIS) internship is a directed program allowing students to apply classroom instruction to real-world GIS problem solving by working with a government or private agency. Students will be under the supervision of an instructor from the college and an advisor from the agency while working in one or more aspects of GIS operations.

**GEOG 140 Introduction to Remote Sensing (1)**

1 hour lecture

**Recommended preparation:** Basic familiarity with computers and the windows operating system.**Transfer acceptability:** CSU

Provides students with a basic understanding of remote sensing theory and implementation. Topics include satellite imagery, data acquisition, and image interpretation.

**GEOG 141 Transportation Systems Analysis (1)**

1 hour lecture

**Prerequisite:** A minimum grade of 'C' in GEOG 120**Transfer acceptability:** CSU

Provides students with more advanced practical experience in applying GIS to transportation systems. Students will gain more advanced hands-on experience using GIS as a tool to help model transportation planning, find the shortest routes, and analyze service areas and optimum routing. Introduces students to ESRI's network analyst extension and the various ways this tool can enhance transportation analysis.

**GEOG 142 Environmental Applications of GIS (1)**

1 hour lecture

**Prerequisite:** A minimum grade of 'C' in GEOG 120**Transfer acceptability:** CSU

Provides students with knowledge and practical experience in the application of GIS in an environmental setting. We will explore how location-based GIS tools are used in many areas of environmental management such as natural disasters, biodiversity, water resources, and pollution. Case studies will be used to explore and understand how GIS is being used to help preserve the earth's resources and environment.

**GEOG 143 Introduction to Cartography and Computer Mapping (1)**

1 hour lecture

**Prerequisite:** A minimum grade of 'C' in GEOG 120**Transfer acceptability:** CSU; UC (pending)

Provides the technical and design skills needed to create an effective map using Geographic Information Systems (GIS). Students will receive a review on map projection, coordinate systems, and datum transformation issues. In addition, students will learn about map templates, map annotations, and other tools that are used to enhance spatial data presentation.

**GEOG 195 Regional Field Studies in Geography (1, 2, 3)**

2, 4, or 6 hours lecture/laboratory

**Transfer acceptability:** CSU; UC – Credit determined by UC upon review of course syllabus.

Extended field studies of the geography of selected regions. Emphasis upon field observation and interpretation of climate, meteorology, vegetation, soils, and landforms.

**GEOG 295 Directed Study in Geography (1, 2, 3)**

3, 6, or 9 hours laboratory

**Prerequisite:** Approval of project or research by instructor**Note:** May be taken 4 times for a maximum of six units**Transfer acceptability:** CSU; UC – Credit determined by UC upon review of course syllabus.

Independent study for students who have demonstrated skills and/or proficiencies in geography subjects and have the initiative to work independently on projects or research outside the context of regularly scheduled classes. Students will work under the personal supervision of an instructor.

**Geology (GEOL)**

Contact the Earth, Space, and Aviation Sciences Department for further information.

(760) 744-1150, ext. 2512

Office: NS-110G

**Associate in Arts Degrees -**

AA Degree requirements are listed in Section 6 (green pages).

- Geology

## PROGRAM OF STUDY

## Geology

Provides the student with sufficient background to begin upper division coursework and will prepare the student for entry-level jobs that require basic geologic knowledge. The student is advised to check with the school to which he/she may wish to transfer for additional courses which may be required.

## A.A. DEGREE MAJOR

## Program Requirements

## Group One

|           |  | Units |
|-----------|--|-------|
| GEOL 100  | Basic Geology                          | 3     |
| GEOL 100L | Basic Geology Laboratory               | 1     |
| GEOL 150  | Dinosaurs and Earth History            | 3     |
| GEOL 150L | Dinosaurs and Earth History Laboratory | 1     |
| GEOL 195  | Regional Field Studies in Geology      | 2     |

## Group Two (Select at least two sets of courses listed below)

## Set 1

|              |   |   |
|--------------|---|---|
| MATH 140 and | Calculus/Analytic Geometry, First Course  | 5 |
| MATH 141     | Calculus/Analytic Geometry, Second Course | 4 |

## Set 2

|              |                       |    |
|--------------|-----------------------|----|
| PHYS 120 and |                       |    |
| PHYS 121     | General Physics       | 8  |
| or           |                       |    |
| PHYS 230 and |                       |    |
| PHYS 231     | Principles of Physics | 10 |

## Set 3

|           |                              |   |
|-----------|------------------------------|---|
| CHEM 110  | General Chemistry            | 3 |
| CHEM 110L | General Chemistry Laboratory | 2 |
| CHEM 115  | General Chemistry            | 3 |
| CHEM 115L | General Chemistry Laboratory | 2 |

## Group Three (Select at least 8 units)

|  |   |         |
|--|---|---------|
| Any other courses in Group Two not taken above |   | 8-10    |
| GEOL 110                                       | General Geology: National Parks and Geol/ | 3       |
| GEOG 125                                       | California Geology and Geography          | 3       |
| GEOL 195                                       | Regional Field Studies in Geology         | 1, 2, 3 |
| GEOL 197                                       | Geology Topics                            | 1, 2, 3 |
| GEOL 295                                       | Directed Study in Geology                 | 1, 2, 3 |
| ASTR 100                                       | Principles of Astronomy                   | 3       |
| BIOL 100                                       | General Biology                           | 4       |
| MATH 205                                       | Calculus/Analytic Geometry, Third Course  | 4       |
| MATH 206                                       | Calculus/Differential Equations           | 4       |
| OCN 100  | Oceanography                              | 3       |
| OCN 100L                                       | Oceanography Laboratory                   | 1       |
| PHYS 232                                       | Principles of Physics                     | 4       |

TOTAL UNITS

35 - 38

## COURSE OFFERINGS

## GEOL 100 Basic Geology (3)

3 hours lecture

**Note:** Together with GEOL 150, a prerequisite to upper division courses in Geology**Transfer acceptability:** CSU; UC

Principles of physical geology. Plate tectonics, rocks and minerals, weathering, mass-wasting, surface and ground water, wind, waves and currents, glaciation, mountain building, volcanoes and other igneous activity, deformation and resulting structures, earthquakes, Earth's interior, geologic time, and earth resources.

## GEOL 100L Basic Geology Laboratory (1)

3 hours laboratory

**Prerequisite:** A minimum grade of 'C' in GEOL 100, or concurrent enrollment in GEOL 100**Note:** May be offered as a field laboratory; satisfies lab requirement in Physical Science**Transfer acceptability:** CSU; UC

Laboratory and field identification of rocks and rock forming minerals. Study of geologic processes by means of geologic and topographic maps.

## GEOL 110 General Geology: National Parks and Monuments (3)

3 hours lecture

**Transfer acceptability:** CSU

Geologic history and processes of formation of our natural landscape. Principles of physical and historical geology as revealed in the structure, stratigraphy, and rock types of the parks and monuments.

## GEOL 120 Planets, Moons, and Comets (3)

3 hours lecture

**Note:** Cross listed as ASTR 120**Transfer acceptability:** CSU; UC – ASTR/GEOL 120 and ASTR 205 combined: maximum credit, one course

The astronomy and geology of the solar system, observations, dynamics, relativistic ideas, including theories of formation and evolution. Comparative survey of the atmospheres, surface features, and interiors of planets and satellites. Minor objects, such as comets and asteroids, will be included.

## GEOL 125 California Geology and Geography (3)

3 hours lecture

**Note:** Cross listed as GEOG 125**Transfer acceptability:** CSU; UC

Emphasizes the physical geographic and geologic factors that have combined to form the varied landscapes of California. Climate and vegetation patterns, as well as the various geomorphic processes will be studied.

## GEOL 150 Dinosaurs and Earth History (3)

3 hours lecture

**Prerequisite:** A minimum grade of 'C' in GEOL 100, 110 or 125**Transfer acceptability:** CSU; UC

Principles of historical geology. The origin and evolution of Earth and its biosphere, incorporating plate tectonics, stratigraphy, paleontology, and geologic dating. Together with GEOL 100, a prerequisite to upper division courses in geology.

## GEOL 150L Dinosaurs and Earth History Laboratory (1)

3 hours laboratory

**Prerequisite:** A minimum grade of 'C' in GEOL 150, or concurrent enrollment in GEOL 150**Transfer acceptability:** CSU; UC

Laboratory and field identification of rocks and fossils. Elements of stratigraphic methods and of vertebrate and invertebrate paleontology. Study of geologic and topographic maps in relation to earth history.

## GEOL 195 Regional Field Studies in Geology (1, 2, 3)

2, 4, or 6 hours lecture/laboratory

**Prerequisite:** A minimum grade of 'C' in GEOL 100, 110 or 125 or GEOG 100**Note:** May be taken 4 times with different content for a maximum of 6 units**Transfer acceptability:** CSU; UC – Credit determined by UC upon review of course syllabus.

Extended field studies of the geology of western North America over weekends and during vacation and summer sessions. Emphasis upon field observation and interpretation of rock types, landforms, and structure. Localities visited may vary from year to year.

## GEOL 197 Geology Topics (1-3)

Units awarded in topics courses are dependent upon the number of hours required of the student. Any combination of lecture, laboratory, or lecture/laboratory may be scheduled by the department. Refer to Class Schedule.

**Note:** May be taken 3 times for a maximum of 6 units**Transfer acceptability:** CSU

Topics in Geology. See Class Schedule for specific topic offered. Course title will designate subject covered.

**GEOL 295 Directed Study in Geology (1, 2, 3)**

Arrange 3, 6, or 9 hours laboratory with department chairperson

**Prerequisite:** A minimum grade of 'C' in GEOL 150

**Note:** May be taken 4 times for a maximum of 6 units

**Transfer acceptability:** CSU – UC Credit determined by UC upon review of course syllabus.

Individual study in field, library, or laboratory for interested students.

**German (GERM)**

Contact the World Languages Department for further information.

(760) 744-1150, ext. 2390

Office: F-5

**COURSE OFFERINGS**

For students who have completed foreign language course work at the high school level, and need clarification regarding placement in college level course work, contact the Counseling Center. Universities have varying policies regarding the granting of transfer credit when there is a combination of high school and college level course work.

**GERM 101 German I (5)**

5 hours lecture-1 hour laboratory

**Transfer acceptability:** CSU; UC

This course is the first semester of German. This elementary level course is a study of the German language and German-speaking cultures, with emphasis on the development of communicative skills and basic structures. Course combines in-class instruction and practice with self-paced study in the Foreign Language Laboratory. This beginning-level course is for students with no previous course-work in German.

**GERM 101A German IA (3)**

3 hours lecture

**Note:** Covers the first half of GERM 101; not open to students with credit for GERM 101

**Transfer acceptability:** CSU; UC

German 101A is equivalent to the first half of German 101. This elementary level course is a study of the German language and German-speaking cultures, with emphasis on the development of communicative skills and basic structures. This beginning-level course is for students with no previous coursework in German.

**GERM 101B German IB (3)**

3 hours lecture

**Prerequisite:** A minimum grade of 'C' in GERM 101A or one year of high school German

**Note:** Covers the second half of GERM 101; not open to students with credit for GERM 101

**Transfer acceptability:** CSU; UC

German 101B is equivalent to the second half of German 101, and is a continuation of German 101A. This elementary level course is a study of the German language and German-speaking cultures, with emphasis on the development of communicative skills and basic structures.

**GERM 102 German II (5)**

5 hours lecture-1 hour laboratory

**Prerequisite:** A minimum grade of 'C' in GERM 101 or 101B or two years of high school German

**Transfer acceptability:** CSU; UC

This course is the second semester of German. This elementary level course is a study of the German language and German-speaking cultures, with continued emphasis on the development of communicative skills and basic structures. Course combines in-class instruction with self-paced study in the Foreign Language Laboratory.

**GERM 102A German IIA (3)**

3 hours lecture

**Prerequisite:** A minimum grade of 'C' in GERM 101 or 101B or two years of high school German

**Note:** Covers the first half of GERM 102; not open to students with credit for

**GERM 102**

**Transfer acceptability:** CSU; UC

German 102A is equivalent to the first half of German 102. This elementary level course is a study of the German language and German-speaking cultures, with continued emphasis on the development of communicative skills and basic structures.

**GERM 102B German IIB (3)**

3 hours lecture

**Prerequisite:** A minimum grade of 'C' in GERM 102A or two years of high school German

**Note:** Covers the second half of GERM 102; not open to students with credit for GERM 102

**Transfer acceptability:** CSU; UC

German 102B is equivalent to the second half of German 102, and is a continuation of German 102A. This elementary level course is a study of the German language and German-speaking cultures, with continued emphasis on the development of communicative skills and basic structures.

**GERM 201 German III (5)**

5 hours lecture

**Prerequisite:** A minimum grade of 'C' in GERM 102 or three years of high school German

**Transfer acceptability:** CSU; UC

This course is the third semester of German. This intermediate level course is a study of the German language and German-speaking cultures, focusing on intermediate level structures and readings of culturally relevant authentic materials. Emphasis is on developing oral, listening, reading and writing skills in order to acquire proficiency in German. Class is largely conducted in German.

**GERM 202 German IV (5)**

5 hours lecture

**Prerequisite:** A minimum grade of 'C' in German 201 or four years of high school German

**Transfer acceptability:** CSU; UC

This course is the fourth semester of German. This intermediate level course is a study of the German language and of special topics on the culture of the German-speaking world. Emphasis is on further development of cross-cultural awareness, as well as, the development of oral, listening, reading and writing skills in order to improve communicative competence in German. Class is largely conducted in German.

**Graphic Communications (GC)**

**See also Graphic Communications - Imaging & Publishing, and Graphic Communications - Multimedia & Web**

Contact the Graphic Communications Department for further information.

(760) 744-1150, ext. 2452

Office: GJ-6

For transfer information, consult a Palomar College Counselor.

**COURSE OFFERINGS****GC 100 Graphic Communications (3)**

3 hours lecture

**Transfer acceptability:** CSU

Explores the history and theory of effective mass communication from prehistoric cave art, to invention of the printing press, and modern graphic communication techniques using computers and the Internet. The class examines communication models revolving around imagery, type, delivery systems, and technology. The students will be able to understand and establish the effects of a clear visual message. Learning modules include slideshow, field trips, guest speakers, discussion, lectures and hands-on application with computers and the Internet to promote an understanding of graphic communications and visual messages and their impact on society.

**GC 101 History of Graphic Communications (3)**

3 hours lecture

**Transfer acceptability:** CSU

This course focuses on the history and evolution of graphic communications from