

ENS 487A. Kinesiotherapy Internship – Neurological (1) I, II

Prerequisites: Acceptance in the kinesiotherapy professional program and completion of competency checklist.

Clinical experience in medically supervised exercise programs for individuals with neuromuscular disorders.

ENS 487B. Kinesiotherapy Internship – Geriatric/Extended Care (1)

Prerequisites: Acceptance in the kinesiotherapy professional program and completion of competency checklist.

Clinical experience in extended care facilities, for geriatric population of severely physically disabled populations.

ENS 487C. Kinesiotherapy Internship – Fitness and Wellness (1)

Prerequisites: Acceptance in the kinesiotherapy professional program and completion of competency checklist.

Clinical experience in physical fitness facilities.

ENS 487D. Kinesiotherapy Internship – Psychiatric (1)

Prerequisites: Psychology 350; acceptance in the kinesiotherapy professional program and completion of competency checklist.

Clinical experience in psychiatric care facilities.

ENS 487E. Kinesiotherapy Internship – Cardiac Rehabilitation (1)

Prerequisites: Acceptance in the kinesiotherapy professional program and completion of competency checklist.

Clinical experience in medically supervised exercise programs for the rehabilitation of cardiopulmonary diseases.

ENS 487F. Kinesiotherapy Internship – Orthopedic (1)

Prerequisites: Exercise and Nutritional Sciences 487A and credit or concurrent registration in Exercise and Nutritional Sciences 477, 478.

Clinical experience in medically supervised exercise programs for individuals with orthopedic disorders.

ENS 496. Experimental Topics (1-4)

Selected topics. May be repeated with new content. See Class Schedule for specific content. Limit of nine units of any combination of 296, 496, 596 courses applicable to a bachelor's degree.

ENS 499. Special Study (1-3) I, II

Prerequisite: Consent of department chair. Limited to kinesiology majors. Major Code: 08351.

Individual study. Maximum credit six units.

**UPPER DIVISION COURSE
(Also Acceptable for Advanced Degrees)**

ENS 596. Selected Topics in Exercise and Nutritional Sciences (1-3) I, II

Selected topics in exercise and nutritional sciences. May be repeated with new content and approval of instructor. See Class Schedule for specific content. Limit of nine units of any combination of 296, 496, 596 courses applicable to a bachelor's degree. Maximum credit of six units of 596 applicable to a bachelor's or master's degree. Maximum combined credit of six units of 596 and 696 applicable to a 30-unit master's degree.

**GRADUATE COURSES
Refer to the *Graduate Bulletin*.**

Filipino (FILIP)

*In the Department of Linguistics and
Asian/Middle Eastern Languages
In the College of Arts and Letters*

LOWER DIVISION COURSES

Native speakers of Filipino will not receive credit for taking lower division courses in Filipino except with advance approval from the department.

No credit will be given for Filipino 101, 102, 201 taken out of sequence.

FILIP 101. Elementary Filipino I (4) [GE]

Introduction to Filipino (Tagalog), with emphasis on everyday conversation. Focus on essentials of grammar and sufficient vocabulary for speaking and reading Filipino. Not open to students who have completed three years of high school Filipino unless the third course was completed five or more years ago.

FILIP 102. Elementary Filipino II (4) [GE]

Prerequisite: Filipino 101.

Continuation of Filipino 101 with focus on grammar and oral proficiency. Emphasis on grammatical accuracy by responding orally to spoken and written inquiries. Not open to students who have completed four years of high school Filipino unless the fourth course was completed five or more years ago. Not open to students with credit in Filipino 201.

FILIP 201. Intermediate Filipino (4) [GE]

Prerequisite: Filipino 102.

Extensive review of all structures learned in Filipino 101 and 102. Integrated approach to learning Filipino by offering opportunities to acquire communicative skills while developing awareness and appreciation of the Filipino culture.

Finance (FIN)

In the College of Business Administration

LOWER DIVISION COURSE**FIN 240. Legal Environment of Business (3) I, II**

Business legal system, sources of law, social and ethical influences, judicial and administrative systems, contracts, torts, bankruptcy, agency, business organizations, securities regulation, regulation of property, and protection of intellectual property interests.

**UPPER DIVISION COURSES
(Intended for Undergraduates)**

FIN 300. Personal Finance (3)

Prerequisite: Upper division standing.

Understanding and awareness of financial decisions students will make during their lives, and services and products available to them in implementing these decisions. This course is open to non-business majors.

FIN 321. Managerial Economics (3) I, II

Prerequisite: Approved upper division business major, business minor, or another major approved by the College of Business Administration.

Role of economic analysis in management decisions. Study of demand, cost, supply theories from a business viewpoint. Emphasis on managerial decision making.

FIN 323. Fundamentals of Finance (3) I, II

Prerequisite: Approved upper division business major, business minor, or another major approved by the College of Business Administration. **Proof of completion of prerequisite required:** Change of major form or other evidence of acceptable major code.

Objectives of financial management. Financing the business enterprise. Internal financial management. Introduction to the cost of capital, valuation, dividend policy, leverage, international finance, and the techniques of present value and its applications. Sources of capital.

FIN 325. Intermediate Finance (4) I, II

Prerequisite: Finance 323 with minimum grade of C.

Capital expenditure decision process. Measuring and evaluating benefits and costs. Cost of capital and the evaluation process. Capital rationing problems. Risk and uncertainty in decision process. Agency theory, option pricing, and arbitrage pricing in decision process.

FIN 326. Financial Institutions Management (3) I, II

Prerequisite: Finance 323 with minimum grade of C.

Management of financial institutions including savings and loan associations, mutual savings banks, credit unions, private pension plans, brokerage houses, investment companies, consumer credit institutions, federal credit agencies, and commercial banks. Emphasis on internal financial management of these institutions.

FIN 327. Investments (3) I, II

Prerequisite: Finance 323.

Measures of risk and return. Methods of security analysis, valuation, and capital asset pricing model. Portfolio theory and management; stocks, bonds, options, and futures; hedging; mutual funds and partnerships; and investment taxation.

FIN 328. Entrepreneurial Finance (3) I, II

Prerequisite: Finance 323.

Financial management tools and techniques over the stages of life cycle of a venture: development, start up, rapid growth and maturity. Linkages between market opportunity, competitive position, composition, and sources of financing of the ventures.

FIN 329. International Business Finance (3) I, II

Prerequisite: Finance 323.

Foreign exchange markets and instruments; international financial institutions; trade and balance of payments; exchange rate behavior and currency-risk hedging; cross-border investment; applications to management of international business.

FIN 331. Real Estate Essentials (3) I, II

Prerequisite: Completion of lower division course requirements in business major or minor.

Fundamental operations of the real estate market; principles of real property valuation, financing, law, investment, brokerage, management, and development.

FIN 333. Law of Real Property (3) II

Prerequisite: Finance 331.

Legal theory and practice of estates in land; landlord and tenant relationships; land transactions; mortgages and trust deeds; easements; land use; ownership rights in land; environmental law.

FIN 335. Land Markets and Real Estate Analysis (3) I, II

Prerequisite: Finance 331.

Theory and analysis of land utilization. Location analysis and determinants of land use patterns. Real estate market behavior and economic growth. Basic real estate investment analysis. Public controls and policies affecting land markets.

FIN 421. Portfolio Management and Security Analysis (3)

Prerequisite: Finance 327.

Market efficiency. Risk and utility analysis. Portfolio theory. Security analysis under modern investment theory. Advanced debt management and options techniques. Financial options and futures. Asset allocation and performance evaluation. Limited partnership investment analysis.

FIN 423. Financial Analysis and Management (4) I, II

Prerequisites: Finance 321 and 325. Strongly recommended: Accountancy 326.

Integration of various aspects of finance, application of financial theory. Financial decision making in the firm. Case study.

FIN 425. Business Forecasting (3)

Prerequisite: Finance 323.

Business fluctuations; forecasting, and related problems confronting the business firm; forecasting techniques; specific forecasts. The use of forecasts in the firm.

FIN 427. Derivatives and Financial Risk Management (3)

Prerequisite: Finance 323.

Introduce derivative instruments such as futures, options and swaps, nature of their markets and pricing methods. Applications of those instruments for hedging risks in equities, commodities, and exchange rates.

FIN 431. Real Estate Finance (3) I

Prerequisite: Finance 331.

Methods of financing real estate; sources of funds; governmental financial agencies; feasibility analysis for various types of properties.

FIN 433. Theory of Real Property Value (3) II

Prerequisite: Finance 331.

Introduction to theories of real property value. Techniques of value determination. Data analysis techniques.

FIN 435. Real Estate Investment Analysis (3) I, II

Prerequisites: Finance 335 and Finance 431 or 433.

Theories and methods of investment analysis applied to real estate. Integration of various aspects of real estate from the investors perspective. Use of computer models for investment decision making.

FIN 445. Estate Planning (3)

Prerequisite: Finance 323.

Fundamentals of estate planning, social and family implications of federal/state taxation of transfers of wealth by gift or at death. Study of trusts, conservatorships, guardianship and postmortem planning. How planning is affected by business assets, employee benefits, and insurance.

FIN 496. Selected Topics in Finance (1-4)

Prerequisite: Consent of department chair.

Selected areas of concern in finance. See Class Schedule for specific content. May be repeated with new content with consent of department chair. Limit of nine units of any combination of 296, 496, 596 courses applicable to a bachelor's degree. Maximum credit six units.

FIN 498. Investigation and Report (1-3) I, II

Prerequisites: Senior standing and consent of instructor.

A comprehensive and original study of a problem connected with finance under the direction of one or more members of the finance staff. May be repeated with new content. Maximum credit six units.

FIN 499. Special Study (1-3)

Prerequisite: Consent of instructor.

Individual study. Maximum credit six units.

UPPER DIVISION COURSES
(Also Acceptable for Advanced Degrees)

FIN 522. Individual Insurance Management (3) II

Prerequisites: Undergraduate: Completion of lower division requirements for the major. Graduate: Completion of prerequisite core.

Economic, legal, social, and ethical considerations of individual, business and group insurance including life, health, property, and liability insurance. Risk exposure and policy analysis.

FIN 523. Employee Benefit Planning (2) I

Prerequisites: Undergraduate: Completion of lower division requirements for the major. Graduate: Completion of prerequisite core.

Employee benefit and pension planning, including regulation and taxation issues.

FIN 589. Personal Financial Planning (3) I

Prerequisite: Finance 323.

Financial planning process including data gathering, cash flow and debt considerations, goal programming (including retirement and education funding), integration, plan formulation, and implementation. Practice management considerations including establishment of ethical and legal, client and professional relationships.

GRADUATE COURSES

Refer to the *Graduate Bulletin*.

French (FRENC)

*In the Department of European Studies
In the College of Arts and Letters*

LOWER DIVISION COURSES

Native speakers of French will not receive credit for taking lower division courses except with advance approval from the department.

All lower division courses in French are taught in French.

No credit will be given for lower division courses taken after successfully completing any upper division French course taught in French.

No credit will be given when French 100A, 100B, or the 200 series are taken out of sequence.

FRENC 100A. Elementary French I (5) [GE] I, II

Interactive introduction to speaking, reading, and writing French in a cultural context. Essential language structures for communication at the novice level. Not open to students who have completed three years of high school French unless the third course was completed five or more years ago.

FRENC 100B. Elementary French II (5) [GE] I, II

Prerequisite: French 100A or two years of high school French.

Continuation of French 100A. Not open to students who have completed four years of high school French unless the fourth course was completed five or more years ago.

FRENC 200. Intermediate French in Paris (3) II

Four hours per week in a 12 week period in the Paris Semester.

Development of intermediate level proficiency skills through lecture and work in small groups. Offered only through the Paris Semester study abroad program. This course satisfies the language graduation requirement.

FRENC 201. Readings in French (3) [GE] I, II

Prerequisite: French 100B or three years of high school French.

French majors, minors, and International Business majors are encouraged to enroll concurrently in French 210. Emphasis on reading. See Class Schedule for emphasis offered: Readings in French Culture, Readings in Francophone Culture, or Readings in Business French.

FRENC 210. French Grammar (3) [GE] I, II

Prerequisite: French 100B with a grade of C or better or three years of high school French.

French majors, minors, and International Business majors are encouraged to enroll concurrently in French 201.

Comprehensive survey of French grammar at the intermediate level. Analysis and use of typical French structures.

FRENC 220. Grammar of Spoken French (3) [GE] I, II

Prerequisite: French 210.

French majors, minors, and International Business majors are encouraged to enroll concurrently in French 221.

Analysis of grammar and use of modern French through study of cultural materials, for proficiency in oral communication.

FRENC 221. Writing French (3) [GE] I, II

Prerequisite: French 210 with a grade of C or better.

French majors, minors, and International Business majors are encouraged to enroll concurrently in French 220.

Emphasis on written composition: study of a variety of prose models and practice in writing.

FRENC 296. Experimental Topics (1-4)

Selected topics. May be repeated with new content. See Class Schedule for specific content. Limit of nine units of any combination of 296, 496, 596 courses applicable to a bachelor's degree.

**UPPER DIVISION COURSES
(Intended for Undergraduates)**

All upper division courses in French are taught in French unless otherwise stated.

French 301 is not open to students who hold a French *baccalauréat*. French 301 and 302 may not be taken concurrently or out of sequence.

FRENC 301. Advanced Grammar and Composition (3) [GE] I, II

Prerequisites: Minimum 12 units of 200-level French, to include French 221 with a grade of C or better, and completion of the General Education requirement in Foundations II.C., Humanities. General Education prerequisite not required for French majors.

Advanced grammar and stylistics, intensive writing practice focused on a theme in French culture.

FRENC 302. Translation and Stylistics (3) [GE] I, II

Prerequisites: French 301 with a grade of C or better, and completion of the General Education requirement in Foundations II.C., Humanities. General Education prerequisite not required for French majors.

Comparative stylistics of French and English, taught through translation.

FRENC 304. Phonetics and Oral Proficiency (3) I

Two lectures and two hours of activity.

Prerequisite: Upper division standing in French.

Phonetic theory, listening, intonation and transcription practice, corrective phonetic and intonation exercises. Study of varieties of Francophone oral expression.

FRENC 305A. Survey of French Literature (3) [GE] I

Prerequisites: Twelve units of 200-level French, and completion of the General Education requirement in Foundations II.C., Humanities. General Education prerequisite not required for French majors.

Important movements, authors, and works in French literature from the Middle Ages to the Revolution.

FRENC 305B. Survey of French Literature (3) [GE] II

Prerequisites: Twelve units of 200-level French, and completion of the General Education requirement in Foundations II.C., Humanities. General Education prerequisite not required for French majors.

Important movements, authors, and works in French literature from the Revolution to present.

FRENC 400. Advanced French in Paris (3) II

Prerequisites: Twelve units of 200-level French.

Development of advanced level proficiency skills through writing and speaking. Offered only through the Paris Semester study abroad program.

FRENC 421. French Civilization (3) [GE] I

Prerequisites: Twelve units of 200-level French, and completion of the General Education requirement in Foundations II.C., Humanities. General Education prerequisite not required for French majors.

French civilization from Middle Ages to the present. Artistic, intellectual achievements and cultural movements.

FRENC 422. Contemporary France (3) [GE] II

Prerequisites: Twelve units of 200-level French, and completion of the General Education requirement in Foundations II.C., Humanities. General Education prerequisite not required for French majors.

Contemporary France, emphasizing political, economic and social structures as well as artistic, intellectual, and cultural trends.

FRENC

FRENC 423. Commercial French (3) II

Prerequisite: French 301. **Proof of completion of prerequisite required:** Copy of transcript.

French commercial practices and language, the enterprise, correspondence, advertising, telecommunications, banking, transportation, import-export, insurance, accounting, stock market, preparation for the Certificat offered by the Paris Chamber of Commerce.

FRENC 424. French Cinema and Theory (3) [GE]

Two lectures and two hours of activity.

Prerequisites: Twelve units of lower division French. General Education students must also have completed Foundations II.C. Humanities.

French cinema emphasizing social, political, and cultural changes in modern France. Topics include film theory, the new wave, history in cinema, influence of feminism, French colonialism, race, class, and gender in modern culture. Taught in English.

FRENC 465. Africa in Literature and Film (3) [GE]

(Same course as Africana Studies 465.)

Prerequisite: Completion of the General Education requirement in Foundations II.C., Humanities for nonmajors.

African cultural history through literature and film. Consistency/variety of African cultural expressions and conventions in literature and film. Taught in English.

FRENC 495. French Internship (3) Cr/NC

Prerequisites: Upper division standing in major and consent of instructor.

Practical work experience in a field related to French and Francophone studies. Work done under joint direction of activity sponsor and instructor. Approved international internships may count towards international requirement for major.

FRENC 496. Topics in French Studies (1-4)

Topics in French literature, culture and linguistics. May be repeated with new content. Maximum credit nine units. Limit of nine units of any combination of 296, 496, 596 courses applicable to a bachelor's degree. May be taught in English. See Class Schedule for specific content.

FRENC 499. Special Study (1-3) I, II

Prerequisites: French 302, 305A, 305B.

Individual study. Maximum credit six units. This course is intended only for students who are currently enrolled in or who already have credit for all upper division courses in French available in any given semester.

**UPPER DIVISION COURSES
(Also Acceptable for Advanced Degrees)**

FRENC 501. Translation (3)

Prerequisite: French 302.

Stylistic comparison of French and English through translation of a variety of prose styles from English to French and from French to English.

FRENC 520. French and Francophone Literary Studies (3)

Prerequisites: French 302 and 305A or 305B.

Specialized study of a century, genre, movement or theme in French and Francophone literature. May be repeated with new title and content. See Class Schedule for specific content. Maximum credit six units.

FRENC 530. French and Francophone Cultural Studies (3)

Prerequisites: French 302 and 421 or 422.

Specialized study of artistic and intellectual trends, customs, and politics in French and Francophone culture. May be repeated with new title and content. See Class Schedule for specific content. Maximum credit six units.

FRENC 596. Topics in French Studies (1-4)

Prerequisite: French 302.

Topics in French literature, culture, and linguistics. May be repeated with new content. See Class Schedule for specific content. Limit of nine units of any combination of 296, 496, 596 courses applicable to a bachelor's degree. Maximum credit of nine units of 596. Maximum combined credit of six units of 596 and 696 applicable to a 30-unit master's degree.

**GRADUATE COURSES
Refer to the *Graduate Bulletin*.**

General Mathematics Studies (GMS)
*In the Department of Rhetoric and Writing Studies
In the College of Arts and Letters*

**LOWER DIVISION COURSES
(Non-Baccalaureate Credit)**

General mathematics studies courses numbered below 100 may not be used to satisfy general education or graduation requirements.

GMS 90. Fundamentals of Mathematics (3) Cr/NC/RP I, II, S

Prerequisite: Appropriate score on the CSU Entry-Level Mathematics Examination (ELM), the General Mathematics Studies diagnostic test, or other standardized mathematics examination.

Review of arithmetic and elementary algebra; topics from geometry covered in adjunct workshops (General Mathematics Studies 98A). Students earning "Cr" (credit) should enroll in General Mathematics Studies 91. Students earning "RP" (report in progress) go to specially designated sections of General Mathematics Studies 91. Students earning "NC" (no credit) should repeat General Mathematics Studies 90. May be repeated with consent of instructor. Maximum credit six units. General Mathematics Studies 90 (formerly numbered General Mathematics Studies 90A) is equivalent to General Mathematics Studies 99A.

***GMS 91. Intermediate Algebra (3) Cr/NC I, II, S**

Prerequisites: Credit in General Mathematics Studies 90 or 99A or appropriate score on the ELM.

A review of intermediate algebra skills. Topics include polynomials, rational and radical expressions, complex numbers, linear and quadratic equations (and graphs), systems of equations, set and function notation, conic sections, exponential and logarithmic functions, and sequences and series. Credit in General Mathematics Studies 91 satisfies the Mathematics Placement Examination, Part IA and Entry Level Mathematics Examination requirements.

GMS 98. Mini-Course: Selected Topics (1) Cr/NC

Assorted short courses which will cover a variety of general mathematics skills through intensive lectures and laboratory work.

Suggested topics: Communication skills, research tools, and learning skills. See Class Schedule for specific content. Credit earned in courses from this series is not applicable to a bachelor's degree.

- A. Learning Skills
- B. Communication Skills

GMS 99A. Fundamentals of Mathematics (4) Cr/NC/RP I, II

Three lectures and one hour of activity.

Prerequisite: Appropriate score on the CSU Entry-Level Mathematics Examination (ELM), the General Mathematics Studies diagnostic test, or other standardized mathematics examination and freshman class standing.

Review of arithmetic and elementary algebra; topics from geometry covered in adjunct workshops (General Mathematics Studies 98A). Students attend mandatory weekly reinforcement workshops one hour each week in mathematics laboratory. Students earning credit in General Mathematics Studies 99A enroll in General Mathematics Studies 99C the next semester, students earning an "RP" (report in progress) enroll in General Mathematics Studies 99C or specially designated sections of General Mathematics Studies 91, and students earning "NC" (no credit) enroll in General Mathematics Studies 90 or 99A in their next semester. General Mathematics Studies 99A is equivalent to General Mathematics Studies 90.

***GMS 99C. Intermediate Algebra (4) Cr/NC**

Three lectures and one hour of activity.

Prerequisite: Grade of "Cr" (credit) in General Mathematics Studies 99A or appropriate score on ELM or General Mathematics Studies diagnostic test and freshman class standing.

For freshmen who have attained "Cr" (credit) in General Mathematics Studies 99A or whose ELM or diagnostic score indicates that this is the appropriate level for them, but who have not yet satisfied the CSU-Entry Level Mathematics Examination (ELM) requirement. Course content is identical to General Mathematics Studies 91, but General Mathematics Studies 99C class sessions will be augmented by one mandatory hour of reinforcement laboratory work each week. A "credit" in General Mathematics Studies 99C satisfies ELM and SDSU Mathematics Placement Examination, Part IA.

* The ELM requirement is satisfied by this course **only if** the student has already attempted and failed the ELM.

General Studies (GEN S)

LOWER DIVISION COURSES

GEN S 100. University Seminar (1) Cr/NC

Prerequisite: Open only to freshmen.

Provides opportunities to interact with faculty and staff in a small group setting. Students acquire study and interpersonal skills for academic and personal success. Special sessions are offered featuring campus resources including library, advising, career, health and wellness services.

- A. University Seminar
- B. Learning in Communities
- C. Living/Learning Community

GEN S 200. Professional Experience and Community Service (1-3) Cr/NC

Prerequisites: Twelve units of college credit, minimum grade point average of 2.0, concurrent participation in professional or community service activity, and approval of course contract.

Academic work designed with faculty approval to complement concurrent paid or unpaid professional or community service experience. Information and course contract forms available in Division of Undergraduate Studies, AD-101. Applications must be submitted to the division prior to the end of the first week of classes. May be used to satisfy major or minor requirements only upon written approval of department chair. No combination of General Studies 200 and 400 in excess of six units may be counted for credit toward a bachelor's degree.

GEN S 250. Interdisciplinary Topics (1-4)

Interdisciplinary selected topics course. To enroll contact the faculty adviser of the department offering the course. May be repeated with new content. Maximum credit four units.

GEN S 260A-260B-260C. Composing Identities (3-3-3) [GE]

Prerequisite for 260A: Satisfaction of the SDSU writing competency requirement. (See Graduation Requirements section of catalog.) **Proof of completion of prerequisites required:** Copy of EPT or competency scores or verification of exemption; proof of credit (Cr) in Rhetoric and Writing Studies 92A or 92B or 97.

Interdisciplinary course that explores the rich complexity of human identity in diverse cultures. Nine-unit package taught by three faculty members, emphasizes discussion seminars and active learning, including a community-based service learning project. See Class Schedule for specific content. General Studies 260A not open to students with credit in Africana Studies 120, Chicana and Chicano Studies 111B, English 100, Linguistics 100, Rhetoric and Writing Studies 100, 101, or higher-numbered composition course. (General Studies 260A formerly numbered General Studies 250A entitled Composing Identities: Writing. General Studies 260B formerly numbered General Studies 250B entitled Composing Identities: Humanities. General Studies 260C formerly numbered General Studies 250C entitled Composing Identities: Social and Behavioral Sciences.)

GEN S 260D-260E-260F. Imagining Communities (3-3-3) [GE]

Prerequisite for 260D: Satisfaction of the SDSU writing competency requirement and General Studies 260A or Africana Studies 120 or Chicana and Chicano Studies 111B or English 100 or Linguistics 100 or Rhetoric and Writing Studies 100 or 101.

Interdisciplinary exploration of diverse human communities as they are imagined, expressed, and transformed. Nine-unit package taught by three faculty members, emphasizes discussion seminars and active learning, including a community-based service learning project. See Class Schedule for specific content. General Studies 260D not open to students with credit in Africana Studies 200, Chicana and Chicano Studies 200, English 200, Linguistics 200, or Rhetoric and Writing Studies 200. (General Studies 260D formerly numbered General Studies 250D entitled Imagining Communities: Writing. General Studies 260E formerly numbered General Studies 250E entitled Imagining Communities: Humanities. General Studies 260F formerly numbered General Studies 250F entitled Imagining Communities: Social and Behavioral Sciences.)

GEN S 275. Honors Special Study (1)

For further information contact the Division of Undergraduate Studies.

Prerequisite: Admission to the University Honors Program.

Special study associated with a lower division course offered as an honors section, and serving as an extension of the course. Maximum credit six units.

UPPER DIVISION COURSES (Intended for Undergraduates)

GEN S 321. Gay and Lesbian Identities in the Modern World (3) [GE]

Prerequisite: Completion of the General Education requirement in Foundations II.B., Social and Behavioral Sciences.

Interdisciplinary field of lesbian and gay studies with attention to social and political institutions and development of personal identity. Topics include discrimination, internalized homophobia, political activism, and diversity within lesbian, gay, bi-sexual, and transgendered community.

GEN S 322. Gay and Lesbian History and Culture (3) [GE]

Prerequisite: Completion of the General Education requirement in Foundations II.B., Social and Behavioral Sciences.

Interdisciplinary field of lesbian and gay studies with attention to history and artistic expression. Topics include varying attitudes toward homosexuality in history, as well as literary, artistic, theatrical, and musical contributions of the lesbian, gay, bi-sexual, and transgendered community.

GEN S 330. Plagues Through the Ages (3) [GE]

Prerequisite: Completion of the General Education requirement in Foundations II.B., Social and Behavioral Sciences.

Political, economic, religious, and cultural effects of disease. Significant role epidemics and disease have played in development of civilizations from beginning of recorded history to present.

GEN S 340. Confronting AIDS (3) [GE]

Prerequisite: Completion of the General Education requirement in Foundations II.A. Natural Sciences and Quantitative Reasoning, II.B. Social and Behavioral Sciences, and II.C. Humanities.

Examines the AIDS epidemic from historical, epidemiological, biological, medical, psychological, political, legal, and ethical perspectives.

GEN S 350. Interdisciplinary Topics (1-4)

Interdisciplinary selected topics course. To enroll contact the faculty adviser of the department offering the course. May be repeated with new content. Maximum credit four units.

GEN S 400. Professional Experience and Community Service (1-3) Cr/NC

Prerequisites: Upper division standing, minimum grade point average of 2.0, concurrent participation in professional or community service activity and approval of course contract. Completion of prerequisites required.

Academic work designed with faculty approval to complement concurrent paid or unpaid professional or community service experience. Information and course forms available in Division of Undergraduate Studies, AD-101. Applications must be submitted to the division prior to the end of the first week of classes. May be used to satisfy major or minor requirements only upon written approval of department chair. No combination of General Studies 200 and 400 in excess of six units may be counted for credit toward a bachelor's degree.

GEN S 410. Civilization Through Travel-Study (2-3)

Prerequisite: Upper division standing.

Civilization through faculty-supervised foreign travel-study. Requires lecture attendance, excursions and site visits, examinations and written reports.

GEN S 420. Disability and Society (3) [GE] I, II

Prerequisites: Psychology 101, Sociology 101, or Anthropology 101, and completion of the General Education requirement in Foundations II.B., Social and Behavioral Sciences.

Range of human experience of individuals with disabilities: attitudes toward individuals and interrelationship between societal institutions and needs of people with disabilities; historical response to these needs and contemporary issues with particular emphasis on normalization, integration, and community living.

GEN S 450. Life and Culture Semester Abroad (3) [GE]

Prerequisites: Upper division standing and completion of the General Education requirement in Foundations II.C., Humanities.

Life and culture of a foreign country through an approved "semester abroad" program sponsored by an academic department or program at SDSU. Requires lecture attendance, excursions and site visits, examinations and written reports. See Class Schedule for geographic location.

GEOG 102. Principles of Cultural Geography (3) [GE] I, II

Introduction to cultural geography, covering the elements of culture, such as technology, language, religion, political organization, methods of livelihood, settlement patterns and population, and the regional distribution of these elements over the earth. Field trips may be arranged.

GEOG 103. Weather and Climate (3) [GE] I, II

Note: Cannot be used for General Education in combination with Anthropology 101.

The composition, structure, and circulation of the atmosphere, including elementary theory of storms and other weather disturbances.

GEOG 104. Geographic Information Science and Spatial Reasoning (3) [GE]

Prerequisite: Satisfaction of the Entry-Level Mathematics requirement.

Fundamental concepts in geographic information systems, cartography, remote sensing, spatial statistics, and global positioning systems. Use of critical technologies in addressing human and environmental problems.

GEOG 106. World Regional Geography (3) [GE] I, II

Cultural and world geography, focusing on elements of culture as applied to regions of the world: ethnicity, language, religion, urbanization, economics, political organization. Alternative conceptions about geography held by children, adults, and individuals of different cultures.

GEOG 296. Experimental Topics (1-4)

Selected topics. May be repeated with new context. See Class Schedule for specific content. Limit of nine units of any combination of 296, 496, 596 courses applicable to a bachelor's degree.

**UPPER DIVISION COURSES
(Intended for Undergraduates)**

GEOG 312. Culture Worlds (3) [GE] I, II

Prerequisite: Completion of the General Education requirement in Foundations II.B., Social and Behavioral Sciences required for non-majors.

Geographical characteristics and development of major cultural realms of the world. Spatial components of contemporary conflict within and between these regions. Not open to students with credit in Geography 106.

GEOG 321. United States (3) [GE] I, II

Prerequisite: Completion of the General Education requirement in Foundations II.B., Social and Behavioral Sciences required for non-majors. Recommended: Geography 101 or 102.

Systematic and regional analysis of physical and cultural landscapes of the United States.

GEOG 323. Middle America (3) [GE] I, II

Prerequisite: Completion of the General Education requirement in Foundations II.B., Social and Behavioral Sciences required for non-majors. Recommended: Geography 101 or 102.

The land and peoples of Mexico, Central America, and the islands of the Caribbean; a survey of the resources, economies, and trade of the region. Field trips may be arranged.

GEOG 324. South America (3) [GE]

Prerequisite: Completion of the General Education requirement in Foundations II.B., Social and Behavioral Sciences required for non-majors. Recommended: Geography 101 or 102.

The physical regions and human geography of South America, including the history of colonization and the exploitation of resources.

GEOG 336. Europe (3) [GE]

Prerequisite: Completion of the General Education requirement in Foundations II.B., Social and Behavioral Sciences required for non-majors. Recommended: Geography 101 or 102.

Systematic analysis of the geographic bases of modern European life. Regional investigation of countries of Europe except the Soviet Union.

Geography (GEOG)

In the College of Arts and Letters

LOWER DIVISION COURSES

GEOG 101. Principles of Physical Geography (3) [GE] I, II

Note: Cannot be used for General Education in combination with Anthropology 101.

Principles underlying the fundamental nature and dynamics of the physical world: the atmosphere, hydrosphere, biosphere, lithosphere, and their systematic spatial relationships.

GEOG 101L. Physical Geography Laboratory (1) [GE] I, II

Three hours of laboratory.

Prerequisite: Credit or concurrent registration in Geography 101.

Practical exercise and observation in map analysis, weather elements, climatic regions, and the earth's landform features. Designed to supplement Geography 101.

GEOG 353. Location of Economic Activity (3)

Prerequisite recommended: Geography 101 or 102.

International arrangement and interrelationship of resources, production, exchange and consumption; principles and theory in industrial location; world trade and economic development selecting favorable locations for capital investments, determining growth potential of service and market areas, meeting environmental impact requirements.

GEOG 354. Geography of Cities (3) [GE] I, II

Prerequisite: Completion of the General Education requirement in Foundations II.B., Social and Behavioral Sciences required for non-majors. Recommended: Geography 101 or 102.

Survey of the location, function and spread of cities; the spatial and functional arrangement of activities in cities, leading to an analysis of current urban problems: sprawl, city decline, metropolitan transportation. Field trips may be arranged.

GEOG 370. Environmental and Natural Resource Conservation (3) [GE] I, II

Prerequisites: Geography 101 or 102; and completion of the General Education requirement in Foundations II.B., Social and Behavioral Sciences required for nonmajors.

Quality of environmental and natural resources within changing human and natural systems: pollution problems; preservation of open space, habitats, and wilderness; and conservation of natural resources.

GEOG 378. Environmental Geomorphology (3)

Prerequisites: Geography 101 and Mathematics 121 or 150.

Introduction to environmental physiographic dynamics. Assessment of man's role in these dynamics and their effect on urban and rural land use, including such topics as induced erosion, landslides, and flooding.

GEOG 380. Map Investigation (3) I, II

Two lectures and three hours of laboratory.

Prerequisite: Geography 101 or 102.

Use of the map as an analytical tool in geography. History of developments in cartography.

GEOG 381. Computerized Map Design (3) I, II

Two lectures and three hours of laboratory.

Prerequisite: Geography 101 or 102.

Art and science of creating digital maps as media for describing and analyzing geographic phenomena. Computer laboratory instruction and practice in cartographic techniques with emphasis on thematic maps and geographic information systems.

GEOG 385. Spatial Data Analysis (3) I, II

Prerequisites: Geography 101 or 102; Statistics 250 or comparable course in statistics.

Analysis of spatially distributed data including computer applications. Spatial sampling, descriptive statistics for areal data, inferential statistics, use of maps in data analysis.

GEOG 401. Geomorphology (3)

Prerequisite: Geography 101.

Morphology and genetic interpretation of the relief features of the earth's surface.

GEOG 409. Global Climate Change (3)

Prerequisite: Geography 101 or 103.

Global climate system and feedbacks with biosphere. Past climates and potential future changes, including changes in greenhouse gases, ozone depletion and acid rain. Predictions and uncertainty regarding changes including natural and anthropogenic causes.

GEOG 483. Watershed Analysis (3)

Prerequisite: Geography 101.

Watershed analysis is an organizing framework for collecting and analyzing scientific information to facilitate environmental management. Framework examined from both an ecological process and an environmental management perspective.

GEOG 484. Geographic Information Systems (3) I, II

Two lectures and three hours of laboratory.

Prerequisite: Three units from Geography 380, 381, 587, or from computer programming.

Procedures for encoding, storage, management, and display of spatial data; theory of computer-assisted map analysis; examination of important geographic information systems.

GEOG 495. Geography Capstone (1) Cr/NC

Prerequisite: Senior standing in geography (or environmental sciences with an emphasis in watershed science) with the expectation of graduating during the academic year in which the course is taken.

Synthesis of knowledge gained by students in upper division geography courses at SDSU, based on in-class essays and creation of a portfolio outlining learning experiences in geography. Practical information to prepare for professional employment.

GEOG 496. Selected Studies in Geography (3)

Prerequisite: Six units in geography.

Critical analysis of problems within a specific field of the discipline. May be repeated with new content. See Class Schedule for specific content. Limit of nine units of any combination of 296, 496, 596 courses applicable to a bachelor's degree. Maximum credit six units. Field trips may be arranged.

GEOG 498. Senior Thesis (3)

Prerequisite: An overall grade point average of 3.0 and consent of department.

A written thesis based on an individual research project.

GEOG 499. Special Study (1-3) I, II

Individual study. Maximum credit six units.

**UPPER DIVISION COURSES
(Also Acceptable for Advanced Degrees)**

GEOG 504. Coastal and Submarine Geomorphology (3)

Prerequisites: Geography 101 and Mathematics 121 or 150.

Analysis of marine waves, of their modification in shallow waters, of coastal currents and tides. Interpretation of coastal and submarine relief in relation to environmental processes and their modification by humans. Field trips may be arranged.

GEOG 505. Fluvial Geomorphology (3)

Prerequisite: Geography 401.

Physical foundation of river systems. Geographic variability in river channels and influence of human activities on fluvial forms and processes. Role of fluvial geomorphology in river and watershed management. Field trips may be arranged.

GEOG 507. Geography of Natural Vegetation (3) I

Prerequisite: Geography 101.

The natural vegetation associations of the world, their distribution, classification and development, including relationship to human activities. Field trips may be arranged.

GEOG 508. Environmental Climatology (3)

Prerequisites: Geography 103; Mathematics 121 or 150.

Interaction between the atmosphere and earth surface. Solar and thermal radiation, turbulent heat transfer, soil heat transfer. Change in the atmosphere due to natural variations and human activity. Impacts on the environment.

GEOG 509. Regional Climatology (3)

Prerequisite: Geography 103.

The causes of climatic types as they occur throughout the world. Principles of several climatic classifications.

GEOG 511. Hydrology and Global Environmental Change (3)

Prerequisites: Geography 101 or 103.

Hydrologic processes and regimes, how these are affected by environmental change and how hydrologic process and regimes affect patterns of environmental change. Processes operating at global, regional, and local scales are examined, including land-use/land-cover change and climate change.

GEOG 554. World Cities: Comparative Approaches to Urbanization (3) II

Prerequisite: Geography 354.

Worldwide trends in urbanization. Case studies of selected cities from various culture areas with focus on international variations in city structure and urban problems.

GEOG 556. Location and Spatial Structure of Cities (3)

Prerequisite: Geography 354 or three units of upper division coursework in a related field.

Principles and characteristics of urban growth and settlement; the internal structure and functioning of urban centers; spatial models of urban land use; growth management, transportation problems, and sociopolitical urban problems. Field trips may be arranged.

GEOG 559. Urban Transportation Geography (3)

Prerequisite: Three units of upper division urban or transportation coursework in geography or related field.

Urban transportation networks and their effects, past, present and future, on the economy and physical structure of the urban region. Field trips may be arranged.

GEOG 570. Environmental Resource Conservation (3)

Prerequisite: Geography 370.

Management of environmental and natural resources. Effective programs and the institutional frameworks in which they occur.

GEOG 572. Land Use Analysis (3) I

Prerequisite: Geography 370.

Problems of maintaining environmental quality in the process of land conversion from rural to urban uses with emphasis on land capability and suitability studies. Field trips may be arranged.

GEOG 573. Population and the Environment (3)

Prerequisite: Geography 102.

Population distribution, growth, and characteristics as they relate to environmental degradation, both as causes and consequences. Roles of women, sustainable development, carrying capacity, optimum population, and policy initiatives in relationships between population and environment.

GEOG 574. Water Resources (3)

Prerequisite: Geography 370.

Occurrence and utilization of water resources and the problems of water resource development. Field trips may be arranged.

GEOG 575. Geography of Recreational Land Use (3) II

Prerequisite: Geography 101 or 102.

Importance of location and environment in the use, management, and quality of recreation areas. Field trips are required.

GEOG 581. Cartographic Design (3)

Two lectures and three hours of laboratory.

Prerequisite: Geography 381.

Computer-assisted map production techniques with emphasis on map design and color use.

GEOG 583. Internet Mapping and Distributed GIServices (3)

Two lectures and three hours of laboratory.

Prerequisite: Geography 381 or 484.

Current development of Internet mapping and cartographic skills for web-based maps (multimedia, animation, and interactive design). Fundamental theories of distributed GIS to support Internet mapping with focus on distributed component technologies, Internet map servers and web services. Not open to students with credit in Geography 582.

GEOG 584. Geographic Information Systems Applications (3)

Two lectures and three hours of laboratory.

Prerequisite: Geography 484 or 587.

Conceptualization, completion, and implementation of geographic information systems (GIS) at local, regional, national, and global levels. Spatial analysis and modeling with GIS. GIS in planning, management, and research.

GEOG 585. Quantitative Methods in Geographic Research (3)

Prerequisite: Geography 385.

Application of statistical techniques to geographic research including simple regression and correlation, multiple regression, classification, factor analysis, and computer applications.

GEOG 586. Qualitative Methods in Geographic Research (3) II

Prerequisite: Geography 102.

Application of qualitative techniques to geographic research including reflexive survey design and in-depth interviews, non-obtrusive methods, landscape interpretation, textual methods and discourse analysis, feminist criticism, and humanistic and historical materialist perspectives on measurement.

GEOG 587. Remote Sensing of Environment (4) I

Three lectures and three hours of laboratory.

Prerequisite: Geography 101. Recommended: Physics 180A-180B.

Techniques for acquiring and interpreting remotely sensed data of environment. Electromagnetic radiation processes, aerial photographic systems, and human interpretation of aerial and satellite imagery. Geographic analysis of selected terrestrial, oceanographic, and atmospheric processes and resources. (Formerly numbered Geography 488.)

GEOG 588. Intermediate Remote Sensing of Environment (4) II

Three lectures and three hours of laboratory.

Prerequisites: Geography 385 and 587.

Multispectral remote sensor systems and interpretation of imagery from nonphotographic systems. Computer-assisted image processing. Geographic analysis of selected terrestrial, oceanographic, and atmospheric processes.

GEOG 589. GIS-Based Decision Support Methods (3)

Prerequisite: Geography 484.

Integration of Geographic Information Systems (GIS) with decision support techniques for problem-solving and decision-making. Public participation and collaborative use of GIS for location-based planning and resource management.

GEOG 595. Geographic Internship (3) I, II

Prerequisites: Six upper division units in geography and consent of instructor.

Students will be assigned to various government agencies and industry and will work under the joint supervision of agency heads and the course instructor. Maximum credit three units.

GEOG 596. Advanced Topics in Geography (1-3)

Prerequisite: Six upper division units in geography.

Advanced special topics in geography. See Class Schedule for specific content. Limit of nine units of any combination of 296, 496, 596 courses applicable to a bachelor's degree. Maximum combined credit of six units of 596 and 696 applicable to a 30-unit master's degree.

GRADUATE COURSES

Refer to the *Graduate Bulletin*.

Geological Sciences (GEOL)

In the College of Sciences

LOWER DIVISION COURSES**GEOL 100. Planet Earth (3) [GE] I, II**

(Selected sections offered as distance education.)

Earth's global systems. Plate tectonics, earthquakes, and volcanoes; evolution of our planet and life through geologic time; economic resources including fossil fuels and precious minerals; agents of erosion that shape the land.

GEOL 101. Dynamics of the Earth Laboratory (1) [GE] I, II

Three hours of laboratory.

Prerequisite: Credit or concurrent registration in Geological Sciences 100.

Hands-on experience with land forms, rocks, minerals, topographic maps, and aerial photographs. Includes demonstrations and field trips. Designed to accompany and augment Geological Sciences 100.

GEOL 104. Earth Science (3) [GE]

Earth's four principal reservoirs and their interconnectedness: solid earth, ocean, atmosphere, and biosphere. How humanity affects and is affected by these reservoirs. Most appropriate for liberal studies majors.

GEOL 200. Geologic Inquiry and Problem Solving (3) I

Two lectures and three hours of laboratory

Scientific thought process using real problems addressed by student research in field and laboratory. Includes written report and oral presentation.

GEOL 205. Historical Geology (4) I

Three lectures and three hours of laboratory. Arrangement for field study during the semester.

Prerequisites: Geological Sciences 100 and 101.

Evolutionary history of earth as traced through rock and fossil records. Stratigraphic and depositional concepts. (Formerly numbered Geological Sciences 105.)

GEOL 221. Mineralogy (4) I

Two lectures and six hours of laboratory.

Prerequisites: Credit or concurrent registration in Geological Sciences 200; Oceanography 100 or Geological Sciences 100 and 101 or Geological Sciences 101 and 104; high school chemistry and trigonometry, or credit or concurrent registration in college chemistry and trigonometry.

Practice in determination of common minerals; their geologic environment, utilization, and economic significance. Introduction to optical techniques in mineral identification.

GEOL 296. Experimental Topics (1-4)

Selected topics. May be repeated with new content. See Class Schedule for specific content. Limit of nine units of any combination of 296, 496, 596 courses applicable to a bachelor's degree.

**UPPER DIVISION COURSES
(Intended for Undergraduates)**

GEOL 300. Computer Applications in Geology (3) II

Two lectures and three hours of laboratory.

Programming and applications of software fundamentals to geological sciences. Applications software will include DOS, Windows, and MacIntosh operating systems, word processing, spreadsheets, graphing, contouring, and drawing. Introduction to Internet and overview of geology-specific software.

GEOL 301. Geology of National Parks and Monuments (3) [GE] I, II

(Selected sections offered as distance education.)

Prerequisites: Geological Sciences 100 or completion of the General Education requirement in Foundations II.A., Natural Sciences and Quantitative Reasoning.

Geology of a group of national parks and monuments, selected for their geological significance, scenic beauty, and visitor popularity. Not acceptable for a major in geological sciences.

GEOL 302. Fossils: Life Through Time (3) [GE] I, II

Prerequisite: Completion of the General Education requirement in Foundations II.A., Natural Sciences and Quantitative Reasoning.

Traditional and recently discovered aspects of history of life on earth. Topics from the origin of life to extinctions. Not acceptable for a major in geological sciences.

GEOL 303. Natural Disasters (3) [GE] I, II

Prerequisite: Geological Sciences 100 or completion of the General Education requirement in Foundations II.A., Natural Sciences and Quantitative Reasoning.

Geologic processes that have dramatically affected the human race: earthquakes, volcanoes, landslides, and floods. Not acceptable for a major in geological sciences.

GEOL 304. Planetary Geology (3) [GE]

Prerequisite: Completion of the General Education requirement in Foundations II.A., Natural Sciences and Quantitative Reasoning. Recommended: Geological Sciences 100.

Structure, evolution, and surface features of planets from a geological point of view. Insights gained into origin and evolution of planetary bodies provide greater understanding of how planet earth operates and why it is unique. Not acceptable for a major in geological sciences.

GEOL 305. Water and the Environment (3) [GE]

Prerequisites: Geological Sciences 100 or Geography 101 and completion of the General Education requirement in Foundations II.A., Natural Sciences and Quantitative Reasoning.

Movement of fresh water on earth. Hydrologic cycling of water from precipitation, runoff, infiltration, stream and groundwater flow to the ocean. Problems caused by over-use of water resources, urbanization, and water pollution examined with case studies. Not acceptable for a major in geological sciences, emphasis in hydrogeology.

GEOL 306. Structural Geology and Field Methods (5) I

Two lectures and three hours of laboratory and six weekends in the field.

Prerequisites: Geological Sciences 300, 324; algebra, trigonometry and at least high school physics. Highly recommended: First semester college physics.

Integrates structural and introductory field geology. Principles, causes, and mechanisms of rock deformation combined with field study. Graphical, computer, and analytical techniques for working with folds and faults are applied in the field. Field observations are presented in geologic maps, cross sections, and reports.

GEOL 307. Geophysics and Field Methods (4) II

Two lectures and three hours of laboratory and a minimum of three weekends in field during semester.

Prerequisites: Geological Sciences 306; Mathematics 150; Physics 180A or 195.

Principles and field studies of gravity, magnetic, and seismic techniques applied to structure, dynamics, and shallow environment of the earth. Computer-aided data reduction and interpretation.

GEOL 324. Petrology (4) II

Two lectures and six hours of laboratory.

Prerequisite: Geological Sciences 221.

Composition, classification, occurrence, and origin of igneous, sedimentary, and metamorphic rocks. Identification of rocks in hand specimen; petrographic analysis of rocks in thin section; modeling and interpretation of petrologic data. (Formerly numbered Geological Sciences 224.)

GEOL 412. Processes and Inquiry in the Earth Sciences (4)

Three lectures and two hours of activity.

Prerequisite: Completion of the General Education requirement in Foundations II.A., Natural Sciences and Quantitative Reasoning.

Investigation of processes of inquiry and rational thinking skills characteristic of the earth sciences. (Formerly numbered Natural Science 412D.)

GEOL 496. Selected Topics in Geology (1-4)

Prerequisite: Consent of instructor.

Selected topics in geology and related earth sciences. May be repeated with new content. See Class Schedule for specific content. Limit of nine units of any combination of 296, 496, 596 courses applicable to a bachelor's degree. Maximum credit six units.

GEOL 498A. Senior Seminar (1) Cr/NC I,II

Prerequisite: Senior standing in geological sciences.

Preparation of written and oral scientific reports and attendance at departmental seminars.

GEOL 498B. Senior Thesis (2) I, II

Prerequisite: Consent of instructor.

Individual research project, written thesis, and oral presentation done under supervision of professor chosen by student.

GEOL 499. Special Study (1-4) I, II

Prerequisites: Acceptable grade average in at least 12 upper division units within the major and consent of staff.

Individual study in field, library, laboratory, or museum work. Maximum credit four units.

**UPPER DIVISION COURSES
(Also Acceptable for Advanced Degrees)**

GEOL 501. Geochronology (3)

Two lectures and three hours of laboratory.

Prerequisite: Geological Sciences 324.

Survey of radiometric, chemical, stratigraphic, and paleomagnetic methods used to establish time in relationship to the history of the earth. Basis for correlation of geologic events and estimation of rates and periodicity of geologic processes.

GEOL 502. Geology of North America (3) I

Prerequisite: Geological Sciences 205.

A regional analysis of North American geology, its structural, stratigraphic, and tectonic patterns, and hypotheses concerning their origin and evolution.

GEOL 505. Photogeology and Remote Sensing (3) II

Two lectures and three hours of laboratory.

Prerequisite: Geological Sciences 200.

Geologic interpretation of aerial and satellite photographs, elementary stereoscopy and stereometry applied to structural and stratigraphic problems, and compilation of geologic maps from annotated aerial and satellite photographs.

GEOL 508. Advanced Field Geology (4 or 6)

One lecture and three hours of laboratory plus 28 days in the field. For the option with six units: two additional weeks of field or laboratory work.

Prerequisite: Geological Sciences 306.

Investigation of individually assigned areas, preparation of geologic maps, geologic sections, and gathering other types of data, e.g., petrologic, geophysical, or paleontologic, as appropriate. Students are responsible for cost of food and transportation.

GEOL 514. Process Geomorphology (3)

Two lectures and three hours of laboratory.

Prerequisite: Geological Sciences 306.

Processes shaping and affecting the earth's surface, and application of resultant land forms in interpretation of geologic structure, stratigraphy, and neotectonics.

GEOL 520. Ore Deposits (3)

Prerequisite: Geological Sciences 306.

Geologic relations, origin, distribution, and economics of metallic and nonmetallic mineral deposits.

GEOL 521. Petroleum Geology (3) II

Prerequisite: Geological Sciences 306.

History of petroleum exploration; statistics of energy use; principles of well logging; theories of petroleum generation, migration, and accumulation; exploration and production techniques; case studies of important oil fields.

GEOL 530. Geochemistry (3) I

Two lectures and three hours of laboratory.

Prerequisites: Geological Sciences 324; Chemistry 201; Mathematics 150.

Fundamental principles of low- and high-temperature geochemistry. Origin of the elements; formation of the solar system; differentiation of the earth; weathering at the earth's surface; chemistry of natural waters. Laboratory methods applied to geological problems. Not open to students with credit in Geological Sciences 530L.

GEOL 533. Geophysical Analysis (3)

Two lectures and three hours of laboratory.

Prerequisites: Geological Sciences 307, Mathematics 252, Physics 197. Recommended: Physics 195L, 196L, 197L.

Analog and digital data collection, processing, modeling and error estimation. Computer-aided examples and field tests from seismics, gravity, magnetics, and electromagnetics including magnetotellurics.

GEOL 536. Sedimentology and Lithostratigraphy (3) II

Two lectures and three hours of laboratory.

Prerequisites: Geological Sciences 205 (not required but recommended for Emphases in Geochemistry and Geophysics) and 324.

Sedimentologic description and interpretation of the textures and structures of sediments and sedimentary rocks. Stratigraphic analysis of stratal succession, age relationships, and correlation on local and global scales.

GEOL 537. Geobiology (3) II

Two lectures and three hours of laboratory.

Prerequisites: Geological Sciences 205 and either Biology 100-100L, 101-101L or 201A, and Geological Sciences 536.

Principles of paleontology, including ecology and evolution. Tools of paleontology, including biomechanics, shape analysis, phylogeny, population analysis, study of biogeographic, temporal, and environmental distribution. Focus on using biology to solve geologic problems and vice versa.

GEOL 540. Marine Geology (3)

Prerequisites: Geological Sciences 205, and either Geological Sciences 324, 502, 514, or 537.

Plate tectonic origin and history of the ocean basins. Formation and distribution of sediments in response to biologic, chemical, and geologic processes.

GEOL 545. Descriptive Physical Oceanography (3)

Prerequisites: Mathematics 121 and 122, or 150; Physics 180A or 195.

Physical environment of oceans including heat, water, and salt budgets, physical properties of sea water, sea ice, air-sea relationships, effects of light and sound, distribution of temperature, salinity, density, surface current, deep circulation, water mass formation, instruments and methods of study.

GEOL 550. Engineering Geology (3) I

Two lectures and three hours of laboratory.

Prerequisite: Geological Sciences 306.

Relationships between geologic processes and works of humans. Topics include rock and soil mechanics, ground water flow, slope stability, seismicity, land subsidence, and evaluation of geologic materials with respect to dam sites, tunnel alignments, and building foundations.

GEOL 551. Hydrogeology (3) I

Two lectures and three hours of laboratory.

Prerequisites: Geological Sciences 306 and Mathematics 150.

Theory of ground water flow. Exploration for and development of the ground water resource. Aquifer tests, water quality, and water resource management. Occurrence of water in alluvial, sedimentary, volcanic, plutonic, and metamorphic terrains.

GEOL 560. Earthquake Seismology (3)

Two lectures and three hours of laboratory.

Prerequisites: Mathematics 252, Physics 197. Recommended: Mathematics 342A.

Theory of seismic wave excitation, propagation, and recording. Methods of seismogram interpretation and analysis. Applications to tectonics and earthquake hazard analysis.

GEOL 580. Seismic Interpretation and 3D Visualization (3)

Two lectures and three hours of laboratory.

Prerequisite: Geological Sciences 306.

Computer-based seismic interpretation, mapping, and modeling in both 2D and 3D. Overview of basic seismic processing. Emphasis on industrial applications, both petroleum and shallow geotechnical. (Formerly numbered Geological Sciences 647.)

GEOL 596. Advanced Topics in Geology (1-4)

Prerequisite: Consent of instructor.

Advanced special topics in the geological sciences. See Class Schedule for specific content. Limit of nine units of any combination of 296, 496, 596 courses applicable to a bachelor's degree. Maximum credit of six units of 596 applicable to a bachelor's degree. Maximum combined credit of six units of 596 and 696 applicable to a 30-unit master's degree.

**GRADUATE COURSES
Refer to the *Graduate Bulletin*.**