

835. Seminar in Location Theory
Fall. 3(3-0) Approval of department, GEO 435.
Recent developments and research in location analysis and regional science.

839. African Research
(IDC 838.) Fall, Winter, Spring. 2 to 4 credits. May reenroll for a maximum of 8 credits. Graduate standing or approval of instructor. Interdepartmental with African Languages and the departments of Administration and Curriculum, Anthropology, History, Political Science, and Sociology. Administered by the Department of Anthropology.
African-related archival and field research topics and methodologies viewed from perspective of relevant social science and humanistic disciplines associated with the African Studies Center.

846. Seminar in Cartography
Winter. 3(3-0) May reenroll for a maximum of 12 credits. Approval of department.
Selected research topics in cartographic theory and map design.

850. Advanced Field Techniques
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 8 credits.
Instruction and practical training in the selection, data-gathering, on-site analysis, and presentation of geographic field problems.

870. Seminar in Medical Geography
Winter. 3(3-0)
Spatio-environmental analysis of selected health problems.

899. Master's Thesis Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

901. Problems in Cultural Geography
Fall, Winter, Spring. 1 to 3 credits. May reenroll for a maximum of 6 credits. Approval of department.
Special research problems.

902. Problems in Physical Geography
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 6 credits.
Supervised research in specific topics of physical geography.

906. Problems in Economic Geography
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 6 credits. Approval of department.
Special research problems.

910. Problems in Historical Geography
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 6 credits. Approval of department.
Special research problems in historical geography.

912. Independent Study in Regional Geography
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 15 credits. Approval of department.
Individual studies in regional geography.

918. Problems in Geography
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 9 credits. Approval of department.
Research on specific geographical problems.

934. Problems in Population
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 9 credits. Approval of department.
Special research problems.

999. Doctoral Dissertation Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

GEOLOGICAL SCIENCES

(Name changed effective July 1, 1983. Formerly the Department of Geology.)

College of Natural Science

Geology GLG

200. The Geology of Our Environment
Fall, Winter, Spring, Summer. 3(3-0)
Not open to Geology majors. Credit will be given in only one of the following: GLG 200, GLG 201, GLG 306.

Our geologic environment: earthquakes, volcanoes, landslides, subsidence, flooding, coastal erosion, hydrology and human use, waste disposal, geologic aspects of environmental health, resources and energy, environmental law.

200L. Laboratory-Geology of Our Environment
Fall, Winter, Spring, Summer. 1(0-3)
GLG 200 or concurrently.

Laboratory study of geologic processes associated with environmental hazards. Emphasis placed on land-use planning, applying geologic criteria to evaluate land potentials.

201. Earth Processes
Fall, Winter, Spring, 4(4-2) Credit will be given for only one of the following: GLG 200, GLG 201, GLG 306.

Physical processes concerning evolution of Earth and its environments. Conservation and interaction of energy and matter through time. Laboratory stresses interpretation of process through studies of geologic data.

202. Evolution of the Earth
Fall, Winter, Spring. 4(4-2) GLG 200; or GLG 201; or GLG 306.

Integration of physical, chemical and biological processes from which our present environment has evolved; problems and controversies in the development of ideas of geologic and organic evolution.

205. Oceanology-The Marine Environment
Fall. 3(3-0)

Physical oceanography, including origin, hydrologic, chemical, geological properties; and environmental quality of the oceans. Human-sea interactions are emphasized including resource utilization and pollution.

282. Energy Resources of the Earth
Winter. 3(3-0)
World energy resources of petroleum, coal, and atomic fuel. Social, political, economic and environmental problems of fuels.

300. Solar System Geology
Winter. 4(4-0) AST 119 or AST 217 or AST 229; GLG 200 or GLG 201.
The origin, relationships, make-up and features of the bodies in the solar system emphasizing recent space exploration results and developing theories.

302. Vertebrate Life of the Past
Fall. 3(3-0) One course in a physical or biological science or Juniors. Interdepartmental with the Department of Zoology.
Fossil vertebrates from fish to humans.

304. Geology of Michigan
Fall. 3(3-0) GLG 200 or GLG 201 and/or GLG 202; or approval of department.
A historical accounting of the physical, historical and economic geology of Michigan and its environs; a course designed for students seeking an overall picture of the rather unique Michigan geological environment.

306. Engineering Geology
Fall, Spring. 3(3-2) Credit will be given for only one of the following: GLG 200, GLG 201, GLG 306. Sophomore Engineering students.

Fundamental principles of geology as applied to civil engineering practice. Minerals and rocks, aerial photographs, topographic and areal geologic maps and geologic cross sections studied in laboratory. Source of geologic literature and maps.

307. Geology Central Appalachians
Winter. 1(0-2) GLG 200, or GLG 201, or GLG 202, or concurrently.

General geology of the Central Appalachians. A preparatory course for GLG 308. Field excursions—Central Appalachians during spring vacation.

308. Field Excursion-Central Appalachians
Spring. 2 or 3 credits. GLG 307.

Training in stratigraphic, sedimentological, paleontologic, and structural principles as applied to field methods.

321. Mineralogy
Fall. 5(4-4) One term of chemistry.

Basics of crystallography, crystallography, and crystal chemistry. The classification, occurrence, composition and identification of minerals. Mineral genesis.

323. Introduction to Optical Mineralogy
Winter. 1(0-3) GLG 321.

Basic principles underlying the use of the polarizing microscope. Recognition and understanding fundamental optical properties. Identification of minerals and texture in thin sections of rocks.

327. Introduction to Geochemistry
(495.) Winter. 3(3-0) CEM 152, GLG 321.

Geochemical evolution of the universe, solar system, earth. Application of crystal field theory and thermodynamics to the solution of geological problems. Factors affecting the distribution of elements on earth. Principles of isotope geology.

**Descriptions – Geological Sciences
of
Courses**

335. Fossil Plants, Their History and Paleocology

Spring. 3(3-0) One course in geology or botany or biology or approval of department. Interdepartmental with the Department of Botany and Plant Pathology.

History of plants through geologic time; their form and evolution; how and where found, identified and reconstructed; their use in determining ancient geographic patterns, paleoenvironments, paleoclimates and community structure. Field trip.

337. The Fossil Record of Organic Evolution

Spring. 3(3-0) One course in a natural science; Juniors. Interdepartmental with the Department of Zoology.

The direct evidence for organic evolution in the fossil record. Evolution of life from prebiological systems to humans. Impact of fossil discoveries on human thought.

344. Field Geology–Summer Camp

Summer. 9 credits. GLG 351, GLG 363, GLG 392. Trigonometry; GLG 437, GLG 446 recommended.

Methods and techniques of geological surveying and mapping. Field interpretation of geological phenomena in igneous, metamorphic and sedimentary rocks in northern Michigan and Wisconsin.

**A. Introduction to Field Techniques
3 credits.**

Introduction to field techniques with stress in those that apply to sedimentary rocks. Stratigraphic correlation.

**B. Methods of Geological Mapping
4 credits.**

Plane table surveys, aerial photo and reconnaissance mapping. Examination and interpretation of structural and textural relationships in igneous and metamorphic rocks.

**C. Geologic Interpretation of Selected Areas
2 credits.**

Independent mapping and interpretation.

351. Structural Geology

(451.) Fall. 4(2-6) GLG 202; MTH 111.

Description, classification, and origin of secondary structures such as folds, faults, joints, cleavages, foliations and lineations. Three-dimensional visualization stressed in economic laboratory problems involving descriptive geometry, stereographic projections, areal, and structural geologic maps.

363. Lithology

Spring. 4(3-4) GLG 321, GLG 323, GLG 327.

Processes that form igneous and metamorphic rocks, origin, distribution, variation and occurrence of rock. Study of rock properties in the field, in laboratory, and with the microscope.

375. Introduction to Geophysics

Winter. 3(3-0) GLG 201; MTH 111; PHY 239 or PHY 289.

Earth's interior, lithospheric tectonics, and geophysical exploration including: refraction seismology, gravity, magnetism, earth's internal structure, global seismicity, plate tectonics, structure of plate margins, and planetary geology.

392. Sedimentology

Spring. 3(2-3) GLG 323, GLG 327.

Grain and aggregate properties of sediments; relationships of these properties to processes in the environment of deposition and to the pre-depositional and post-depositional history.

400H. Honors Work

Fall, Winter, Spring. 1 to 3 credits. May reenroll for a maximum of 9 credits. Honors College student or 3.00 grade-point average, or approval of chairperson; written proposal approved by faculty sponsor and chairperson.

403. Fluvial Geomorphology

Fall. 4(3-4) Junior majors in GLG, C E, and CSS; one course in physical geology and junior standing in geology, civil engineering or soil science.

Quantitative analyses of the fluvial processes associated with the development of drainage basin morphology, with emphasis on stream bed erosion and sediment transport. Field trips are required.

411. Hydrogeology

Winter. 3(3-2) One term of geology and trigonometry.

Principles of the sources, occurrence, and movement of ground water. Surface and subsurface investigations of ground water and elementary ground water hydrology.

413. Glacial Geology

Spring. 4(3-4) GLG 201.

Geological aspects of glaciers and glaciation. Theories of ice ages through geologic time. Origin and development of glacial geomorphic features. Character and chronology of the Pleistocene. Laboratory techniques, with field trips to observe glacial materials and features of Michigan.

426. Optical and X-ray Mineralogy

Fall. 4(3-4) GLG 321, PHY 239 or PHY 289.

Theory, principle and application of the polarizing microscope and X-ray diffractometer in mineral analysis.

430. Vertebrate Paleontology

Winter. 4(3-3) ZOL 428 or approval of department. Interdepartmental with the Department of Zoology.

Fossil vertebrates with emphasis on the evolution of major groups. Laboratories on modern techniques and on the identification and interpretation of fossils.

437. Invertebrate Paleontology

Fall. 4(3-4) GLG 202 or ZOL 303 or approval of department. Interdepartmental with the Department of Zoology.

Systematics and evolution of marine invertebrates; uses of fossils in correlation and delineation of geologic time; structure and morphology of fossils as related to evolutionary development.

438. Paleocology

Spring. 4(3-4) GLG 202 or ZOL 389 or approval of department. Interdepartmental with the Department of Zoology.

Distribution and abundance of marine fossils; response of skeletal morphology to environmental conditions; uses of fossils in reconstructing ancient climates and depositional environments.

445. Field Studies

Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 9 credits. Approval of department.

Advanced geologic or geophysical field studies.

446. Principles of Stratigraphy

Fall. 3(3-0) GLG 437, GLG 392 or approval of department.

Covers principles of stratigraphy and application and exemplification of these principles to known geologic occurrences.

462. Petrology

Winter. 4(3-4) GLG 363, GLG 426.

Introduction to the chemical and physical processes that are responsible for the origin and evolution of igneous and metamorphic rocks. Laboratory studies of rock suites that illustrate basic processes in petrology.

474. Exploration Geophysics

Fall. 4(3-2) GLG 201 or GLG 306; GLG 375; MTH 214; PHY 239 or PHY 289.

Techniques used in geophysical exploration, with application in petroleum prospecting, minerals exploration, and engineering. Includes gravity, magnetic, seismic, electrical and other methods, and well logging. Interpretation of geophysical data.

475. Solid Earth Geophysics

Winter. 3(3-0) GLG 201 or GLG 306; GLG 375; MTH 215; PHY 289; MTH 310 recommended.

Geophysics, including Earth's composition and structure, its dynamic character, radioactivity and age determinations, seismicity and seismology, gravity and magnetic fields, heat flow, physical properties of earth materials.

478. Exploratory Seismology

(872.) Spring of odd-numbered years. 4(2-4) GLG 474.

Theory and technique of field seismic exploration methods. An associated geophysical survey will be conducted and a report prepared.

479. Tectonophysics

Spring. 3(3-0) GLG 351; GLG 474 or GLG 475.

Tectonics of crustal plates emphasizing sea-floor spreading and continental drift. Tectonics of plate margins, plate kinematics, observational seismology, inter- and intra-plate stresses, and paleo-continental reconstructions.

482A. Mineral Resources

Spring of odd-numbered years. 4(4-0) GLG 321, GLG 351.

Genesis, distribution, and classification of ore deposits. Emphasis on metallic ores. Global patterns and tectonic relationships.

482B. Mineral Resources Evaluation

Spring of even-numbered years. 3(3-0) GLG 321, GLG 351, approval of department.

Emphasis on practical applications of geoscience to mineral resources and the extractive industries. Aspects of exploration and development of reserves including evaluation, grade estimation, drilling, recovery, and beneficiation.

483. Petroleum Geology

Fall. 4(3-2) Approval of department.

Fundamental principles of the origin, migration and accumulation of petroleum. Exploration techniques to include well drilling, electric and radioactivity well logging, surface and subsurface exploration methods, seismic surveys, land leasing and oil field development. Laboratory study of well log plotting and subsurface mapping technique.

484. Applied Petroleum Geology

Winter. 4(1-6) GLG 483.

Microscopic examination of well cuttings, practice in the use of electric and radioactivity logs, exploration for petroleum in selected areas by subsurface mapping techniques, economics of petroleum exploration. Field trips.

493. Carbonate Sedimentology

Fall. 3(2-3) GLG 327, GLG 392.

Genesis of carbonate sediments including discussion of carbonate-secreting organisms, effects of environment on mineralogy, depositional environments and diagenesis.

497. Geochemistry

Spring. 3(3-0) GLG 201; CEM 152 or approval of department.

Oxidation-reduction systems, chemical weathering, stable and unstable isotopes, the geochemistry of ore-forming solutions, and the behavior of trace components in silicate melts.

800. Special Problems

Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 9 credits. Approval of department.

Special problems in hydrogeology, geomorphology and glacial geology, mineralogy and crystallography, petrology, paleontology, structural geology, and petrofabrics, stratigraphy, aerogeology, geophysics, economic geology, petroleum geology, sedimentation, and geochemistry.

810. Seminar

Fall, Winter, Spring. 1 to 3 credits. May reenroll for a maximum of 12 credits.

Seminar relating to current research in geology.

825. Clay Mineralogy

Winter. 4(3-4) CSS 840, CSS 850 or approval of department. Interdepartmental with the Department of Crop and Soil Sciences.

Structures and properties of clays; their origins, occurrence, and utilization. Methods of studying clays including x-ray diffraction, differential thermal analysis, infrared absorption and other chemical and physical techniques.

830. Paleobotany

Fall. 4(3-4) Approval of department. Interdepartmental with and administered by the Department of Botany and Plant Pathology.

Survey of fossil plants: their preservation, occurrence, geology, paleogeography, paleoecology, evolutionary history, classification and representative types. One weekend field trip to fossil plant locality.

831. Palynology

Spring. 4(3-4) Approval of department. Interdepartmental with the Department of Botany and Plant Pathology.

An introduction to the principles and techniques of spore and pollen analysis, both fossil and recent, and utilization of plant microfossils for stratigraphic determinations and paleoecological interpretations of most sedimentary accumulations and rocks. Includes certain algae, protozoans, similar organisms of uncertain affinity and dissociated fragments of larger organisms.

833. Advanced Invertebrate Paleontology

B. Quantitative Paleontology

Fall. 3(2-4) GLG 437 or GLG 438. Interdepartmental with the Department of Zoology.

Application of mathematical tools to paleontological problems, including statistical applications and numerical taxonomy; computer applications.

C. Paleocology

Fall. 3(2-4) GLG 437 or GLG 438. Interdepartmental with the Department of Zoology.

Advanced problems in population, community, and province level paleoecology, primarily of marine invertebrates, including study of taxonomy, diversity, and adaptation.

D. Developmental Paleontology

Fall. 3(2-4) GLG 437 or GLG 438, ZOL 317 or approval of department. Interdepartmental with the Department of Zoology.

Application of the principles of development to the ontogeny and phylogeny of fossil invertebrates as known from skeletal morphology.

E. Evolutionary Paleontology

Fall. 3(2-4) GLG 437 or GLG 438. Interdepartmental with the Department of Zoology.

Aspects of evolutionary biology that can be studied in the fossil record, with emphasis on marine invertebrates.

834. Advanced Vertebrate Paleontology

Winter of even-numbered years. 3(3-0) GLG 430 or approval of department. Interdepartmental with the Department of Zoology.

Recent advances and controversial issues in vertebrate paleontology including origin, classification, phylogeny, and stratigraphic relationships of fossil vertebrates.

838. Advanced Paleobotany

Winter. 3(2-4) Approval of department. Interdepartmental with and administered by the Department of Botany and Plant Pathology.

Morphology, anatomy, phylogenetic relationships and classification of fossil plants. Microscopic analysis of tissues and organs prepared by thin section, transfers, peels, polished and etched surfaces, and macerations.

843. Paleozoic Stratigraphy

Winter of even-numbered years. 4(5-0) GLG 446, GLG 392.

Classification, distribution, paleogeography, paleontology, interrelation, and structural setting of stratigraphic units within the Paleozoic systems. Laboratory work involves construction of correlation charts, structure and restored sections, paleogeologic, paleogeographic, and lithofacies maps, and study of certain key fossils.

844. Mesozoic and Cenozoic Stratigraphy

Winter of odd-numbered years. 3(3-0) GLG 446.

Stratigraphy and paleontology with emphasis on tectonics and sedimentation.

852. Structure of Ore Bodies

Winter of even-numbered years. 3(2-4) GLG 451, MTH 214.

Mathematics and physics applied to problems in structural geology.

861. Evolution of the Earth's Crust and Mantle

Fall. 3(3-0) GLG 462.

The composition, mineralogy and petrology of the Earth's mantle and crust. Plate tectonics and its relationship to earlier models of geosynclines, orogenic cycles, continental drift, etc.

862. Petrology-Igneous

Spring of even-numbered years. 2 to 4 credits. May reenroll for a maximum of 8 credits. GLG 462. Must enroll for laboratory with initial registration.

Physical and chemical principles involved in the origin of igneous rocks. Application of experimental techniques in petrology.

863. Petrology-Metamorphic

Spring of odd-numbered years. 2 to 4 credits. May reenroll for a maximum of 8 credits. GLG 462. Must enroll for laboratory with initial registration.

Origin and classification of metamorphic rocks. Study includes thin section investigation of the metamorphic textures and mineral associations and the physical-chemical principles involved in their development.

870. Topics in Geophysics

Spring. 1 to 3 credits. May reenroll for a maximum of 12 credits. Approval of department.

Topics and problems in geophysics, such as tectonophysics, terrestrial heat flow, processing and analysis of geophysical data, geomagnetism, paleomagnetism, high-pressure geophysics.

873. Seismology I

Fall of even-numbered years. 3(3-0) MTH 215 or concurrently; PHY 289 or concurrently.

Theory and application of seismic wave propagation in earth materials.

874. Seismology II

Winter of odd-numbered years. 3(3-0) GLG 873 or approval of department.

Continuation of GLG 873.

875. Advanced Geophysical Exploration I

Fall of odd-numbered years. 4(3-2) GLG 474.

Theory and technique of gravity and magnetic methods, and their use in geophysical exploration. Associated practical exercises.

877. Geophysics of the Lithosphere II

Fall of even-numbered years. 3(3-0) GLG 475, GLG 479.

Structure and tectonic processes at convergent and divergent plate margins. Earthquake location and prediction, thermal modelling of slabs, origin of back-arc basins, and inter- and intra-plate stresses. Regional tectonic analyses.

878. Dynamic Processes in the Earth

Fall of odd-numbered years. 3(3-0) GLG 451, GLG 475, MTH 310 or approval of department.

Stress and strain analysis, rheology of materials, buckling and bending of strata, lithospheric stresses, geofluid dynamics, surface waves, attenuation, and other seismological topics.

884. Regional Petroleum Geology

Spring. 3(3-0) Approval of department.

Regional study of tectonics, stratigraphy and sedimentation in the U.S. and their relationship to petroleum occurrences in sedimentary basins. Analysis of petroleum distribution with emphasis on creative thinking in petroleum exploration. Practice in the analysis of petroleum possibilities in selected foreign areas.

891. Advanced Sedimentology

Spring. 3(2-4) GLG 392, GLG 462.

Origin, deposition and diagenesis of sandstones. Study includes thin section, X-ray, and SEM analysis of sediments.

894. Aqueous Geochemistry

Spring. 3(3-0) GLG 497 or a course in physical chemistry or approval of department.

Nature and regulation of electrolytes in solution (fresh water, seawater, brine); activity, complexation, and redox effects. Trace metals in solution. Carbonate, silica, alumina systems. Chemical weathering and mobility of elements.

**Descriptions – Geological Sciences
of
Courses**

**895C. Topics in Geochemistry:
Analytical Geochemistry**
Fall of even-numbered years. 1 to 3 credits. May reenroll for a maximum of 12 credits. GLG 462, GLG 495.

Instrumental techniques for the analysis of geological materials. Topics on application of X-ray diffraction, X-ray fluorescence, neutron activation analysis, and atomic absorption spectrometry. Recently developed techniques in geochemistry will be discussed.

896. Applied Geochemistry
Spring of even-numbered years. 3(3-0)
GLG 495 or GLG 894.

Migrations of elements in the near surface environment. Prediction of mineral deposits, hydrocarbon traps and harmful concentrations of both naturally occurring and artificially introduced hazardous elements and compounds.

899. Master's Thesis Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

900. Special Problems
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 9 credits. Approval of department.

Special problems in hydrogeology, geomorphology and glacial geology, mineralogy and crystallography, petrology, paleontology, structural geology and petrofabrics, stratigraphy, aerogeology, geophysics, economic geology, petroleum geology, sedimentation, and geochemistry.

999. Doctoral Dissertation Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

Earth Science **E S**

445. Field Studies
Fall, Winter, Spring, Summer. 1 to 9 credits.; May reenroll for a maximum of 15 credits. Approval of department.
Experience and techniques in field investigation of the near surface layers of the earth.

446. Laboratory Investigations
Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 15 credits. E S 445 or concurrently.
Independent laboratory investigation of materials and phenomena obtained from field studies.

800. Problems in Earth Science
Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 12 credits. Approval of department.
Independent study in topics related to earth science education.

GERMAN

See Linguistics and Germanic, Slavic, Asian and African Languages.

GERMAN AND RUSSIAN

See Linguistics and Germanic, Slavic, Asian and African Languages.

GREEK

See Romance and Classical Languages.

**HEALTH AND PHYSICAL
EDUCATION** **HPE**

(Name change effective September 1, 1981. Formerly the Department of Health, Physical Education and Recreation.)

College of Education

Instructional Courses

Physical Education instructional courses are offered every term to give students an opportunity to become involved in physical activities that will benefit them, not only in attaining physical well being, but in acquiring a measure of carry-over skill which will promote a healthful way of life through continued participation. The areas of selection are: HPE 104-105, Individual Sports (Golf, Bowling, etc.); HPE 106-107, Dual Sports (Tennis, Racquetball, etc.); HPE 108, Team Sports (Soccer, Softball, etc.); HPE 109, Aquatics (Beginning Swimming, Life Saving, etc.); HPE 110, Gymnastics (Floor Exercises, Apparatus, etc.); HPE 111, Dance (Social, Dancercise, etc.); and HPE 211, Dance (Modern, Ballet, etc.).

104. Individual Sports I
(HPR 106.) Fall, Winter, Spring, Summer. 1(0-3) May reenroll for a maximum of 12 credits if different activities or the same activities at higher levels are involved. Students are limited to a combined total of 12 credits in HPE 104 through HPE 111.

Development of sports skills and physical fitness through participation in individual sports activities.

105. Individual Sports II
Fall, Winter, Spring, Summer. 1(0-3) May reenroll for a maximum of 12 credits if different activities or the same activities at higher levels are involved. Students are limited to a combined total of 12 credits in HPE 104 through HPE 111.

Development of sports skills and physical fitness through participation in individual sports activities.

106. Dual Sports I
Fall, Winter, Spring, Summer. 1(0-3) May reenroll for a maximum of 12 credits if different activities or the same activities at higher levels are involved. Students are limited to a combined total of 12 credits in HPE 104 through HPE 111.

Development of sports skill and physical fitness through participation in dual sports activities.

107. Dual Sports II
(HPR 107.) Fall, Winter, Spring, Summer. 1(0-3) May reenroll for a maximum of 12 credits if different activities or the same activities at higher levels are involved. Students are limited to a combined total of 12 credits in HPE 104 through HPE 111.

Development of sports skill and physical fitness through participation in dual sports activities.

108. Team Sports
(HPR 108.) Fall, Winter, Spring. 1(0-3) May reenroll for a maximum of 12 credits if different activities or the same activities at higher levels are involved. Students are limited to a combined total of 12 credits in HPE 104 through HPE 111.

Team sports skills and physical fitness through participation in group activities.

109. Aquatics
(HPR 109.) Fall, Winter, Spring, Summer. 1(0-3) May reenroll for a maximum of 12 credits if different activities or the same activities at higher levels are involved. Students are limited to a combined total of 12 credits in HPE 104 through HPE 111.

Aquatics skills, physical fitness, and water safety.

110. Gymnastics
(HPR 110.) Fall, Winter, Spring. 1(0-3) May reenroll for a maximum of 12 credits if different activities or the same activities at higher levels are involved. Students are limited to a combined total of 12 credits in HPE 104 through HPE 111.

Gymnastics skill and physical fitness through tumbling and apparatus.

111. Dance
(HPR 111.) Fall, Winter, Spring. 1(0-3) May reenroll for a maximum of 12 credits if different activities or the same activities at higher levels are involved. Students are limited to a combined total of 12 credits in HPE 104 through HPE 111.

Beginning and intermediate folk dance, social dance, square dance, and dancercise.

211. Dance
(HPR 211.) Fall, Winter, Spring. 2(0-6) May reenroll for a maximum of 12 credits if different activities or the same activities at higher levels are involved. Approval of department for Level II and higher.

Various graded levels of ballet, modern, and jazz dance.

Professional Courses
Physical Education—120, 125, 130, 140, 151, 152, 153, 232, 240, 246, 252, 253, 260, 261, 270, 306, 310, 316, 321, 322, 323, 328, 342, 343, 344, 345, 349, 350, 352, 353, 354, 355, 357, 358, 359, 371, 372, 385, 386, 387, 390, 403, 404, 405, 406, 407, 411, 412, 415, 418, 424, 425, 436, 440, 441, 442, 445, 452, 480, 490, 491, 800, 802, 804, 805, 809, 810, 812, 816, 817, 818, 819, 823, 824, 825, 826, 831, 832, 835, 836, 842, 844, 846, 850, 853, 854, 858, 860, 863, 864, 865, 867, 869, 875, 879, 882, 884, 885, 889, 899, 950, 984, 985, 999.
Health Education—120, 125, 316, 328, 405, 407, 810, 812, 850, 879, 884, 885, 889, 899.

120. Personal Health
(HPR 103.) Fall, Winter, Spring. 3(3-0)
Development of understandings, attitudes and practices that are necessary for more healthful living. Provides background for teaching health to children.

125. First Aid and Emergency Care
(HPR 331.) Fall, Winter, Spring. 3(3-0)
Knowledges and skills relative to: legal liability, wounds, shock, respiratory disorders and artificial respiration, cardiac disorders and cardiopulmonary resuscitation, burns, fractures, poisoning, drug overdose, emergency childbirth, transportation techniques, extrication techniques and environmental emergencies.

130. Professional Perspectives
(HPR 121.) Fall. 1(0-2)
Exploration of physical education and coaching through micro-teaching and laboratory experiences concerning goals and objectives, scientific bases of coaching and teaching, and laws related to legal liability and safety.