851. African Linguistics

Winter. 3(3-0) May re-enroll for a maximum of 9 credits. 401; 402 or concurrently.

Investigation of linguistic issues and phenomena in one or a group of African languages.

860. Special Projects

Fall, Winter, Spring, Summer. Variable credit. Approval of instructor.

Supervised study, reading, and research in specialized areas of linguistics.

865. Contrastive Analysis

Spring. 3(3-0) 403.

The essentials of contrastive analysis, with emphasis on methods of making such analysis. The usefulness of and controversies concerning contrastive analysis will also be discussed.

871. Comparative Indo-European Linguistics

Spring of odd-numbered years. 3(3-0) 471.

Comparative linguistics as applied to the investigation of the development and historical relationships of the languages of the Indo-European family.

880. Seminar in Linguistics

Fall, Winter, Spring. 3(3-0) May re-enroll for a maximum of 18 credits in different topics. Approval of department.

Advanced critical study of current topics in linguistics such as applications to other disciplines, aspects of linguistic theory, child language acquisition, contrastive analysis, structure of particular languages.

899. Research

Fall, Winter, Spring, Summer. Variable credit. Approval of instructor.

980. Seminar in Linguistics

Spring. 3(3-0) May re-enroll for a maximum of 9 credits in different areas. Approval of department.

Special topics in linguistics for advanced graduate students.

999. Research

Fall, Winter, Spring. Variable credit. Approval of instructor.

South Asian Languages SAL

101. South Asian Languages—Elementary

Fall. 5(3-2) May re-enroll for 101-102-103 sequence in more than one South Asian Language.

The spoken language. Emphasis on intensive pronunciation, comprehension drills, and developing sentence structure. Orthography introduced.

102. South Asian Languages—Elementary

Winter. 5(3-2) May re-enroll for 101-102-103 sequence in more than one South Asian Language. 101.

Continuation of 101.

103. South Asian Languages—Elementary

Spring. 5(3-2) May re-enroll for 101-102-103 sequence in more than one South Asian Language. 102.

Continuation of 102.

201. South Asian Languages—Intermediate

Fall. 4(3-2) May re-enroll for 201-202-203 sequence in more than one South Asian Language. 103.

Continued development of oral and aural skills. Study of grammar, readings in simple texts and exercises in composition.

202. South Asian Languages—Intermediate

Winter. 4(3-2) May re-enroll for 201-202-203 sequence in more than one South Asian Language. 201.

Continuation of 201.

203. South Asian Languages—Intermediate

Spring. 4(3-2) May re-enroll for 201-202-203 sequence in more than one South Asian Language. 202.

Continuation of 202.

LYMAN BRIGGS COLLEGE LBC

111. College Algebra

Fall. 5(5-0) Placement Test or approval of the college. Not open to students with credit in MTH 108, 109, or 111.

Topics covered include polynomial, trigonometric, exponential, and logarithmic functions, their inverses and their properties; and analytic geometry with an emphasis on conics.

112. Calculus I

Fall, Winter, Spring. 5(5-0) 111 or MTH 109; LBC 124 concurrently. Not open to students with credit in MTH 112.

Topics covered include sequences and their limits, derivatives of rational power functions, techniques of differentiation, applications, numerical methods for evaluatng polynomials and approximating square roots.

113. Calculus II

Fall, Winter, Spring. 5(5-0) 112 and 124. Not open to students with credit in MTH 113.

Continuation of 112. Topics covered are applications of the derivative integration, exponential, logarithmic, and trigonometric functions, power series, and numerical methods for integrating, root finding, and series evaluating.

124. APL-Computer Programming for Scientists

Fall, Winter, Spring. 3(3-0) 112 or concurrently. Interdepartmental with the Computer Science Department.

APL programming; interactive programming techniques; arithmetic, logical, and extended APL operators; functions; applications to concurrent topics in mathematics; principles of operations of time-shared computers.

131. Third Culture Rhetoric I

Fall, Winter. 4(4-0)

Instruction and practice in expository writing. Paper and report topics drawn from readings which relate science and human values.

132. Third Culture Rhetoric II

Winter, Spring. 4(4-0) 131.

Continuation of 131 with emphasis upon investigative papers. Selected students may meet course requirements through independent study.

140. Biology I

Winter, Spring. 4(3-3) Not open to students with credit in B S 212.

The organisms and their environment. Organismal level of organization. Evolution and adaptation as forces for biological variance.

*141. Biology II

Fall, Spring. 3(2-3) 140; Not open to students with credit in B S 210.

Maintenance and manipulation of materials, energy, space and information at the cellular and tissue level of organization.

142. Biology IA

Winter, Spring. 1 to 2 credits. May re-enroll for a maximum of 4 credits. 140 or concurrently.

Selected problems such as analysis of biological data, interspecific and intraspecific competition, microarthopods inhabiting leaf litter, spring flora, diversity, stability and evolution of natural communities.

143. Biology IIA

Fall, Spring. 2 to 4 credits. May re-enroll for a maximum of 4 credits. 141 or concurrently.

Selected biology problems considering such topics as genetics, bacterial culturing and staining techniques, photosynthesis and histological techniques.

150. Physics—Elementary Concepts

Fall. 1(2-0) MTH 108 or 109 or LBC 111 and LBC 151 concurrently.

Elementary concepts of mechanics, electricity, magnetism and optics.

151. Introduction to Chemistry and Physics I

Fall. 4(4-3) MTH 108 or 109 or LBC 111 concurrently; high school physics or 150 concurrently.

Fundamental techniques of quantitative scientific investigation; gas laws, kinetic theory and thermodynamics.

152. Introduction to Chemistry and Physics II

Winter. 4(4-3) 151.

Topics in modern physics: photons, electrons, atoms and nuclei; radioactivity, nuclear reactions; Bohr theory of the hydrogen atom; special theory of relativity.

153. Introduction to Chemistry and Physics III

Spring. 4(4-3) 152.

Topics in modern chemistry: atomic structure, chemical bonding, molecular orbitals; stoichiometry, chemical dynamics and equilibria, fundamentals of organic chemistry.

216. Calculus III

(215.) Fall, Winter, Spring. 5(5-0) 113.

Introduction to the calculus of several variables.

217. Calculus IV

(214.) Fall, Winter, Spring. 5(5-0) 216.

Topics covered include infinite series, power series, and introduction to differential equations; first order, second order linear with constant coefficients, first order systems; numerical methods, power series solutions, and applications.

*For prerequisite purposes this introductory biology sequence may be used in place of Biological Science 210, 211, 212.

233. *Special Topics in Third Culture Rhetoric*

Fall, Winter, Spring. 1 to 2 credits. May re-enroll for a maximum of 6 credits. 132

Guided study of relations between the humanities and sciences. Students submit written work.

*242. *Biology III*

Fall, Winter. 4(3-3) 141. Not open to students with credit in B S 211.

Organismal growth and development from molecular genetics through life cycles of selected plant and animal species.

251. *Introduction to Chemistry and Physics IV*

Fall. 4(4-3) 153.

Classical physics; kinematics and dynamics of particles and rigid bodies; electricity; magnetism, electromagnetism, wave motion and wave optics.

252. *Introduction to Chemistry and Physics V*

Winter. 4(4-3) 251.

Chemistry of non-metals, transitional elements and coordination compounds, organic chemistry.

253. *Introduction to Chemistry and Physics VI*

Spring. 4(4-3) 252.

Relativity; atomic, molecular, and solid-state physics, quantum-mechanical effects and devices, nuclear models and nuclear energy levels.

IDC. *Energy Consumption and Environmental Quality*

For course description, see Interdisciplinary Courses.

290. *Directed Study*

Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 6 credits. Approval of college.

Faculty directed studies in curricular areas which are normally related to regular course offerings.

A. Directed Study—General
1 or 2 credits.

B. Directed Study—Biology
1 or 2 credits.

C. Directed Study—Chemistry/Physics
1 or 2 credits.

F. Directed Study—Computer Science
1 to 3 credits.

295. *Independent Study*

Fall, Winter, Spring, Summer. 1 to 4 credits. May re-enroll for a maximum of 12 credits. Approval of college.

Student conceived individual courses of study in curricular areas. Preliminary faculty approval and continuing guidance.

A. Independent Study—General

B. Independent Study—Biology

C. Independent Study—Chemistry/Physics

D. Independent Study—Mathematics

E. Independent Study—Science Studies

331. *Modern Fiction*

Fall. 4(4-0) 132 or 131 with a 3.0 or better.

Recent fiction and its cultural backgrounds, particularly those of special value to students of science. Students may submit original fiction in partial fulfillment of course writing requirements.

*For prerequisite purposes, this introductory biology sequence may be used in place of Biological Science 210, 211, 212.

332. *Modern Drama*

Winter. 4(4-0) 132 or 131 with 3.0 or better.

Recent plays which have social and literary significance. Students may submit original dramatic writings as partial fulfillment of course writing requirements.

333. *Modern Poetry*

Spring. 4(4-0) 132 or 131 with 3.0 or better.

Recent poetry of literary and social nature. Students may submit original poetry in partial fulfillment of course writing requirements.

344. *Introductory Animal Systematics Laboratory*

Fall. 1(0-3) ZOL 303 concurrently. Interdepartmental with the Zoology Department.

Laboratory examination of form and function of representative vertebrate and invertebrate animals.

361. *Philosophy of Technology*

Fall, Winter. 4(4-0) Sophomores or approval of college. Interdepartmental with the Department of Philosophy.

Is our technology desirable? Are its social forms desirable? What alternatives are there? Students will develop and defend their own appraisals of technology.

372. *Introduction to Symbolic Logic*

Fall, Winter. 4(4-0) Sophomores or approval of college.

Concepts, notation and application of truth-functional and quantificational logic. Special topics may include axiomatics, meta-theory, modal logic, fallacies, paradoxes, inductive argument, the justification of logic.

373. *Introduction to the Philosophy of Science*

Winter, Spring. 4(4-0) 372. Juniors or approval of college.

Philosophical problems about the character and justification of scientific knowledge. Possible topics: concept formation, theory construction, scientific explanation, confirmation theory, "logic" of discovery, philosophical implications of physical theories.

374. *Historical Problems in the Biological Sciences*

Fall, Winter. 4(4-0) Juniors or approval of college.

Various themes or periods in the biological sciences. The course may emphasize the pattern of theoretical development, changes in explanatory ideals, the interaction of external factors and scientific ideas, etc.

375. *Historical Problems in the Physical Sciences*

Spring. 4(4-0) Juniors or approval of college.

Various themes or periods in the physical sciences. The course may emphasize the pattern of theoretical development, changes in explanatory ideals, the interaction of external factors and scientific ideas, etc.

376. *Historical Problems in Technical Change*

Fall, Spring. 4(4-0) Juniors or approval of college.

Factors which influence technical change. Exploration of both historical and contemporary problems of technology and technical change.

377. *The Natural Environment: Perceptions and Practices*

Spring. 4(4-0) Sophomores.

Factors which have influenced environmental attitudes in the U.S. Environmental attitudes as reflected in art and literature. Ways in which changing attitudes have led to changes in legislation and practice.

378. *Popular Culture and Technical Change*

Winter. 4(4-0) Juniors or approval of college.

How mass culture and technology affect each other. The course demonstrates several approaches to this question and introduces students to research in this area.

483. *Philosophy of Physical Science*

Fall. 4(4-0) Nine credits in physical science or approval of department. Interdepartmental with the Department of Philosophy.

Philosophical problems of the physical sciences. The topics will be taken from such areas as: quantum mechanics, space-time, classical mechanics, relativity.

484. *Philosophy of Biological Sciences*

Winter, Spring. 4(4-0) Nine credits in science or approval of department. Interdepartmental with the Department of Philosophy.

Methodological notions and problems of the biological sciences such as: observation and measurement, classification, teleological and functional explanation, teleological systems, emergentism, vitalism, value neutrality.

490. *Directed Study*

Fall, Winter, Spring, Summer. 1 to 6 credits. May re-enroll for a maximum of 6 credits. Juniors and approval of college.

Faculty directed studies in curricular areas which are normally related to regular course offerings.

A. Directed Study—General

B. Directed Study—Biology

C. Directed Study—Chemistry/Physics

D. Directed Study—Mathematics

E. Directed Study—Science Studies

491. *Senior Seminar I*

Fall, Winter, Spring. 3(3-0) Seniors or approval of college.

Selected interdisciplinary problems concerned with the interface between science and society or science and man are identified and formulated. A bibliography is generated and an outline for a thesis prepared.

492. *Senior Seminar II*

Fall, Winter, Spring. 3(3-0) 491.

The thesis planned in 491 is written and evaluated.

495. *Independent Study*

Fall, Winter, Spring, Summer. 1 to 12 credits. May re-enroll for a maximum of 12 credits. Juniors and approval of college.

Student conceived individual courses of study in curricular areas. Preliminary faculty approval and continuing guidance.

A. Independent Study—General

B. Independent Study—Biology

C. Independent Study—Chemistry/Physics

D. Independent Study—Mathematics

E. Independent Study—Science Studies