

LANDSCAPE ARCHITECTURE

See Urban Planning and Landscape Architecture.

LARGE ANIMAL SURGERY AND MEDICINE LSM

College of Veterinary Medicine

- 412. Livestock Hygiene and Disease Control**
Spring. 3(3-0) Juniors; Agriculture majors.
Fundamentals of health and disease in animals, relation of infectious and parasitic diseases of animals to human health, disease prevention and role of veterinarian in preventive medicine.
- 621. Integrative Clinical Problems**
Fall, Winter, Spring, Summer. 2(0-6) to 4(0-12) May reenroll for a maximum of 12 credits. Approval of department.
Comprehensive problem-solving explorations of selected clinical diseases, either systems or species oriented, in large animals.
- 642. Special Problems-Research**
Fall, Winter, Spring, Summer. 2 to 4 credits. May reenroll for a maximum of 8 credits. LSM 650 or LSM 660 or LSM 670, approval of department.
Research related to a large animal specialty.
- 650. Equine Clerkship I**
Fall, Winter, Spring, Summer. 4 credits. Satisfactory completion of term 8 of the professional veterinary curriculum, approval of department.
Concepts and supervised practice in equine medicine. Emphasis on diagnosis, prognosis, treatment and disease prevention.
- 652. Equine Clerkship II**
Fall, Winter, Spring, Summer. 4 credits. LSM 650 and approval of department.
Advanced, supervised equine medicine and surgery.
- 654. Equine Clerkship III**
Fall, Winter, Spring, Summer. 4 credits. LSM 652 and approval of department.
In-depth, supervised equine medicine and surgery.
- 656. Large Animal Anesthesiology Clerkship I**
Fall, Winter, Spring, Summer. 4 credits. Satisfactory completion of term 8 of the professional veterinary curriculum, LSM 650, approval of department.
Concepts and supervised practice in large animal anesthesiology.
- 660. Ambulatory Clerkship I**
Fall, Winter, Spring, Summer. 4 credits. Satisfactory completion of term 8 of the professional veterinary curriculum, approval of department.
Concepts and supervised practice in ambulatory clinics. Emphasis is on diagnosis, prognosis, treatment and disease prevention.

- 662. Introduction to Herd Health Clerkship**
Fall, Winter, Spring, Summer. 4 credits. LSM 660, approval of department.
Concepts and supervised practice in herd health programs. Emphasis on developing programs for food animal species and equine species.
- 664. Dairy Herd Health Clerkship**
Fall, Winter, Spring, Summer. 4 credits. LSM 660, approval of department.
Dairy farm and herd health management. Record keeping, general management, housing, nutrition, and mastitis control will be emphasized.
- 666. Equine Herd Health Clerkship**
Winter, Spring, Summer. 4 credits. LSM 660, approval of department.
Establishing and maintaining herd health programs for equine operations. Reproduction, parasite control, immunization, and diagnostic medicine and surgery in the field.
- 670. Food Animal Clerkship I**
Fall, Winter, Spring, Summer. 4 credits. Satisfactory completion of term 8 of the professional veterinary curriculum, approval of department.
Concepts and supervised practice in food animal medicine. Emphasis on diagnosis, prognosis, treatment and disease prevention.
- 672. Food Animal Clerkship II**
Fall, Winter, Spring, Summer. 4 credits. LSM 670, approval of department.
Advanced, supervised food animal surgery and medicine.
- 674. Preceptorial Clerkship**
(603.) Fall, Winter, Spring, Summer. 8(0-24) to 16(0-48) May reenroll for a maximum of 16 credits. LSM 660, LSM 670, approval of department. Students may not receive credit in both V M 610 and LSM 674.
Applied large animal clinical science. Students participate in all activities in assigned private practices tutored by practitioners with adjunct faculty appointments.
- 809. Problems in Large Animal Surgery**
Fall, Winter, Spring, Summer. Variable credit.
- 811. Problems in Large Animal Medicine**
Fall, Winter, Spring, Summer. Variable credit.
- 813. Seminar**
Fall, Winter, Spring. 1 credit.
- 825. Fundamental Biomedical Experimental Techniques**
Fall. 3(2-3) Students enrolled in a graduate degree program and approval of instructor.
Fundamentals of humane treatment of animals, anesthesia, aseptic techniques, instrumentation, suture materials and patterns, tissue handling and woundhealing for experimental animal research.
- 899. Master's Thesis Research**
Fall, Winter, Spring, Summer. Variable credit. May reenroll for a maximum of 18 credits. Approval of department.
Research on thesis problems.

- 921. Pathology of Nutritional and Metabolic Diseases**
(HNF 921.) Spring of odd-numbered years. 4(3-2) Approval of department; PTH 404 or ANT 420. ANS 525, BCH 452, HNF 462 recommended. Interdepartmental with Human Nutrition and Foods.
Development, physiopathology and morphologic pathology of nutritional and metabolic diseases including carbohydrate, protein, fatty acid, vitamin and mineral deficiencies, their experimental induction and their medical or economic significance.

LATIN

See Romance and Classical Languages.

LINGUISTICS AND ORIENTAL AND AFRICAN LANGUAGES

College of Arts and Letters

Courses in Chinese and Japanese on the 300 level or higher are normally conducted in the language.

Linguistics and Oriental and African Language Courses LOA

- 299. Special Projects**
Fall, Winter, Spring, Summer. Variable credit. May reenroll for a maximum of 18 credits. Approval of department.
Work in areas outside regular course offerings.
- 360. World Literature in English**
(315.) Fall. 3(3-0) Interdepartmental with and administered by the Department of English.
Representative works, not from England or the United States, which were written originally in English, especially the English literature of present or former British Commonwealth nations, and nations from the Middle East and Africa.
- 361. World Literature in English Translation**
(316.) Winter. 3(3-0) Interdepartmental with the Department of English.
Significant and characteristic works of the Orient, the Middle East, and Africa in English translation.
- 362. Genres and Themes in World Literature**
(317.) Spring. 3(3-0) Interdepartmental with and administered by the Department of English.
Work will center each term round a single literary genre, type or theme. Typical examples: The Quest, Literature of Revolt, Satire. Literary examples will be selected from several national literatures.
- 499. Special Projects**
Fall, Winter, Spring, Summer. Variable credit. May reenroll for a maximum of 18 credits. Approval of department.
Work in areas outside regular course offerings.

African Languages**AFR****101. African Languages--Elementary**
Fall. 4(4-1) May reenroll for AFR 101-102-103 sequence in more than one African language.

Comprehension and speaking taught by a linguist with native informants. Offerings include Bemba, Hausa, Ibo, Pidgin, Swahili, Yoruba. These and other African languages are taught upon sufficient demand and availability of instructors.

102. African Languages--Elementary
Winter, 4(4-1) May reenroll for AFR 101-102-103 sequence in more than one African language. AFR 101.

Continuation of AFR 101.

103. African Languages--Elementary
Spring, 4(4-1) May reenroll for AFR 101-102-103 sequence in more than one African Language. AFR 102.

Continuation of AFR 102.

200H. Honors Work

Fall, Winter, Spring. 1 to 16 credits. Approval of department.

201. African Languages--Intermediate
Fall. 4(5-0) May reenroll for AFR 201-202-203 sequence in more than one African language. AFR 103 in appropriate language or approval of department.

Continuation of African Languages-Elementary. Comprehension, speaking, reading and writing taught by a linguist with native informants. See AFR 101 for languages available.

202. African Languages--Intermediate
Winter. 4(5-0) May reenroll for AFR 201-202-203 sequence in more than one African Language. AFR 201.

Continuation of AFR 201.

203. African Languages--Intermediate
Spring. 4(5-0) May reenroll for AFR 201-202-203 sequence in more than one African language. AFR 202.

Continuation of AFR 202.

400H. Honors Work

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

420. African Literature in Translation

Fall, Winter, Spring. 3(3-0) May reenroll for a maximum of 9 credits. Juniors or approval of department.

Development and influence of the ideas, forms and motifs of African literatures in the literatures of the world.

450. African Languages--Advanced

Fall, Winter, Spring. Variable credit. May reenroll for a maximum of 18 credits. Approval of department.

Advanced training or specialized research in particular African languages.

Arabic**ARB****101. Elementary Arabic**
Fall. 4(4-1)

Introduction to Modern Standard Arabic, with pronunciation and conversation practice, reading and writing, and basic grammatical analysis.

102. Elementary Arabic
Winter. 4(4-1) ARB 101.

Continuation of ARB 101.

103. Elementary Arabic
Spring. 4(4-1) ARB 102.

Continuation of ARB 102.

201. Intermediate Arabic
Fall. 4(4-1) ARB 103.

Continuation of ARB 103.

202. Intermediate Arabic
Winter. 4(4-1) ARB 201.

Continuation of Arabic 201.

203. Intermediate Arabic
Spring. 4(4-1) ARB 202.

Continuation of ARB 202.

Chinese**CHS****101. Elementary Chinese**
Fall. 4(4-1)

Introduction to Mandarin, the official spoken language of China, with emphasis on pronunciation drill and conversation practice.

102. Elementary Chinese
Winter. 4(4-1) CHS 101.

Continued practice in conversation and aural comprehension; introduction to the reading and writing of Chinese characters.

103. Elementary Chinese
Spring. 4(4-1) CHS 102.

Continuation of CHS 102 and grammatical analysis of basic Chinese sentence structure.

200H. Honors Work

Fall, Winter, Spring. 1 to 16 credits. Approval of department.

201. Second-Year Chinese
Fall. 3(3-0) CHS 103.

Conversation, reading, and writing at the intermediate level.

202. Second-Year Chinese
Winter. 3(3-0) CHS 201.

Reading of advanced texts; introducing Chinese radicals and practice in the use of a Chinese dictionary.

203. Second-Year Chinese
Spring. 3(3-0) CHS 202.

Continuation of CHS 202; selected texts from Chinese newspapers, periodicals, and political journals.

221. Second-Year Conversation and Composition
Fall. 2(2-0) CHS 103.

Conversation and composition at the intermediate level to supplement CHS 201.

222. Second-Year Conversation and Composition
Winter. 2(2-0) CHS 221.

Continuation of CHS 221.

223. Second-Year Conversation and Composition
Spring. 2(2-0) CHS 222.

Continuation of CHS 222.

250. Chinese Calligraphy

Spring. 2(2-0) One year in Chinese language or approval of department.
The essential characteristics of and fundamental skills involved in writing Chinese characters, from the point of view of practical use.

301. Readings in Modern Chinese Literature

Fall. 3(3-0) CHS 203.

Selected short stories from authors of the twentieth century.

302. Readings in Modern Chinese Literature

Winter. 3(3-0) CHS 301.

Selected essays from authors of the twentieth century.

303. Readings in Classical Chinese Literature

Spring. 3(3-0) CHS 302.

Selections from the writings of the important philosophers, historians and poets.

321. Conversation and Composition

Fall, Winter, Spring. 3(3-0) May reenroll for a maximum of 9 credits. CHS 203.

Directed topical conversation and practice in composition.

400H. Honors Work

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

401. Survey of Chinese Literature

Fall, Winter, Spring. 3(3-0) May reenroll for a maximum of 9 credits. Oral command and reading knowledge of Chinese language.

Survey of Chinese literature from earliest record to contemporary writings. Lectures and discussions conducted in Chinese. Most assigned readings in Chinese, some in English translation.

420. Oriental Literature in Translation

Fall, Winter, Spring. 3(3-0) May reenroll for a maximum of 9 credits. Juniors or approval of department.

Development and influence of the ideas, forms and motifs of Far Eastern literatures in the literatures of the world.

431. Chinese Poetry

Fall. 3(3-0) Reading knowledge of Chinese.

Rise and development of Chinese poetry with particular attention to poetry of the T'ang Dynasty.

432. Chinese Drama

Winter. 3(3-0) Reading knowledge of Chinese.

Special emphasis on drama of the Yuan Dynasty.

Hebrew**HEB****101. Elementary Hebrew**

Fall. 4(4-1) Interdepartmental with the Department of Religious Studies.

Introduction to the Hebrew language, with pronunciation and conversation practice, reading and writing, and basic grammatical analysis of biblical and modern Hebrew.

Descriptions – Linguistics and Oriental and African Languages

of

Courses

102. Elementary Hebrew

Winter. 4(4-1) HEB 101. Interdepartmental with the Department of Religious Studies.

Continuation of HEB 101.

103. Elementary Hebrew

Spring. 4(4-1) HEB 102. Interdepartmental with the Department of Religious Studies.

Continuation of HEB 102.

Japanese

JAP

101. Elementary Japanese

Fall. 4(4-1)

Spoken and written Japanese; emphasis on conversation and easy reading.

102. Elementary Japanese

Winter. 4(4-1) JAP 101.

Continuation of JAP 101.

103. Elementary Japanese

Spring. 4(4-1) JAP 102.

Continuation of JAP 102.

201. Second-Year Japanese

Fall. 3(3-0) JAP 103.

A second-year course, stressing both oral and written Japanese.

202. Second-Year Japanese

Winter. 3(3-0) JAP 201.

Continuation of JAP 201.

203. Second-Year Japanese

Spring. 3(3-0) JAP 202.

Continuation of JAP 202.

221. Second-Year Composition

Fall. 2(2-0) JAP 103.

Review grammar and composition to supplement JAP 201.

222. Second-Year Composition

Winter. 2(2-0) JAP 221.

Continuation of JAP 221.

223. Second-Year Composition

Spring. 2(2-0) JAP 222.

Continuation of JAP 222.

400H. Honors Work

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

Linguistics

LIN

200. Language and Linguistics

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

Especially for students in areas other than linguistics, this course consists of an introduction to language and linguistics, emphasizing the application of linguistics to various other disciplines.

320. Introduction to Sociolinguistics

Winter. 3(3-0)

The association of linguistic features and choice among linguistic varieties with socio-cultural variables. Topics: small group interactions, styles and dialects, multilingualism, code-switching, language maintenance and shift, language policy.

401. Introduction to Linguistics

Fall, Winter, Spring, Summer. 4(4-0) Juniors or approval of department. Not open to students with credit in LIN 200.

The scientific study of human languages. Basic goals, assumptions, terminology, and research results of modern theoretical and applied linguistics, with examples from a variety of languages.

402. Phonology

Fall, Winter. 3(3-0) LIN 200, LIN 401 or approval of department.

Sounds and sound systems, emphasizing the four basic areas of articulatory phonetics, phonetic features and components, classical phonemics, and phonology in contemporary linguistic theories.

403. Morphology

Winter, Spring. 3(3-0) LIN 402 the previous term or approval of department.

Structure of words, covering the identification and classification of morphemes, morphophonemics alternation, and morphology in contemporary linguistic theories.

404. Syntactic Phenomena

Spring. 3(3-0) LIN 200 or LIN 401.

Essential syntactic phenomena in the languages of the world. Syntactic description of phrases, clauses, and sentences, and its relation to morphological structures and meaning structures.

408. History of Linguistics

(811.) Fall. 3(3-0) LIN 200 or LIN 401.

The origin and development of linguistic studies from ancient India and Greece to the present. Provides a foundation for the understanding of contemporary issues in linguistics.

410. Child Language Acquisition

Fall. 3(3-0) LIN 200 or LIN 401 or approval of instructor.

Linguistic issues, perspectives, and research on the acquisition of language, in spoken and written form, by children; phonology, morphology, syntax, semantics, and linguistic universals; implications for related disciplines.

421. Articulatory Phonetics

Fall, Spring. 3(2-2) Approval of department.

Development of phonetic skills for the learning and teaching of languages.

425. Field Methods

(841.) Fall. 3(3-0) May reenroll for a maximum of 9 credits. LIN 403 or approval of department.

Methods of working with informants in order to gather linguistic information, processing and analyzing data, writing linguistic descriptions.

431. Introduction to Transformational Grammar

Winter, Spring. 4(4-0) LIN 200, LIN 401 or approval of department.

Investigation of the origin and development of transformational theory of syntax; properties of deep structure, surface structure, and transformations; application of transformational concepts to native and foreign language learning.

471. Principles and Methods of Historical Linguistics

Winter. 3(3-0) LIN 403 or concurrently.

Types of linguistic change and the methods used by linguists to study the historical development of languages and language families.

490. Senior Research

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

Individual projects demonstrating ability to do independent research.

808. Foundations of Modern Linguistics

Fall. 3(3-0) LIN 403.

Critical reading of basic texts of modern linguistics from 1900 to the 1950's with primary emphasis on American writers.

821. Phonological Analysis

Fall, Winter, Spring. 3(3-0) May reenroll for a maximum of 9 credits. Approval of department.

Advanced study of phonology, generally utilizing one of the following theories: stratificational, tagmemic, transformational.

831. Grammatical Analysis

Fall, Winter, Spring. 3(3-0) May reenroll for a maximum of 9 credits. Approval of department.

Advanced study of syntax and related topics, generally utilizing one of the following theories: stratificational, tagmemic, transformational.

835. Semantics of Natural Languages

Spring. 3(3-0) LIN 431 or approval of department.

Selected topics on the study of meaning in human languages. History, issues, and theories of semantics.

IDC. Subsaharan Africa Seminar

For course description, see Interdisciplinary Courses.

851. African Linguistics

Winter. 3(3-0) May reenroll for a maximum of 9 credits. LIN 401; LIN 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) LIN 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)

LIN 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 reenroll 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. Master's Thesis Research

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

999. Doctoral Dissertation Research

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

**LYMAN BRIGGS
SCHOOL**

LBS

College of Natural Science

Lyman Briggs School has a six term sequence in Chemistry and Physics that may be completed to fulfill the School's requirements in Chemistry and Physics. This sequence involves Lyman Briggs School 161 through 163L and Lyman Briggs School 261 through 263L. It is a coordinated sequence that is comparable to certain courses in the Department of Chemistry and the Department of Physics. Any student who plans to complete only part of the sequence must contact the faculty coordinator of either the Chemistry or the Physics portion.

111. College Algebra

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

Rational and real numbers, functions, inverse functions, polynomials, rational functions, exponential and logarithmic functions, trigonometric functions and their inverses.

112. Calculus I

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

Theory and applications of derivatives to polynomials, rational functions, trigonometric functions and their inverses, logarithmic and exponential functions. Definition and properties of the definite integral. Numerical approximations of definite integrals.

113. Calculus II

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

Further applications of the derivative to related rates, approximations including Newton's method and graphing. The mean value theorem. Integration techniques, applications, and improper integrals. The conics and polar coordinates.

124. APL-Computer Programming for Scientists

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

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) LBS 131.

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

For prerequisite purposes the introductory biology sequence LBS 140, 141, 242 may be used in place of Biological Science 210, 211, 212.

140. Biology I

Winter, Spring, 4(3-3) Not open to students with credit in B S 210.

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

141. Biology II

Fall, Spring, 4(3-3) LBS 140; not open to students with credit in B S 210.

Cellular structure and function. 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 reenroll for a maximum of 4 credits. LBS 140 or concurrently.

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

143. Biology IIA

Fall, Spring, 2 credits. May reenroll for a maximum of 4 credits if different topic is taken. LBS 141 or concurrently.

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

160. Physics--Elementary Concepts

(150.) Winter, 1(2-0) LBS 162 or concurrently.

Elementary concepts of mechanics, electricity, magnetism and optics.

161. Introduction to Chemistry and Physics I

Fall, 3(4-0) MTH 108 or MTH 109 or MTH 111 or LBS 111 concurrently; LBS 161L or concurrently or approval of instructor.

Gases and gas laws, kinetic theory, heat and thermodynamics. Equilibria, solutions, acids and bases, ionization and electrolysis.

161L. Introductory Chemistry Laboratory

Fall, 1(0-3) LBS 161 or concurrently or approval of instructor.

Techniques and instruments in the chemistry laboratory. Includes qualitative, quantitative and synthetic work.

162. Introduction to Chemistry and Physics II

Winter, 3(4-0) LBS 161; LBS 162L or concurrently or approval of instructor.

Basic concepts of atomic and nuclear structure, wave particle duality, the quantum theory and the special theory of relativity. Radioactivity, nuclear reactions and elementary particle physics.

162L. Introductory Physics Laboratory

Winter, 1(0-3) LBS 162 or concurrently or approval of instructor.

Introduction to techniques and instruments in the physics laboratory. Selected experiments in classical and modern physics.

163. Introduction to Chemistry and Physics III

Spring, 3(4-0) LBS 162; LBS 163L or concurrently or approval of instructor.

Periodic properties and chemical families, stoichiometry, modern theory of chemical bonding, molecular orbitals. Chemical dynamics and equilibria, some organic chemistry nomenclature and reaction kinetics.

163L. Introductory Chemistry Laboratory

Spring, 1(0-3) LBS 163 or concurrently or approval of instructor.

Continuation of LBS 161.

216. Calculus III

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

Series, sequences, power series including Taylor series, and indeterminate forms. Graphing and vector geometry in 3-spaces. Differential calculus of functions of several variables through Taylor series and extreme points.

217. Calculus IV

Fall, Winter, Spring, 5(5-0) LBS 216. Credit may not be earned in both LBS 217 and MTH 310.

Double and triple integrals and their applications. Line integrals. Ordinary differential equations of first order and linear second order equations, including series solutions. Numerical methods for single and Simultaneous equations.

233. Special Topics in Third Culture Rhetoric

Fall, Winter, Spring, 1 to 2 credits. May reenroll for a maximum of 6 credits. LBS 132.

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

For prerequisite purposes the introductory biology sequence LBS 140, 142, 242 may be used in place of Biological Science 210, 211, 212.

242. Biology III

Fall, Winter, 4(3-3) LBS 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.

256. Energy Consumption and Environmental Quality (N)

Spring, 3(3-0) Interdepartmental with and administered by the Department of Physics.

The role of energy as a fundamental pollutant will be discussed along with the availability of fossil energy sources. Limitations on the safe utilization of both fossil and nuclear energy will also be considered.