664. Ambulatory Clerkship III
Fall, Winter, Spring, Summer. 4 credits. LSM 667, approval of department. In-depth, supervised farm animal medicine and surgery.

666. Herd Health Clerkship I
Fall, Winter, Spring, Summer. 4 credits. LSM 666, approval of department. Concepts and supervised procedures for preventing health problems in herds maintained of professional veterinary.

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. Preceptorship Clerkship
(603.) Fall, Winter, Spring, Summer. (18-24 to 16-48). 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(0-3) 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

921. Pathology of Nutritional and Metabolic Diseases
Summer of even-numbered years. 4(3-2) Approval of department. PTH 404 or ANT 420. ANS 325, BCH 452, HNF 462 recommended. Interdepartmental with Human Nutrition and Foods and the departments of Animal Husbandry, and Pathology. Administered by 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

AFR

101. African Languages—Elementary
Fall. 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 203 in appropriate language or approval of department. Continuation of AFR 210. AFR 202.

202. African Languages—Intermediate
Spring. 4(5-0) May reenroll for AFR 201-202-203 sequence in more than one African language. AFR 210. 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 201.

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

AFR

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

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

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

Continuation of AFR 101.

Continuation of AFR 102.
### Chinese

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Department</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHS 101</td>
<td>Elementary Chinese</td>
<td></td>
<td>4-1</td>
<td>Introduction to Mandarin, the official spoken language of China, with emphasis on pronunciation drill and conversation practice.</td>
</tr>
<tr>
<td>CHS 102</td>
<td>Intermediate Chinese</td>
<td></td>
<td>4-1</td>
<td>Continued practice in conversation and aural comprehension; introduction to the reading and writing of Chinese characters.</td>
</tr>
<tr>
<td>CHS 201</td>
<td>Elementary Chinese</td>
<td></td>
<td></td>
<td>Continuation of CHS 101.</td>
</tr>
<tr>
<td>CHS 202</td>
<td>Intermediate Chinese</td>
<td></td>
<td></td>
<td>Continuation of CHS 102 and grammatical analysis of basic Chinese sentence structure.</td>
</tr>
<tr>
<td>CHS 221</td>
<td>Second-Year Chinese</td>
<td></td>
<td></td>
<td>Conversation, reading, and writing at the intermediate level.</td>
</tr>
<tr>
<td>CHS 222</td>
<td>Second-Year Composition</td>
<td></td>
<td></td>
<td>Reading of advanced texts; introducing Chinese idioms and practice in the use of a Chinese dictionary.</td>
</tr>
</tbody>
</table>

### Japanese

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</thead>
<tbody>
<tr>
<td>JAP 101</td>
<td>Elementary Japanese</td>
<td></td>
<td>4-1</td>
<td>Written and spoken Japanese; emphasis on conversation and easy reading.</td>
</tr>
<tr>
<td>JAP 102</td>
<td>Elementary Japanese</td>
<td></td>
<td></td>
<td>Continuation of JAP 101.</td>
</tr>
<tr>
<td>JAP 201</td>
<td>Second-Year Japanese</td>
<td></td>
<td></td>
<td>A second-year course, stressing both oral and written Japanese.</td>
</tr>
<tr>
<td>JAP 202</td>
<td>Second-Year Japanese</td>
<td></td>
<td></td>
<td>Continuation of JAP 201.</td>
</tr>
</tbody>
</table>

### Linguistics

<table>
<thead>
<tr>
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<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIN 101</td>
<td>Elementary Hebrew</td>
<td></td>
<td>4-1</td>
<td>Interdepartmental with the Department of Religious Studies.</td>
</tr>
<tr>
<td>LIN 200</td>
<td>Language and Linguistics</td>
<td></td>
<td>3-0</td>
<td>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.</td>
</tr>
</tbody>
</table>

### Intermediate Arabic

<table>
<thead>
<tr>
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<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARB 101</td>
<td>Elementary Arabic</td>
<td></td>
<td></td>
<td>Continuation of ARB 103.</td>
</tr>
<tr>
<td>ARB 201</td>
<td>Intermediate Arabic</td>
<td></td>
<td></td>
<td>Continuation of Arabic 201.</td>
</tr>
<tr>
<td>ARB 301</td>
<td>Advanced Arabic</td>
<td></td>
<td></td>
<td>Continuation of ARB 202.</td>
</tr>
</tbody>
</table>

### Chinese Calligraphy

<table>
<thead>
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<th>Description</th>
</tr>
</thead>
</table>
| CHS 250    | Chinese Calligraphy |  | 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. |

### Chinese Literature

<table>
<thead>
<tr>
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<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHS 301</td>
<td>Chinese Drama</td>
<td></td>
<td>3-0</td>
<td>Special emphasis on drama of the Yuan Dynasty.</td>
</tr>
</tbody>
</table>
| CHS 302    | Chinese Poetry |  | 3-0 | Reading knowledge of Chinese. 
| CHS 303    | Chinese Prose |  | 3-0 | Reading knowledge of Chinese. 
| CHS 304    | Modern Chinese Literature |  | 3-0 | Selections from the writings of the important philosophers, historians, and poets. |

### Hebrew

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<th>Credits</th>
<th>Description</th>
</tr>
</thead>
</table>
| HEB 101    | Elementary Hebrew |  | 4-1 | Interdepartmental with the Department of Religious Studies. 
| HEB 200    | Language and Linguistics |  | 3-0 | The association of linguistic features and choice among linguistic 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, traditional 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
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.

411. Articulatory Phonetics
Fall, Spring, 3(2-2) Approval of department.
Development of phonetic skills for the learning and teaching of languages.

415. Field Methods
Fall, 3(3-0) May reenroll for a maximum of 9 credits. LIN 402 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.

999. 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 COLLEGE

Lyman Briggs College has a six term sequence in Chemistry and Physics that may be completed to fulfill the College's requirements in Chemistry and Physics. This sequence involves Lyman Briggs College 161 through 163L, and Lyman Briggs College 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 college. Not open to students with credit in MTH 106, MTH 109 or MTH 111.
Rational and real numbers, functions, inverse functions, polynomials, rational functions, exponential and logarithmic functions, trigonometric functions and their inverses.

122. Calculus I
Fall, Winter, Spring, 5(5-0) LBC 111 or MTH 110; LBC 112 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.

123. Calculus II
Fall, Winter, Spring, 5(5-0) LBC 112 and LBC 114. Not open to students with credit in MTH 112.
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) LBC 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) LBC 131.
Continuation of LBC 131 with emphasis upon investigative papers. Selected students may meet course requirements through independent study.

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