

transformation, domination, colonialism as well as sharing to understand both the cultural commonalities and differences in identity formation.

ANTY 426 - Culture, Health and Healing

Credits: 3. Offered autumn. Cross-cultural comparisons of theories and concepts and health and illness.

Examination of the impact of these concepts upon health practices and treatment of disease around the world.

ANTY 427 - Anthropology of Gender

Credits: 3. Offered spring. Comparative study of the history and significance of gender in social life.

ANTY 430 - Social Anthropology

Credits: 3. Offered spring. Prereq., ANTY 220S. Seminar style senior capstone course for cultural anthropology students. This course focuses on bringing theory and methods together in written and visual ethnography.

ANTY 431 - Ethnographic Field Methods

Credits: 3. Offered spring. Prereq., ANTY 220S, ANTY 401, or consent of instr. Introduction to socio-cultural anthropological methods including participant observation, interviewing and narrative techniques and analysis of qualitative data.

ANTY 433 - Indig Global Health & Healing

Credits: 3. Offered alternate years. Examination of traditional and contemporary uses of medicine in Native American societies. Issues covered will include current health conditions of American Indians, and the relationship from a cultural perspective on health, healing and medicine.

ANTY 435 - Drugs, Culture and Society

Credits: 3. Offered intermittently. Drug use in a cross-cultural perspective. The role of drugs in cultural expression and social interaction. Examination of the prehistory of drug use, drug use in traditional non-Western and Western societies, and drug use in the context of global sociocultural change.

ANTY 440 - Cont. Issues of SSEA

Credits: 3. Offered intermittently. Prereq., ANTY 102H. An examination of the major issues that affect the contemporary experience of South and Southeast Asians.

ANTY 442 - Cities/Landscapes Central Asia

Credits: 3. Offered spring odd numbered years. Analysis of the main centers of civilization and culture, rich sites and monuments of Central Asia and Southwest Asia since ancient times.

ANTY 444 - Artistic Tradtns Central Asia

Credits: 3. Offered spring even numbered years. Analysis of the study of human artistic creativity and scientific innovations of various cultures in Central and Southwest Asia since ancient times.

ANTY 450 - Archaeological Theory

Credits: 3. Offered autumn. Prereq., ANTY 250S. Historical trends and current major theories and methods in archaeology. Course Attributes: Writing Course-Advanced

ANTY 451 - Cultural Resource Management

Credits: 3. Offered autumn. Introduction to the laws and practice of cultural resource/heritage property management. Focus on the management of archaeological sites, historic structures, and traditional cultural places due to federal laws. Emphasis is on laying foundation of CRM practices for students interested in pursuing it as a potential career. Course Attributes: Writing Course-Advanced

ANTY 452 - GIS in Archaeology

Credits: 3. Prereq., ANTY 250s. Anthropological and archaeological data acquisition, management, and analysis using Geographic Information Systems (GIS) tools and techniques.

ANTY 454 - Lithic Technology

Credits: 3. Offered autumn odd-numbered years. Prereq., ANTY 250S and consent of instr. Analysis of stone artifacts and debitage.

ANTY 455 - Artifact Analysis

Credits: 3. Offered spring. Prereq., ANTY 250S and consent of instr. Laboratory approaches and techniques for analyzing material culture from technological, stylistic, and chronological perspectives. Course Attributes: Writing Course-Advanced

ANTY 456 - Historical Archaeology

Credits: 3. Offered spring. Prereq., ANTY 250S or consent of instr. Understanding and interpreting the past through historical archaeological remains, methods, and theories. Focuses on historical archaeological sites and topics from the American West, but also examines the field's global perspective.

ANTY 457 - Arch of the Pacific Northwest

Credits: 3. Offered autumn even-numbered years. Introduction to the study of archaeology in the Pacific Northwest region inclusive of the Northwest Coast and Columbia/Fraser-Thompson Plateau. Understanding hunter-gatherer adaptations, evolution of social complexity, and ancient history of contemporary native peoples in the region.

ANTY 458 - Arch of Hunter-Gatherers

Credits: 3. Offered autumn even-numbered years. Introduction to the archaeological study of hunter-gatherer societies. Primary emphasis on archaeological method and theory.

ANTY 459 - Arch of the Arctic/Subarctic

Credits: 3. Offered spring even-numbered years. Introduction to the study of Arctic and Subarctic archaeology emphasizing the Pleistocene and Holocene prehistory of North America and eastern Siberia. Understanding of methodological problems associated with archaeology in a northern context, the evolution of Inuit, Eskimo, Aleut and Athapaskan cultures, and hunter-gatherer adaptations to northern interior and coastal environments.

ANTY 465 - Arch of the SW United States

Credits: 3. Offered intermittently. The development of the prehistoric communities in the southwestern United States from ancient times to the dawn of history in the area.

ANTY 466 - Archaeological Survey

Credits: 1 TO 12. (R-12) Prereq., ANTY 250S and consent of instr. Offered autumn. A field course in Montana archaeology.

ANTY 467 - Archaeological Field School

Credits: 3 TO 12. (R-12) Offered summer. Prereq., ANTY 250S and consent of instructor. Provides students with a well-rounded experience in archaeological field methods. Field schools will typically occur at archaeological site locations away from campus. During the archaeological field experience, students may learn methods of excavation, survey, research, and analysis to facilitate their transition to careers as professional archaeologists.

ANTY 476 - Methods for Native Languages

Credits: 3. (R-6) Offered Spring. In an effort to highlight promising methodologies that will advance the success of Native language acquisition and instruction, students will be exposed to an innovative methodology while being instructed in an Indigenous language.

ANTY 491 - Special Topics

Credits: 1 TO 9. (R-9) Offered intermittently. Prereq., consent of instr. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

ANTY 492 - Independent Study

Credits: 1 TO 6. (R-6) Offered every term. Prereq., consent of instr. Course material appropriate to the needs and objectives of the individual student.

ANTY 494 - Seminar/Workshop

Credits: 3. Offered spring. Advanced analysis of historical and contemporary issues involving human communities, cultures, and economies of a particular region, and that region's role in the world.

ANTY 495 - Field Experience:

Credits: 1 TO 12. (R- 12) Offered intermittently. Prereq., consent of instr. Organized field experience in anthropology. Course Attributes: Internships/Practicums

ANTY 500 - Cont Anthro Thought

Credits: 3. Offered autumn and spring. Prereq., graduate standing or consent of instructor. A review of major contributions to current anthropological theory, with an emphasis on the application of theory to anthropological problems. Significant advances in general theory, symbolic anthropology, critical theory, cultural studies, and postmodernism. Level: Graduate

ANTY 501 - Historical Anthropology

Credits: 3. Offered spring even numbered years. The location, use, and value of written records in anthropological research. Level: Graduate

ANTY 502 - Curatorial & Archival Mgmt

Credits: 3. Offered intermittently. Theory and practice in the curation of anthropological collections and the maintenance of anthropological information and records. Level: Graduate

ANTY 503 - Cultl Resrc Interpretation

Credits: 3. Offered intermittently. Practice of presenting anthropological knowledge of cultural resources to the public, with an emphasis on writing. Level: Graduate

ANTY 510 - Sem Human Var & Evol

Credits: 3. (R-6) Offered autumn. Prereq., ANTY 515. Various topics related to genetic evidence of human biological evolution, morphological and genetic diversity of modern humans, and problems of "race". Level: Graduate

ANTY 512 - Adv Forensic Anthropology

Credits: 3. (R-6) Offered spring. Prereq., ANTY 515 and consent of instr. Review of traditional methods and exploration of new methods of skeletal analysis, as applied to cases from the forensic collection. Level: Graduate

ANTY 513 - Sem Bioarch & Skel Biol

Credits: 3. (R-6) Offered spring. Prereq., ANTY 515 or consent of instructor. Theoretical and methodological approaches to the analysis of human skeletal remains derived from archaeological contexts. Demography, health

and disease, diet and nutrition, growth, activity patterns, and measures of biological relatedness are interpreted within a biocultural framework. Level: Graduate

ANTY 514 - Sem Paleoanth & Evol Analy

Credits: 3. (R-6) Offered intermittently. Prereq., ANTY 515 or consent of instructor. Exploration of selected aspects of the human fossil, archaeological, & genetic records and the theories and methods of evolutionary analysis used to analyze them. Level: Graduate

ANTY 515 - Theor & Meth in Bioanth

Credits: 3. Offered autumn. A detailed review of the body of theory that is foundational for the study of human evolution, human variation, bioarchaeology, forensic anthropology, and primatology, along with a consideration of major methods used to analyze data in these fields. Level: Graduate

ANTY 520 - Seminar in Ethnology

Credits: 3. (R-6) Offered autumn. A review and discussion of current research. Topics vary. Level: Graduate

ANTY 521 - Applied Anthropology

Credits: 3. Offered spring odd-numbered years. Study of ways in which anthropological skills may be used in non-academic fields. Level: Graduate

ANTY 522 - Medical Anthropology

Credits: 3. Offered spring even-numbered years. An examination of selected issues and trends in contemporary theory and methodology within medical anthropology. Seminar assignments and discussions focus on understanding the application of anthropological concepts and methods in medical settings and are organized around several topics, including cultural conceptualizations of health, illness and risk; global health; the social and cultural construction of illness; drug and pharmaceutical use; and mental health in cultural context. Level: Graduate

ANTY 550 - Seminar in Archaeology

Credits: 3. Offered autumn odd-numbered years. A review and discussion of current research. Topics vary. Level: Graduate

ANTY 551 - Seminar Historical Archaeology

Credits: 3. Offered autumn odd-numbered years. An exploration of theories, methods, and literature in historical archaeology. Level: Graduate

ANTY 552 - Power, Prestige & Things

Credits: 3. Offered autumn even-numbered years. Investigation of power, prestige, leadership, and inequality in past social systems as interpreted through artifacts and architecture. Level: Graduate

ANTY 553 - Evolutionary Archaeology

Credits: 3. Offered intermittently. Examination of method and theory in Darwinian evolutionary archaeology. Seminar assignments and discussions focus on human behavioral ecology, cultural transmission, and macroevolution. Level: Graduate

ANTY 593 - Professional Project

Credits: 1 TO 10. (R-10) Offered every term. Prereq., consent of instr. Preparation of a professional paper appropriate to the needs and objectives of the individual student. Level: Graduate Course Attributes: Faculty-Led Study Abroad

ANTY 595 - Special Topics

Credits: 1 TO 9. (R-9) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics. Level: Graduate Course Attributes: Internships/Practicums
ANTY 596 - Independent Study

Credits: 1 TO 9. (R-9) Offered every term. Prereq., consent of instr. Course material appropriate to the needs and objectives of the individual student. Level: Graduate Course Attributes: Service Learning/Volunteer
ANTY 597 - Research

Credits: 1 TO 10. (R-10) Offered every term. Prereq., consent of instr. Directed individual research and study appropriate to the back ground and objectives of the student. Level: Graduate
ANTY 598 - Internship

Credits: 1 TO 6. (R-6) Offered intermittently. Prereq., graduate standing and consent of faculty supervisor. Practical application of classroom learning through internship in a number of areas such as museology, cultural resource management and forensics. Written reports are required. Level: Graduate Course Attributes: Internships/Practicums
ANTY 599 - Thesis

Credits: 1 TO 10. (R-10) Offered every term. Prereq., consent of instr. Preparation of a thesis or manuscript based on research for presentation and/or publication. Level: Graduate
ANTY 600 - Issues Cultural Herit

Credits: 3. Offered autumn. Prereq., consent of instr. Doctoral dissertation research activities. A review of the range of topics that fall under the umbrella of cultural heritage and a review of theory and practice in one or more of these topics. Level: Graduate

ANTY 601 - Resrch Design & Proposal Prep

Credits: 3. Offered spring. Prereq., graduate standing. Seminar in the development of anthropological research designs and proposals. Level: Graduate

ANTY 602 - Cultl Herit Policy & Pract

Credits: 3. Offered spring odd-numbered years. Prereq., graduate standing. Exploration of critical issues in cultural heritage policy emphasizing the regulatory basis for federal CRM, public anthropology, and indigenous people's issues. Hands-on training in the design and production of federal planning documents. Level: Graduate

ANTY 694 - Seminar Cultural Heritage

Credits: 1 TO 6. (R-6) Offered intermittently. A review and discussion of current research. Topics vary. Level: Graduate

ANTY 697 - Advanced Research

Credits: 1 TO 6. (R-6) Offered every term. Prereq., consent of instr. Independent research projects, other than dissertation. Level: Graduate

ANTY 699 - Dissertation

Credits: 1 TO 10. (R-10) Offered every term. Doctoral dissertation research activities. Level: Graduate

Criminal Justice

CJUS 125N - Fund of Forensic Science

Credits: 3. Offered autumn and online spring. A survey of the forensic sciences and related disciplines and their use in criminal investigations, the role of forensic scientists in the investigative process and as expert witnesses. Course

Attributes: Natural Science Course

CJUS 488 - Foren Sci: Beyond Crime Lab

Credits: 3. Offered spring and online in autumn. Prereq., ANTH 286N or consent of instr. Examination of the forensic sciences with emphases on the non-crime lab forensic sciences, new technologies, and new directions in the forensic sciences.

English as a Second Language

EASL 195 - Special Topics

Credits: 1 TO 6. (R-6) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

EASL 250 - Interm Eng Acad Purpose I

Credits: 3. Offered autumn and spring. Prereq., 525 to 549 on the Paper-Based TOEFL or equivalent. Concentration on academic tasks prompting comprehension of evidence offered to support opinion; gathering facts to be stated in narrative/descriptive patterns is emphasized as distinct from practicing summary exposition. This course is highly recommended to all international students with TOEFL scores between 525 and 549. Student Option Grade Mode (traditional or credit/no credit).

EASL 251 - Inter Eng Acad Purposes II

Credits: 3. Offered autumn and spring. Prereq., 525 to 549 on the Paper-Based TOEFL or equivalent. Concentration on academic tasks guiding identification of main ideas underlying formal speech (broadcasts, lectures, interviews); recognition of intent of discussion and status of detail therein bearing on readings is emphasized. This course is highly recommended to all international students with TOEFL scores between 525 and 549. Student Option Grade Mode (traditional or credit/no credit).

EASL 450 - Adv Eng Acad Purposes I

Credits: 3. Offered autumn and spring. Prereq., 550 to 574 on the Paper-Based TOEFL or equivalent. Concentration on academic tasks prompting the collection and comprehension of evidence used to draw inferences regarding debatable issues; explanation of connection between evidence and inference is emphasized. This course is highly recommended to all international students with TOEFL scores between 550 and 574. Student Option Grade Mode (traditional or credit/no credit).

EASL 451 - Adv Eng Acad Purposes II

Credits: 3. Offered autumn and spring. Prereq., 550 to 574 on the Paper-Based TOEFL or equivalent. Concentration on academic tasks obliging comprehension of main ideas/details furnished in spoken media (broadcasts, lectures, discussions); detection of intended message and essential facts related to readings is emphasized. This course is highly recommended to all international students with TOEFL scores between 550 and 574. Student Option Grade Mode (traditional or credit/no credit).

Historic Preservation

HPRV 400 - Historic Preservation

Credits: 3. This course is intended to provide a comprehensive foundation to historic preservation practice and issues. Topics include the history and theory of the American historic preservation movement, identification and documentation of historic properties, preservation technology, strategies for conservation of historic resources and a critical examination of the philosophy and principles of preservation.

Linguistics

LING 191 - Special Topics

Credits: 1 TO 6. (R-6) Offered autumn and spring. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

LING 198 - Internship

Credits: 1 TO 6. Offered autumn and spring. Prereq., consent of department. Extended classroom experience which provides practical application of classroom learning during placements off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation. Course Attributes: Internships/Practicums

LING 270S - Intro to Ling

Credits: 3. Offered autumn and spring. An introduction to the field of modern linguistics and to the nature of language. Emphasis on the ways different cultures develop symbol systems for representing meaning. Course Attributes: Social Sciences Course

LING 375X - Endangered Languages

Credits: 3. Offered spring. Survey of endangered languages and the communities in which those endangered languages are spoken. Topics to be addressed include linguistic diversity, language endangerment, language shift and loss, language maintenance efforts, and prospects for the future of these languages. Course Attributes: Indigenous and Global

LING 391 - Special Topics

Credits: 1 TO 9. (R-9) Offered autumn and spring. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

LING 398 - Internship

Credits: 1 TO 6. Offered autumn and spring. Prereq., consent of department. Extended classroom experience which provides practical application of classroom learning during placements off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation. Course Attributes: Internships/Practicums

LING 465 - Structure & History of English

Credits: 3. Offered one per year. The development of the English language from a historical perspective contrasted with the phonological and grammatical structure of English from a modern linguistic point of view; specifically designed for teachers.

LING 466 - Pedagogical Grammar

Credits: 3. Offered intermittently. Prereq., LING 470. Discussion of English grammar from a non–native speaker perspective focusing on items and structures that are difficult for non–native speakers.

LING 470 - Linguistic Analysis

Credits: 3. Offered autumn and spring. An in-depth examination of the formal properties of language, concentrating on the core areas of linguistic analysis (phonetics, phonology, morphology, syntax and semantics).

LING 471 - Phonetics and Phonology

Credits: 3. Offered autumn. Prereq., LING 470. A study of phonetic and phonological systems from as many as 20 languages, most of them non–Indo–European; training in how to do linguistic analysis as well as linguistic theory.

This course co-convenes with LING 571. Course Attributes: Co-Convened Course

LING 472 - Generative Syntax

Credits: 3. Offered autumn. Prereq., LING 470. This course is Co-convened with LING 572. A study of the human language sentence–formation system, the means for expressing semantic information as propositional content.

Emphasis on the abstraction of utterances in the form of mathematical objects. This course co-convenes with LING 572. Course Attributes: Co-Convened Course

LING 473 - Language and Culture

Credits: 3. Offered spring. Prereq., LING 470. Technical study of the relationships between grammatical categories and world view. This course co-convenes with LING 573. Course Attributes: Co-Convened Course Writing Course-Advanced

LING 474 - Historical Linguistics

Credits: 3. Offered spring. Prereq., LING 470. An introduction to the study of language change over time. Topics include: methods for studying language change (the comparative method and internal reconstruction); types of language change (sound change, borrowing, analogical change, lexical, syntactic, and semantic change); and explanations for language change. The principles of historical reconstruction and comparative method in the analysis of linguistic variation and change. This course co-convenes with LING 574. Course Attributes: Co-Convened Course

LING 475 - Linguistic Field Methods

Credits: 3. Offered spring odd-numbered years. Prereq., LING 470. Writing up linguistic data; developing techniques for eliciting linguistic data by working with a native speaker of a less commonly taught language. This course co-convenes with LING 575. Course Attributes: Co-Convened Course

LING 477 - Bilingualism

Credits: 3. Offered autumn. Prereq., LING 270S or equiv. Societal and individual bilingualism: topics include language policy, maintenance, interference, code-switching and mixing, and bilingual education.

LING 478 - Second Language Development

Credits: 3. Offered spring. Prereq., LING 471 and 472 or consent of instructor. Like studies in Second Language (L2) Acquisition, this course considers Interlanguage (i.e., a language system that develops non–natively) and includes analysis of L2 data taken from naturalistic and experimental setting.

LING 480 - Tchg Engl as For Lang

Credits: 3. Offered autumn. Prereq., LING 270 or equiv. Same as ENLI 480. The application of principles of modern linguistics to the problems of teaching English as a foreign language.

LING 481 - The ESL Professional

Credits: 3. Offered intermittently. Prereq. or coreq., LING 491; prereq., LING 480 or consent of instr. Professional development techniques for the independent language teacher: language test construction, self-critique of teaching strategies, materials development, curriculum evaluation and design, and electronic and print media resources for the language teaching professional.

LING 484 - NA Indigenous Lang & Ling

Credits: 3. Offered spring even-numbered years. Prereq. LING 470. Description and analysis of grammatical features of Indigenous languages of North America. This course co-convenes with LING 584. Course Attributes: Co-Convened Course Writing Course-Advanced

LING 489 - Morphology

Credits: 3. Offered spring. Prereq., LING 470. A survey of the morphological features of several unrelated languages to provide the student with a broad overview of how languages compare and contrast. This course co-convenes with LING 589. Course Attributes: Co-Convened Course

LING 491 - Special Topics

Credits: 1 TO 6. (R-6) Offered autumn and spring. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics. Course Attributes: Internships/Practicums

LING 492 - Independent Study

Credits: 1 TO 9. (R-9) Offered autumn and spring. Prereq., consent of instr. Special projects in linguistic analysis.

LING 495 - ESL Practicum

Credits: 1 TO 3. Offered autumn and spring. Prereq., or coreq., LING 480. Offered every term. Same as ENLI 491. Students with a teaching major take the course for 3 credits; others take it for 1 credit and do one third of the work. Course Attributes: Internships/Practicums

LING 498 - Internship

Credits: 1 TO 6. Offered autumn and spring. Prereq., consent of department. Extended classroom experience which provides practical application of classroom learning during placements off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation. Course Attributes: Internships/Practicums

LING 559 - Preceptorship

Credits: 1. (R-4) Offered autumn and spring. Prereq., consent of instr. Materials development, assessment and evaluation of learners' needs and interests in teaching English as an academic second Language to international students attending universities with English instruction. Level: Graduate

LING 570 - Seminar in Linguistics

Credits: 3. (R-12) Offered autumn and spring. Advanced topics in linguistic analysis. Level: Graduate

LING 571 - Phonetics and Phonology

Credits: 3. Offered autumn. A study of phonetic and phonological systems from as many as 20 languages, most of them non-Indo-European; training in how to do linguistic analysis as well as linguistic theory. This course co-convenes with LING 471. Graduate students taking LING 571 will complete additional requirements and their work will be of a more advanced nature. Level: Graduate Course Attributes: Co-Convened Course

LING 572 - Generative Syntax

Credits: 3. Offered autumn. Prereq., LING 470 or equivalent. An inquiry in foundations of common human language sentence–formation system, understood as a type of mapping function (a computational world of calculations) that relates human utterances (the physical world of sound) and their propositions (the mental world of meaning). An emphasis on the abstraction of observable forms (cross-linguistic data) as prime mathematical objects. This course is Co-convened with LING 472. Graduate Requirements: weekly data-analysis problem-sets assigned to undergraduates plus additional exercises that extend several particular methods of analysis, consequently exploring the margins of generative-syntactic theory, which also includes one extra item on the midterm and final exams that complicates the theory, thus provoking the necessity for graduates to provide their observations of how these data confound the theory and to furnish plausible revisions to a theory of generative syntax as construed at that point during the course of the term. Level: Graduate Course Attributes: Co-Convened Course

LING 573 - Language and Culture

Credits: 3. Offered spring. Technical study of the relationships between grammatical categories and world view. This course co-convenes with LING 473. Graduate students will complete additional requirements and their work will be of a more advanced nature. Level: Graduate Course Attributes: Co-Convened Course

LING 574 - Historical Linguistics

Credits: 3. Offered spring. An introduction to the study of language change over time. Topics include: methods for studying language change (the comparative method and internal reconstruction); types of language change (sound change, borrowing, analogical change, lexical, syntactic, and semantic change); and explanations for language change. The principles of historical reconstruction and comparative method in the analysis of linguistic variation and change. This course co-convenes with LING 474. Graduate students will complete additional requirements and their work will be of a more advanced nature. Level: Graduate Course Attributes: Co-Convened Course

LING 575 - Linguistic Field Methods

Credits: 3. Offered spring odd-numbered years. Writing up linguistic data; developing techniques for eliciting linguistic data by working with a native speaker of a less commonly taught language. This course co-convenes with LING 475. Graduate students will complete additional requirements and their work will be of a more advanced nature. Level: Graduate Course Attributes: Co-Convened Course

LING 584 - NA Indigenous Lang and Ling

Credits: 3. Offered intermittently. Description and analysis of grammatical features of Indigenous languages of North America. This course co-convenes with LING 484. Graduate students will complete additional requirements and their work will be of a more advanced nature. Level: Graduate Course Attributes: Co-Convened Course

LING 589 - Morphology

Credits: 3. Offered spring. A survey of the morphological features of several unrelated languages to provide the student with a broad overview of how languages compare and contrast. This course co-convenes with LING 489. Graduate students taking LING 589 will complete additional requirements and their work will be of a more advanced nature. Level: Graduate Course Attributes: Co-Convened Course

LING 595 - Special Topics

Credits: 1 TO 9. (R–9) Offered autumn and spring. Experimental offerings of visiting professors, experimental offerings of new courses, or one–time offerings of current topics. Level: Graduate Course Attributes:

Internships/Practicums

LING 596 - Independent Study

Credits: 1 TO 3. (R-6) Offered autumn and spring. Course material appropriate to the needs and objectives of the individual student. Level: Graduate Course Attributes: Service Learning/Volunteer

LING 598 - Internship

Credits: 1 TO 6. (R-6) Offered autumn and spring. Extended classroom experience which provides practical application of classroom learning during placements off campus. Level: Graduate Course Attributes: Internships/Practicums

LING 599 - Professional Paper

Credits: 1 TO 6. (R-6) Offered autumn and spring. Preparation of a professional paper appropriate to the needs and objectives of the individual student. Level: Graduate

LING 699 - Thesis

Credits: 1 TO 6. (R-6) Offered autumn and spring. Preparation of a thesis or manuscript based on research for presentation and/or publication. Level: Graduate

Applied Science

College Humanities & Sciences Catalog Year: 2015-2016

Degree Type: Bachelor of Applied Science Level: Major Subject: **Applied Science**

Total Credits: 127 Cumulative GPA Required: 2.0

Lower Division Core

Category Name: Perspectives

Rule: A minimum of 3 credits towards each Perspective Category is required, except Natural Sciences.

Criterion: C- Number of Credits 27

Course Listing

Commentary: Some courses satisfy multiple Perspectives or GER Categories. Some courses included in your specific degree plan may overlap with Perspective or other GER categories; visit with your advisor for more information.

Subcategory Name: Expressive Arts (A) Rule: A minimum of three credits is required.

Criterion: C- Number of Credits 3

Course Listing Commentary:

Subcategory Name: Literary & Artistic Studies (L) Rule: A minimum of three credits is required.

Criterion: C- Number of Credits 3

Course Listing Commentary:

Subcategory Name: Historical & Cultural Studies (H) Rule: A minimum of three credits is required.

Criterion: C- Number of Credits 3

Course Listing Commentary:

Criterion: C- Number of Credits 3

Course Listing Commentary:

Subcategory Name: Ethical & Human Values (E) Rule: A minimum of three credits is required.

Criterion: C- Number of Credits 3

Course Listing Commentary:

Subcategory Name: American & European Perspectives (Y) Rule: A minimum of three credits is required.

Criterion: C- Number of Credits 3

Course Listing Commentary:

Subcategory Name: Indigenous & Global Perspectives (X) Rule: A minimum of three credits is required.

Criterion: C- Number of Credits 3

Course Listing Commentary:

Subcategory Name: Natural Sciences (N)

Rule: A minimum of six credits is required. At least one course must have a laboratory component.

Criterion: C- Number of Credits 6

Course Listing Commentary:

Commentary: Lower Division Core

Category Name: Symbolic System/Foreign Language

Rule: Students must complete either a Symbolic System OR a Foreign Language.

Criterion: C- Number of Credits 3-10

Course Listing Commentary:

Subcategory Name: Symbolic Systems

Rule: Successful completion of 1 course from the list below.

Criterion: C- Number of Credits 3-4

Course Listing

M 133 Geom & Meas for K-8 Teachers 3

M 162 Applied Calculus 4

SOCI 202 Social Statistics 3

STAT 216 Introduction to Statistics 4

Commentary: Prerequisites apply for all courses listed below; some courses from this list are major-restricted. Other baccalaureate major-specific Symbolic Systems may be used in lieu of course list above; speak with your advisor for more information.

Subcategory Name: Foreign Language

Rule: Successful completion of first-year sequence of a Modern and Classical Language (MCLL).

Criterion: C- Number of Credits 3-10

Course Listing

Commentary: A first-year sequence usually consists of courses numbered 101 & 102 (5 credits each) for most catalog-approved languages, though some exceptions to this course numbering and sequencing apply. Depending on the language, students may take a placement test to demonstrate proficiency to receive non-credit exemption from this requirement. Refer to the General Education Requirements section of this catalog and speak with your advisor for more information.

Commentary: Lower Division Core

Category Name: Mathematics

Rule: Any Mathematics course level 104 or higher (excluding M 111 Technical Mathematics).

Criterion: C- Number of Credits 3-4

Course Listing

Commentary: Appropriate placement into mathematics courses required. Prerequisites may apply. If a student successfully places into and completes a mathematics (either "M" or "STAT") course that is also considered a Symbolic System, that course may be used to count towards both the Mathematics and Symbolic Systems General Education Requirements.

Commentary: Lower Division Core

Category Name: Writing Skills

Rule: Both WRIT 101 AND an Approved Writing Course are required.

Criterion: C- Number of Credits 6

Course Listing

Commentary: NOTE: Students who place into and successfully complete WRIT 201 are considered to have satisfied both the WRIT 101 and the Lower-Division Approved Writing Course General Education Requirements.

Subcategory Name: WRIT 101 Rule: Take 1 of the courses below.

Criterion: C- Number of Credits 3

Course Listing

WRIT 101	College Writing I	3	F,S,SU
WRIT 201	College Writing II	3	

Subcategory Name: Lower-Division Approved Writing Course

Rule: Any course designated as an Approved Writing Course during semester it's taken.

Criterion: C- Number of Credits 3

Course Listing Commentary:

Commentary: Upper Division Core

Category Name: Upper-Division Credit Requirement

Rule: 39 upper-division courses required for UM GERs. At least 30 of the 39 upper-division credits must be from the degree plan. Criterion: Number of Credits 39

Course Listing Commentary: null

Upper Division Writing

Category Name: Upper-Division Writing

Rule: At least one upper-division writing course is required for UM GERs.

Criterion: Number of Credits 3

Course Listing

Commentary: This course may be included as part of the student's degree plan or total Upper-Division Credits.

Commentary: Other Courses

Category Name: AAS Degree Credits

Rule: Up to 50 technical credits earned from AAS may be counted towards the 127 required for the BAS.

Criterion: C- Number of Credits 38-50

Biochemistry

Bruce E. Bowler, Program Director

The Biochemistry Program is a joint program between the Department of Chemistry and Biochemistry and the Division of Biological Sciences. Biochemistry is an interdisciplinary science that integrates chemistry and biology to understand the molecular basis of life. The program offers a B.S. in Biochemistry and M.S. and Ph.D. degrees in Biochemistry & Biophysics.

Undergraduate majors receive a solid foundation in both chemistry and biology. Biochemistry courses are usually taken in the junior year allowing majors to become involved in research with faculty and to take electives in their senior year. The major also introduces students to computer science and bioinformatics, essential tools in modern biochemistry. The B.S. in Biochemistry prepares students for advanced degrees in biochemistry or biophysics, for medical, dental or veterinary schools and for careers in the pharmaceutical and biotechnology industries. A Health Professions option is also offered within the B.S. in Biochemistry for students whose career goals are in fields related to biochemistry. This option allows more flexibility in upper division electives, permitting students to tailor the degree to their needs. Students desiring a basic grounding in biochemistry to complement their primary major can choose to pursue a minor in Biochemistry.

The graduate degrees in Biochemistry & Biophysics prepare students to be independent researchers in academic laboratories or in the biotechnology and pharmaceutical industries. Through coursework and independent research, graduate students in this program will become adept at the physical and structural methods necessary to probe important problems in the life sciences at the molecular level. In collaboration with the Center for Biomolecular Structure & Dynamics, the Biochemistry Program provides state-of-the-art facilities for research in biochemistry, biophysics and structural biology.

Prospective students desiring further information on these degrees should contact the Program Director by visiting the [Biochemistry Program web site](#).

High School Preparation: In addition to the general University admission requirements, it is strongly recommended that a student take four years of mathematics, four years of science, and a foreign language.

College Humanities & Sciences Catalog Year: 2015-2016

Degree Type: Bachelor of Science Level: **Major** Subject: **Biochemistry**

Total Credits: 96 Cumulative GPA Required: 2.0

Lower Division Core

Category Name: Lower Division Core

Rule: Must complete the following subcategories

Criterion: Number of Credits 54

Course Listing Commentary:

Subcategory Name: Biochemistry

Rule: All of the following courses are required

Criterion: C- Number of Credits 5

Course Listing

BCH 110 Intro Biology for Biochemists 3

BCH 111 Intro Biol for Biochemists Lab 1

BCH 294 Seminar/Workshop 1

Subcategory Name: Biology

Rule: All of the following courses are required

Criterion: C- Number of Credits 8

Course Listing

BIOB 260 Cellular and Molecular Biology 4

BIOB 272 Genetics and Evolution 4

Subcategory Name: General and Organic Chemistry Rule: All of the following courses are required

Criterion: C- Number of Credits 20

Course Listing

CHMY 141N College Chemistry I 5

CHMY 143N College Chemistry II 5

CHMY 221 Organic Chem I 3

CHMY 222 Org Chm I Lab 2

CHMY 223 Organic Chm II 3

CHMY 224 Org Chm II Lab 2

Subcategory Name: Physics

Rule: All of the following courses are required

Criterion: C- Number of Credits 10

Course Listing

PHSX 215N Fund of Physics w/Calc I 4

PHSX 216N Physics Laboratory I w/Calc 1

PHSX 217N Fund of Physics w/Calc II 4

PHSX 218N Physics Laboratory II w/Calc 1

Subcategory Name: Mathematics

Rule: All of the following courses are required

Criterion: C- Number of Credits 8

Course Listing

M 171 Calculus I 4

M 172 Calculus II 4

Commentary:

Subcategory Name: Computer Science Rule: The following course is required

Criterion: C- Number of Credits 3

Course Listing

CSCI 250 Computer Mding/Science Majors 3

Commentary: We advise that students take CSCI 250 in their third year after completing lower division biochemistry, biology, chemistry, mathematics and physics coursework.

Commentary: Upper Division Core

Category Name: Upper Division Core

Rule: Must complete the following subcategories

Criterion: Number of Credits 29

Course Listing Commentary:

Subcategory Name: Biochemistry

Rule: All of the following courses are required

Criterion: C- Number of Credits 9

Course Listing

BCH 480 Advanced Biochemistry I 3

BCH 482 Advanced Biochemistry II 3

BCH 486 Biochemistry Research Lab 3

Subcategory Name: Biology

Rule: The following course is required

Criterion: C- Number of Credits 3

Course Listing

BIOB 425 Adv Cell & Molecular Biology 3

Subcategory Name: Analytical Chemistry Rule: All of the following courses are required

Criterion: C- Number of Credits 8

Course Listing

CHMY 311 Analytical Chem-Quant Analysis 4

CHMY 421 Advanced Instrument Analysis 4

Subcategory Name: Inorganic Chemistry Rule: The following course is required

Criterion: C- Number of Credits 3

Course Listing

CHMY 401 Advanced Inorganic Chemistry 3

Subcategory Name: Physical Chemistry Rule: Choose 1 of the following courses

Criterion: C- Number of Credits 3-4

Course Listing

CHMY 360 Applied Physical Chemistry 3

CHMY 373 Phys Chem-Kntcs & Thrmdynmcs 4

Commentary: Students planning to attend graduate school in biochemistry or biophysics are strongly advised to take the CHMY 373-371 sequence

Subcategory Name: Computer Science Rule: The following course is required

Criterion: C- Number of Credits 3

Course Listing

CSCI 451 Computational Biology 3

Upper Division Electives

Category Name: Advanced Electives

Rule: Choose 13 credits from the courses listed

Criterion: C- Number of Credits 13

Course Listing

BCH 490	Undergraduate Research	1 To 10
BIOB 301	Developmental Biology	3
BIOB 375	General Genetics	3
BIOB 410	Immunology	3
BIOB 411	Immunology Laboratory	2
BIOB 440	Biological Electron Microscopy	2
BIOB 486	Genomics	3
BIOB 490	Adv Undergrad Research	1 To 10
BIOH 360	Intro Neuroscience	3
BIOH 365	Human AP I for Health Profsns	4
BIOH 370	Human AP II for Health Profsns	4
BIOH 405	Hematology	3
BIOH 462	Principles Medical Physiology	3
BIOM 360	Gen Microbiolgy (equiv to 260)	3
BIOM 361	Gen Microbiolgy Lb (equiv 261)	2
BIOM 400	Medical Microbiology	3
BIOM 410	Microbial Genetics	3
BIOM 411	Exprmntl Microbial Genetcs Lab	1
BIOM 427	General Parasitology	2
BIOM 428	General Parasitology Lab	2
BIOM 435	Virology	3
CHMY 371	Phys Chem-Qntm Chm & Spctrscopy	4
CHMY 397	Teaching Chemistry	1
CHMY 402	Advanced Inorganic Chem Lab	2
CHMY 403	Descriptive Inorganic Chem	3
CHMY 442	Aquatic Chemistry	3
CHMY 465	Organic Spectroscopy	3
CHMY 466	FT-NMR Optn for Undrgrd Rsrch	1
CHMY 485	Laboratory Safety	1
CHMY 490	Undergraduate Research	1 To 9

CHMY 494	Seminar/Workshop	1 To 9
CHMY 498	Internship/Cooperative Educ	1 To 6
PHAR 421	Medicinal Chem I	3
PHAR 422	Medicinal Chem II	3

Commentary: No more than 3 credits combined of BIOB 490, CHMY 490, CHMY 498 and BCH 490. No more than 3 credits combined of CHMY 397 and CHMY 494.

College Humanities & Sciences Catalog Year: 2015-2016

Degree Type: Bachelor of Science Level: Major Subject: **Biochemistry** Option: **Health Professions**

Total Credits: 99 Cumulative GPA Required: 2.0

The B.S. in Biochemistry prepares students for advanced degrees in biochemistry or biophysics, for medical, dental or veterinary schools and for careers in the pharmaceutical and biotechnology industries. A Health Professions option is also offered within the B.S. in Biochemistry for students whose career goals are in fields related to biochemistry. This option allows more flexibility in upper division electives, permitting students to tailor the degree to their needs.

Lower Division Core

Category Name: Lower Division Core

Rule: Must complete the following subcategories

Criterion: Number of Credits 50

Course Listing Commentary:

Subcategory Name: Biochemistry

Rule: All of the following courses are required

Criterion: C- Number of Credits 5

Course Listing

BCH 110 Intro Biology for Biochemists 3

BCH 111 Intro Biol for Biochemists Lab 1

BCH 294 Seminar/Workshop 1

Subcategory Name: Biology

Rule: All of the following courses are required

Criterion: C- Number of Credits 8

Course Listing

BIOB 260 Cellular and Molecular Biology 4

BIOB 272 Genetics and Evolution 4

Subcategory Name: General and Organic Chemistry Rule: All of the following courses are required

Criterion: C- Number of Credits 20

Course Listing

CHMY 141N College Chemistry I 5

CHMY 143N College Chemistry II 5

CHMY 221 Organic Chem I 3

CHMY 222 Org Chm I Lab 2

CHMY 223 Organic Chm II 3

CHMY 224 Org Chm II Lab2

Subcategory Name: Physics

Course Listing

PHSX 205N College Physics I 4

PHSX 206N College Physics I Laboratory 1

PHSX 207N College Physics II 4

PHSX 208N College Physics II Laboratory 1

PHSX 215N Fund of Physics w/Calc I 4

PHSX 216N Physics Laboratory I w/Calc 1

PHSX 217N Fund of Physics w/Calc II 4

PHSX 218N Physics Laboratory II w/Calc 1

Subcategory Name: Mathematics

Rule: Either the M162/M274 sequence or the M171/M172 sequence may be completed
Criterion: C- Number of Credits 7-8

Course Listing

M 162 Applied Calculus 4

M 171 Calculus I 4

M 172 Calculus II 4

M 274 Intro to Differential Equation 3

Upper Division Core

Category Name: Upper Division Core

Rule: Must complete the following subcategories

Criterion: Number of Credits 25

Course Listing Commentary:

Subcategory Name: Biochemistry

Rule: All of the following courses are required

Criterion: C- Number of Credits 6

Course Listing

BCH 480 Advanced Biochemistry I 3

BCH 482 Advanced Biochemistry II 3

Subcategory Name: Microbiology

Course Listing

BIOM 360 Gen Microbiolgy (equiv to 260)3

Subcategory Name: Analytical Chemistry Rule: All of the following courses are required

Criterion: C- Number of Credits 8

Course Listing

CHMY 311 Analytical Chem-Quant Analysis 4

CHMY 421 Advanced Instrument Analysis 4

Subcategory Name: Inorganic Chemistry Rule: The following course is required

Criterion: C- Number of Credits 3

Course Listing

CHMY 401 Advanced Inorganic Chemistry 3

Subcategory Name: Physical Chemistry Rule: Choose 1 of the following courses

Criterion: C- Number of Credits 3-4

Course Listing

CHMY 360 Applied Physical Chemistry 3

CHMY 373 Phys Chem-Kntcs & Thrmdynmcs 4

Subcategory Name: Biology Laboratory Course Rule: Choose one of the following lab courses

Criterion: C- Number of Credits 2

Course Listing

BIOB 411 Immunology Laboratory 2

BIOB 440 Biological Electron Microscopy 2

BIOM 361 Gen Microbiolgy Lb (equiv 261) 2

BIOM 428 General Parasitology Lab 2

Upper Division Electives

Criterion: C-

Course Listing Number of Credits 21

BCH 486 Biochemistry Research Lab 3

BCH 490 Undergraduate Research 1 To 10

BIOB 301 Developmental Biology 3

BIOB 375 General Genetics 3

BIOB 410 Immunology 3

BIOB 411 Immunology Laboratory 2

BIOB 425 Adv Cell & Molecular Biology 3

BIOB 440 Biological Electron Microscopy 2

BIOB 486 Genomics 3

BIOB 490 Adv Undergrad Research 1 To 10

BIOH 360 Intro Neuroscience 3

BIOH 365 Human AP I for Health Profsns 4

BIOH 370 Human AP II for Health Profsns 4

BIOH 405 Hematology 3

BIOH 462 Principles Medical Physiology 3

BIOM 400 Medical Microbiology 3

BIOM 410 Microbial Genetics 3

BIOM 411 Exprmntl Microbial Genetcs Lab 1

BIOM 427 General Parasitology 2

BIOM 428	General Parasitology Lab	2
BIOM 435	Virology	3
CHMY 371	Phys Chem-Qntm Chm & Spctrscopy	4
CHMY 397	Teaching Chemistry	1
CHMY 402	Advanced Inorganic Chem Lab	2
CHMY 403	Descriptive Inorganic Chem	3
CHMY 442	Aquatic Chemistry	3
CHMY 465	Organic Spectroscopy	3
CHMY 466	FT-NMR Optn for Undrgrd Rsrch	1
CHMY 485	Laboratory Safety	1
CHMY 490	Undergraduate Research	1 To 9
CHMY 494	Seminar/Workshop	1 To 9
CHMY 498	Internship/Cooperative Educ	1 To 6
PHAR 421	Medicinal Chem I	3

Degree Specific Ethical & Human Values Category Name: Ethics

Rule: Complete the following course

Criterion: C- Number of Credits 3

Course Listing

CHMY 302E Chem Lit and Science Writing 3

College Humanities & Sciences Catalog Year: 2015-2016

Degree Type: Minor Level: **Minor** Subject: **Biochemistry**

Total Credits: 29 Cumulative GPA Required: 2.0

Lower Division Core

Category Name: Biochemistry Rule: All courses are required

Criterion: C- Number of Credits 4

Course Listing

BCH 110 Intro Biology for Biochemists 3

BCH 111 Intro Biol for Biochemists Lab 1

Commentary: Lower Division Core

Category Name: Chemistry Rule: All courses are required

CHMY 141N College Chemistry I 5

CHMY 143N College Chemistry II 5

CHMY 221 Organic Chem I 3

CHMY 223 Organic Chm II 3

Commentary: Upper Division Core

Category Name: Upper Division Biochemistry Rule: All courses are required

Criterion: C- Number of Credits 9

Course Listing

BCH 480	Advanced Biochemistry I	3
BCH 482	Advanced Biochemistry II	3
BCH 486	Biochemistry Research Lab	3

Department Faculty

Professor

- Bruce Bowler, Professor and Director, Biochemistry Program
- J. Stephen Lodmell, Professor
- J.B. Alexander (Sandy) Ross, Dean of the Graduate School and Professor of Chemistry and Biochemistry
- D. Scott Samuels, Professor
- Stephen Sprang, Professor, DBS & Director, CBSD
- Kent Sugden, Professor of Chemistry and Biochemistry

Associate Professor

- Klara Briknarova, Associate Professor
- Bradley Layton, Energy Technology Program Director/Associate Professor
- Douglas Raiford, Computer Science Department Chair, Bioinformatics, Modeling, Machine Learning, Pattern Recognition, Data Science

Assistant Professor

- Kasper Hansen, Assistant Professor
- Travis Hughes, Assistant Professor
- Brent Ryckman, Assistant Professor
- Valeriy Smirnov, Assistant Professor
- Ekaterina Voronina, Assistant Professor
- Travis Wheeler, Assistant Professor

Emeritus

- Walter Hill, Professor Emeritus

Course Descriptions

Biochemistry

BCH 110 - Intro Biology for Biochemists

Credits: 3. Offered spring. Prereq. CHMY 141N or equivalent. Prereq. or Coreq., CHMY 143N. Coreq., BCH 111. An introductory course that explores biomolecules and their roles in life processes. Provides a foundation for Cellular and Molecular Biology (BIOB 260), Genetics and Evolution (BIOB 272), Introductory Biochemistry Seminar (BCH 294), and many other advanced science courses.

BCH 111 - Intro Biol for Biochemists Lab

Credits: 1. Offered spring. Prereq., CHMY 141N or equivalent. Prereq., or Coreq., CHMY 143N. Coreq., BCH 110. Introduction to the experimental techniques used to study biomolecules and their roles in life processes. Provides a foundation for other advanced level laboratory courses in chemistry and biochemistry.

BCH 294 - Seminar/Workshop

Credits: 1. Offered spring. Prereq., BCH 110/111 or equivalent. An introduction to important advances in biochemistry through readings from the primary literature and discussion of this literature. Faculty members will also make presentations on their research. Graded credit/no credit.

BCH 380 - Biochemistry

Credits: 4. Offered autumn and spring. Prereq., CHMY 223 or BIOB 260. Fundamental biochemistry; chemistry and metabolism of biomolecules, energy relationships in metabolism; storage, transmission, and expression of genetic information. Credit not allowed for both BCH 380 and 480-482.

BCH 480 - Advanced Biochemistry I

Credits: 3. Offered autumn. Prereq., CHMY 223. Primarily for science majors. The chemistry of biomolecules, with emphasis on the structure and function of proteins, carbohydrates, lipids and nucleic acids. The chemistry and regulation of the transfer and expression of genetic information, protein synthesis. Credit not allowed for both BCH 380 and 480-482.

BCH 482 - Advanced Biochemistry II

Credits: 3. Offered spring. Prereq., BCH 480 or equiv. Continuation of BCH 480. Enzyme kinetics, metabolism, especially macromolecule biosyntheses and energy acquisition pathways, and the associated energetics and molecular physiology. Credit not allowed for both BCH 380 and BCH 480-482.

BCH 486 - Biochemistry Research Lab

Credits: 3. Offered spring. Prereq., BCH 380 or 480. Applications of biochemical principles to modern protein biochemistry. Basic micro- and molecular biology techniques are used to produce mutant proteins; then students learn basic and advanced biophysical techniques to characterize the mutant proteins.

BCH 490 - Undergraduate Research

Credits: 1 TO 10. (R-10) Offered every term. Prereq., junior or senior standing and consent of instr. Independent research under the direction of a faculty member. Course Attributes: Research & Creative Schlrshp

BCH 491 - Special Topics

Credits: 1 TO 10. (R-10) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

BCH 499 - Senior Thesis/Capstone

Credits: 3 TO 6. (R-6) Offered every term. Prereq., senior standing and consent of instr. Preparation of a thesis or manuscript based on undergraduate research for presentation and/or publication. Student must give an oral or poster presentation at the Undergraduate Research Symposium or a scientific meeting.

BCH 547 - Exptl Mol/Cell/Chem Biol

Credits: 1. (R-8) Offered every term. Prereq., graduate standing or consent of instr. Same as BIOB 547. Focus on experimental design, methods, and presentation of experimental results for graduate students in laboratories with a molecular, cellular or chemical biological focus. Level: Graduate

BCH 561 - RNA Structure & Function

Credits: 1. (R-8) Offered every semester. Prereq., BCH 482, BIOB 260, and consent of instr. Exploration of current scientific literature and new data that focuses on RNA biochemistry. Emphasis on literature relevant to research on RNA viruses and ribosomes and protein synthesis. Level: Graduate

BCH 570 - Intro to Research

Credits: 1. (R-2) Offered autumn and spring. Prereq., graduate standing. Required course for Biochemistry and Biophysics graduate students. Students are acquainted with faculty research projects. Instruction in basic research techniques, research equipment. Introduction to relevant scientific research literature. Level: Graduate

BCH 581 - Physical Biochemistry

Credits: 3. Offered spring odd-numbered years. Prereq., CHMY 360 or CHMY 373 or CHMY 371; BCH 480. Techniques of physical chemistry used in studying biological structure and function of macromolecules. Emphasis is on spectroscopic methods, hydrodynamic methods and x-ray and other scattering and diffraction techniques. Level: Graduate

BCH 582 - Proteins and Enzymes

Credits: 3. Offered autumn even-numbered years. Prereq., BCH 482 or equivalent. An investigation into the structure/function relationship in proteins and a detailed exploration of enzyme kinetics, using examples from current literature. Level: Graduate

BCH 584 - Nucleic Acids

Credits: 3. Offered autumn odd-numbered years. Prereq., BCH 482 or equivalent. Emphasis on critical reading of current literature that investigates structure, chemistry, and function of nucleic acids. Level: Graduate

BCH 595 - Special Topics

Credits: 1 TO 6. (R-6) Offered intermittently. Prereq., graduate standing and consent of instr. Experimental offering of new courses by resident or visiting faculty. Level: Graduate Course Attributes:

Internships/Practicums

BCH 597 - Research

Credits: 1 TO 18. (R-18) Offered intermittently. Directed individual research and study appropriate to the background and objectives of the student. Level: Graduate

BCH 599 - Thesis

Credits: 1 TO 10. (R-10) Offered intermittently. Prereq., master's student in biochemistry and biophysics. Laboratory research for and preparation of a master's thesis. Level: Graduate

BCH 600 - Cell Organization & Mechanisms

Credits: 3. Offered spring even-numbered years. Prereq., BCH 480 or consent of instr. Same as BMED 600. Primary literature exploration of the regulation of structure, function, and dynamics of eukaryotic cells. Topics include membranes, cytoskeleton, transcription, translation, signal transduction, cell motility, cell proliferation, and programmed cell death. Level: Graduate

BCH 694 - Biochemistry & Biophysics Seminar

Credits: 1. (R-10) Credit/No credit only. Offered Autumn and Spring. Prereq., graduate standing or consent of instructor. Presentation of current research in Structural Biology, Biochemistry, Biophysics, or related fields by invited outside speakers, UM faculty, and senior graduate students. Level: Graduate

BCH 699 - Dissertation

Credits: 1 TO 20. (R-20) Offered intermittently. Prereq., doctoral student in biochemistry. Laboratory research for and preparation of a doctoral dissertation. Level: Graduate

Biological Sciences

Charles H. Janson, Associate Dean for the Biological Sciences

The Division of Biological Sciences has undergraduate and graduate programs representing the full range of the biological sciences. The Division offers a bachelor degree in Biology (with a broad array of formal options described in more detail below), Medical Technology, Microbiology including microbial ecology, Wildlife Biology (a cooperative program administered by the College of Forestry and Conservation), and Biochemistry (an interdepartmental degree administered by the Chemistry Department). The Division also advises students in pre-health sciences and offers a series of summer field courses at the University's Flathead Lake **Biological Station** (<http://flbs.umt.edu>) a year-round academic center for the ecological sciences, located 85 miles north of Missoula near Kalispell and Glacier National Park. The Division is one of the leading research units in the

University. Research programs in the Division provide abundant opportunities for students to enhance their educational experience by participating in mentored research. Several sources of funding are available to support undergraduate student research, and the Division participates in the University of Montana Conference on Undergraduate Research each spring.

Graduate degrees offered by the Division of Biological Sciences include Master's of Science and Doctor of Philosophy degrees in Cellular, Molecular and Microbial Biology (CMMB), Organismal Biology and Ecology (OBE), and Systems Ecology (SE). The Division also participates in the graduate (M.S. and Ph.D.) program in Wildlife Biology, administered by the College of Forestry and Conservation and in the Ph.D. program in Biochemistry and Biophysics, administered by the Chemistry Department. Information on graduate study and program requirements is available from the Graduate School or the Division of Biological Sciences.

The Division offers a Bachelor's degree in **Biology** that provides a solid foundation in core areas of the biological sciences and in supporting physical sciences and mathematics. Several options are provided within the biology degree:

Cellular and molecular biology: For students interested in the cellular and molecular aspects of biology, and for students interested in health-related professions.

Ecology and organismal biology: For students interested in the biology of organisms (plants and animals), populations or communities, and for students interested in veterinary school.

Field ecology: For students interested in field-based ecology. Students with this option spend one or two summers taking field courses at the Flathead Lake Biological Station.

Genetics and evolution: For students interested in all aspects of genetics, as well as evolutionary biology, and for students interested in health-related professions.

Human biological sciences: Provides a strong background in the biological sciences for students interested in pursuing further study in a health sciences professional program.

Natural history: For students who would like to combine basic natural history and biological sciences with another field such as art, journalism, or creative writing.

Biological Education and General Sciences Broadfield: Two separate options designed for students interested in a career teaching biology or all sciences at the secondary (middle or high school) level.

The Division also offers a Bachelor's degree in **Microbiology**. Microbiology is the study of microorganisms, including bacteria, yeasts, molds, viruses, protozoa and other microscopic parasites. The Bachelor's degree in Microbiology is offered as a general degree or with an option in microbial ecology. The general option