313. Great Cities, Arts, and Ideas: The Modern World (A)
(HUM 313.) Spring. 4(4-0) Sophomores.
The humanities in an urban culture during the modern era: Major ideas, works of art and literature; their significance in the life of an important world capital during the 18th, 19th, or 20th century.

332. Development of American Indians as an Ethnic Minority
(REC 333.) Spring. 4(4-0) Approval of college.
The history of the contact between Euro-Americans and American Indians is examined from the perspective of Native Americans.

333. Contemporary Problems of American Indians
(REC 333.) Spring. 4(4-0) A L 332.
An overview of contemporary American Indian problems, including their background in federal policies, protests, and solutions.

345. Jewish Humanities in the Twentieth Century (A)
(HUM 345.) Fall, Winter. Spring. 4(4-0) Sophomores. Previous studies in the humanities recommended.
An interdisciplinary study of the novel, short story, drama, music, film, and art of the Twentieth Century as they have reflected the experiences, preoccupations, and contributions of the Jews.

390H. Perspectives in Literature
Fall. 3(3-0) Juniors, approval of Honors College.
Attention will be focused on several major literary works. Students will employ various types of literary analysis, considering theme, idea, structure, etc., and examining some major trends in contemporary literary criticism.

390H. Perspectives in Philosophy
Winter. 3(3-0) Juniors, approval of Honors College.
The two primary areas of concern will be ethics and aesthetics, the emphasis on one or the other to be determined by the professor. The course will include reading of major works, discussion of major figures in the field, and the preparation of a substantial paper.

392H. Perspectives in History
Spring. 3(3-0) Juniors, approval of Honors College.
The focus will be on the nature of international diplomacy in the 20th century, the development of nationalism, the balance of power system, the influence of new ideologies, and the developments of the power structure since 1945.

393H. Perspectives in 20th Century Arts: 1900-1920
Fall. 3(3-0) Juniors, approval of Honors College.
Reaction to Naturalism across the arts traced in Symbolism and Expressionism as interrelated phenomena in response to the crisis of confidence in European institutions.

394H. Perspectives in 20th Century Arts: 1920-1945
Winter. 3(3-0) Juniors, approval of Honors College.
Formalist analysis of art elements examined across the arts in Cubism, Surrealism and new musical structures as positive response to war, depression and dictatorship.

395H. Perspectives in Contemporary Arts: Post-Fascist Period
Spring. 3(3-0) Juniors, approval of Honors College.
The function of avant-garde arts after World War II to the present studied in the new dimensions of an environment created by new technology and the mass media explosion.

IDC. Women's Studies Senior Level Seminar
For course description, see Interdisciplinary Courses.

450. Arts Management
Fall, Winter, Spring. 3 to 5 credits. May be repeated for a maximum of 9 credits. Juniors or Graduate Students or approval of department.
Administration of arts organizations, management of facilities, understanding operational methods and procedures of performing companies, financial structure and funding of arts centers, study of audience development, contemporary trends in arts management field.

461. Aging and Human Values
Fall, Winter, Spring. 3(3-0) Juniors.
Development of personal and professional responses to value-laden questions concerning aging and the elderly through historical, literary, philosophical, and related perspectives.

491H. Perspectives in the Social Sciences and Humanities
Fall, Winter, Spring. 3(3-0) Juniors.
Perspectives in the Social Sciences and Humanities.

492. Integrative Topics in the Arts and Humanities
Fall, Winter, Spring. 3(3-0) Juniors.
Perspectives in the Social Sciences and Humanities.

Astronomy and Astrophysics
See Physics and Astronomy.

AUDIOLGY AND SPEECH SCIENCES

College of Communication Arts and Sciences

105. Voice and Articulation
Fall, Winter, Spring, Summer. 3(4-0) The study and development of the skills of voice and articulation.

201. Introduction to Communication Disorders
(F372) Fall, Winter. 3(3-0) Speech, hearing and language disorders in adults and children.

222. Oral Language Development
Fall, Winter, Spring, Summer. 3(3-0) Emergence and development of receptive and expressive aspects of oral language of the child.

227. Physics for Audiology and Speech Sciences
Fall, Spring. 4(4-0) MTH 108. Not open to students with credit in PHY 231. Interdepartmental with Physics.
Introductory physics for Audiology and Speech Sciences majors: kinematics, Newton's Law, conservation of energy and momentum, waves and vibrations, sound propagation, resonance, speech production.

274. Structures and Functions of Speech and Hearing Mechanisms
Fall, Winter. 5(4-2) ASC 106 or approval of department.
Peripheral and central auditory mechanisms and the respiratory, phonatory and articulatory mechanisms for speech.

276. Descriptive Phonetics
Winter, Spring. 3(3-0) ASC 274 or approval of department.
Detailed description of the principles that underlie the production of speech sounds.

277. Speech Science
Fall, Spring. 3(3-0) ASC 274, ASC 278. Scientific bases of voice communication with special reference to the acoustic aspect of production.

373. Clinical Procedures in Speech Pathology and Audiology
Winter, Spring. 4(4-0) 2.00 grade-point average in ASC 201 and ASC 277 or approval of department.
Principles underlying the clinical interview and client relationships essential to diagnosis and therapy. Procedures in obtaining, recording, and evaluating test results and therapeutic methods.

444. Oral Language of Urban Areas
Winter, Summer. 3(3-0) Concentration in the characteristics of language and human communication as these relate to studies and practices of those involved in urban affairs.

445. Communication Disorders: Social and Emotional Components
Spring. 3(3-0) Juniors.
Analysis and management of the social and emotional components of speech, language, and hearing problems.
454. Introduction to Audiology
Fall, Spring. 5(4-2) ASC 276, ASC 277. Fundamental aspects of normal hearing; hearing disorders, hearing tests.

460. Aural Rehabilitation
Winter, Summer. 5(5-0) ASC 454 or approval of instructor. Fundamental aspects of hearing aids, auditory training, and speechreading for the hearing-impaired person.

470. Communication Disorders
Spring, Summer. 3(3-0) Juniors. Not open to Audiology and Speech Sciences majors. An overview of communication disorders, the professions of speech and language pathology and audiology and their relationships to allied professions.

474. Clinical Practicum in Speech and Language Pathology
Fall, Winter, Spring, Summer. 1 credit. May enroll for a maximum of 6 credits. Grade of C or better in both ASC 201 and ASC 372; satisfactory completion of a speech, language, and hearing screening/evaluation at the MSU Speech and Hearing Clinic. Therapeutic experience in speech and language pathology.

476. Speech Pathology II: Diagnostics
Fall, Winter, Spring. 5(4-2) ASC 474 or approval of department. Test procedures and analysis; supervised clinical experience in language and speech evaluations and report writing.

477. Methods in Public School Speech and Hearing Therapy
Fall, Winter. 4(3-2) ASC 201, ASC 373. Must be taken prior to term of student teaching. Administration and organization, procedures and materials in public school speech and hearing therapy.

490. Basic Laboratory in Experimental Audiology
Fall, Spring. 3(1-4) MTH 108, PHY 227, ASC 454; Juniors. Contemporary experimental procedures in basic audiological research. Projects include systematic exercises in equipment use, calibration, physiophysical methods, and data analysis.

499. Independent Study
Fall, Winter, Spring, Summer. 1 to 6 credits. May enroll for a maximum of 12 credits. Approval of department.

801. Phonological Disorders
Winter. 4(4-0) Approval of department. Advanced study of normal aspects and correlates of phonological development; traditional and contemporary intervention issues, and issues related to research in phonological disorders.

810. Audiologic Calibration Standards
Winter. 4(3-2) ASC 854 or ASC 833A, ASC 833B. Contemporary electro-acoustic and other measurement standards for audiometers, sound level meters, earphones, hearing aids, and related devices; current issues in standards development; laboratory to applied measurement.

833. Specialized Clinical Audiology
A. Differential Audiology
Fall. 4(3-2) Pure tone audiometric tests as an aid to the otologist in evaluating the pathology of hearing loss, including the development of norms. Consideration of nonorganic loss.
B. Speech Audiology
Fall. 4(3-2) Evaluation of speech and speech-like signals: detection, discrimination and recognition.
C. Industrial Audiology
Spring. 4(4-0) Evaluation of the role of the audiologist in industry emphasizing identification of procedures, damage-risk criteria, measurement and control of noise, conservation procedures, and medico-legal problems.

841. Evaluation and Treatment of Speech and Language Disorders
A. Aphasia
(Fall) 4(4-0) Neuroprosthology, symptomatology, and speech and language habilitation and rehabilitation of individuals with aphasia.
B. Apraxia and Dysarthria
(Fall) 4(4-0) Neuroprosthology, symptomatology, and speech and language habilitation and rehabilitation of individuals with apraxia and dysarthria, including those with cerebral palsy.
C. Voice Disorders
(Winter) 4(4-0) Etiology, symptomatology, diagnosis, and treatment of voice disorders including the specific communication problems of the laryngotomized.
D. Stuttering
(Spring) 4(4-0) History, symptomatology, development, evaluation, and theories of stuttering. Focus is to facilitate clinical involvement with stutterers.
E. Orofacial Anomalies
(Spring) 4(4-0) Etiology, symptomatology, diagnosis, and treatment of various orofacial anomalies including lip and/or palatal cleft, glottolaryngotomy, jaw resection, dental anomalies, and tongue thrust.
F. Delayed Language Assessment
(Fall) 4(4-0) Evaluative techniques including audiometry, psychometry, and case history as aids to differential evaluation of delayed language development.
G. Language Intervention: Early Stages
Winter. 4(4-0) Approval of department. Language intervention for those children functioning at or below a four-year-old level in their language behavior; mental retardation, autism, and other developmental delays associated with severe language impairments.
H. Language Intervention: Later Stages
Summer. 4(4-0) Approval of department. Treatment of developmental language delays and disorders with emphasis upon children functioning at or above the four-year-old level in language behavior: preschool and adolescent language disorders are included.

842. Augmentative and Alternative Communication Systems
Summer. 4(4-0) Approval of department. Historical perspective and philosophy of augmentative/alternative communication systems. Aided and unaided nonspeech communication systems. Assessment, selection, and intervention procedures.

843. Transfer and Maintenance of Speech Behavior
Spring. 4(4-0) Various clinical procedures; assisting others in transferring and maintaining these behaviors outside the clinical environment.

Summer. 4(4-0) Approval of department. Evaluation and analysis of various theories of speech perception and their implications for speech and language pathologists, audiologists, and speech and hearing scientists.
Survey metabolic activities of living organisms.

200. College Credit. Approval of department.

400H. Honors Work
Fall, Winter, Spring, 1 to 4 credits. May reenroll for a maximum of 12 credits. Approval of department. Assigned reading and experimentation.

401. Basic Biochemistry
Fall, Spring, 5(5-0) Credit may not be earned in both BCH 200 and BCH 401. One-year organic chemistry or CEM 242, not open to biochemistry majors.

A one-term presentation of biochemistry emphasizing structure and function of major biomolecules, metabolism and regulation. Examples used for illustrative purposes will emphasize the mammalian organism.

404. General Biochemistry Laboratory
Winter, 3(1-6) Analytical chemistry; BCH 401 or BCH 451.

Experimental aspects of biochemistry.

405. Biochemistry Laboratory
Fall, Spring, 3(0-9) BCH 453 or concurrently. BCH 451; not open to biochemistry majors or approval of department.

Advanced undergraduate laboratory to illustrate modern biochemical methods and techniques.

412. Clinical Biochemistry
Winter, 3(2-3) BCH 401; CEM 162.

Medical Technology majors. Not acceptable for a B.S. degree in biochemistry. Others: approval of department.

Quantitative clinical laboratory methods.

451. Biochemistry I
Fall, 3(3-0) Credit may not be earned in both BCH 401 and BCH 451. One-year organic chemistry or CEM 242.

A comprehensive survey of biochemistry, with emphasis on protein structure and function, enzymology, and bioenergetics.

452. Biochemistry II
Winter, 3(3-0) BCH 451.

Continuation of BCH 451, with emphasis on intermediary metabolism.

453. Biochemistry III
Spring, 3(3-0) BCH 452.

Continuation of BCH 452, with emphasis on the replication and expression of genetic information.

456. Principles of Biochemical Methods
Spring, 3(3-0) BCH 451.

One-year organic chemistry or CEM 242 concurrently, BCH 453 or concurrently, or BCH 401.

Principles of biochemical methods with emphasis on electrophoresis, chromatography, immunological techniques, sedimentation, diffusion, viscosity, radiochemistry, and absorption and emission spectroscopy.

470. Biological Membranes
(IDC 470); Spring, 3(3-0) BCH 451.

Interdepartmental with the departments of Microbiology and Public Health, and Physiology. Admission by the Department of Physiology.

The chemistry, physics and mathematics of the permeability, energy transductions and surface functions of differentiated cell membranes and membranous organelles are compared. A brief discussion of theoretical and experimental models is included.

499. Research
Fall, Winter, Spring, Summer, 1 to 4 credits. May reenroll for a maximum of 12 credits. Undergraduates: approval of department. Participation in research projects.

501. Medical Biochemistry
Fall, 3(3-0) Open only to students in the professional programs in the College of Human Medicine and the College of Osteopathic Medicine.

Basic biochemical principles and terminology of importance in medical biology.

502. Medical Biochemistry
Winter, 3(3-0) BCH 501 or approval of department.

A continuation of BCH 501.

503. Introduction to Medical Biology
Fall, 5(5-0) Admission to the College of Human Medicine. Interdepartmental with the departments of Medical Sciences and Pathology, Pharmacology and Toxicology, and Physiology. Administered by the Department of Microbiology and Public Health.

Principles of medical biology for medical students.

511. Medical Biochemistry I
Winter, 3(3-0) One year of organic chemistry. Open only to students in the professional programs in the College of Human Medicine and the College of Osteopathic Medicine.

Basic biochemical principles and terminology with emphasis on metabolism and function of biomolecules of importance in medical biology.

512. Medical Biochemistry II
Spring, 4(4-0) BCH 511.

Basic biochemical principles and processes pertinent to specific areas of human pathophysiology.

811. Nucleic Acid Structure and Function
Fall, 4(4-0) One year of organic chemistry, one term of introductory biochemistry, or approval of department. Limited to graduate students in biochemistry or other students needing a similar professional preparation.


812. Protein Structure and Function
Winter, 4(4-0) BCH 811.

Protein structure and function relationships, macromolecule-ligand interactions, enzyme kinetics and principles of methods used in enzymology.

813. Metabolism and Its Regulation
Spring, 4(4-0) BCH 812.

Molecular basis of metabolic regulation, compartmentation and interrelationships of metabolic cycles involving carbohydrates, proteins and lipids.

821. Biochemical Mechanisms and Structure
Fall, 4(4-0) One year of organic chemistry, introductory biochemistry, and physical chemistry or concurrently.

Structures, methods of structural analysis, synthesis, and reaction mechanisms of biological substances including proteins, carbohydrates, lipids, porphyrins, phosphate esters, enzymes and coenzymes.