Directory of Courses

The following directory lists the undergraduate courses which the University expects to offer, although the University in no way guarantees that all such courses will be offered in any given academic year, and reserves the right to alter the list if conditions warrant. Students may ordinarily determine when courses are to be offered by consulting the Directory of Classes published prior to each semester through the Office of the Registrar.

Courses to be offered through the Office of Credit Programs, Extended and Continuing Education, are included in brochures issued each semester and summer session.

Numbering System. Students are referred to the condensed curricula of the several colleges for information concerning the semester and year in which required courses should be taken. Courses numbered 01-99 are courses in the Rattrcliffe Hicks School of Agriculture; baccalaureate students may not register for these courses. Courses numbered 100-199 are primarily for freshmen and sophomores; courses numbered 200-299 for juniors and seniors. Courses numbered 300-399 are for graduate students and appear in The Graduate School Catalog. University regulations allow undergraduates to take courses at the 300’s level only if they have a cumulative grade point average of 2.6 or above and if they are in the seventh or eighth semester of University standing; individual schools and colleges may have more stringent requirements which students must meet. Exceptions can be made only by the instructor and the dean of the school or college in which the student is registered.

If a course was formerly given under another number the fact is listed in the course description. In such cases the course cannot be taken for credit by students who have received credit for it under the earlier number.

Skill Codes. In compliance with the General Education Requirements, skill code designations (W, Q, C and combinations thereof) have been added to courses where applicable. Students may find a comprehensive explanation of these skill codes under “Course Information” of the Academic Regulations section of this Catalog. Note: The same 3-digit numerics are not repeatable, i.e., 107, 107W.

Course Semester. Single semester courses designated as “either semester” are given in the first semester and repeated in the second semester. Such courses may be taken in either semester but may be taken for credit only once. Courses carrying hyphenated numbers are full year courses extending over the two semesters. The first semester of such courses is always prerequisite to the second, but the student may receive credit for the first semester without continuing with the second. If a course with hyphenated numbers is designated as “either semester,” the student may start the year’s work in either semester; if it is designated as “both semesters,” the course starts in the first semester and runs through the academic year.

A few advanced courses, usually of a seminar or special problems nature, are labeled “either or both semesters.” Students may take such courses in either semester alone or they may repeat them for credit. Only in these cases unless the course description carries a specific statement to the contrary, may a student take the course more than once for credit.

Course Hours. Classes meet for the equivalent of three 50-minute periods, unless otherwise specified. Information about the specific times that a course will meet may be obtained from the Directory of Classes that is available before the opening of each semester through the Office of the Registrar.

Refer to the Academic Regulations section of this Catalog for further information regarding registration for courses.

Accounting (ACCT)

Head of Department: Professor Richard F. Kochanek
Department Office: Room 329, Hall Building

For major requirements, see the School of Business Administration section of this Catalog.

Courses in this department, with the exception of Accounting 131, are open to juniors and seniors only.

Accounting majors are required to achieve a 2.0 grade point average in all accounting courses taken at the University of Connecticut, excluding grades and credits for independent studies (Accounting 299's) and internships (Accounting 289's) as a requirement for graduation.

Either semester. Three credits. Not recommended for freshmen.
The study of the generation and interpretation of accounting information as a basis for financial statement analysis and management decision-making.

200. Principles of Managerial Accounting
Either semester. Three credits. Prerequisite: ACCT 131. Open to sophomores.

Internal reporting to managers for use in planning and controlling operating systems, for use in decision-making, formulating major plans and policies, and for costing products for inventory valuation and income determination.

201. Intermediate Accounting I
Either semester. Three credits. Prerequisite: ACCT 200 and ECON 112.

An in-depth study of financial accounting, giving particular emphasis to balance sheet valuations and their relationship to income determination.

202. Intermediate Accounting II
Either semester. Three credits. Prerequisite: ACCT 201 and OPIM 203 (formerly IMGT 203).

A continuation of Accounting 201.

203. Advanced Accounting
(Also offered as ACCT 303.) Either semester. Three credits. Prerequisite: ACCT 202.

An in-depth study of accounting for business combinations. Coverage will also be given to accounting for nonprofit entities and contemporary issues in financial accounting.

203P. Advanced Accounting
(Also offered as ACCT 303.) This course and one additional course from the Accounting Department constitute one W requirement.

205. Introduction to a Profession
First semester. One credit. Prerequisite: ACCT 131. Required for Accounting majors.

Designed to help students (1) understand the professional responsibilities of accountants, (2) enhance one’s knowledge of the structure of the accounting profession and the reporting process, (3) evaluate alternative accounting careers, and (4) prepare for accounting internship and career opportunities. Consists of a series of evening seminars. Topics include: alternative accounting careers, accounting standard setting, professional certification for accountants, and analysis and interpretation of accounting information. A major course project involves the analysis of the annual report of a real-life company. The course will also introduce and allow students to interact with UConn accounting alumni in a variety of accounting careers.

210. Management and Engineering for Manufacturing Accounting
First semester. Three credits. Prerequisite: Successful completion of ACCT 131 or Accounting Model Tutorial Module, with proficiency test in ACCT 210. Open only to MEM majors.

Understanding of cost management system concepts as applied to manufacturing enterprises. Designed for students with no prior accounting experience. Coverage of the interrelationships among product cost elements and the impact of accounting procedures on management decisions. Traditional and alternative cost accounting methods will be considered.

221. Cost Accounting
Either semester. Three credits. Prerequisite: ACCT 200 and OPIM 203 (formerly IMGT 203) (may be taken concurrently).
The study of (1) product costing as a basis for income determination and inventory valuation and (2) accounting concepts for planning and controlling organizational operations.

222. Cost Analysis
Either semester. Three credits. Prerequisite: ACCT 221.


243. Assurance Services
(Also offered as ACCT 304.) Either semester. Three credits. Prerequisite: ACCT 202.

This course focuses on issues relevant to the public accounting profession, such as legal liability and ethics, audit risk analysis, planning of audit engagements, audit reports, and other assurance services and reports. Students will learn to think critically about issues facing the accounting profession, primarily by analyzing cases and completing a number of individual and group research projects.

243P. Assurance Services
(Also offered as ACCT 304.) This course and one additional course from the Accounting Department constitute one W requirement.

260. Federal Income Taxes
Either semester. Three credits. Prerequisite: ACCT 131.

A study of the underlying concepts of federal income taxation. Emphasis to be placed upon the impact of taxes on business decisions.

264. Advanced Federal Taxes and Tax Research
Second semester. Three credits. Prerequisite: ACCT 260.

An in-depth analysis of the tax aspects of corporations, partnerships, and S corporations, including their organization, operations (including international aspects), and liquidation. The course includes an examination of tax research methodology and techniques, using both printed and electronic materials, and discussions of cases requiring tax planning.
† Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

Agricultural and Resource Economics (ARE)

(formerly Agricultural Economics and Rural Sociology)

Head of Department: Professor Emilio Pagoulatos
Department Office: Room 318, W.B. Young Building

For major requirements, see the College of Agriculture and Natural Resources section of this Catalog.

110. Population, Food, and the Environment
Either semester. Three credits.

The role of agriculture in the growth and development of societies throughout the world. Economic and sociological problems of food and fiber needs and production in the developing and the advanced societies.

150. Principles of Agricultural and Resource Economics
Either semester. Three credits.

An introduction to agricultural economics, the role of agriculture in today’s United States economic system, and relationships that regulate the entire economic environment.

215C. Business Management
First semester. Three credits. L. Lee

Analysis of marketing, management, and financial decision-making tools in agribusiness, including computer applications.

217. Business Finance in Food and Resource Industries
Second semester. Three credits. Prerequisite: One of the following: ARE 150, ECON 112 or ARE 215C; or consent of instructor. Not open for credit to students who have passed AERS 230. L. Lee

Analysis of financial statements, credit, risk, and investment decision-making.

221. Organization and Strategies in Food Industries
Second semester. Three credits. Prerequisite: ARE 150 or ECON 112. Cotterill

Market structure and business strategies of firms, pricing, advertising, entry strategies, mergers, and the impact of public policies.

222. Food Trends and the Changing Consumer
Second semester. Three credits.

Determinants of food consumption trends. Particular attention to demographic and economic factors and to changing concerns regarding health and food safety.

225. Marketing and Price Analysis
Second semester. Three credits. Prerequisite: ARE 150 or ECON 112 or consent of instructor. Lopez

Principles and applications of marketing, with special reference to business, economics, and policies under which the food system operates. Price risk management via commodity futures markets, practical problems, computer exercises, and usually a field trip.

234. Environmental and Resource Policy
Either semester. Three credits. Altobello

Economic and policy aspects of natural resource use and environmental quality issues. Designed for students with diverse departmental affiliations.

235. Environmental and Resource Economics
Second semester. Three credits. Prerequisite: ARE 150 or ECON 112.

Natural resource use and environmental quality analysis using economic theory. Reviews of empirical research and relevant policy issues.

238. Economics of Outdoor Recreation
Second semester. Three credits. Prerequisite: ARE 150 or ECON 112 or consent of instructor. L. Lee

Application of outdoor recreation decision tools for public and private recreation resource managers.

255. The Role of Agriculture in Economic Development
First semester. Three credits. Prerequisite: ARE 150 or ECON 112 or consent of instructor. Credit may not be received for both ARE 305 and 255.

The role of agriculture in the economic development of less developed countries. Population and rural employment, the economics of food consumption and nutrition, international food aid, agricultural marketing and trade, land tenure, agrarian reform, and appropriate agricultural technology.

255W. The Role of Agriculture in Economic Development

First semester. Three credits. Prerequisite: ARE 150 or ECON 112. Credit may not be received for both ARE 307 and 257.

Theoretical foundations and applications of benefit-cost analysis in project appraisal and in evaluation of public policies regarding resource management and environmental protection.

260. Food and Agricultural Policy
First semester. Three credits. Prerequisite: ARE 150 or ECON 112 or consent of instructor. Lopez

Analysis of food and agricultural policies in the United States and abroad. Designed for students with diverse departmental affiliations.

260W. Food and Agricultural Policy

First semester. Three credits. Prerequisite: ARE 150 or ECON 112. Cotterill

Management techniques for achieving the merchandising objective and standards of the firm, with maximum efficiency in the use of capital, personnel, facilities and equipment. Directed toward those students who plan to enter agribusiness.

280. Economic Organization of Agriculture
First semester. Three credits. Prerequisite: ARE 150 or ECON 112.

Economic organization of competitive industries using agriculture as an example of one such industry. The problems growing out of the competitive structure of agriculture, and the economic concepts, principles and research results applicable to these problems.

285. International Commodity Trade
First semester. Three credits. Prerequisite: ARE 150 or ECON 112 or consent of instructor. Pagoulatos

The basic principles of international commodity trade and market institutions. Applications to current problems of international commodity trade and policy.

290V. Quantitative Methods for Agriculture
Second semester. Three credits. Open only with consent of instructor. L. Lee

Data collection, compilation, charts, frequency distribution, simple descriptive statistics, index numbers, economic time series analysis and simple correlations.

295. Seminar
Either or both semesters. Credits and hours by arrangement. May be repeated for credit with a change of topic. Open only with consent of instructor.

Participation in staff conferences and discussions, reviews of important books, and reports on recent developments in agricultural economics research.

297. Resource Economics Internship
Either semester or summer. One to six credits (repeatable for a total of six credits). Open only to Upper DiVision students majoring in Resource Economics who have demonstrated outstanding academic ability and possess excellent professional potential. Requires Independent Study Authorization with consent of department head and advisor.

This course is designed to provide students with a meaningful experience in a formalized agribusiness or natural resources program under supervised conditions. Each student taking this course must submit a formal written report for evaluation and meet all other course requirements as specified by the instructor.

298. Special Topics
Either or both semesters. Credits and hours by arrangement. May be repeated for credit with a change of topic. Open only with consent of instructor.

Topics and credits to be published prior to the registration period preceding the semester offerings.

299. Independent Study
Either or both semesters. Credit and hours by arrangement. May be repeated for credit with a change of topic. Open only with consent of instructor. Requires Independent Study Authorization.

This course is designed primarily for major students.
Air Force Studies (AIRF)

**Head of Department:** Colonel Robert M. Gabor  
**Department Office:** 28 North Eagleville Road

For departmental description, see the College of Liberal Arts and Sciences section of this Catalog.

**113. Air Force Studies I**  
First semester. One credit. One class period and one 2-hour leadership seminar. Gabor  
Military customs/courtesies, officership/leadership. Air Force mission, military as a profession, and basics of flight.

**114. Air Force Studies II**  
Second semester. One credit. One class period and one 2-hour leadership seminar. Gabor  
The organization, mission, and functions of the Department of Defense and the military services. Emphasis is on the U.S. Air Force.

**123. Air Force Studies II**  
First semester. One credit. One class period and one 2-hour leadership seminar. Gabor  
Study of air power from balloons through World War II; WW I, Interwar Years, WW II. Principles of war, Berlin Airlift. Development of communication skills.

**124. Air Force Studies II**  
Second semester. One credit. One class period and one 2-hour leadership seminar. Gabor  
Air power from post World War II to the present: Korean Conflict, War in Vietnam, force modernization. Development of communication skills.

**201. Aviation Ground School**  
One credit. One 2-hour class period per week for twelve weeks. Prerequisite: MATH 109 or permission of instructor. Open only with consent of instructor. Gabor  
The principles of flight. Meets the course of study requirement for private pilot's written examination. (FAA)

**235-236. Air Force Studies III**  
Both semesters. Three credits each semester. One class period, and a 2-hour leadership seminar. Prerequisite: AIRF 114 and 124, or six weeks field training. Open only with consent of instructor. May not be taken concurrently with AIRF 225-226. Anderson  
Management fundamentals, motivational processes, leadership, group dynamics, organizational power, managerial strategy. Development of communication skills.

**235W-236W. Air Force Studies III**  
Second semester. One credit. One class period and one 2-hour leadership seminar. Prerequisite: AIRF 225-226. Open only with consent of instructor. May not be taken concurrently with AIRF 235-236. Eagles  
American civil-military relations, defense policy formulation, role of the professional officer, military justice system, Air Force Commands.

**245-246W. Air Force Studies IV**  
First semester. Three credits. One 2-hour class period per week for twelve weeks. Prerequisite: MATH 109 or permission of instructor. Open only with consent of instructor. May not be taken concurrently with AIRF 225-226. Anderson  
Management fundamentals, motivational processes, leadership, group dynamics, organizational power, managerial strategy. Development of communication skills.

245-246W. Air Force Studies IV

**Allied Health**

**Applied Health Sciences**

**Head of Department:** Dean Joseph Smeey  
**Department Office:** Room 227A, Koons Hall

For major requirements, see the School of Allied Health section of this Catalog.

**Cytotechnology (CYTO)**

**Cytotechnology Program Academic Coordinator:** Associate Professor Denis A. Coble  
**Program Office:** Room 306, Koons Hall

For major requirements, see the School of Allied Health section of this Catalog.

**220. Cancer and Your Health**  
(Formerly offered as MLS 220.) First semester. Three credits. Three hours of lecture. Prerequisite: One course in Biology or concurrent enrollment in a Biology course.  
This course introduces students to cancer risk education, causes, early detection, prevention and public education.

**221. Introduction to Cancer and Diagnostic Cytology**  
(Formerly offered as MLS 221.) Second semester. Three credits. Three hours of lecture. Open only to Cytotechnology majors; others by consent.  
This course introduces students to the microscopic study of cancer. The basic cytology and pathology of the female genital tract will be presented from a Woman's Health Perspective.

**243. Cytology of the Female Genital Tract**  
(Formerly offered as MLS 243.) First semester. Six credits. Prerequisite: All other degree requirements must be completed. Open only to Cytotechnology majors.  
This course provides the student with comprehensive knowledge of the female genital tract cytology and provides the skills necessary to identify accurately the cytologic changes associated with normal and abnormal cells of the female genital tract.

**244. Cytology of the Respiratory Tract**  
(Formerly offered as MLS 244.) First semester. Four credits. Prerequisite: All other degree requirements must be completed. Open only to Cytotechnology majors.  
This course provides the student with comprehensive knowledge of respiratory tract cytology and provides the skills necessary to identify accurately the cytologic changes associated with normal and abnormal cellular changes in the respiratory tract.

**245. Cytologic Techniques**  
(Formerly offered as MLS 245.) First semester. Three credits. Prerequisite: All other degree requirements must be completed. Open only to Cytotechnology majors.  
This course provides the student with both didactic knowledge and technical skills necessary to ensure optimum specimen preparation.

**246. Cytology of the Alimentary Tract**  
(Formerly offered as MLS 246.) Second semester. Three credits. Prerequisite: All other degree requirements must be completed. Open only to Cytotechnology majors.  
This course provides the student with comprehensive knowledge of alimentary tract cytology and provides the skills necessary to identify accurately the cytologic changes associated with normal and abnormal cellular changes in the alimentary tract.

**247. Cytology of Miscellaneous Fluids**  
(Formerly offered as MLS 247.) Second semester. Four credits. Prerequisite: All other degree requirements must be completed. Open only to Cytotechnology majors.  
This course provides the student with comprehensive knowledge of miscellaneous fluids cytology and provides the skills necessary to identify accurately the cytologic changes associated with normal and abnormal changes in miscellaneous fluids.

**248. Cytology Aspiration Biopsy**  
(Formerly offered as MLS 248.) Second semester. Three credits. Prerequisite: All other degree requirements must be completed. Open only to Cytotechnology majors.  
This course provides the student with comprehensive knowledge of cytopathology and provides the skills necessary to identify accurately the cytologic changes associated with normal and abnormal cellular changes in aspiration biopsies.

**249. Senior Seminar in Cytotechnology**  
(Formerly offered as MLS 249.) Second semester. Three credits. Prerequisite: All other degree requirements must be completed. Open only to Cytotechnology majors.  
This course exposes the student to management principles and practices and the knowledge and skills necessary to develop an education project and to perform a research project.
250. **Clinical Practicum**  
(Formerly offered as MLS 250.) Second semester. Four credits. Prerequisites: CYTO 243, 244, 245, 247 and 248. Open only to Cytotechnology majors.  
This course provides the student with clinical experience to complete the integration of didactic and laboratory components of Cytotechnology.

298. **Special Topics**  
Either semester. Credits and hours by arrangement. Prerequisite: The completion of all Lower Division requirements in the Cytotechnology Program. Open only with consent of instructor. May be repeated for credit.  
Application of the scientific method of inquiry to planning, implementing, evaluating, and reporting a study of a problem related to Cytotechnology.

299. **Independent Study for Undergraduates**  
Either semester. Credits and hours by arrangement. Open only with consent of instructor. May be repeated for credit.  
This course is primarily for students who wish to extend their knowledge in some specialized area in the field of Cytotechnology.

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### Diagnostic Genetic Sciences (DGS)

**Diagnostic Genetic Sciences Program Director:**  
Martha B. Keagle  
**Program Office:** Room 222, Koons Hall

For major requirements, see the School of Allied Health section of this Catalog.

#### 222. **Medical Cytogenetics**  
(Formerly offered as MLS 205.) Both semesters. Four credits. Two 2-hour lectures. Prerequisite: MCB 203; MCB 200 or 213; and all of which may be concurrent. Open to students in the Diagnostic Genetic Sciences Program; others who have met the prerequisites.

- Birth defects, prenatal assessment, cell culture and harvest, staining and banding techniques, mechanisms of numerical and structural chromosome abnormality, numerical syndromes, duplication and deletion syndromes, the sex chromosomes, sex chromosome abnormalities, human chromosome nomenclature, mosaicism, genetic imprinting, cancer cytogenetics, molecular cytogenetic testing.

#### 223. **Laboratory in Cytogenetics**  
(Formerly MLS 203.) Both semesters. Three credits. One 3-hour laboratory period and 1-hour discussion. Four additional laboratory sessions are required during the first half of the semester. Prerequisite: DGS 222 (Formerly MLS 205.) which may be taken concurrently. Open only to students enrolled in the Diagnostic Genetic Sciences Program; others with consent of instructor.

- Human chromosome morphology and identification, aseptic technique, lymphocyte culture and harvest, chromosome banding, karyotyping and microscopic analysis of normal and abnormal cases.

#### 234. **Diagnostic Molecular Technologies**  
(Formerly MLS 217.) Both semesters. Three credits. Prerequisite: MCB 200 or 213; and MLS 208 or MCB 211 which may be taken concurrently. Open only to students enrolled in the Diagnostic Genetic Sciences Program; others with instructor consent.

- DNA and RNA diagnostic technologies used in clinical settings; clinical applications in prenatal diagnosis; cancer management, transplantation, paternity testing; forensic medicine and microbiology.

#### 235. **Laboratory in Molecular Diagnostics**  
Both semesters. Four credits. Prerequisite: DGS 234 or MLS 217 which may be taken concurrently. Open only to students enrolled in the Diagnostic Genetic Sciences Program; others by consent of instructor.

- Practicum experience in DNA sequencing.

#### 279. **Microbiological Applications of Regular Diagnostics**  
Both semesters. Two credits. Prerequisite: DGS 234 and DGS 235. Open only to students enrolled in the Molecular Diagnostic Sciences Certificate Program; others with consent of the instructor.

- Practicum experience in the application of molecular technologies to microbiology.

#### 280. **Bone Marrow Cytogenetics**  
(Formerly MLS 271.) Both semesters. Two credits. Prerequisite: In order to enroll in the course, the student must have earned a “C” or better in DGS 222 (Formerly MLS 205) and DGS 223 (Formerly MLS 203). Open only to Diagnostic Genetic Sciences majors.  
**Clinical Staff**
- Culture, harvest, banding and analysis of leukemic bone marrow samples; chromosomal abnormalities associated with hematologic malignancies.

#### 281. **Peripheral Blood Cytogenetics**  
(Formerly MLS 271.) Both semesters. Four credits. Prerequisite: In order to enroll in this course, the student must have earned a “C” or better in DGS 222 (Formerly MLS 205) and DGS 223 (Formerly MLS 203). Open only to Diagnostic Genetic Sciences majors.  
**Clinical Staff**
- Culture, harvest, banding and analysis of peripheral blood samples.

#### 282. **Practicum in Staining and Karyotyping**  
(Formerly MLS 272.) Both semesters. One credit. Prerequisite: In order to enroll in this course, the student must have earned a “C” or better in DGS 222 (Formerly MLS 205) and DGS 223 (Formerly MLS 203). Open only to Diagnostic Genetic Sciences majors.  
**Clinical Staff**
- Utilization and application of special staining and banding techniques, karyotyping of normal and abnormal metaphases from all specimen types.

#### 283. **Practicum in Photomicroscopy/Imaging**  
(Formerly MLS 273.) Both semesters. One credit. Prerequisite: In order to enroll in this course, the student must have earned a “C” or better in DGS 222 (Formerly MLS 205), DGS 223 (Formerly MLS 203), and DGS 242. Open only to Diagnostic Genetic Sciences majors.  
**Clinical Staff**
- Techniques of photomicroscopy, B/W film development, print enlargement, computer imaging.

#### 284. **Variable Topics in Cytogenetics**  
(Formerly MLS 275.) Both semesters. One credit. Prerequisite: In order to enroll in this course, the student must have earned a “C” or better in DGS 222 (Formerly MLS 205) and DGS 223 (Formerly MLS 203). Open only to Diagnostic Genetic Sciences majors.  
**Clinical Staff**
- In-depth examination of a topic of the students' choosing in the field of human genetics.

#### 285. **Research in Cytogenetics**  
(Formerly MLS 276.) Both semesters. One credit. Prerequisite: In order to enroll in this course, the student must have earned a “C” or better in DGS 222 (Formerly MLS 205) and DGS 223 (Formerly MLS 203). Open only to Diagnostic Genetic Sciences majors.  
**Clinical Staff**
- Design and implementation of a research project in clinical cytogenetics.

#### 286. **Prenatal Cytogenetics**  
(Formerly MLS 277.) Both semesters. Four credits. Prerequisite: In order to enroll in this course, the student must have earned a “C” or better in DGS 222...
**Dietetics (DIET)**

Interim Dietetics Program Director: Martha Ludemann

Dietetics Program Office: Room 314, Koons Hall

For major requirements, see the School of Allied Health section of this Catalog.

The following courses are open only to students enrolled in the Dietetics Program. Others must obtain the permission of the Director of the Dietetics Program.

**204. Food Service Systems**
Second semester. Three credits. Hours by arrangement. Prerequisite: DIET 208.

Concepts, methods and experiences in food service systems. The relationship of nutrition care services and food service units.

**208. Introduction to Nutritional Care I**
First semester. Four credits. Hours by arrangement. Prerequisite: A course in nutrition, a course in biochemistry and course work in anatomy and physiology. Supervised practice is required.

Nutritional care for people throughout the lifecycle. Nutrition care processes, nutritional assessment, nutrition care plans.

**209. Introduction to Nutritional Care II**
Second semester. Three credits. Hours by arrangement. Prerequisite: DIET 208. Supervised practice is required.

Continuation of DIET 208. Planning, implementation, counseling techniques, and evaluation of client-centered nutritional care.

**210. Community Nutrition**
Second semester. Three credits. Hours by arrangement. Prerequisite: DIET 208. Supervised practice is required.

Assessment of community structure, agencies and resources. Plan, implement, and evaluate nutritional care and nutritional education in the community setting.

**210W. Community Nutrition**

**210S. Community Nutrition (W,C)**
Second semester. Four credits. Hours by arrangement. Prerequisite: DIET 208. Open only with consent of the program director. Clinical experiences and hands-on computer experiences are required.

**235. Applied Dietetics**
First semester. Eight credits. Hours by arrangement. Prerequisite: DIET 204, 209, 210. Supervised practice is required.

Advanced planning, implementing, counseling and evaluating nutritional care in health care environments. Introduction to professional issues in dietetics.

**238. Advanced Nutrition for the Clinical Practitioner**

Relationship of nutrients to each other and to body function.

**244. Practicum in Foodservice Management**
Second semester. Four credits. 160-hour practicum. Prerequisite: DIET 204 and 235.

Application and synthesis of performance requirements in the food service system.

**247. Seminar in Dietetics**
Second semester. Three credits. Hours by arrangement. Prerequisite: DIET 235. To be taken concurrently with DIET 248.

Special problems and issues in dietetics. The management role in patient care, nutrition education and the integration of nutrition and food service units.

**248. Applied Clinical Dietetics**
Second semester. Six credits. 256-hour practicum. Prerequisite: DIET 235.

Application and synthesis of performance requirements in clinical dietetics. Practicum.

**250. Dietetic Practice**

Student defines objectives to extend knowledge in a specialized area of dietetics. Research project.

**289. Special Topics**
Either semester. Credits and hours by arrangement. Prerequisite: The student must have completed all other requirements in the Program in Dietetics. May be repeated for credit with a change in topic.

Application of the scientific method of inquiry to planning, implementing, evaluating, and reporting a study of a problem related to dietetics.

**299. Independent Study for Undergraduates**
Either semester. Credits and hours by arrangement. Prerequisite: Open only with consent of instructor. May be repeated for credit.

This course is designed primarily for students who wish to extend their knowledge in some specialized area in the field of diagnostic sciences.

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**Medical Laboratory Sciences Programs (MLS)**

Cytotechnology Program Academic Coordinator: Associate Professor Denis A. Cole

Cytotechnology Program Office: Room 306, Koons Hall

Diagnostic Genetic Sciences Program Director: Martha B. Keagle

Diagnostic Genetic Sciences Program Office: Room 222, Koons Hall

Medical Technology Program Director: Elizabeth Epp

Medical Technology Program Office: Room 318, Koons Hall

For major requirements, see the School of Allied Health section of this Catalog.

The following courses are open only to the students enrolled in the Medical Laboratory Sciences Programs.

**298. Special Topics**
Either semester. Credits and hours by arrangement. Prerequisite: The completion of all Lower Division requirements in Medical Laboratory Sciences. Open only with consent of instructor. May be repeated for credit. Application of the scientific method of inquiry to planning, implementing, evaluating, and reporting a study of a problem related to the medical laboratory.

**299. Independent Study for Undergraduates**
Either semester. Credits and hours by arrangement. Open only with consent of the instructor. May be repeated for credit.

This course is designed primarily for students who wish to extend their knowledge in some specialized area in the field of cytology, diagnostic genetic sciences, clinical laboratory medicine or medical technology.

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**Medical Technology (MT)**

Medical Technology Program Director: Elizabeth Epp

Program Office: Room 318, Koons Hall

For major requirements, see the School of Allied Health section of this Catalog.

The following courses are open only to the students enrolled in the Medical Technology Program unless otherwise noted. Others must obtain the permission of the Director of the Medical Technology Program.

**210. Infectious Disease Process I**
(Formerly MLS 204) First semester. Three credits. One 2-hour lecture and one 2-hour laboratory period and one 1-1/2-hour laboratory. Prerequisite: MCB 203 or MCB 204 which may be taken concurrently. Not open for
260. Theory of Phlebotomy
(Formerly MLS 291.) Either semester. One credit. Prerequisite: MLS 200.
Venipuncture and special phlebotomy techniques, safety, ethics, and management of phlebotomy services.

261. Phlebotomy Laboratory
(Formerly MLS 292.) Either semester. One credit. Prerequisite: MT 260 (formerly MLS 291).
Application of the theory and techniques learned in MT 260 (formerly MLS 291) to the clinical laboratory setting. Understanding work flow, teamwork, evaluation of normal and abnormal results, instrumentation and quality assurance in the general laboratory environment.

264. Hematology
(Formerly MLS 280.) Either semester. Three credits. Prerequisite: MLS 200.
Principles of hemostasis, blood cell formation, morphology, function and kinetics; pathophysiology of coagulation and blood cell disorders; principles and procedures used to evaluate coagulation and blood cells in blood and body fluids; laboratory practice in microscopic evaluation.

266. Clinical Microbiology
(Formerly MLS 284.) First semester. Four credits. Prerequisite: MT 210 (formerly MLS 204).
Isolation and identification of normal flora and clinically significant bacteria and fungi from clinical specimens, correlation of the organisms isolated to disease states, and susceptibility testing of bacteria.

267. Clinical Microbiology Laboratory
(Formerly MLS 285.) Second semester. Four credits. Prerequisite: MT 266 (formerly MLS 284).
Application of the theory and techniques learned in MT 252 and MT 266 (formerly MLS 284) to the clinical laboratory setting. Understanding work flow, teamwork, evaluation of normal and abnormal results, instrumentation, and quality assurance in the general laboratory environment.

269. Clinical Immunology Laboratory
(Formerly MLS 289.) Second semester. One credit. Prerequisite: MT 213.
Application of the theory and techniques learned in MT 213 to the clinical laboratory setting. Understanding work flow, teamwork, evaluation of normal and abnormal results, instrumentation, and quality assurance in the general laboratory environment.

270. Transfusion Services
(Formerly MLS 286.) First semester. Two credits. Prerequisite: MLS 208(W).
Human blood groups, HLA antigens, compatibility testing, donor selection, and their relationship to transfusion and transplantation. Evaluation of laboratory results for selection of blood components for therapy.

272. Urinalysis Laboratory
(Formerly MLS 293.) Either semester. One credit. Prerequisite: MLS 200.
Renal physiology, chemical and microscopic examination of urine, correlation of results with disease states, chemical analysis of feces.

273. Urinalysis
(Formerly MLS 294.) Either semester. One credit. Prerequisite: MT 272 (formerly MLS 293).
Application of the theory and techniques learned in MT 272 (formerly MLS 293) to the clinical laboratory setting. Understanding work flow, teamwork, evaluation of normal and abnormal results, instrumentation and quality assurance in the general laboratory setting environment.

274. Hematology Laboratory
Second semester. Three credits. Prerequisite: MT 264.
Application of the theory and techniques learned in MT 264 (formerly MLS 280) to the clinical laboratory setting. Understanding work flow, teamwork, evaluation of normal and abnormal results, instrumentation and quality assurance in the general laboratory environment. Correlation of blood cell morphology and laboratory data in normal and disease states.

275. Transfusion Services Laboratory
Second semester. Two credits. Prerequisite: MT 270.
Application of the theory and techniques learned in MT 270 (formerly MLS 286) to the clinical laboratory setting. Understanding work flow, teamwork, evaluation of normal and abnormal results, instrumentation and quality assurance and preparation of blood components in the general laboratory environment.

280. Seminar in Medical Technology
(Formerly MLS 253.) Second semester. Two credits. Prerequisite: AH 241W. Hospital Staff
Examination of case studies integrating all areas of the clinical laboratory in the prevention, diagnosis, and treatment of disease. Design and implementation of a research project or investigation of a topic in medical technology. Oral and written presentation of research project or topic.

298. Special Topics
Either semester. Credits and hours by arrangement. Prerequisite: The completion of Lower Division requirements in the Medical Technology Program. Open only with consent of instructor. May be repeated for credit.

Head of Department: Dean Joseph Smey
Department Office: Room 227A, Koons Hall
For major requirements, see the School of Allied Health section of this Catalog.

100. Introduction to Allied Health Professions
Semester and hours by arrangement. One credit. Open only with consent of instructor.
Overview of health professions, team approach to health care delivery.

101. Health and Wellness
Either semester. Three credits. Open to all students in the University.
Wellness, holistic health, mind-body connection, health and wellness models, mental wellness, positive self-concept, preventing heart disease and cancer, licit and illicit lifestyle drugs, stress management, diet, nutrition, weight control, aerobic and anaerobic exercise, healthy lifestyle behaviors, applications to life.

115. Introduction to the Health Professions
Semester and hours by arrangement. Three credits.
Introduction to the Allied Health professional curriculum through special topics.

200. Drugs and Society
Either semester. One credit. Two class periods for seven weeks. Priority given to Allied Health and Education students.
Overview of drugs in America, co-dependence, the role of the counselor, psychological and physiological addiction, cocaine, heroin, marijuana, psychoactives, over-the-counter drugs, prescription drugs, AIDS.

202. Clinical Biomechanics
First semester. Three credits. Open only to Orthotics and Prosthetics Students.
An introduction to fundamental biomechanical principles through a review of concepts from applied physics with an application to technically relevant problems.

203. Aging: Implications for Health Professionals
Either semester. Three credits. Three hours of lecture.
Age-related physiological changes and pathologies, psychological function in health behaviors and care, role change and transition, health care issues, therapeutic relationships.

204. Conversational Spanish for the Health Professional
Either semester. Three credits. Three hours of lecture.
Open to Allied Health students and students in other
health-related fields (i.e., nursing, nutritional sciences, pharmacy), others with consent of instructor.

Basic conversational skills, medical terminology, patient/client interviewing skills, cultural factors affecting health care delivery.

207. Peer Health Education
Either semester. Three credits. Three hours of lecture. Not open for credit for students who have passed AH 205 or AH 206.
This course will provide a foundation of knowledge, self awareness, and skills that will prepare the student to function effectively as a peer health educator.

215. Critical Health Issues of Asian Americans
First semester. Three credits. Palaniswamy
Examination of critical health issues affecting Asian American sub populations. Topics to include gender specific health problems; cultural issues; and health care issues.

216. Asian Medical Systems
Second semester. Three credits. Palaniswamy
Examination of traditional medical systems of Asian origin and their prevalence in the United States. Topics to include popular medical systems: Ayurveda, Traditional Chinese Medicine, Chinese, Indian and Japanese Herbal Medicine; the values and beliefs of different models.

236. Issues for Women and Health
Semester and hours by arrangement. Two credits.
A study of current issues related to women as providers and consumers of health care.

241. Research for the Health Professional
Either semester. Three credits. Three hours of lecture. Prerequisite: A course in statistics or consent of the instructor. Open only to Allied Health majors; others with consent of instructor.
Research questions/hypothesis, finding and using research literature, ethical considerations, research design, sampling, measurement, reliability and validity, descriptive and inferential statistics, computer analysis of data, evaluating research, reviews of literature and proposals.

241W. Research for the Health Professional
Prerequisite: A course in statistics and English 105 or consent of the instructor.

242. Counseling and Teaching for the Health Professional
Either semester. Three credits. Three hours of lecture. Open only to Allied Health and Nutritional Science students; others with consent of instructor.
Learning theory and counseling strategies; role of health professional as teacher and counselor; communicating with special groups, individuals and groups.

243. Health Care Issues for the Health Professional
Either semester. Three credits. Three hours of lecture. Open only to Allied Health students; others with consent of instructor. Not open for credit to students who have passed Allied Health 202.
Individual, community and institutional health care needs and issues from a bio-medical and socio-cultural point of view. The health care delivery system; health and its relationship to poverty, ethnicity, life-cycle events, ethics, etc.

244. Management for the Health Professional
Either semester. Three credits. Three hours of lecture. Open only to Allied Health and Nutritional Science students; others with consent of instructor. Not open for credit to students who have passed Allied Health 240.
Basic management principles and concepts of planning, organizing, supervising, controlling and evaluating in health care environments. Leadership, motivation, supervision, time management, labor relations, quality assurance/proficiency, financial management.

280. Safety and Health Management
First semester, alternate years. Three credits. Three hours of lecture.
This course encompasses the principles of managing occupational safety and health programs from development, implementation through evaluation.

281. Industrial Hygiene
First semester, alternate years. Three credits. Three hours of lecture.
This course introduces the principles of industrial hygiene with emphasis on protecting workers' health through evaluation and intervention within the workplace.

282. Accident Prevention Techniques
Second semester, alternate years. Three credits. Three hours of lecture.
This course provides the student with the fundamental skills needed to prevent occupational injuries and illnesses in the workplace.

283. Occupational Safety and Health Regulations
First semester, alternate years. Three credits. Three hours of lecture.
This course provides a comprehensive overview of the occupational safety and health regulatory process and standards.

284. Ergonomics
First semester, alternate years. Three credits. Three hours of lecture.
This course is concerned with the achievement of an optimal relationship between humans and their work.

298. Special Topics
Either or both semesters and summer. Credits and hours by arrangement. Open only with consent of instructor. May be repeated for credit.
Investigation of a special topic in allied health related to the basic core or interdisciplinary areas.

299. Independent Study for Undergraduates
Either semester. Credits and hours by arrangement, not to exceed four. Open only with consent of instructor. May be repeated for credit.
Individualized study in a specialized area in the field of allied health.

Health Sciences (HESC)
Head of Department: Dean Joseph Smey
Department Office: Room 227A, Koons Hall

298. Special Topics
Either semester and summer session. Credits and hours by arrangement. Open only with consent of instructor. May be repeated for credit.
Investigation of special topics in health sciences that are related to basic core interdisciplinary areas.

299. Independent Study for Undergraduates
Either semester. Credits and hours by arrangement: not to exceed four credits. Open only with consent of instructor. May be repeated for credit.
This course is designed primarily for students who wish to extend their knowledge in some specialized subject in the field of health sciences.

Allied Health

Physical Therapy (PT)
Head of Department: Professor Scott M. Hasson
Department Office: Room 214, Koons Hall
For major requirements, see the School of Allied Health section of this Catalog.

The following courses are open only to the students enrolled in the Physical Therapy Program unless otherwise noted. Others must obtain the permission of the Director of the Physical Therapy Program.

210. Fundamentals of Assessment
Either semester. Five credits. Hours by arrangement. Clinical field experiences will be required. Open only to Physical Therapy students. Prerequisites: PT 213, PT 215, PT 217 and PT 240.
This course provides a foundation for the physical therapy assessment process, introducing the student to more general observational and interview skills to gather, document and analyze evaluation data. Students build skill in specific evaluation procedures which are fundamental to the practice of physical therapy. Students explore the scientific evidence which supports or questions the measuring characteristics of selected evaluation procedures. Students begin to use information from assessments in decisions for diagnosis, program planning and referrals.

212. Fundamentals of Treatment: Acute Care
Either semester. Six credits. Hours by arrangement. Clinical Field experiences will be required. Open only to Physical Therapy students. Prerequisites: PT 213, PT 215, PT 217, PT 210 and PT 240.

213. Human Anatomy
(Formerly offered as HESC 213.) Either semester. Three credits. Three hours of lecture. Open to students in Physical Therapy, ESLE students second semester only; others with consent of instructor. Prerequisite: Biology: PNB 264; PT 215 and Biology: PNB 265, either of which may be taken concurrently.
Discussion of the conceptual and structured bases of osteology, myology, neurology, human development and basic kinesiology and biomechanics. Selected anatomical and physiological dysfunctions will also be analyzed.

215. Human Anatomy Laboratory
(Formerly offered as HESC 215.) Either semester. Three credits. Laboratory and discussion. Open to students in Physical Therapy; ESLE students second semester only; others with consent of instructor. Prerequisite: Biology: PNB 264; PT 213 and Biology: PNB 265, either of which may be taken concurrently.
Laboratory and discussion utilizing bones, models, audiovisuals and projected human specimens to provide in-depth study of the skeletal, articular, muscular, cardiovascular, respiratory and nervous systems of the entire human body.

217. Human Physiology
(Formerly offered as HESC 217.) Either semester. Three credits. Open to students in Physical Therapy
and EKIN students; others with consent of instructor. Prerequisite: PT 213 and 215 or the equivalent, which may be taken concurrently.

Discussion of the biochemical, nutritional, cellular and physiological principles necessary for the analysis of the normal and abnormal function and for the rehabilitation of the human musculoskeletal, cardiovascular and respiratory systems. The effects of exercise and of selected pathologies upon these systems will also be analyzed.

220. Tissue Dysfunction
Either semester. Hours by arrangement. Open only to Physical Therapy students. Prerequisites: PT 213, PT 215; and PT 217 which may be taken concurrently.

After a general introduction to cellular mechanisms by which an organism becomes dysfunctional, pathological conditions common to the musculoskeletal, gastrointestinal, genitourinary, endocrine, integumentary, central and peripheral nervous and cardiopulmonary systems are overviewed. Focus is on knowledge of pathology and disease management as a basis for program planning in physical therapy. Discussion groups may be scheduled.

221. Pharmacology for Physical Therapy
Either semester. Two credits. Hours by arrangement. Open only to Physical Therapy students. Prerequisites: PT 217 and PT 220.

The body’s response to single and multiple medications, radiation and chemical treatments are considered as they relate to safe, comprehensive and effective outcomes of physical therapy care.

222. Musculoskeletal Dysfunction
Either semester. Four credits. Hours by arrangement. Open only to Physical Therapy students. Prerequisites: PT 210, PT 240; and PT 221 which may be taken concurrently.

Pathology related to the musculoskeletal system is overviewed. Focus is on knowledge of pathology and disease management as a basis for assessment, diagnosis, program planning, treatment and referrals in physical therapy. Interaction with physicians and other health professionals gives students an understanding of the role physical therapy plays in a complex multiprofessional health care system.

224. Neuromuscular Dysfunction
Either semester. Three credits. Hours by arrangement. Open only to Physical Therapy students. Prerequisites: PT 210, PT 221 and PT 260.

Focus is on pathology related especially to the neuromuscular systems. Knowledge of pathology and disease management is presented for assessment, diagnosis, program planning, treatment and referrals in physical therapy. Interaction with physicians and other health professionals as well as consumers gives the students the basis for understanding the role physical therapy plays in a complex multiprofessional health care system.

226. Field Work in Socialization and Leisure Time Activity with Persons with Disabilities
Either semester. Two credits. Hours by arrangement. Field work and independent study. Open only to Physical Therapy majors and Sophomore Pre-Allied Health majors in the College of Liberal Arts & Sciences; others with consent of instructor.

Students will have the opportunity to meet and work with persons with disabilities outside of the regular clinical setting through participation in residential weekends at an outdoor recreational center. In addition to studying the common physical barriers students will examine the common psychological and social difficulties encountered in an attempt to reach an optimal level of productivity in society. Students are required to provide their own transportation.

227. Field Work in Normal Motor Development
Either semester. Three credits. Hours by arrangement. Open only to Physical Therapy majors and Sophomore Pre-Allied Health majors in the College of Liberal Arts & Sciences; others with consent of instructor.

This course provides an opportunity for observation of normal motor skill development through participation in the educational programming, daily care, and social and emotional support offered to infants, toddlers, and preschool age children. Students are required to spend six hours per week participating in programming and care of the children. Field work and independent study are used to develop expertise in a selected area of motor development and students are required to present in-service training in their chosen area.

240. Clinical Kinesiology
Either semester. Three credits. Hours by arrangement. Prerequisite: PHYS 122; PT 213 and 215 which may be taken concurrently.

Students will analyze the impact of force systems on the human body during functional motion, thus preparing the student to apply knowledge of normal anatomical structure and function to therapeutic intervention.

260. Functional Neurology and Movement
Either semester. Four credits. Hours by arrangement. Prerequisite: PT 213 and 215.

The goal of this course is to provide the students with basic information on the central nervous system structure and function in order that they may better understand movement, the movement of patients with neurological disorders and the neurological basis behind treatment procedures. Emphasis will be placed on the analysis of segmental motion as seen in the acquisition of posture, postural reactions and adult movement patterns.

298. Special Topics
Either semester. Credits and hours by arrangement. Open only with consent of instructor. (Investigation of special topics is available to qualified students.) May be repeated for credit.

Investigation of special topics related to, but not ordinarily covered in the undergraduate offerings. These courses will be announced in advance for each semester.

299. Independent Study for Undergraduates
Either semester. Credits and hours by arrangement. Open only with consent of instructor. May be repeated for credit.

The course is designed primarily for students who wish to extend their knowledge in some specialized subject in the field of physical therapy.

Animal Science (ANSC)

Head of Department: Professor Ian C. Hart
Department Office: Room 107, White Building
(Animal Science)

For major requirements, see the College of Agriculture and Natural Resources section of this Catalog.

120. Introduction to Animal Science
First semester. Three credits. Two class periods and one 2-hour discussion or laboratory period. Taught concurrently with SAAS 020. Darre

The biological, physical, and social factors that influence animal production and utilization.

125. Behavior and Training of Domestic Animals
Second semester. Three credits. Two class periods and one 2-hour laboratory. Taught concurrently with SAAS 027. Stake

Application of behavior of cattle, horses, sheep, goats, swine and poultry to their management, training and welfare. Basic principles of genetics and physiology of behavior, perception, training, learning, motivation, and stress with consideration of integrated behavioral management and animal welfare.

127. Introduction to Companion Animals
Second semester. Three credits. Taught concurrently with SAAS 027. Stake

Basic concepts of the nutrition, physiology, health and management of companion animals.

160. The Science of Food
(Also offered as NUSC 160.) Second semester. Three credits. Faustman, Zhao

An introductory level course for students interested in the application of science to food. Nutritional and functional attributes of various food constituents are discussed. Issues concerning food processing and food safety are covered.

216. Principles of Nutrition and Feeding of Animals
First semester. Three credits. Two class periods and one 2-hour discussion or laboratory period. Andrew

This course covers feed nutrients and their digestion and use. Nutrient requirements and feeding standards for various classes of livestock for reproduction, lactation, growth, work and maintenance are included. Attention also is given to characteristics of common feedstuffs and to formulating rations and nutritional programs for animal enterprises.

217. Animal Breeding and Genetics
First semester. Three credits. Two class periods and one 2-hour discussion or laboratory period. Faustman, Zhao

The principles of genetic, chemistry of nucleic acids, replication, transcription, translation and regulation of genes, population and quantitative genetics, and modern molecular genetic approaches to animal breeding.

219. Reproductive Physiology
Second semester. Three credits. Two class periods and one 2-hour laboratory or discussion period. Riesen

A study of the reproductive anatomy and physiology of domestic animals. Laboratory will include macro and micro anatomy, hormone action, and techniques used in reproductive management of domestic animals.

221. Environment, Genetics and Cancer
Second semester, alternate years (even numbered). Three credits. Prerequisites: BIOL 107, CHEM 141 or 243. Concurrent enrollment in at least one of the following courses is strongly recommended: MCB 203 or 204, MCB 200 or 213; or MCB 210. Silburt

Basic principles in tumor biology will be presented with an emphasis on phenotypic changes in transformed cell morphology and behavior. The biochemical basis of cell transformation, proliferation, and metastasis will be covered, followed by discussions of molecular mechanisms by which environmental chemicals interact with DNA and other cellular components. Metabolic activation of genotoxic carcinogens will be covered in detail, and the importance of polymorphisms in activating enzymes among human sub-populations will be discussed in
terms of individual risks of cancer. Activation of proto-
oncogenes, inactivation of tumor suppressor genes, and
the role of these proteins in regulating the cell cycle
will be covered in detail. Approaches for estimating
human risk of cancer based on exposure estimates and
biological markers will also be presented.

222. Growth Biology and Metabolism of Domestic
Livestock
Second semester. Three credits. Two class periods and
one 2-hour discussion period. Recommended prepara-
tion: PATH 200 or consent of instructor. Zinn
Course will focus on the embryonic and postnatal
growth and development of domestic livestock with
emphasis on metabolic and hormonal regulation of
processes that influence growth and development.
Discussion period will focus on methods used to
measure growth and metabolism.

224. Food Safety
Second semester. Three credits. Prerequisite: Biology
107. A one semester course in organic chemistry is
recommended. Faustman
Current topics in food safety will be discussed, with
special emphasis on microbial and chemical
contamination of food. Specific topics including the
safety of natural versus synthetic chemicals, food
additives, irradiation and other practices, basic
microbiology and toxicology, current regulatory
practices and risk assessment will also be included.
The Hazard Analysis Critical Control Points (HACCP)
approach to food safety will be discussed.

225. Environmental Health Field Experience
First semester. One credit. One class period.
Field trips and discussion periods will focus on
waste management and disposal. Topics will include
water purification and sewage treatment, municipal and
industrial waste incineration, a superfund site and
pharmaceutical waste management. Some field trips
will be scheduled by arrangement.

226. Environmental Health
First semester. Three credits. Prerequisite: BIOL 100
or equivalent; CHEM 122 or 127; or consent of in-
structor. Silburt
Course will focus on the environmental health
consequences of exposure to toxic chemicals, food
contaminants and radiation. Basic principles of
 toxicology will be discussed, followed by lectures on
specific topics such as: cancer, occupational hazards,
radiation, genetic biomonitoring, risk assessment
techniques, risk/benefit analysis, social/legal aspects
of regulating toxic chemicals, and other related topics.

229. Animal Embryology and Biotechnology
First semester. Three credits. Required preparation:
ANSC 219 or MCB 219, or consent of instructor. Yang
Introduction to recent research in animal
embryology and related reproductive biotechnologies.
Basic principles, methodology and state of the
technology for numerous established and emerging
animal biotechnologies such as transgenesis and
cloning.

231. Developing the Driving Horse
First semester. Two credits. One 1-hour lecture and two
1-hour laboratories. Prerequisite: Junior or senior stand-
ring. Consent only. Callahan
Techniques related to training the driving horse will
be described. Prior working experience is
recommended.

234. Pleasure Horse Appreciation and Use
Either semester. One credit. One 1-hour lecture and
one 1-hour laboratory. Not open to students who have
passed ANSC 236. Callahan
Open to all University students interested in
pleasure horses. The principles of horse management
and horsemanship.

235. Horse Science
First semester. Three credits. Two class periods and
one 2-hour laboratory or discussion period. Open to
sophomores. Dinger
This course will be of particular value to animal
science majors and includes horse types and breeds
and their nutrition, breeding, evaluation, behavior, care
and management with attention given to detailed
studies of the problems and practices of horse
production and use.

236. Light Horse Training and Management
Second semester. Two credits. Three 1-hour labora-
tory and one 1-hour discussion period. Prerequisite:
ANSC 235. Open only with consent of instructor.
Callahan
The theory, fundamentals and practice of breaking,
training, fitting, showing, and the use of horses for
riding. Primarily for Animal Science majors.

237. Methods of Equitation Instruction
Second semester. Two credits. One class period and one
2-hour laboratory or discussion period. Taught concur-
rently with SAAS 37. Consent of instructor required.
Callahan
The techniques and procedures of teaching
equitation including the theories of riding and teaching
methods. Practice teaching will be required under the
supervision of the instructor.

238. Horse Breeding Farm Management
Second semester. Three credits. One class period and
two 2-hour laboratory or discussion periods. Recom-
manded preparation: ANSC 235. Dinger
This course is designed to develop technical and
managerial skills necessary for operating horse
breeding farms. Programs for herd health, hoof care,
nutrition, breeding, foaling, and record keeping will
be included.

253. Animal Food Products
First semester. Three credits. Two class periods and
one 3-hour laboratory. Faustman
A study of the food products derived from animal
agriculture, including dairy, meat, poultry and fish.
Emphasis will be placed on inspection, grading,
processing, nutritive value and food safety concerns
of these products. Field trips will be required.

253W. Animal Food Products
Second semester. Three credits. One 4-hour laboratory
period. Taught concurrently with SAAS 85. Consent
of instructor required. May be repeated twice for credit.

253W. Animal Food Products
Second semester. Three credits. One 4-hour laboratory
period. Taught concurrently with SAAS 85. Consent
of instructor required. May be repeated twice for credit.

273. Livestock Management
First semester. Four credits. Three class periods and
one 2-hour laboratory period. Hoagland
The production and management of beef cattle,
sheep, and swine. Laboratories involve theory and
practice in livestock management, skills, and
techniques.

275. Dairy Cattle Management
First semester of even numbered years. Three credits.
Two class periods and one 2-hour laboratory period.
Kazmer
Management of dairy cattle including milking
procedures, sanitation, reproduction, selection, and
record keeping.

277S. Dairy Herd Management (W, C)
Second semester of odd numbered years. Three credit-
ts. Two class periods and one 2-hour discussion pe-
riod. Taught concurrently with SAAS 077. Prerequi-
site: ENGL 105 and ANSC 275. Kazmer
Dairy farm management practices with emphasis
on business and economic decision making. The effects
of various programs in selection, nutrition, facilities,
reproduction and herd health on overall business
health will be evaluated. Each student will manage a
computer simulated herd during the semester and must fulfill
requirements for “W” and “C” skill course designations
to successfully complete the course. Field trips are
required.

278. Dairy Management Decision-making
Both semesters. One credit. One 2-hour discussion
period. Consent of instructor required. May be repeated
once for credit. Kazmer
Participation in all phases of dairy herd
management including decision-making activities, with
particular emphasis on impact of decisions on financial
health and stability. Course requires participation
beyond specific semester calendars.

281. Horse Selection and Evaluation
Second semester. Two credits. One 4-hour laboratory
or discussion period. Taught concurrently with SAAS
081. Not open for credit to graduate students. Consent
of instructor is required. Bennett
Comparative evaluation, classification and selection
of horses according to conformation, breed characteris-
tics and performance. Judging skills including justifica-
tion of placings through presentation of oral reasons will
be developed. The Intercollegiate Horse Judging Team
may be selected from this course. Field trips are required.

283. Livestock and Carcass Evaluation
Second semester. Two credits. Two 2-hour laboratory
periods. Taught concurrently with SAAS 83. Not open
for credit to graduate students. Hoagland
Classification, form to function relationships,
grades and value differences of livestock are included.
Objective and subjective methods of appraisal are used to
evaluate beef cattle, horses, sheep and swine.

284. Dairy Cattle Evaluation
Second semester. Two credits. Two 2-hour laboratory
or discussion periods. Kazmer
An introduction to the evaluation of dairy cattle on
the basis of conformation. Breed classification and type
improvement programs, score card criteria in relation to
longevity, physiological efficiency and performance are
included. Attention is also given to fitting and showing
methods. Field trips may be required.

288. Advanced Animal and Product Evaluation
First semester. Two credits. One 4-hour laboratory or
discussion period. Taught concurrently with SAAS 88.
Not open for credit to graduate students. May be
repeated once for credit. Consent of instructor required.
Intensive training in the evaluation of selected species of farm animals or their products. Type standards and the relation of anatomical features to physiological function are emphasized. Evaluation skills including justification of decisions will be developed. Intercollege dairy cattle, horse, livestock, poultry judging teams will be selected from this course. Field trips are required, some of which may occur prior to the start of the semester.

295. Seminar
Second semester. One credit. One 2-hour discussion period. Open only to juniors and seniors. Zinn

296. Professional Internship
Either semester. Credits and hours by arrangement. Open only to juniors and seniors with consent of instructor. Andrew, Darre

298. Special Topics
Either semester. Credits and hours by arrangement. Open only with consent of instructor. May be repeated for credit with a change of topic. Contact Department Main Office for list of current topics and instructors.

299. Independent Study
Either or both semesters. Credits and hours by arrangement of instructor. May be repeated for credit.

Anthropology (ANTH)

Head of Department: Professor Jocelyn Limnken
Department Office: Room 311, Manchester Hall

100. Other People’s Worlds
Either semester. Three credits.
A survey of the development, contributions, and contemporary social problems of selected non-Euroamerican peoples and cultures.

106. Introduction to Anthropology
Either semester. Three credits. Two class periods and one 1-hour discussion. Students should ordinarily take this course in the fall semester.
This course is concerned with the biological and cultural development of humans from their origin to the present. A brief survey of human evolution is followed by a comparative study of behavior and beliefs of our own and other societies.

193. Foreign Study
Either or both semesters. Credits and hours by arrangement. May be repeated for credit (to a maximum of 17). Consent of Department Head is required before departure. May count toward the major with the consent of the advisor.
Special topics taken in a foreign study program.

212W. The Development of Anthropological Theory
Either semester. Three credits. Prerequisite: ANTH 220. Recommended for seniors. Historical and contemporary theories in social and cultural anthropology.

214. Introduction to Archaeological Methods
First semester. Three credits. Open to sophomores. Dewar, McBride
The concepts, methods and practice of anthropological archaeology.

215. Migration
Second semester, alternate years. Three credits. Recommended preparation: ANTH 100 or ANTH 106.
The social, cultural and economic causes and consequences of internal and international migration in the modern era. Topics include migrant selection, social adaptation, effects on home and host societies, and cultural identity.

217. Old World Prehistory
First semester. Three credits. McBrearty
The origin of humanity in Africa, hunters and gatherers of the Paleolithic, the origins of agriculture and the transition to settled life, and the emergence of civilizations in Africa, Asia, and the Near East.

218. New World Prehistory
Second semester. Three credits.
The entry of early hunters into the New World, the origins of agriculture and sedentary life, and the rise of complex civilization in Mesoamerica and South America.

220. Social Anthropology
Either semester. Three credits. Open to sophomores. Not open for credit to students who have passed ANTH 200.
A comparative study of social structure including an analysis of kinship, marriage, community organization, political and economic institutions, and the role of the individual in these institutions.

220W. Social Anthropology
(Formerly offered as Anthropology 200.) Open to sophomores.

221. Contemporary Latin America
Either semester. Three credits.
The history, ecology, and culture of the native peoples of South America.

223. Pre-Colonial Africa
First semester. Three credits.
A survey of African society and history prior to and including the Atlantic slave trade.

225. Contemporary Africa
Second semester. Three credits.
Africa since its partition in 1884. Urbanization, social stratification, racial and ethnic conflict.

226. Peoples and Cultures of North America
Either semester. Three credits. Bee
A survey of representative Native American cultures as they existed prior to the twentieth century, together with a view of the changing life of modern Native Americans.

227W. Contemporary Mexico
Either semester. Three credits.
Analysis and interpretation of interrelated economic, political and cultural processes in the contemporary social life of Mexico and the U.S.-Mexico borderland. Draws broadly on the social science literature with a special focus on anthropological contributions.

228. Australian Aborigines
Either semester. Three credits. Recommended preparation: ANTH 220. Dussart
An introduction to the study and understanding of Aboriginal ways of life and thought. Social relations, modes of thought and belief that are particularly Aboriginal and which show continuity with the past. Notions of identity and the relationship of various indigenous communities to the non-Aboriginal population of Australia.

229. Caribbean Cultures
Either semester. Three credits. Berleant-Schiller, Martinez
Peoples and cultures of the Carribean region.

230. Peoples of the Pacific Islands
Either semester. Three credits. Linnekin
Survey of the indigenous societies and cultures of the Pacific Islands, from the first settlement to the postcolonial period. Topics include prehistoric canoe voyaging, modes of subsistence, political forms, ritual and religion, ceremonial exchange, gender ideologies, European colonization, and modern indigenous nationalism. Ethnographic examples will be drawn from Polynesia, Melanesia, and Micronesia.

231. Anthropological Perspectives on Women
First semester. Three credits. Open to sophomores. Dussart
Major conceptual and historical problems in the study of gender in anthropology. Women’s roles in different historical and contemporary settings, and new understandings of family, kinship, power, and cultural ideologies. (Crosslisted with Women’s Studies 231)

232. Cognitive Anthropology
Either semester. Three credits. Recommended preparation: ANTH 244. Boster
The study of how the content of thought or knowledge, is created, organized, and distributed in human communities. Topics include cultural models of the mind, emotions, personality, and relationships.

233. Human Evolution
Second semester. Three credits. Open to sophomores. McBrearty
The processes and events leading to the origin of human beings. Human physical and cultural development from its beginning to the dawn of settled life, through the approaches of physical anthropology and archaeology.

234W. Culture and Religion
Either semester. Three credits. Prerequisite: ANTH 106 or consent of instructor. Dussart
Religion as a social institution, with emphasis on the social and psychological functions of religious beliefs and practices. Materials are drawn from a wide range of historical and contemporary societies.

235. Economic Anthropology
Either semester. Three credits.
An introduction to the comparative study of economic life in contrasting pre-industrial, tribal and peasant economies.

236Q. Human Behavioral Ecology
Either semester. Three credits. Sosis
The application of the theory of natural selection to the study of human culture and behavior, with emphasis on the interaction between humans and their environment.

237. Psychological Anthropology
Either semester. Three credits.
Cross-cultural overview of critical issues regarding the relationship between individual personality and sociocultural systems, and mental health and illness.

238. Peoples and Cultures of the Middle East
Either semester. Three credits.
Selected social and cultural features of past and contemporary Middle Eastern social forms, and the origins and varieties of Western perceptions of these features.
239. Cultural Dynamics
First semester. Three credits. Bee
(Specification: breadth in cultural, social and psychological factors influencing the process of cultural growth and change.

240. Cross-Cultural Perspectives in Education
First semester. Three credits.
Implications of anthropology for education, with emphasis on the relationship between the learning process and the cultural setting.

241. Latin American Minorities in the United States
Either semester. (Also offered as PRLS 241.) Three credits.
Emphasis on groups of Mexican and Puerto Rican origin, including treatment and image in various media, historical background, social stratification, informal social relations, ethnic perceptions and relations.

242W. African-American Culture
Either semester. Three credits.
Sociological and anthropological analysis of the development and persistence of Afro-American culture.

243W. The American in Foreign Cultures
Second semester. Three credits. Prerequisite: SOCI 107 (required for sociology majors) or ANTH 106. Not open for credit to students who have passed SOCI 225.
The nature of the foreign situation encountered by past and present overseas Americans and their responses to it.

244. Culture, Language, and Thought
Either semester. Three credits. Boster
Anthropological contributions to the study of language, culture, and their relationship. Topics include the Sapir-Whorf hypothesis and the application of cognitive anthropological methods and theory to the study of folk classification systems.

245. Parent-Child Relations in Cross-Cultural Perspective
(Also offered as HDFR 245.) Offered every third semester. Three credits. Not open for credit to students who have passed HDFR 245.
Survey of theory and research on major dimensions of parenting in the U.S.A. and cross-culturally, including parental warmth, control and punishment.

246W. Illness and Curing
Either semester. Three credits. One 3-hour class period. Erickson
Cross-cultural analysis of ethnomedicine, major medical systems, alternative medical systems, curing and healing illness and social control, gender and healing, and the role of traditional and cosmopolitan medical systems in international health.

247. Culture, Power, and Social Relations
Either semester. Three credits.
Comparative and historical analysis of the sources and consequences of power in human populations.

248. Urban Anthropology
(Also offered as Urban Studies 248.) Either semester. Three credits. Not open for credit to students who have passed URBN 248.
A general course on urbanization, emphasizing contrasts between “developed” and “developing” countries.

249. Field Research in Social Settings
(Also offered as HDFR 249.) Either semester. Three credits. Not open to students who have passed HDFR 249.
Methods and techniques of field research in social settings, including observational procedures, interviewing, and the construction and use of questionnaires.

251. The Status of Women in Evolutionary Perspective
Either semester. Three credits.
A cross-cultural analysis of the status of women from a biocultural and cultural evolutionary perspective.

252. Native American Arts
(Also offered as Art History 258.) Either semester. Three credits. Not open for credit to students who have passed Art History 258. One three-hour class period.
Valentino
A topical survey of the arts of Native American culture in the United States and Canada.

253W. North American Pre-History
Either semester. Three credits. McBride
Prehistoric cultures of North America from the earliest traces to European contact, with emphasis on the region east of the Mississippi.

254. Archaeology of Eastern North America
Second semester. Three credits. Prerequisite: ANTH 253 or consent of instructor. McBride
Prehistoric cultures of the eastern United States and Canada from their earliest appearances to the arrival of the Europeans. Laboratory and field work projects.

255. Archaeology of Mesoamerica
Either semester. Three credits.
An archaeological survey of the ancient cultures of Meso-America, from the earliest evidence through the emergence of agricultural village life, chiefly societies and the high civilizations, including the Zapotec, Teotihuacan, Toltec, Maya, and Aztec.

256. Archaeology of South America
Either semester. Three credits.
The prehistoric cultures of South America, including the Inca and other high civilizations of ancient Peru, as well as the complex chiefdoms of Colombia, Venezuela and the Caribbean.

257W. Near Eastern Pre-History
(Also offered as History 212W.) Either semester. Three credits. Not open for credit to students who have passed HIST 212.
From the earliest hunter-gatherers to the rise of the state: the transition from food gathering to food production and the development of complex societies in the Near East.

258. Archaeology of Eastern Asia
First semester, alternate years. Three credits. Dewar
The development of cultures in China, Japan and Southeast Asia from their earliest beginnings until the historical period.

259W. Primitive Technology
Second semester. Three credits.
Technology of pre-industrial and non-industrial societies from the first evidence of tool-making to the present, emphasizing materials, processes, and products of simple crafts.

261. Medical Ecology
Either semester. Three credits. One 3-hour class period. Recommended preparation: ANTH 277. Erickson
Anthropological perspectives on the interrelationships between culture, biology, environment, and disease. Major topics include ecology and adaptation, population dynamics, nutrition, reproduction, disease in sociological context, health seeking behavior, and the complexity of the interaction of western and non-western medical systems.

262. Laboratory Techniques in Archaeology
Second semester. Three credits. Prerequisite: ANTH 214. McBride
The analysis, interpretation, and presentation of various kinds of archaeological artifacts, floral and faunal remains and sedimentary contexts from excavated sites.

263. Ethnohistory of Native New England
Either semester. Three credits. McBride
Includes archaeological and ethnohistorical data to reconstruct lifeways of the Native Americans of southern New England from the prehistoric period to the present.

264. African Prehistory
Either semester, alternate years. Three credits. McBride
The African archaeological record from first artifacts to historic times. The stone age, the domestication of crops, the ways of life of early herding societies, the development of metal working, and the rise of early African kingdoms.

265. Paleoanthropology
Fossil evidence for the evolution of the human family, Hominidae. Anatomical features, behavior, and evolutionary relationships of extinct hominids; the use of biological, geological, and archaeological evidence to reconstruct past hominid adaptations.

266. Human Osteology
Human skeletal anatomy from an evolutionary and functional perspective. Identification and interpretation of bones of the human skeleton, methods for aging, sexing, and identifying pathologies.

267. Lithic Technology
Either semester. Three credits. McBride
The properties of stone tools—the primary evidence of human behavior for humanity’s first 2.5 million years—and the processes of their manufacture. Analysis of prehistoric tools and tool replication.

268. Cultural Research
Either semester. Three credits. Boster, Handwerker, Linnekin
The theoretical foundations and basic methods used to collect and analyze cultural data.

270. Contemporary Native Americans
Either semester. Three credits. Bee
Analysis of Native American reservations and urban communities and their relationship to the larger U.S. society. Special focus on federal policy and economic development, cultural identity, and politics of Native Americans.

271. Social Change and Development
Second semester. Three credits. Bee
Developmental change in western and non-western societies, focusing on theories, processes, and sociocultural contexts of development.

274. Women and Religion
Either semester. Three credits. Linnekin
The theological standing and ritual activities of women in a cross-cultural sample of the world’s religions. Overview of selected topics and current issues relevant to the study of women and religion, such as comparative gender ideologies, feminist hermeneutics, feminist theology, and fundamentalism.
275. Race, Ethnicity, and Nationalism
Either semester. Three credits.
Popular and scholarly theories of human group identity and diversity, in cross-cultural and historical perspective. Topics include: an overview of ‘race’ and ‘ethnicity’ in Western thought, ethnic group formation and transformation, political mobilizations of group identity, and systems of inequality.

276. Human Reproductive Ecology
Either semester. Three credits. Sosis
The influence of ecology on the evolution of the human life course, with emphasis on men’s and women’s reproductive decisions.

277. Medical Anthropology
First semester. Three credits. Erickson
An introduction to the theory, method, and content of medical anthropology.

281. Sex and Gender
Either semester. Three credits.
Cross-cultural and interdisciplinary analysis of biological sex, gender, sex roles, and sexuality.

285. Anthropological Perspectives on Art
Second semester. Three credits.
Approaches to cultural creativity and aesthetics in the graphic and plastic arts of pre-state societies. Examples from North America, Oceania, and Africa.

293. Foreign Study
Either or both semesters. Credits and hours by arrangement.
Special topics taken in a foreign study program.

295. Variable Topics
Either semester. Three credits. With a change in topic, may be repeated for credit. Prerequisites, required preparation, and recommended preparation vary.

296. Directed Field Research in Anthropology
Either semester. Course may be repeated, but credits may not exceed 12 by graduation. Hours by arrangement.
Prerequisite: ANTH 249 or consent of instructor.
The investigation of a sociocultural and/or archaeological problem in some domestic or foreign field location.

297. Field Work in Archaeology
Summer session. Variable credits. Open only with consent of instructor. McBrine
Training in the techniques of archaeological site excavation; mapping; recording; field conservation, and preliminary analysis of materials.

298. Special Topics
Either semester. Credits and hours by arrangement. Open only with consent of instructor. With a change of content, may be repeated for credit.

299. Independent Study
Either semester. Credits and hours by arrangement. Open only with consent of instructor. With a change in content, may be repeated for credit.

Art and Art History
Head of Department: Professor Gina S. Werfel
Department Office: Room 100, Art Building

Art (ART)

135. Art Appreciation
Either semester. Three credits. Not open to Art majors.
Introduction to the visual arts, past and present. The visual language of artists, historical and cultural significance of works of art.

193. Foreign Study
Both semesters. Credits and hours by arrangement. Consent of Department Head required, normally before the student’s departure to study abroad.
Special topics taken in a foreign study program.

274. History of Graphic Design
History of visual communication with emphasis on modern developments.

STUDIO COURSES

110. Foundation Studio I
Either semester. Three credits. Two 3-hour or three 2-hour studio periods.
Introduction to perception and organization through two-dimensional problems.

112. Three-Dimensional Foundation
Either semester. Three credits. Two 3-hour or three 2-hour studio periods.
Introduction to the fundamentals of three-dimensional form.

113. Foundation: Criticism and Interpretation
Fall semester. Three credits. One 3-hour class period. Not open to students who have taken Art 232.
An introduction to various critical approaches to the producers, contexts, audiences, and history of contemporary visual culture.

130. Drawing I
Either semester. Three credits. Two 3-hour or three 2-hour studio periods.
Fundamental principles of drawing based on observation.

152. Drawing II
Either semester. Three credits. Two 3-hour or three 2-hour studio periods. Prerequisite: ART 130.
Observational drawing; emphasis on spatial organization and structure.

153. Life Drawing I
Either semester. Three credits. Two 3-hour or three 2-hour studio periods. Prerequisite: ART 152.
Introduction to figure drawing.

160. Basic Studio, Printmaking
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 130.
Introduction to practice and principles of printmaking, including intaglio, relief and lithographic processes.

163. Basic Studio, Sculpture
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 112 or consent of instructor.
Introduction to principles and techniques of sculpture.

164. Basic Studio, Painting
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 130.
Introduction to the principles and techniques of painting media.

165. Graphic Design I
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 110 and ART 130.
Introduction to visual communication design.

166. Basic Studio, Photography
Either semester. Three credits. Two 3-hour studio periods.
Introduction to techniques and aesthetics of photography, with emphasis on camera work.

195. Architectural Graphics I
First semester. Three credits. Two 3-hour studio periods.
Architectural graphics. Basic two- and three-dimensional delineation: axonometric, isometric and perspective drawing.

204. Life Drawing II
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 153. Open to sophomores.
Drawing from the figure.

211. Pottery and the Vessel
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 163 or consent of instructor. Open to sophomores. May be repeated for credit with a change in course content to a maximum of 9 credits.
Vessel-oriented ceramics, wheel-thrown and hand-built. Basic technical information on clay, glazes and kiln firings.

212. Sculpture: Clay
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 163 or consent of instructor. Open to sophomores. May be repeated for credit with a change in course content to a maximum of 9 credits.
Investigation of sculptural form, process, and environment, using wood.

217. Sculpture: Metals
Either semester. Two 3-hour studio periods. Prerequisite: ART 163. Open to sophomores. May be repeated for a maximum of 9 credits.
Investigation of sculptural form, process, and environment, using metal fabrication techniques such as welding, forging, and casting.

219. Sculpture: Moldmaking/Casting
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 163 or consent of instructor. Open to sophomores. May be repeated for credit with a change in course content to a maximum of 9 credits.
Investigation of mold-making techniques and casting processes, including ceramic slip casting, for students in any area of concentration.

220. Sculpture Seminar
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 163 and 9 credits in any area of concentration.
For the advanced undergraduate in any area of concentration. Exploration of 3-dimensional issues in a studio seminar format.
221. Intaglio Printmaking
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 160 or consent of instructor. Open to sophomores. Investigation of black-and-white and color intaglio techniques.

222. Lithography
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 160 or consent of instructor. Open to sophomores. Investigation of lithographic techniques.

224. Intaglio II
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 221. Open to sophomores. Continuation of ART 221 with emphasis on color printing.

225. Lithography II
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 222. Open to sophomores. Continuation of ART 222 with emphasis on color printing.

226. Printmaking Workshop
Either semester. Variable credit. Two 3-hour studio periods. Required preparation: ART 221 or 222, or consent of instructor. Open to sophomores. May be repeated for credit with a change in course content to a maximum of 18 credits. Workshop for students to continue developing ideas in a print medium.

228. Architectural Graphics II
Second semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 195 or consent of instructor. Open to sophomores. Development of presentation skills and techniques. Graphic analysis of architectural forms using various drawing media and models.

235. Intermediate Painting I
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 164. Open to sophomores.

236. Intermediate Painting II

237. Advanced Painting I
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 236. Individually determined painting projects.

238. Advanced Painting II
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 237. May be repeated once with change in course content. Continuation of ART 237.

239. Aqua Media I
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 152. Open to sophomores. Introduction to the materials and methods of painting in aqua media.

240. Aqua Media II
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 239. Open to sophomores. Continuing study in aqua media.

255. Advanced Figure Drawing
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 204. May be repeated once. Advanced studies in figure drawing.

256. Digital Imaging
Either semester. Three credits. Prerequisite: ART 166 and 261C. Introduction to the use of the computer to digitize and manipulate photographic imagery.

257. Advanced Drawing
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 204 and consent of instructor. May be repeated with a change in course content to a maximum of 9 credits. Advanced studies in drawing. Course content varies with instructor.

260. Graphic Design II
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 276, portfolio review and consent of instructor. Intermediate visual communication design.

261C. Introduction to Digital Media
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 110 and ART 130. Open to sophomores. Introduction to digital media.

262. Alternative Processes (Photography)
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 265. May be repeated once with a change of content. Open to sophomores. Craig Photographic printmaking systems outside conventional silver imaging processes.

263. Color Photography
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 256. May be repeated once with a change of content. Open to sophomores. The processes and aesthetics of color photography.

264. Advanced Graphic Design
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 260. May be repeated for credit with a change of instructor to a maximum of 9 credits. Advanced visual communication design.

265. Intermediate Photography
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 166 or consent of instructor. Open to sophomores. Principles and techniques of black-and-white photography in fine-art applications, with emphasis on darkroom work.

266. Advanced Photography
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 265 or consent of instructor. May be repeated once with change of content. Advanced problems in the use of photography as an art medium.

267. Visual Identity Systems
Spring semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 264. Introduction to identity system design.

269. Advanced Typography
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 276, portfolio review, and consent of instructor. Advanced typographic design.

270. Design Center
Either semester. Three or six credits. Two 3-hour studio periods. Prerequisite: portfolio review and consent of instructor. Introduction to professional design practice.

271. Illustration
Either semester. Three credits. Two 3-hour or three 2-hour studio periods. Prerequisite: ART 153 and 164, or consent of instructor. Open to sophomores. Introduction to principles of illustration, media, and techniques.

272. Topics in Illustration
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 204 and 271 or consent of instructor. May be repeated with a change of course content up to 9 credits. Continuing problems in illustration. Projects may include book, editorial, reportage, or self-promotion illustration.

274. History of Graphic Design
First semester. Three credits. Two 1/2-hour lecture periods. Counts toward one Art History course credit in graphic design and illustration BFA concentrations. History of visual design.

276. Typography
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 165 and ART 261C. Open to sophomores. Introduction to typographic design.

277. Publication Design
Fall semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 264. Introduction to publication design.

278. Digital Multimedia
Spring semester. Three credits. Two 3-hour studio periods. Prerequisite: ART 264. Introduction to time-based communication design.

279. Art Outside the Mainstream
Either semester. Three credits. One 3-hour seminar period. An examination of the range of contemporary art produced by self-taught artists working outside the mainstream in the United States, Europe, and selected global areas.

280. Percussion Instrument Design and Fabrication

283. Investigation of Special Topics
Either semester. Credits and hours by arrangement. Prerequisite: Consent of instructor. May be repeated for credit with a change in course content. Special topics. See Directory of Classes for title. Field trips may be required.

290. Materials and Techniques of Painting
Either semester. Three credits. Two 3-hour studio periods. Prerequisite: Consent of instructor. Media and techniques of traditional and experimental painting.

293. Foreign Study
Either or both semesters. Credits and hours by arrangement. Consent of department head required. Special topics taken in a foreign study program.

295. Studio Internship
Either semester. Three credits. Hours by arrangement. Open only with consent of instructor. Supervised practical experience in studio and studio related work. Section one: Graphic Design Studio Internship
Supervised practical experience in a commercial design studio, agency or in related work. Prerequisite: B average in graphic design classes, ART 165, ART 260, one semester of ART 264 and consent of graphics coordinator.

Section two: Photography Studio Internship
Supervised practical experience in a commercial photography studio, agency or in related work. Prerequisite: B average in photography classes, ART 266 and consent of a photography instructor.

Section three: Art Studio Internship
Supervised practical experience in an art studio. Prerequisite: B average in major Upper Division course work and consent of instructor from the major.

†296. Cooperative Education in Art
Either semester. Three credits. Hours by arrangement. Prerequisite: Upper Division standing. Open only with consent of Department Head. Practicum for students participating in the off-campus Cooperative Education Program.

297. Senior Project
Both semesters. Three credits. Hours by arrangement. Limited to advanced B.F.A. students seventh semester or higher. To fulfill graduation requirement for B.F.A. students, must be passed with grade of C or better.

Project developed in student’s area of concentration, to be exhibited in the Annual Senior Show. A vigorous and consistent thematic body of work which articulates both technical and conceptual concerns required.

299. Independent Study
Either semester. Maximum of up to 6 credits. May be repeated for a total of 6 credits. Limited to advanced students 5th semester or higher. Must have department grade point average (DGPA) of at least 3.0 and no outstanding incompletes for any other 299. Exceptions only by approval of the department head.

For advanced students to develop a special project in advanced studio art.

**Art History (ARTH)**

(Art History courses formerly offered as ART are now offered as ARTH under the same course numbers.)

136. Introduction to Art History I – Discussion
First semester. One credit. One class period. If elected, must be taken concurrently with Art History 137.

Discussion section for Art History 137.

137. Introduction to Art History I
First semester. Three credits.

Survey of art and architecture from prehistoric times through the fourteenth century.

138. Introduction to Art History II
Second semester. Three credits.

Survey of art and architecture from the fifteenth century to the present day.

139. Introduction to Art History II – Discussion
Second semester. One credit. One class period. If elected, must be taken concurrently with Art History 138.

Discussion section for Art History 138.

140. Introduction to Asian Art
Either semester. Three credits.

Survey of art and its social context in China, India and Japan from prehistoric times to the present.

141. Latin American Art
Either semester.
A thematic survey of Latin American art from 200 B.C. to the present.

191. Introduction to Architecture
(Formerly offered as ART 191.) Either semester. Three credits.
An introduction to the history of architecture considered in its social, technological and urban context.

193. Foreign Study
Either or both semesters. Credits and hours by arrangement. Consent of department head required, normally before the student’s departure to study abroad.

Special topics taken in a foreign study program.

209. History of the Print
Either semester. Three credits.
Survey of printmaking in Europe and America from the Renaissance to the present.

243. Greek Art
(Also offered as Classics 251.) Either semester, alternate years. Three credits.
Greek art and architecture from the ninth century B.C. to the first-century A.D.

243W. Greek Art
Open to art history and art majors; others with consent of instructor.

246. Roman Art
(Also offered as Classics 252.) Either semester, alternate years. Three credits.

History of Roman art and architecture.

246W. Roman Art
Open to art history and art majors; others with consent of instructor.

250. Art of the Northern Renaissance
Either semester, alternate years. Three credits.

Painting, sculpture, graphic arts of the Lowlands and Germany, 1400-1600.

250W. Art of the Northern Renaissance
Open to art history and art majors; others with consent of instructor.

251. Baroque Art
Either semester. Three credits.

Art and architecture of the seventeenth and early eighteenth centuries with emphasis on Italy, Netherlands, France and Spain.

251W. Baroque Art
Open to art history and art majors; others with consent of instructor.

252. Nineteenth Century European Art
Either semester. Three credits.

European art from Neo-Classicism to Realism.

252W. Nineteenth Century European Art
Open to art history and art majors; others with consent of instructor.

253. American Architecture
Either semester. Three credits.
American architecture from the colonial era to the present. Field trips may be required.

254. Nineteenth Century American Art
Either semester. Three credits.

Topics in American Art, 1770-1900.

254W. Nineteenth Century American Art
Open to art history and art majors; others with consent of instructor.

256. Native American Arts
(Also offered as Anthropology 252.) Either semester. Three credits.
A topical survey of the arts of Native American cultures in the United States and Canada.

257. Early Medieval Art
Either semester, alternate years. Three credits.
Early medieval art from the fifth through the tenth centuries. Germanic metalwork, Hiberno-Saxon manuscripts, and the art of the era of Charlemagne and his successors.

257W. Early Medieval Art
Open to art history and art majors; others with consent of instructor.

258. Romanesque Art
Either semester, alternate years. Three credits.
Topics in medieval painting, architecture and sculpture through the twelfth century.

259W. Romanesque Art
Open to art history and art majors; others with consent of instructor.

262. The Early Illustrated Book
Either semester. Three credits.
The early history of the illustrated book, from antiquity through the introduction of printing.

262W. The Early Illustrated Book
Open to Art History and Art majors; others with consent of instructor.

266. History of Photography I
Either semester. Three credits.
Topics in the history of photography from 1839 to World War I.

268. History of Photography II
Either semester. Three credits.
Topics in the history of photography from World War I to the present.

272. The Artist and Society
Either semester. Three credits.
An investigation of the artist’s professional function throughout history in different Western societies.

273. Art of the Italian Renaissance
Either semester. Three credits.
Italian art and architecture 1400-1600.

273W. Art of the Italian Renaissance
Open to art history and art majors; others with consent of instructor.

275. Mexican and Chicano Art, 19th Century – Present
Either semester. Three credits.
Topics in Mexican and Chicano art from Mexican Independence to the present.

275W. Mexican and Chicano Art, 19th Century – Present
Open to Art History and Art majors; others with consent of instructor.

276. Caribbean Art, 19th and 20th Centuries
Either semester. Three credits. Open to Art History and Art majors, others with consent of instructor.

† Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).
A survey of art and visual production in the Caribbean from the 1804 Haitian Revolution to the present.

276W. Caribbean Art, 19th and 20th Centuries
Either semester, alternate years. Three credits.

277. Art of Mesoamerica
Either semester, alternate years. Three credits.

278. Colonial Mexican Art
Either semester, alternate years. Three credits.

278W. Colonial Mexican Art
Open to art history and art majors; others with consent of instructor.

279. Modern Latin American Art
Either semester. Three credits.

279W. Modern Latin American Art
Open to art history and art majors; others with consent of instructor.

280. Early Christian and Byzantine Art
Either semester. Three credits.

280W. Early Christian and Byzantine Art
Open to art history and art majors; others with consent of instructor.

281. Modern Art
Either semester. Three credits.

281W. Modern Art
Open to art history and art majors; others with consent of instructor.

282. Architecture of the Twentieth Century
Either semester. Three credits.

283. Investigation of Special Topics
Either semester. Credits and hours by arrangement. May be repeated for credit with a change in course content.

285. African Art
Either semester. Three credits.

285W. African Art
Open to art history and art majors; others with consent of instructor.

286. The Art of China
Either semester. Three credits.

286W. The Art of China
Open to art history and art majors; others with consent of instructor.

287. The Art of Japan
Either semester. Three credits.

287W. The Art of Japan
Open to art history and art majors; others with consent of instructor.

288. Far Eastern Painting
Either semester, alternate years. Three credits. Recommended preparation: ARTH 286 or 287.

289. Buddhist Art in the Orient
Either semester. Alternate years. Three credits.

290. Ethnicities, Sexualities, Modernisms
(Also offered as Women’s Studies 290.) Either semester. Three credits.

291W. Contemporary Art
Either or both semesters. Credits and hours by arrangement. Consent of Department Head required.

292W. Impressionism and Post-Impressionism
Either semester. Three credits.

293. Foreign Study
Either or both semesters. Credits and hours by arrangement. Consent of Department Head required.

294. Field Studies Internship in Art History
Both semesters. Variable credit to a maximum of 12 credits. May be repeated for credit. Prerequisite: Junior standing. ARTH 137, ARTH 138 and two 200-level Art History courses and consent of instructor.

295. Cooperative Education in Art
Either semester. Three credits. Hours by arrangement. Prerequisite: Upper Division standing. Open only with consent of Department Head.

296. Cooperative Education in Art
Either semester. Three credits.

297. Art Historical Methods
Either semester. Three credits. Required preparation: Two Upper Division courses in Art History or consent of instructor.

† Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).

An introduction to the methods of Art Historical analysis.

299. Independent Study
Either semester. Variable credit to a maximum of 6 credits. May be repeated for a total of 6 credits. Limited to advanced students 7th semester or higher with a departmental G.P.A. of 3.0 or higher. Consent of instructor required. Exceptions only by approval of Department Head.

Designed for advanced students who wish to pursue the study of a special topic, culminating in a project in art history.

Asian American Studies Institute (AASI)

Director, Asian American Studies Institute:
Roger N. Buckley
Office: Room 416, Beach Hall

221. Sociological Perspectives on Asian American Women
(Also offered as SOCI 221.) Either semester. Three credits. Purkayastha
An overview of social structures and inter-group relations focusing on the experience of Asian American women.

221W. Sociological Perspectives on Asian American Women
(Also offered as SOCI 221W.)

239. Geography of Asian American Experience
(Also offered as GEOG 239.) First semester. Three credits. Li
Geographical perspective on issues facing Asian American communities: immigration, community formation, economic structure, race relations, and political participation. The changing dynamics of American ethnicity and study of the ethnurb. Diversity among Asian Americans, and comparison with other ethnic groups.

241. Asian American Literature
(Also offered as ENGL 274.) Either semester. Three credits. Required preparation: ENGL 109. Open to sophomores. Chow
An introduction to the history of Asia from the Mughal and European invasions of the 16th century to the present. India’s synthesis of Eastern and Western culture, traditional and new, will be the focus.

241W. Asian American Literature
(Also offered as ENGL 274W.) Second semester. Three credits. Buckley

277. Modern India
(Also offered as HIST 277.) Second semester. Three credits. Buckley
An introduction to the history of India from the Mughal and European invasions of the 16th century to the present. India’s synthesis of Eastern and Western culture, traditional and new, will be the focus.

278. East Asia to the Mid-Nineteenth Century
(Also offered as HIST 278.) First semester. Three credits. Li

The major problems and issues of traditional Chinese and Japanese history and historiography. Special emphasis on the “Great Tradition” in ideas of both civilizations.

278W. East Asia to the Mid-Nineteenth Century
(Also offered as HIST 278W.)

287. East Asia to the Mid-Nineteenth Century
(Also offered as HIST 287.) Second semester. Three credits. Wang
The reactions of East Asia to the Western threat, and the rise of Asian nationalism, communism, and
288W. *East Asia Since the Mid-Nineteenth Century*  
(Also offered as HIST 288W.)

294. *Asian American Experience Since 1850*  
(Also offered as HIST 294.) Either semester. Three credits. 
Survey of Asian Americans in the United States since 1850. Responses by Asian Americans to both opportunities and discrimination.

298. *Special Topics in Asian American Studies*  
Either semester. Credits and hours by arrangement. 
A change in content, may be repeated for credit. Prerequisites, required preparation, and recommended preparation vary.

**Biology**

For major requirements, see the College of Liberal Arts and Sciences section of this Catalog.

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**General Biology (BIOL)**

Students with inquiries about an undergraduate major should go to Torrey Life Sciences Building, Room 312. Torrey Life Sciences Building

102. *Foundations of Biology*  
Either semester. Four credits. Three class periods and one 2-hour laboratory period. Not open for credit to students who have completed a year of advanced biology in high school. Students may not receive more than 12 credits for courses in Biology at the 100’s level. A laboratory course designed for non-science majors; surveys major biological principles with emphasis on their importance to humans and modern society.

103. *The Biology of Human Health and Disease*  
(Also offered as PATH 103.) First semester. Four credits. Three lecture periods and one 2-hour laboratory. This course may not be combined with BIOL 102 to satisfy the General Education Group VIII Requirement. Smol, Terry  
A laboratory course which introduces the concepts of biology and their application to the individual, society and humankind by focusing on health and disease issues.

107, 108. *Principles of Biology*  
Either semester. May be taken in either order. Four credits. Three class periods and one 3-hour laboratory period. Students may not receive more than 12 credits for courses in biology at the 100’s level. A course in high school level chemistry or concurrent enrollment in CHEM 127 are recommended for students enrolling in 107.

110. *Introduction to Botany*  
First semester. Four credits. Three class periods and one 3-hour laboratory period. Students may not receive more than 12 credits for courses in biology at the 100’s level. Goffinet  
Structure, physiology and reproduction of seed plants as a basis for an understanding of the broader principles of biology as well as the relation of plants to human life. Includes a survey of the important groups throughout the plant kingdom.

196. *Topics in Modern Biology*  
Either semester. One credit. One class period. Concurrent enrollment in BIOL 107 or 108 required. May be repeated for credit with a change in content. Designed primarily for, but not restricted to, honors students. Students may not receive more than 12 credits for courses in Biology at the 100’s level. Readings, lectures, seminars, films and field trips exploring current developments in biology and their social and scientific implications.

295. *Introduction to Undergraduate Research*  
(Formerly offered as MCB 295.) Either or both semesters. One credit. Open to sophomores. Recommended preparation: BIOL 107 and 108, or equivalent. With a change in content, this course may be repeated for credit.

Introduction to the variety of research programs in the Life Sciences on the Storrs campus. Required of Sophomore Biology Honor students; also open to students interested in undergraduate research.

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**Biology: Ecology and Evolutionary Biology (EEB)**

Head of Department: Professor Gregory J. Anderson  
Department Office: Room 312, Torrey Life Sciences Building

For major requirements, see the College of Liberal Arts and Sciences section of this Catalog.

200. *Biology of Fishes*  
Second semester, alternate years. Four credits. Two 1 1/2-hour class periods, one three-hour laboratory period. Prerequisite: BIOL 108. Not open for credit to students who have passed RNR/NRME 200, 201 or 202 or MARN 200, 201 or 202. Schultz  
An introduction to the biology of fishes, with an emphasis on adaptation and evolutionary diversification. Topics include the evolution of major groups, morphology, physiology, behavior, and population and community ecology. Laboratory periods will include field and laboratory exercises; field trips required.

203. *Developmental Plant Morphology*  
(Also offered as EEB 303.) First semester, alternate years. Four credits. Two class periods and two 2-hour laboratory periods. Prerequisite: BIOL 108 or consent of instructor. Jones  
Analysis of diversity in plant form; principles of plant construction and development.

204. *Aquatic Plant Biology*  
(Also offered as EEB 304.) First semester, alternate years. Four credits. Two lectures and two 3-hour field trip/laboratory periods. Prerequisite: BIOL 108 or 110, or consent of instructor. Les  
Field and laboratory-oriented study of the anatomy, morphology, ecology, physiology, systematics and evolution of vascular aquatic and wetland plants.

214. *Biology of the Vertebrates*  
First semester. Three credits. Two 1-hour lecture periods, with demonstrations. Three credits of Introductory Biology. Open to sophomores. Rubega, Schwenk, Wells  
Evolutionary history and diversity of vertebrates with emphasis on classification, fossil history, feeding, locomotion, physiological ecology, reproduction, defense, and social behavior.

227. *Concepts in Botany*  
Second semester. Three credits. Prerequisite: BIOL 108 or 110. EEB 228 recommended concurrently. Open to sophomores.

Intermediate level coverage of ecology, evolution, function and structure of plants.

228. *Concepts in Botany, Laboratory*  
Second semester. One credit. One 2-hour laboratory. Prerequisite: EEB 227, which may be taken concurrently. Open to sophomores. 
Laboratory course to complement EEB 227.

238. *Limnological Methods*  
Second semester. Three credits. One class period and two 3-hour field/laboratory periods. Prerequisite: Consent of instructor and CE 268 or EEB 247, either of which may be taken concurrently. This course and CE 207 may not both be taken for credit. Rich  
Field and laboratory study of physical, chemical, and biotic elements of freshwater habitats. Field trips required.

243. *Insect Classification and Identification*  
Second semester, alternate years. Four credits. Two 1-hour lecture periods and one 4-hour laboratory. Prerequisite: EEB 286 or consent of instructor. Not open for credit to students who have passed EEB 253. Henry  
Insect classification, evolution, and phylogeny.

243W. *Insect Classification and Identification*  
(Formerly offered as EEB 253.) Second semester, alternate years. Four credits. Two 1-hour lecture periods plus individual tutorial. Prerequisite: Consent of instructor, Henry  
Content as in EEB 243; field, museum, and library research; requires major writing assignment.

244. *General Ecology*  
Either semester. Four credits. Prerequisite: Six credits of college biology. Open to sophomores. Not open for credit to students who have passed EEB 257. Adams, Cardon, Chazdon, Colwell, Silander, Turchin  
Fundamental ecological dynamics of communities, populations and ecosystems, with emphasis in discussion sections on reading primary literature, problem-solving, and exposure to ecological research techniques.

244W. *General Ecology*  
(Formerly offered as EEB 257.) Four credits. Adams, Cardon, Chazdon, Colwell, Silander, Turchin  
Content as in EEB 244; requires major writing assignment.

245. *Evolutionary Biology*  
Either semester. Three credits. Prerequisite: Six credits of college biology and three credits of college chemistry. Open to sophomores. Not open for credit to students who have passed EEB 267. Cairns, Henry, Holsinger, Simon  
Introduction to evolutionary mechanisms, biogeography, and the history of major groups of plants and animals.

245W. *Evolutionary Biology*  
(Formerly offered as EEB 267.) Four credits. Four class periods. Content as in EEB 245; requires major writing assignment.

247. *Limnology*  
(Also offered as CE 268 and ENV 268.) First semester. Three credits. Prerequisite: MATH 109 or 112, or 115 and three or more credits in chemistry (CHEM 122, 127, or 129); three credits of introductory biology are recommended. Not open for credit to students who have passed CE 268. Rich  
Physical, chemical, and biotic interrelationships of freshwater habitats (see also EEB 238).
249. **Biology of the Honey Bee**  
Summer session, alternate years. Three credits. Two class periods and one 2-hour laboratory period. Prerequisite: Three credits of introductory biology. Open to sophomores.  
Chemical communication, structure and function in honey bee hives and colonies; practical beekeeping.

252. **Field Entomology**  
Either semester, summer sessions, or any fractions thereof. Credits and hours by arrangement, to permit offering special sessions of the course to interested students during the spring recess or over Christmas break. Consent of instructor required.  
Collection, identification, and ecology of insects.

256. **Plants and Civilization**  
First semester. Three credits. Prerequisite: Three credits of introductory biology. Anderson  
Plants and animals used by people; origin, history, biology, distribution, and role in development of civilizations.

268. **Ecological Plant Geography**  
Second semester, alternate years. Three credits. Three class periods and one weekend field trip. Prerequisite: EEB 244 and 245 or consent of instructor.  
Geographical differences in vegetation composition and plant adaptation. A global perspective on effects of climate, soil, local conditions and ecosystem processes.

269. **Social Insects**  
(Also offered as EEB 369.) Second semester, alternate years. Three credits. Prerequisite: Six credits of introductory biology. Adams  
Behavior, ecology, evolution of social insects: ants, wasps, bees, and termites.

271. **Systematic Botany**  
Second semester, alternate years. Four credits. Two class periods and two 2-hour laboratory periods. Prerequisite: BIOL 108 or 110. Les  
Classification, identification, economic importance, evolution and nomenclature of flowering plants. Laboratory compares vegetative and reproductive characters of major families.

272. **The Summer Flora**  
Summer session. Three credits. Prerequisite: Three credits of college botany. Mehroff  
Identification of Connecticut’s native and exotic plants; lecture, laboratory and field study.

273. **Comparative Vertebrate Anatomy**  
Second semester, alternate years. Four credits. Three class periods and one 3-hour laboratory period. Prerequisite: BIOL 108 to sophomores. Schwenk  
Anatomy, development, functional morphology, and evolution of living vertebrate animals.

275. **Invertebrate Zoology**  
First semester, alternate years. Four credits. Two class periods and one 4-hour laboratory period. Prerequisite: Six credits of introductory biology or permission of instructor. Caira  
Body organization, functional morphology and evolution compared among major invertebrate phyla. Field trips required.

276. **Plant Anatomy**  
First semester, alternate years. Four credits. Two class periods and two 2-hour laboratory periods. Prerequisite: BIOL 108 or 110, or consent of instructor. Jones  
Internal structure of seed plants: development and environmental responses.

277. **Floristics of Vascular Plants**  
First semester. Four credits. Two class periods and two 2-hour laboratory periods. Prerequisite: BIOL 110.  
Taxonomy of common local vascular plants.

280. **Plant Morphology**  
Second semester, alternate years. Four credits. Two class periods and two 2-hour laboratory periods. Prerequisite: BIOL 110 or 108. Staff  
Evolution, relationships, reproduction and structure of flowering and non-flowering plants.

281. **Omnithology**  
Second semester. Two credits. Two class periods. Not open for credit to students who have passed EEB 285. Rubega  
Adaptations, habits, and importance of birds.

281W. **Omnithology**  
(Formerly offered as EEB 285.) Second semester. Three credits. Prerequisite: Consent of instructor. Rubega  
Content as in EEB 281; requires major writing assignment.

283. **Introduction to Animal Parasitology**  
First semester, alternate years. Four credits. Two class periods, and two 2-hour laboratory periods. Prerequisite: BIOL 108. Caira  
Protozoan and metazoan parasites of humans and other animals.

284. **Medical Entomology**  
Second semester, alternate years. Three credits. Two class periods and one 2-hour laboratory period. Prerequisite: BIOL 108. Schaefer  
Identification and biology of disease-spreading poisonous, and parasitic arthropods.

284W. **Medical Entomology**  
Four credits.

286. **General Entomology**  
First semester. Four credits. Two class periods and two 2-hour laboratory periods. Prerequisite: BIOL 108. Henry, Schaefer, Wagner  
The biology of insects: anatomy, physiology, ecology, behavior, development, evolution, and diversity.

287. **Ornithology Laboratory**  
Second semester. Two credits. One 4-hour laboratory period; required field trips. Prerequisite: consent of the instructor. Open only to students who are currently taking, or have completed, EEB 281. Rubega  
Methods of field study and identification of birds; functional morphology, preparation of study skins and specimens. Field trips, including at least one required day-long weekend trip.

288. **Concepts of Applied Entomology**  
Second semester, alternate years. Four credits. Three class periods and one 3-hour laboratory period. Prerequisite: BIOL 108 or 110. Schaefer  
Control, ecology, economics, damage assessment and detection of insect infestations.

289. **Variable Topics**  
Either semester. Three credits. With a change of topic, may be repeated for credit. Prerequisites, required preparation, and recommended preparation vary.

290. **Introductory Phylogeny**  
First semester, alternate years. Four credits. Two class periods and two 2-hour laboratory periods. Prerequisite: Six credits of 200-level biology or consent of instructor. Lewis  
Taxonomic survey of major algae groups.

292W. **Senior Research Thesis in Ecology and Evolutionary Biology**  
Either semester. Three credits. Hours by arrangement. Prerequisite: Three credits of EEB 299, which may be taken concurrently. Open only with consent of instructor and department honors committee. Not limited to honors students.  
A “W” course for students writing a senior thesis on their independent research.

293S. **Methods of Ecology (W.C)**  
First semester. Four credits. Two class periods and two 3-hour laboratories. Prerequisite: EEB 244 or consent of instructor. Recommended: One course in statistics and one course in calculus. Chazdon, Silander  
An intensive introduction to field and laboratory methods in ecology. Emphasis will be placed on the use of quantitative and analytical techniques in physiological, population, community and ecosystem ecology. An introduction to sampling procedures, data collection and statistical analysis. Computers will be used to model population and community dynamics and to analyze ecological data sets. Laboratory periods will consist of field and laboratory problems; field trips required, including occasional weekend trips.

294. **Marine Biology**  
(Also offered as MARN 294.) First semester. Three credits. Two class periods and one 2-hour laboratory period. Prerequisite: Six credits of laboratory biology or consent of instructor. Whitlatch  
Survey and distribution of marine organisms. Abiotic and biotic features of oceans, organism-habitat relationships, ecological influences on marine communities and populations. Field trips required.

296. **Physiological Ecology**  
Second semester, alternate years. Three credits. Recommended preparation: PNB 250 or MCB 259. Schultz  
Physiological adaptations and responses of plants and animals to different environments.

297. **Undergraduate Seminar**  
Either or both semesters. Credits and hours by arrangement. May be repeated for credit with a change in topic. Content varies with instructor.

298. **Special Topics**  
Either semester. Credits and hours by arrangement. With a change in content, may be repeated for credit. Prerequisites, required preparation, and recommended preparation vary.

299. **Independent Study**  
Either or both semesters. Credits and hours by arrangement. Open only with consent of instructor and the department honors committee. May be repeated for credit with a change in topic.  
Independent investigation of special problems in ecology and evolutionary biology.

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**Biology: Molecular and Cell Biology (MCB)**

*Head of Department:* Professor Philip L. Yeagle  
*Department Office:* Room 205, Life Sciences Annex

*For major requirements, see the College of Liberal Arts and Sciences section of this Catalog.*

200. **Human Genetics**  
First semester. Three credits. Two lectures and one problem session. Prerequisite: BIOL 107. Open to sophomores. Strausbaugh  
Principles of genetics as applied to humans. Focus on modern methods of molecular genetics.
201. Gene Expression
Second semester. Three credits. Recommended preparation: MCB 200 or 210 or 229. Open to sophomores.
High over
Basic mechanisms of genetic information transfer in eukaryotic cells from DNA to folded and assembled proteins. Regulation of transcription, translation, DNA replication, and the cell cycle.

202. Introduction to Biochemistry
Either semester. Four credits. Three class periods and one 3-hour laboratory period. Prerequisite: CHEM 141 or 244. (CHEM 244 may be taken concurrently.) Open to sophomores. Not open for credit to students who have passed MCB 204. May substitute for MCB 204 only if taken with MCB 226 and with permission of the Department Head to satisfy the biochemistry requirement of the molecular and cell biology major. The structure, chemistry, and metabolism of carbohydrates, lipids and proteins. Enzyme function and kinetics, energy metabolism, and structure and function of nucleic acids. A survey course for students of agriculture, general biology, medical technology, nursing, and pharmacy. Molecular and Cell Biology majors, biophysics majors, and other students desiring a more intensive introduction or considering advanced course work in biochemistry or molecular biology should take MCB 204.

204. Biochemistry
First semester. Five credits. Four class periods and one 3-hour laboratory. Recommended preparation: CHEM 244, which may be taken concurrently. Not open for credit to students who have passed MCB 203. Teschke/Staff
The structure and function of biological macromolecules. The metabolism of carbohydrates, lipids, amino acids, proteins and nucleic acids and its regulation. Energy metabolism. An in-depth introduction, designed for students planning to take advanced course work in biochemistry, biophysics, or other areas of molecular biology.

207Q. Introduction to Biophysical Chemistry
Second semester. Three credits. Prerequisite: CHEM 243; MATH 114 or 116; PHYS 122, 132 or 142; or consent of instructor.
Energetics and kinetics of metabolic reactions. Interactions of electromagnetic radiation and biological macromolecules. Formation and energetics of supramolecular structures. The basis of selected techniques of molecular biology, such as DNA hybridization, radioimmune assays. DNA melting and thermal transitions in polymers, thermodynamics, analysis of reactions, binding theory, cooperative interactions.

208Q. Techniques of Biophysical Chemistry
Second semester. Three credits. Prerequisite: MCB 207, or CHEM 263, or consent of instructor. Brasswell
The characterization of biological macromolecules (i.e., proteins and nucleic acids) in solution is important to the biotechnology and pharmaceutical industries. This course deals with hydrodynamic techniques (i.e., diffusion, electrophoresis, sedimentation, light scattering, and viscosity) for molecular size and shape, and spectroscopic methods (such as circular dichroism) for more detailed structure.

209. Structure and Function of Biological Macromolecules
Second semester. Three credits. Prerequisite: MCB 204, which may be taken concurrently; or consent of instructor. Knox
Correlation of 3D molecular structure with function and activity in proteins, nucleic acids, and a variety of macromolecular assemblies. Principles of x-ray diffraction, electron microscopy, and other biophysical techniques.

210. Cell Biology
First semester. Three credits. Prerequisite: BIOL 107. This course is intended to be taken before MCB 203 or 204 (Biochemistry). Open to sophomores. Knecht/Lee
Structural organization of cells and the molecular basis of dynamic cellular processes, with emphasis on eukaryotic cells. Topics include protein targeting, vesicle trafficking, cytoskeleton, cell-cell interactions in tissues, and the molecular basis of related human diseases.

211. Basic Immunology
First semester. Three credits. Prerequisite: BIOL 107. Recommended preparation: MCB 210. Lyenes
An introduction to the genetic, biochemical, and cellular mechanisms of the immune system. This course will address basic aspects of immune function, and will examine abnormal immune function associated with cancer, autoimmune disease, AIDS, and other immunological abnormalities.

212. Genetic Engineering
First semester. Three credits. Prerequisite: BIOL 107, CHEM 128, Recommended preparation: MCB 200 or 213 or 229; MCB 203 or 204, O’Neill
Methodology and applications of genetic engineering including gene manipulation and transfer techniques in prokaryotes and eukaryotes. Industrial, agricultural, pharmaceutical and biomedical applications of recombinant DNA technology and their related societal issues.

213. Concepts of Genetic Analysis
Second semester. Four credits. Three class periods and 2-hour laboratory. Prerequisite: BIOL 108 or 110, or MCB 200 or equivalent, and CHEM 128. Open to sophomores. Zhang
Survey of genetic theory and applications of genetic analysis. Model genetic systems in animals, plants, and microbes.

214. Experiments in DNA Identification
Second semester. Two credits. One fifty minute lecture period and one 3-hour laboratory session. Required preparation: MCB 200 and consent of instructor. O’Neill
An introductory laboratory course in principles and techniques of DNA manipulation and identification. Course simulates independent research, using modern molecular genetics techniques.

215. Experiments in Molecular Genetics
First semester. Three credits. One 1-hour lecture and two 3-hour laboratory periods. Open only with consent of instructor. Required preparation: MCB 204, which may be taken concurrently. Recommended preparation: MCB 212 or 217. Not open for credit to students who have passed MCB 230, Reiter
Modern methods in molecular genetics arranged to meet a research goal. Use of polymerase chain reaction, bacteriophage library screening, molecular cloning, nucleic acid hybridizations, and DNA sequence determinations to isolate and characterize a eukaryotic gene.

217. Molecular Biology and Genetics of Prokaryotes
First semester. Four credits. Three lecture periods and one 2-hour discussion. Prerequisite: MCB 229. Noll
Molecular genetics of bacteria, archaeabacteria, and their viruses. Transcription and replication of DNA, transformation, transduction, conjugation, genetic mapping, mutagenesis, regulation of gene expression, genome organization.

218. Heredity and Society
First semester. Three credits. Open to sophomores. May not be counted toward the biology major. Not open for credit to students who have passed MCB 222.

218W. Heredity and Society
(Formerly offered as MCB 222.) First semester. Four credits. Three class periods and library research. Open to sophomores. May not be counted toward the biology major.

219. Developmental Biology
Second semester. Three credits. Prerequisite: BIOL 107, Recommended preparation: MCB 210 and 213 or 200, which may be taken concurrently. Krider
Principles of embryogenesis, pattern formation, and cell differentiation. The focus will be on molecular and cellular aspects of development in several experimental systems, including the mouse, nematode, fruit fly, and frog.

220. Laboratory in Developmental Biology
Second semester. Three credits. Two 3-hour laboratory periods and a discussion/recitation period. Prerequisite: MCB 219, which may be taken concurrently, or six credits of college biology and consent of instructor. Not open for credit to students who have passed Biology: MCB 221 or 223.

224. Experiments in Bacterial Genetics
Second semester. Three credits. Two 3 1/2 hour laboratory/lecture periods. Prerequisite: MCB 213, and either MCB 217 or 229, which may be taken concurrently. Open only with consent of instructor.
Experiments in bacterial genetics, emphasizing genetic manipulations using modern techniques for mutant isolation, DNA characterization and cloning. These include the use of transposons, DNA isolation, restriction analysis, gel electrophoresis, PCR and DNA sequencing.

226W. Advanced Biochemistry Laboratory
Second semester. Four credits. One 1-hour lecture and two 4-hour laboratories. Prerequisite: Either MCB 204, or MCB 203 with consent of instructor. Teschke
Theory and application of modern techniques for separation and characterization of biological macromolecules, including several types of liquid chromatography, liquid scintillation spectrophotometry, and SDS polyacrylamide gel electrophoresis. Instruction in writing a scientific paper.

229. Fundamentals of Microbiology
Either semester. Four credits. Three lecture periods and one 2-3/4 hour laboratory period. Prerequisite: CHEM 141 or 243 (either may be taken concurrently). Recommended preparation: BIOL 107 or equivalent. Open to sophomores. Gage, Terry, Vinopal
A study of microorganisms, especially bacteria. Cellular structure, physiology, genetics, and interactions with higher forms of life. Laboratory familiarizes students with methodology of microbiology and aseptic techniques.
230. Laboratory in Biotechnology and Molecular Genetics
Summer session. Two credits. One 4-hour laboratory. Prerequisite: MCB 200 or 213, and 229, which may be taken concurrently. Not open for credit to students who have passed MCB 215.
Theory and application of techniques used in biotechnology and molecular genetics, including recombinant DNA procedures, gel electrophoresis and blot analysis.

232C. Microcomputer Applications in Molecular and Cell Biology
First semester. Three credits. One 1-hour lecture and two 3-hour laboratory periods. Recommended preparation: MCB 200 or 204 or 210 or 213 or 229. Brasswell
Introduction to the use of microcomputers in molecular biology, emphasizing commercially available applications software, both general (spreadsheet, word processing, database, graphics) and specialized (DNA and protein sequence database manipulation, molecular modeling, data acquisition, others).

233. Pathogenic Microbiology
Second semester. Four credits. Two class periods and two 2-hour laboratory periods. Prerequisite: MCB 229. Recommended preparation: MCB 204 (or 203).
A detailed study of microbial genera, emphasizing species which are important in diseases of man and animals and which have special public health significance. Diagnostic methods include some standard serological procedures.

235. Applied Microbiology
First semester. Four credits. Two class periods and two 2-hour laboratory periods. Prerequisite: MCB 229. Recommended preparation: MCB 204 (or 203). Benson
A study of the biology, physiology, and genetics of microorganisms useful in industry, agriculture, and selected environmental processes.

236. Marine Microbiology
(Also offered as MARN 236). Second semester. Three credits. Two lecture-discussion class periods and one 2-hour laboratory period for which field trips may be substituted. Offered at the Avery Point Campus. Prerequisite: MCB 229, or consent of instructor.
A general survey of the taxonomy, physiology, and ecology of marine microorganisms.

240W. Bacterial Diversity and Ecology
Second semester. Four credits. Two lecture periods and two 3-hour laboratory/discussion periods. Prerequisite: MCB 229 or consent of instructor. Recommended preparation: MCB 204 (or 203). Leadbetter
A study of the ecophysiology of diverse bacterial types with particular emphasis on the activities of bacteria in situ. Investigative laboratory includes individual projects.

241W. Research Literature in Molecular and Cell Biology
First semester. Three credits. Open only with consent of instructor. Recommended preparation: one 200’s course in MCB. With a change in content, may be repeated for credit. Kendall, Leadbetter
Discussion of current research in molecular and cell biology. Different sections address different topics: biomedical applications of genetic information, and microbes as agents of environmental change.

246. Virology
Second semester. Three credits. Three lecture periods. Prerequisite: MCB 229. Recommended preparation: MCB 204 or 210. Marcus
Biological, biochemical, physical, and genetic characteristics of viruses, with an emphasis on molecular and quantitative aspects of virus-cell interactions.

258. Biotechnical Plant Culture
Summer session. Two credits. Prerequisite: MCB 259.
Recent advances in in vitro, hydroponic and controlled environment culture of plants.

259. Plant Physiology
First session. Three credits. Three 1-hour class periods. Recommended preparation: BIOL 108 (or 110) and CHEM 128. Staff Functioning of plants in relation to external and internal factors. The course integrates pertinent findings from cell biology, genetics and molecular biology. Topics include photosynthesis, plant transpiration, hydraulic pathways, phytohormones, photomorphogenesis and movements in plants.

261. Laboratory Techniques of Plant Physiology

289. Variable Topics
First semester. Three credits. Prerequisite: BIOL 107 and either 108 or 110. Open to sophomores. Crivello, Renfro, Tsai
Mechanisms and regulation of basic physiological processes in fish. Mainly teleost fishes of commercial value; also invertebrate physiological processes important to aquaculture.

290. Forensic Application of DNA Science
Second semester. Three credits. Prerequisite: EEB 200 (may be taken concurrently). Chapple, Chen, Crivello, Laugee, Renfro, Tsai
Design of the advanced undergraduate who is pursuing a special problem as an introduction to independent investigation. Research and writing of a thesis.

292W. Senior Research Thesis in Molecular and Cell Biology
Either semester. Three credits. Hours by arrangement. Prerequisite: Three credits of MCB 299, which may be taken concurrently. Open only with consent of instructor and department honors committee. Not limited to honors students.
Designed for the advanced undergraduate who is pursuing a special problem as an introduction to independent investigation. Research and writing of a thesis.

297. Undergraduate Seminar
Either or both semesters. Credits and hours by arrangement. Open only with consent of instructor. May be repeated for credit with a change of topic.

298. Special Topics
Either semester. Credits and hours by arrangement. With a change in content, may be repeated for credit. Prerequisites, required preparation, and recommended preparation vary.

299. Independent Study
Either or both semesters. Credits and hours by arrangement. Open only with consent of instructor and department honors committee. May be repeated for credit with a change of topic.
Designed for the advanced undergraduate student who desires to pursue a special problem as an introduction to independent investigation.

Biology: Physiology and Neurobiology (PNB)
Head of Department: Professor Angel de Blas
Department Office: Room 104, Physiology and Neurobiology Building (Horsebarn Hill #4 Annex)
For major requirements, see the College of Liberal Arts and Sciences section of this Catalog.

225. Biological Rhythms
Second semester, alternate years. Three credits. Prerequisite: PNB 250 or PNB 274-275 or MCB 259 or consent of instructor. Goldman
Neuroendocrine and environmental factors in the control of biological rhythmicity, especially circadian and annual rhythms. Emphasis on animals.

230. Hormones and Behavior
First semester, alternate years. Three credits. Prerequisite: PNB 250 or PNB 262 or PNB 274 - 275 or consent of instructor. Goldman
Hormones and regulation of behaviors: reproductive, parental, social, and aggressive behaviors, as well as migration, hibernation, learning and memory.

235. Fish Physiology and Endocrinology
Second semester. Three credits. Prerequisite: EEB 200 (may be taken concurrently). Chapple, Chen, Crivello, Laugee, Renfro, Tsai
Mechanisms and regulation of basic physiological processes in fish. Mainly teleost fishes of commercial value; also invertebrate physiological processes important to aquaculture.

250. Animal Physiology
First semester. Three credits. Prerequisite: BIOL 107 and either 108 or 110. Open to sophomores. Crivello, Renfro
Physiological mechanisms and regulation in vertebrate animals.

250W. Animal Physiology

251. Biology of the Brain
Second semester. Three credits. Two class periods. Prerequisites: PNB 250 or PNB 274-275 or consent of instructor. LoTurco
Brain functions, from molecular and cellular to overall central nervous system organization. Topics of current scientific interest.

260. Microtechnique
First semester. Four credits. One class period and two 3-hour laboratory periods. Offered in alternate years. Open only with consent of instructor.
Preparation of cells and tissues for microscopic examination, using histological stains, immunohistochemistry, and photomicroscopy.

262. Mammalian Endocrinology
Second semester. Two credits. Two class periods. Prerequisite: PNB 250 or PNB 274-275 or consent of instructor. Gallo
Functions of hormones in mammalian physiology emphasizing humans.

263W. Investigations in Neurobiology
First semester. Three credits. One 1-hour discussion, one 4-hour laboratory period. Prerequisite: PNB 250 or PNB 274-275, Mioseff
Experimental investigations in neurobiology. Emphasis on designing and carrying out independent research projects, and on communicating the results.
Business Law (BLAW)

Courses are open to juniors and seniors only.

271. Business Law
Either semester. Three credits.
A study of the interaction between the business community and the legal environment through a systematic analysis, including cases, of the procedural and substantive rules of law with special emphasis placed on the jurisprudence governing contracts, torts, and property. Business ethics are also considered.

272. Business Law
Alternate semesters. Three credits. Prerequisite: BLAW 271.
The course acquaints the student with the fundamental legal principles surrounding the law of sales and negotiable instruments.

273. Business Law
Alternate semesters. Three credits. Prerequisite: BLAW 271 or 275.
This course covers the basic legal principles of agencies, partnerships, and corporations. Partnerships and corporations are examined from both legal and functional view points.

274. Real Estate Law
Alternate semesters. Three credits. Prerequisite: BLAW 271 or 275.
This course is designed to examine the legal aspects of land sale transactions. A study is made of typical documentation used in such transactions; the role of the real estate broker; the rights, liabilities and remedies of the buyer and seller arising out of their contract; sources and alternative forms of financing; basic tax devices; and development alternatives.

275. Business, Law and Society
Either semester. Three credits.
The meaning of law and the structure of the American legal system are studied with a view toward the impact of law upon the operation of American business. Philosophies of American business enterprise, as well as business ethics and morality, are examined and compared with the demands the law makes upon conduct of business people. Business and governmental relationships are explored, with special attention focused on governmental regulation of business by statutory and decision law.

277. Business Transactions and the Law
Either semester. Three credits. Prerequisite: BLAW 275. Not open to students who have passed BLAW 271.
This course provides an overview of how key business transactions and the law are related. Specific topics include contracts, sales, and negotiable instruments. Also covered are aspects of agency, partnerships, corporations, limited partnership, limited liability companies, secured transactions, and bankruptcy. This course is primarily designed for accounting majors.

280. International Business Law
Alternate semesters. Three credits. Prerequisite: BLAW 271 or BLAW 275.
This course is designed to acquaint the student with international business law and with the legal aspects of international business transactions. In examining the legal considerations involved in doing business internationally, this course explores the law surrounding international dispute resolution, the international sale of goods, the European Community. The General Agreement on Tariffs and Trade, the regulation of imports and exports, and a variety of other topics relevant to the legal relationship between business and the international community.

289. Field Study Internship
Either or both semesters. One to six credits. Hours by arrangement. Prerequisite: Completion of Lower Division School of Business Administration Requirements and consent of instructor and Department Head.
Designed to provide students with an opportunity for supervised field work relevant to one or more areas in business law. Students will work under the supervision of one or more professionals in the specialty in question. Student performance will be evaluated on the basis of an appraisal by the field supervisor and a detailed written report submitted by the student.

293. Foreign Study
Either or both semesters. Credits and hours by arrangement, up to a maximum of six credits. Consent of Department Head required prior to student’s departure.
Special topics taken in a foreign study program.

298. Special Topics
Either semester. Credits and hours by arrangement. Prerequisite: Announced separately for each offering. With a change in content, may be repeated for credit.
Classroom course in special topics in law as announced in advance for each semester.

299. Independent Study
Either or both semesters. Credits by arrangement, not to exceed six in any semester. Open only with consent of instructor.
Individual study of special topics in law as mutually arranged between student and instructor.

Chemical Engineering (CHEG)

Head of Department: Professor Joseph J. Helble
Department Office: Room 204, Engineering II

For major requirements, see the School of Engineering section of this Catalog.

Students who do not have the suggested preparation for a course in the Chemical Engineering department are strongly advised to discuss their preparation with the instructor or the department Head before registering for the course.

203. Introduction to Chemical Engineering
First semester. Three credits. Recommended preparation: CHEM 128, MATH 114 or MATH 116, ENGR 150 or CSE 110 or CSE 123C. Open to sophomores.
Application of the principles of chemistry and physics to chemical processes; units, dimensions, and process variables; material balances; equations of state (ideal and real); single component equilibria; energy balances; non reactive and reactive processes; combined mass and energy balances.

211-212. Chemical Engineering Thermodynamics
Both semesters. Three credits each semester. Three class periods and one discussion period. Recommended preparation: MATH 210 and 211, CHEM 128, and CHEG 203 (or consent of Chemical Engineering Department Head). CHEG 211 and ME 235 may not both be taken for credit. CHEG 211 is open to sophomores.

† Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).
Consent of instructor and department head. 

First semester: first and second law of thermodynamics; thermal and PVT properties of matter; exact differentials and thermodynamic identities; design and analysis of power cycles; analysis of refrigeration and liquefaction processes.

Second semester: properties of ideal and non-ideal mixtures; ideal and non-ideal phase equilibria; design of equilibrium flash separators; phase equilibria using equations of state; chemical equilibria; optimum condition for feasible reaction equilibria.

223-224. Transfer Operations
Both semesters. Three credits each semester. Three class periods and one discussion period. Prerequisite: MATH 210 and 211, CHEM 128, and CHEG 203 (or consent of Chemical Engineering Department Head).

First semester: overall mass, energy, and momentum balances; fluid flow phenomena; theoretical and empirical relationships for design of incompressible fluid-flow systems; conductive heat transfer; heat transfer coefficients and design of heat exchange systems.

Second semester: radiation heat transfer, design of heat exchange equipment; evaporation; design of mass transfer processes including distillation and extraction; analysis and design of diffusional processes such as gas absorption and humidification.

225. Advanced Transfer Operations

An advanced study of transport phenomena, rate processes, and problems of a more complex nature.

237W. Chemical Engineering Laboratory
First semester. Three credits. Two 1-hour discussion periods. Two 3-hour laboratories. Recommended preparation: CHEG 212 and 224.

Open-ended laboratory investigations in chemical engineering focusing on fluid mechanics, heat transfer, thermodynamics, and combined heat and mass transfer; emphasis on student teamwork and on design of experiments to meet objectives; technical report writing; oral presentations.

239W. Chemical Engineering Laboratory
(Formerly offered as CHEG 238.) Second semester. Three credits. Two 1-hour discussion periods. Two 3-hour laboratories. Recommended preparation: CHEG 237, 251 and 247 which may be taken concurrently.

Open-ended laboratory investigations in chemical engineering focusing on reaction kinetics, reactor design, process control, and mass transfer; emphasis on student teamwork and on design of experiments to meet objectives; technical report writing; oral presentations.

241. Process Design and Economics
(Formerly offered as CHEG 240.) First semester. Three credits. Recommended preparation: CHEG 212 and 224.

Chemical engineering process synthesis and design; comparison of alternative processing steps; instrumentation; cost estimation; economic analysis; process optimization; emphasis on conceptual design in application of chemical engineering principles.

242. Process Design

Design of process equipment; computer-aided design of equipment and flow sheets; design and analysis of complete process plants.

243. Process Design and Economics
Second semester. Four credits. Recommended preparation: CHEG 212, CHEG 224, and CHEG 251. Not open for credit to students who have passed CHEG 242.

Chemical engineering process synthesis and design; comparison of alternative processing steps; instrumentation; cost estimation; economic analysis; process optimization; emphasis on conceptual design in application of chemical engineering principles; design of process equipment, computer-aided design of equipment and flow sheets; design and analysis of complete process plants.

245. Chemical Engineering Analysis
First semester. Three credits. Recommended preparation: CHEG 203 and MATH 210 and 211.

Mathematical and numerical methods for solving engineering problems; description and computer modeling of physical and chemical processes with ordinary and partial differential equations; treatment and interpretation of engineering data.

247. Introduction to Process Dynamics and Control
First semester. Three credits. Recommended preparation: CHEG 212 and 224 and MATH 210 and 211.

Chemical process modeling, dynamics, and analysis; measurement and control of process variables; design, and computer simulation of simple processes and control systems.

251. Process Kinetics

Theory of chemical reaction rate; homogeneous, heterogeneous and catalytic systems. Analysis and design of batch and flow reaction systems; analysis of rate data; temperature and catalytic effects in reactor design; mass transport effects; non-ideal reactor design.

252. Chemical Processes
Either semester. Three credits. Recommended preparation: CHEG 211 and 223 and CHEM 244.

Engineering analysis of the principal industrial chemical processes; natural salts, sulfuric acid, chlorine, and soda ash production; petroleum, natural gas, coal, etc.; products from ethylene and propylene; butadiene, acetylene, chlorination, Oxo process, and oxidation processes; polymers and elastomers.

256. Polymeric Materials
Either semester. Three credits. Recommended preparation: CHEM 244. Not open for credit to students who have passed CHEM 280.

Structure, properties, and chemistry of high polymers; solution and phase behavior; physical states, viscoelasticity and flow; production and polymer processing; design of polymers for specific applications.

261. Introduction to Nuclear Engineering
First semester. Three credits. Recommended preparation: CHEG 211 and 223.

Nuclear physics, reactor kinetics, and the nuclear fuel cycle; classification and analysis of nuclear power reactors; environmental effects of nuclear power; analysis of severe nuclear accidents.

270. Energy Process Technology
Second semester. Three credits. Recommended preparation: CHEG 211 or ME 233 or 238.

Present and potential sources of energy; production and processing of fossil fuels; characteristics of energy utilization systems; design and analysis of power generation systems; design of building heating and cooling systems; solar energy technology.

271. Chemical Processing of Fossil Fuels
Semester by arrangement. Three credits. Three class periods. Recommended preparation: CHEG 211 and 223.

Chemical principles, unit operations, and chemical reactions underlying the manufacture of fuels and chemicals from petroleum, coal, shale oil, and tar sands.

280. Introduction to Environmental Rate Processes
(Also offered as ENVE 280.) First semester. Three credits. Recommended preparation: CHEM 128.

Application of thermodynamics, chemical kinetics and transfer operations to environmental problems; water pollution control. Open only to students not majoring in chemical engineering.

281. Introduction to Water Pollution
(Also offered as ENVE 281.) Second semester. Three credits. Recommended preparation: CHEG 224.

Water purification and water quality control; aeration and mass transfer, biological mechanisms and kinetics; design of biological reactors and sludge treatment facilities; design and operation of physical purification methods; alternative processes for industrial wastewater treatment.

283. Introduction to Biochemical Engineering
(Also offered as ENVE 283.) Second semester. Three credits. Recommended preparation: CHEG 224 and 251.

Enzyme and fermentation technology: microbiology, biochemistry, and cellular concepts; biomass production; equipment design, operation, and specification; design of biological reactors; separation processes for bio-products.

285. Introduction to Air Pollution
(Also offered as ENVE 285.) Second semester. Three credits. Recommended preparation: CHEG 211 or ME 233 or 238.

Gaseous pollutants and their properties; basic analytical techniques for air pollutants; particulate pollutants and their properties; equipment design for removal of gaseous and particulate materials; economic and environmental impact of air pollutants; federal and state regulations.

295. Special Topics in Chemical Engineering
Semester, credits and hours by arrangement or as announced. Prerequisite and/or consent: Announced separately for each course. This course, with a change in topic, may be repeated for credit.

A classroom course on special topics as announced.

299. Introduction to Research
Either semester. Credits and hours by arrangement or as announced. Prerequisite: Consent of instructor. This course may be repeated for credit.

Methods of conducting research; design of laboratory investigations and experiments; correlation and interpretation of experimental results; writing of formal, technical reports; oral presentations; independent student effort, initiative and resourcefulness are required.
Chemistry (CHEM)

Head of Department: Professor Gary Epling
Department Office: Room 151, Charles E. Waring Chemistry Building

For major requirements, see the College of Liberal Arts and Sciences section of this Catalog.

122. Chemical Principles and Applications  
Second semester. Four credits. Three class periods and one 1-hour discussion and one 2-hour laboratory per week. Not open for credit to students who have passed CHEM 127 or 129 or 137 or 153.

Brief but comprehensive survey of important chemical theories and applications of chemistry. Preparation for one-semester courses in organic chemistry and biochemistry. Atomic structures, chemical bonding, chemical reactions, stoichiometry, states of matter, and theories of solutions. Does not fulfill the two-semester general chemistry requirement for majors in biology, chemistry, pharmacy, physics and agriculture and natural resources. Does not satisfy the admission requirements of medical and dental schools. With high grade, may serve as a prerequisite for CHEM 128 or 138 or 154.

127Q-128Q. General Chemistry  
Either semester. Four credits. Three class periods and one 3-hour laboratory period. (Students who have passed CHEM 113 or 115 may take CHEM 128.) Students who have passed CHEM 122 will receive only 2 credits for CHEM 127 but 4 credits will be used for calculating QPR scores. A student who has a very high standing in CHEM 122 may be permitted, with the consent of the instructor, to take CHEM 128 without 127. CHEM 127 is not open for credit to students who have passed CHEM 129 or 137 or 153; and CHEM 128 is not open to students who have passed CHEM 130 or 138 or 154.

This course is designed to provide a foundation for more advanced courses in chemistry. The topics covered include the atomic theory, the laws and theories concerning the physical and chemical behavior of gases, liquids, solids, and solutions. The properties of some of the more familiar elements and their compounds are discussed. The laboratory work in the first semester involves quantitative measurements illustrating the laws of chemical combination. In the second semester particular attention is given to equilibrium in solutions and to the qualitative reactions of the common cations and anions.

129Q-130Q. General Chemistry  
(Honors Course.) Both semesters. Four credits each semester. Three class periods and one 3-hour laboratory period. Prerequisite: High standing in high school chemistry and physics, MATH 112, which may be taken concurrently, and consent of instructor. Designed for exceptionally well prepared students not intending to be chemistry majors. This course can be used as an alternate wherever CHEM 127-128 is listed as a prerequisite. CHEM 130 is not open for credit to students who have passed CHEM 128 or 138 or 154.

Atomic-molecular theory and the properties of gases, liquids, solids, and solutions are presented as a background for the descriptive chemistry of the elements and their compounds. Emphasis is given to the structure of atoms, molecules, and crystals and to the nature of the chemical bond. The laboratory work is primarily quantitative in nature. Considerable personal initiative will be demanded of students in carrying out the laboratory assignments.

137Q. General Chemistry  
(Formerly offered as Chemistry 153Q.) First semester. Four credits. Three class periods and one 3-hour laboratory period. Prerequisite: One year of high school chemistry, MATH 112 or 115, which may be taken concurrently, and a high pass on the Q Readiness Test. Primarily for majors in chemistry and related disciplines. Substitutes for CHEM 127 as a prerequisite. Not open for credit to students who have passed CHEM 127 or 129 or 153.

Atoms, molecules, ions, chemical bonding. Gases, liquids, solids, modern materials, metals and metallurgy, nonmetals, environmental chemistry.

138Q. General Chemistry  
(Formerly offered as Chemistry 154Q.) Second semester. Four credits. Three class periods and one 3-hour laboratory period. Prerequisite: CHEM 137 or CHEM 153 or CHEM 127 with consent of instructor, MATH 113 or 116, which may be taken concurrently. Primarily for majors in chemistry and related disciplines. This course may be used as an alternate wherever CHEM 127-128 is listed as a prerequisite. Not open for credit to students who have passed CHEM 128 or 130 or 154.

Solutions, electrolytes, equilibrium, thermodynamics, nuclear chemistry, electrochemistry, kinetics, organic chemistry and biochemistry.

141. Organic Chemistry  
First semester. Three credits. Required preparation: CHEM 127 or 129 or 137 or 153. Not open for credit to students who have passed CHEM 243.

An abridged course in organic chemistry designed to provide a background for related fields in which a general rather than a detailed knowledge of the compounds of carbon is required.

142. Organic Chemistry Laboratory  
First semester. One credit. One 4-hour laboratory period including discussion. Required preparation: CHEM 141, which may be taken concurrently. Not open to students who have passed CHEM 243.

155. Introduction to Chemical Research  
Either semester. Credits, not to exceed 3 and hours by arrangement; three laboratory hours for each credit. Required preparation: CHEM 127 or 129 or 137 or 151 or 153 and consent of instructor. Internship in research laboratories.

195. The Science of Chemistry  
Second semester. One credit. One 1-hour class period. Readings, lectures, films and field trips exploring the field of chemistry and its scientific and social implications.

210. Descriptive Inorganic Chemistry  
First semester. Two credits. Two class periods. Required preparation: CHEM 128 or 130 or 138 or 154. Not open for credit to students who have passed CHEM 151.

Introduction to bonding, structure, spectroscopy, physical properties, and reactivity of inorganic compounds.

214. Intermediate Inorganic Chemistry  

215. Inorganic Chemistry Laboratory  
Second semester. Three credits. One class period and two 3-hour laboratory periods. Prerequisite: CHEM 214, which may be taken concurrently.

The preparation, isolation, purification, and characterization of inorganic compounds; special techniques and instrumentation may be required.

216. Selected Topics in Inorganic Chemistry  
Second semester. Three credits. Prerequisite: CHEM 214.

A systematic study in special topics format of the theory, bonding, and structure of the transition metals and their compounds. The correlation of structure and electronic states with physical properties will be developed.

232Q. Quantitative Analytical Chemistry  
Second semester. Four credits. Two class periods and two 3-hour laboratory periods. Required preparation: CHEM 128 or 130 or 138 or 154. (Two credits for students who have passed CHEM 152 or 230.) Recommended preparation: CHEM 263. Open to sophomores.

Fundamentals of analytical Chemistry. While it is a course for chemistry majors, it is also suitable for students in other technical fields who have an interest in learning quantitative analytical chemistry procedures applicable to analytical instrumentation. Traditional wet chemical techniques and instrumental methods. Quantitative chemistry and chemical computations.

234Q. Instrumental Analysis I  
First semester. Four credits. Two class periods and two 3-hour laboratory periods. Prerequisite: CHEM 232 (or CHEM 152 or 230). Recommended preparation: CHEM 264.

Instrumental analytical techniques including molecular spectroscopy, atomic spectroscopy, electrochemistry, separations, and introductory electronics. This course is an extension of the instrumental portion of CHEM 232.

235. Instrumental Analysis II  
Second semester. Four credits. Three class periods and one 3-hour laboratory period. Prerequisite: CHEM 234. Analytical aspects of electron, X-ray, vibrational, and other spectroscopic methods. Analysis of surfaces. Advanced topics in data analysis and modern analytical methodology.

240. Organic Chemistry Laboratory  
First semester. One credit. One 4-hour laboratory period. CHEM 240 is not open for credit to students who have passed CHEM 245. Required preparation: CHEM 243 which may be taken concurrently. This course is open only to Chemical Engineering majors or by consent of instructor. Open to sophomores.

Introduction to techniques, manipulations, calculations and spectroscopy.

242W. Advanced Organic Chemistry Laboratory  
Either semester. Three credits. One class period and two 3-hour laboratory periods. Prerequisite: CHEM 245. Advanced techniques and fundamentals of organic synthesis and identification.

243. Organic Chemistry  
Either semester. Three credits. (Two credits for students who have passed CHEM 141.) Required preparation: CHEM 128 or 130 or 138 or 154. Open to sophomores.

Structure and reactions of the simpler classes of the compounds of carbon.

244. Organic Chemistry  
Either semester. Three credits. Prerequisite: CHEM 243. Open to sophomores.

A continuation of CHEM 243.

245. Organic Chemistry Laboratory  
Either semester. Three credits. (Students who have passed CHEM 240 will receive only 2 credits for CHEM 245. Students who have passed CHEM 142 will receive only 2 credits for CHEM 245, but 3 credits will be used for calculating QPR scores.) Two 3-hour laboratory periods and one 1-hour discussion pe-
297V. Thesis for Undergraduate Chemistry Majors

Either semester. Three credits. Hours by arrangement. Prerequisite: A minimum of three credits in CHEM 296 or 299. Open only with consent of instructor.

A formal thesis is required, based on original investigation carried on by the student.

298. Special Topics

Either semester. Credits and hours by arrangement. With a change in content, may be repeated for credit. Prerequisites, required preparation, and recommended preparation vary.

299. Independent Study

Either or both semesters. Credits, not to exceed 3 per semester, and hours by arrangement. Open only with consent of instructor. With a change of subject, this course may be repeated for credit.

Civil & Environmental Engineering (CE)

Head of Department: Professor Erling Murtha-Smith
Department Office: Room 302, F.L. Castleman Building

For major requirements, see the School of Engineering section of this Catalog. Courses in Applied Mechanics are listed under that heading, immediately following the Civil Engineering courses. Also see courses listed under Engineering.

222. Civil Engineering Materials

Second semester. Three credits. Two lectures. One 3-hour Laboratory. Prerequisite: CE 287 which may be taken concurrently. Accorsi, Frantz, Martha-Smith

Engineering properties of steel, Portland cement concrete, bituminous concrete cement, and timber; laboratory measurement of properties; interpretation of results. Written reports.

222P. Civil Engineering Materials

Must be taken with another P course in Civil Engineering to equal one W course.

230. Mechanics of Materials and Structures Laboratory

Two credits. One hour lecture and one 2-hour Laboratory. Prerequisite: CE 234 and CE 236, which may be taken concurrently. Accorsi, Davis

Laboratory experiments to complement, reinforce and develop concepts learned in Mechanics of Materials, Basic Structural Analysis and Basic Structural Design. Topics include tension, torsion, flexure and buckling. Written reports.

238. Reinforced Concrete Structures Design

First semester. Three credits. Prerequisite: CE 234 and 236. DeWolf, Epstein, Frantz

Design for flexure, shear, torsion, and axial loads; two-way slabs; serviceability considerations. Applications to buildings.

239. Steel Structures Design

Second semester. Three credits. Prerequisite: CE 234 and 236. DeWolf, Frantz

Beam columns, composite members, plate girders, connections; introduction to plastic design. Applications to buildings. Written reports.

240. Soil Mechanics and Foundations

First semester. Four credits. Three class periods and one 3-hour laboratory period. Prerequisite: CE 287 and CE 297, both of which may be taken concurrently. Demars

Fundamentals of soil behavior and its use as a construction material. Effective stress principle, seepage and flow nets, consolidation, shear strength, limit equilibrium analysis. Written reports.

240P. Soil Mechanics and Foundations

Must be taken with another P course in Civil Engineering to equal one W course.

241. Foundation Design

First semester. Three credits. Prerequisite: CE 240. Demars

Application of soil properties to design of foundations, retaining structures, excavation drainage, shallow footings, deep foundations, specifications, subsurface exploration.

242. Soils Engineering

Second semester. Three credits. Prerequisite: CE 240.

Earth structures, slope stability, consolidation and settlement of soil, vertical drains, surcharging, pressures on buried pipes, and tunnels, numerical solutions.

242P. Soils Engineering

Must be taken with another P course in Civil Engineering to equal one W course.

251. Civil Engineering Systems

(Also offered as ENVE 251.) First semester. Three credits. Open to seniors. Anagnostou, Garrick

Application of statistical principles to the analysis of problems. Topics covered include normal, poisson, and binomial distributions, chi square, comparison of means and variances, least square and regression analysis.

254. Transportation Facilities Design

Second semester. Three credits. Recommended preparation: CE 271 or consent of instructor. Open to sophomores. Davis, Ferguson, Garrick

Design and horizontal and vertical curves, earthwork, runoff and simple drainage structures. Elements of traffic engineering and site development.

256. Advanced Civil Engineering Systems

Second semester. Three credits. Prerequisite: CE 251, or consent of instructor. Davis

Optimization, decision and risk analysis, and simulation in design of civil engineering systems. Network analysis and project scheduling.