Human Development and Family Studies (HDFS)

Dean: Charles M. Super
Program Office: Room 106, Family Studies Building (Design and Resource Management Center)

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

183. Courtship, Marriage, and Sexuality
(Formerly offered as HDFR 183.) Either semester. Three credits.

- Development of patterns of interaction in premarital and marital relationships.

190. Individual and Family Development
(Formerly offered as HDFR 190.) Either semester. Three credits.

- Human development throughout the life span, with emphasis upon the family as a primary context.

201. Diversity Issues in Human Development and Family Studies
(Formerly offered as HDFR 201.) Either semester. Three credits. Recommended preparation: HDFS 190.

- Critical issues in diversity and multiculturalism in human development, family relations, and professional practice.

202. Human Development: Infancy Through Adolescence
(Formerly offered as HDFR 202.) Either semester. Three credits. Open to sophomores.

- Individual development and behavior from prenatal period through adolescence; impact of peers, school, other social agencies, and especially the family.

204. Human Development: Adulthood and Aging
(Formerly offered as HDFR 204.) Either semester. Three credits. Open to sophomores.

- Individual development and behavior from young adulthood through later life with special attention given to family and social influences. Physical, cognitive, social and personality changes, role transitions, and interpersonal and intergenerational relationships.

205. Understanding Research Methods in Human Development and Family Studies
Either semester. Three credits. Prerequisite: STAT 100W or 110W. Recommended preparation: HDFS 190.

- Open only to HDFS majors. Not open for credit to students who have completed HDFR 290 or HDFS 290. Open to sophomores.

- Overview of research methods used in human development and family studies, with emphasis on (1) the social context in which research occurs and is used, and (2) strengths and limitations of social science research methods. Includes topics such as hypothesis formation, measurement of social variables, research ethics, data collection techniques, and interpreting results.

218. Observational Child Study
(Formerly offered as HDFR 218.) Either semester. Three credits. Two class periods and laboratory by arrangement.

- Assessment of developmental skills of young children using a variety of observational methods and procedures. Laboratory experience includes participation in the University of Connecticut’s Child Development Laboratories.

220. Introduction to Programs for Young Children
(Formerly offered as HDFR 220.) Either semester. Three credits. Open only with consent of instructor. Must be taken concurrently with HDFS 221 or 224.

- Components of programs designed for infants and young children. Guided observations are integrated with lecture material. Designed for students who intend to work with infants and young children.

220W. Introduction to Programs for Young Children
(Formerly offered as HDFR 220W.)

221. Programs for Young Children: Introductory Laboratory
(Formerly offered as HDFR 221.) Either semester. One credit. One 2-hour laboratory by arrangement. Open only to students concurrently enrolled in HDFS 220 or 220W, and open only with consent of instructor.

- Guided observation and participation in a program for young children.

222. Integrated Curriculum in Early Childhood Education I
(Formerly offered as HDFR 222.) First semester. Three credits. Two class periods and one 2-hour laboratory period.

- Integration of child development theory with best teaching practices for specific age appropriate learning domains from infancy through kindergarten in language, communication, literacy, arts, sensory motor and physical development.

223. Integrated Curriculum in Early Childhood Education II
(Formerly offered as HDFR 223.) Second semester. Three credits. Two class periods and one 2-hour laboratory period.

- Integration of child development theory with best teaching practices for specific age appropriate learning domains from infancy through kindergarten in cognitive development, mathematical and scientific thinking, social studies, and personal/social development.

224. Child Development Laboratory: Practicum I
(Formerly offered as HDFR 224.) Either semester. Three credits. Open only with the consent of instructor. Concurrent enrollment in HDFS 220 highly recommended. Recommended preparation in HDFR 202. Weekly seminar. Practicum by arrangement.

- Supervised participation in an early childhood education center which has programs for infants, toddlers, preschoolers, and kindergarteners.

225. Analysis of Programs for Young Children
(Formerly offered as HDFR 225.) Either semester. Three credits.

- Analytic study of programs designed for young children, history of such programs, underlying theories, specific models; cultural and subcultural issues, parent involvement, and evaluation procedures.

227. Child Development Laboratory: Supervised Teaching Practicum
(Formerly offered as HDFR 227.) Either semester. Nine credits. Two class periods and laboratory by arrangement. Prerequisites: HDFS 202, 220, 222, 223, 224, GPA of 2.5 in HDFS courses, and consent of instructor.

- Supervised teaching experience in an early childhood education center which has programs for infants, toddlers, preschoolers, and kindergarteners.

228. Child Development Laboratory: Advanced Teaching Practicum
(Formerly offered as HDFR 228.) Either semester. Six credits. Two class periods and laboratory by arrangement. Prerequisite: HDFS 227, GPA of 2.5 in HDFS courses, and consent of instructor.

- Continuation of HDFS 227. Experience in early childhood program implementation, administration, staff supervising, policy making, and curriculum planning.

230. Current Topics in Early Childhood Education
(Formerly offered as HDFR 230.) Semester and hours by arrangement. Variable credits. Open only with consent of instructor. With a change in content this course may be repeated for credit.

- In-depth investigation of a current issue in early childhood education (e.g. emergent literacy, diversity), with focus on recent research and application to classroom practice. Includes classroom instruction and laboratory observation.

231. Infancy
(Formerly offered as HDFR 231.) Either semester. Three credits. Prerequisite: HDFS 202 or PSYC 236.

- Human development from birth through the second year of life within the family setting.

234. Social and Personality Development During Childhood
(Formerly offered as HDFR 234.) Either semester. Three credits. Prerequisite: HDFS 202 or PSYC 236.

- Social and personality development during infancy and childhood; influence of family members, peers, and social institutions on development; aggression, prosocial behaviors, autonomy, self-concept, sex-role development, and moral development.

234W. Social and Personality Development During Childhood
(Formerly offered as HDFR 234W.)

240. The Family-School Partnership
(Formerly offered as HDFR 240.) First semester. Three credits.

- The role of families in the education process. The effective family-school-community partnership in educating children: Communications and the implications of culture, socio-economics, family form, family dynamics, family supports, and public policy.

245. Parent-Child Relations in Cross-Cultural Perspective
(Also offered as ANTH 245.) (Formerly offered as HDFR 245.) Offered every third semester. Three credits.

- Theory and research on major dimensions of parenting in the U.S.A. and cross-culturally: parental warmth, control and punishment.

248. Aging in American Society
(Also offered as SOCI 248.) (Formerly offered as HDFR 248.) Either semester. Three credits.

- Social gerontology: the role and status of older people in a changing society.

248W. Aging in American Society
(Also offered as SOCI 248W.) (Formerly offered as HDFR 248W.)

250. Gender and Aging
(Formerly offered as HDFR 250.) Either semester. Three credits.

- Aging process as it impacts on men and women; historical and cross-cultural perspectives, changing family roles, including grandparenthood and widowhood, and implications of changing gender roles for self-actualization of older persons.
250W. Gender and Aging
(Formerly offered as HDFR 250W.)

252. Death, Dying, and Bereavement
(Formerly offered as HDFR 252.) Either semester. Three credits.
Cultural context of death, personal meaning of death at different stages in life cycle, and the effect of death upon survivors.

252W. Death, Dying, and Bereavement
(Formerly offered as HDFR 252W.)

259. Men and Masculinity: A Social Psychological Perspective
(Formerly offered as HDFR 259.) Either semester. Three credits.
Men’s gender role socialization over the life span; men’s developmental issues, gender role, conflicts, and interpersonal dynamics with women. Theory, research, and personal exploration are integrated.

260. Woman: A Developmental Perspective
(Formerly offered as HDFR 260.) Either semester. Three credits.
Development of women and women’s roles from birth to maturity; physiological, psychological, sociological, and interpersonal systems which contribute to development of women across the life span; cross-cultural and alternative models for role development.

264. Legal Aspects of Family Life
(Formerly offered as HDFR 264.) First semester. Three credits.
Law in family life.

266. Introduction to Counseling
(Formerly offered as HDFR 266.) Either semester. Three credits.
Principles of professional counseling including therapeutic processes, roles, and skills. How counselors help people solve problems is explored. Student’s psychological growth and development is facilitated through psychological education.

267. Latino Health
First semester. Three credits.
Overview of health and health care issues among Latinos in the United States. Particular attention is paid to cultural and social factors associated with health and well-being (e.g., migration, acculturation, SES).

268. Latinos: Sexuality and Gender
Either semester. Three credits.
Critical discussion of issues involving gender and sexuality among Latinos, with particular attention to race, class, ethnicity, and acculturation.

269. Family Violence
(Formerly offered as HDFR 269.) Either semester. Three credits.
Theory, research, prevention, and treatment concerning the multiple forms of violence within contemporary families. The impact of violence on families and family members over the entire life span is considered. Includes child abuse and neglect, courtship violence, spouse abuse, elder abuse, and rape.

270. Low Income Families
(Formerly offered as HDFR 270.) Either semester. Three credits.
Impact of poverty and related problems on development of the child in the context of the family. Family structure, childrearing patterns, early educational and community programs.

271. Black American Family Patterns
(Formerly offered as HDFR 271.) Either semester. Three credits.
Continuities and discontinuities between black American subcultural patterns and dominant cultural norms as reflected by black American families.

272. Family and Work
(Formerly offered as HDFR 272.) Either semester. Three credits.
Interaction of the world of work with family structure; social psychological dynamics that enhance or impede working families’ lives.

273. Family Interaction Processes
(Formerly offered as HDFR 273.) Either semester. Three credits.
Family interaction: communication processes, bonding behaviors, management of conflict and aggression, negotiation of family crisis.

274. Public Policy and the Family
(Formerly offered as HDFR 274.) Either semester. Three credits.
Analysis of government programs and policies impacting the family: child care, aging, family law, mental health, family violence, income maintenance, and family impact analysis.

275. Family Pathology
(Formerly offered as HDFR 275.) Either semester. Three credits.
Theory, research and intervention in families under stress.

276. Planning and Managing Human Service Programs
(Formerly offered as HDFR 276.) Either semester. Three credits.
Planning techniques: needs assessment, data collection and analysis, budgeting, and evaluation. Management skills: decision making, management theory and organizational behavior, personnel motivation, accountability, and financial management.

276W. Planning and Managing Human Service Programs
(Formerly offered as HDFR 276W.)

277. Issues in Human Sexuality
(Formerly offered as HDFR 277.) Either semester. Three credits.
Contemporary issues concerning human sexuality; impact upon individuals and family units.

278. Family in Society
(Formerly offered as HDFR 278.) Either semester. Three credits.
Sociocultural and historic variability of family and kinship systems. Race, class, gender and ethnicity as those advantage or disadvantage the opportunity structure for families and individuals. Effect of public policy on the quality of family life.

278W. Family in Society
(Formerly offered as HDFR 278W.)

279. History of the Family
(Also offered as HIST 209.) (Formerly offered as HDFR 279.) Second semester. Three credits. Not open for credit to students who have passed HIST 209.
Preindustrial and industrial family life in Western society since the Middle Ages; changes in demography, family size and structure, family economy, social expectations, sex roles, sexuality, and affective bonds.

280. Material Culture in American Family Life
(Formerly offered as HDFR 280.) Either semester. Three credits.
Material culture of the American family; interaction between family members and the artifacts in their near environment; role of personal possessions, household objects, housing and diet in daily family life and rituals over time.

281. Comparative Family Policy
(Formerly offered as HDFR 281.) Second semester. Three credits.
Comparative analysis of government programs and policies impacting families in the United States and other countries. Health and welfare policies, family planning, child care, teen pregnancy, and care of the aged.

283. Family Resource Management
Either semester. Three credits.
Decision-making process of families concerning the utilization of financial, personal, environmental and social resources.

284. Adolescence: Youth and Society
(Formerly offered as HDFR 284.) Either semester. Three credits. Prerequisites: HDFR 202 or PSYC 236.
Contemporary adolescence, the multiple forces and behavioral characteristics of this period of development.

Examines the methods through which empirical social science research can affect law and public policy affecting children and families.

287. Parenthood
(Formerly offered as HDFR 287.) Either semester. Three credits.
Parent behavior and the dynamics of parenthood; interpersonal, familial, and societal roles of parents and variables influencing these roles.

287W. Parenthood.
(Formerly offered as HDFR 287W.)

288. Supervised Field Experience
(Formerly offered as HDFR 288.) Either semester. Three or six credits. May be repeated up to a maximum of six credits. Prerequisites: GPA of 2.5 in HDFS courses; 15 credits of 200 level HDFS courses and consent of the Director of Undergraduate Studies. Students who do not meet all of these requirements may take the course with the consent of the fieldwork coordinator and of the seminar instructor. Weekly seminar required. Practicum by arrangement.
Supervised participation in settings where purposes and functions are related to the development and welfare of individuals and families.

289. Fieldwork in Community Settings
(Formerly offered as HDFR 289.) Either semester. Three credits. Prerequisites: HDFS 288; GPA of 2.5 in HDFS courses; 15 credits of 200 level HDFS courses and consent of the Director of Undergraduate Studies. Cannot be repeated for credit. Cannot be used towards meeting major requirements in HDFS nor towards meeting GPA requirements in HDFS. Weekly seminar required. Practicum by arrangement.
Supervised participation in settings where purposes and functions are related to the development and welfare of individuals and families.
290. Research Methods in Human Development and Family Studies  
(Formerly offered as HDFR 290.) Either semester. Three credits. Prerequisite: HDFS 190 and PSYC 132 and 133 or 135. Open only to Human Development and Family Studies majors. Not open for credit to students who have completed HDFS 205.

Research methods used in human development and family studies.

290W. Research Methods in Human Development and Family Studies  
(Formerly offered as HDFR 290W.)

292. Research Practicum in Human Development and Family Studies  
(Formerly offered as HDFR 292.) Either semester. Credits and hours by arrangement. Prerequisite: A GPA of 2.5 in HDFS courses and consent of instructor.

Supervised experience conducting research in human development and family studies.

294. Foreign Study  
(Formerly offered as HDFR 294.) Either or both semesters. Three credits. Prerequisites: HDFS 205, 12 credits of 200-level HDFR/HDFS courses, Open only to Human Development and Family Studies Majors.

Students will work as research team to conduct a research project through all of its phases, from formulating a research question to final presentation of findings.

298. Selected Topics in Human Development and Family Studies  
(Formerly offered as HDFR 298.) Either semester. Three credits. With a change in content this course may be repeated for credit.

Special topics taken in a foreign study program.

299. Senior Seminar in Research Methods  
Either or both semesters. Three credits. Prerequisites: HDFS 205, 12 credits of 200-level HDFR/HDFS courses. Open only to Human Development and Family Studies Majors.

Students will work as research team to conduct a research project through all of its phases, from formulating a research question to final presentation of findings.

299E. Independent Study for Undergraduates  
(Formerly offered as HDFR 299E.) Either or both semesters. Three credits. Prerequisites: HDFS 205, 12 credits of 200-level HDFR/HDFS courses. Open only to Human Development and Family Studies Majors.

Students working with a faculty supervisor, develop plans for an independent research project or review paper, execute the project, and complete a report.

185. Introduction to American Studies  
First semester. Three credits. Not open to students who have passed INTD 276.

A multi-disciplinary survey of American societies and cultures.

188. FYE University Learning Skills  
Either semester. One credit. One class period. Open to freshman and sophomore students only. This course must be taken in combination with a cluster of three courses; with the permission of the instructor, one of the cluster courses may have been completed previously. With a change in content, this course may be repeated for credit.

A component of the First Year Experience (FYE) program, this seminar course is intended to provide an opportunity to integrate the consideration of material from three courses through discussion, assignments, and projects. Students will have opportunities to enhance their academic and interpersonal skills.

191. FYE Learning Community Seminar  
Either semester. One credit. One class period. Open to freshman and sophomore students only. This course must be taken in combination with a cluster of three courses; with the permission of the instructor, one of the cluster courses may have been completed previously. With a change in content, this course may be repeated for credit.

A component of the First Year Experience (FYE) program, this seminar course is intended to provide an opportunity to integrate the consideration of material from three courses through discussion, assignments, and projects. Students will have opportunities to enhance their academic and interpersonal skills.

195. Interdisciplinary Special Topics Lecture Course  
Either semester. Credits and hours as determined by the Senate Curricula and Courses Committee. May be repeated for credit with a change in topic.

196. Interdisciplinary Special Topics Seminar  
Either semester. Credits and hours as determined by the Senate Curricula and Courses Committee. Open only with consent of instructor. May be repeated for credit with a change in topic. This course may or may not count for credit toward graduation. Students should consult the course syllabus and the Dean’s Office of their School or College.

197. Interdisciplinary Special Topics Independent Study  
Either semester. Credits and hours as determined by the Senate Curricula and Courses Committee. Open only to freshmen and sophomores with consent of instructor. May be repeated for credit with a change in topic.

198. Freshman Honors Seminar  
First semester. One credit. One class period. Open only with consent of Honors Director.

A seminar designed to provide fresh orientation and summer studies to students selected as Honors students. The seminar is intended to provide an introduction to some of the major questions and issues in the field.

198E. Freshman Honors Seminar  
First semester. One credit. One class period. Open only with consent of Honors Director.

A seminar designed to provide fresh orientation and summer studies to students selected as Honors students. The seminar is intended to provide an introduction to some of the major questions and issues in the field.

201. Urban Field Studies  
Either semester. Nine credits. Hours by arrangement. Open only with consent of the director of the Urban Semester Program. Must be taken concurrently with INTD 211 and 212. This course is also listed under Sociology. Sponsored by the Urban Semester Program. Director of the Urban Semester Program.

Field experience supervised by the director and an examining committee consisting of the director and two or more faculty members from two departments in the College of Liberal Arts and Sciences.

211. Seminar in Urban Problems  
Either semester. Three credits. Hours by arrangement. Open only with consent of the director of the Urban Semester Program. Must be taken concurrently with INTD 210 and 212. Sponsored by the Urban Semester Program. Director of the Urban Semester Program.

Discussions based upon assigned readings and led by invited speakers from within the University.

212. Urban Semester Field Work Seminar  
Either semester. Three credits. Hours by arrangement. Open only with consent of the Director of the Urban Semester Program. Must be taken concurrently with INTD 210 and 211. Sponsored by the Urban Semester Program. Director of the Urban Semester Program.

Students make analytic presentations of their field experiences, relating these to the pertinent available literature. Particular urban problems are discussed with invited experts from outside the University.

212W. Urban Semester Field Work Seminar  
Either semester. Three credits. Hours by arrangement. Open only with consent of the director of the Urban Semester Program. Must be taken concurrently with INTD 210 and 211. Sponsored by the Urban Semester Program. Director of the Urban Semester Program.

Students make analytic presentations of their field experiences, relating these to the pertinent available literature. Particular urban problems are discussed with invited experts from outside the University.

220. Studies in the Culture of the Middle Ages  
Second semester. Three credits. Open only with consent of the instructor of record. With a change in content this course may be repeated for credit. Sponsored by the committee for Medieval Studies.

This course supplements a three-credit course in a particular discipline by studying selected foreign language texts related to the topic of its companion course. Practice in oral and written expression.

224. Spanish Language and Culture for the Health Professions ("Spanglish")  
Either semester. One credit. Prerequisite: Spanish skills equivalent to four semesters of college course work in a single foreign language (may be completed concurrently). May be repeated for credit, with a change in content. Sponsored by the Language Program.

This course is intended to provide an introduction to the Spanish language and culture, and health issues of relevance to professionals working with Spanish-speaking populations.

230. Social Science Data Utilization  
Either semester. Three credits. Three class periods and one 1-hour laboratory. This course is also listed under Mathematical Statistics and Probability. This course may not be counted toward the major in Psychology or in Psychology. Sponsored by the Social Science Data Center and the Political Science Department. Davis.

Introduction to social science data analysis and utilization. Laboratory assignments will use the University Computer Center facility for the execution of statistical package setups, and data bases by the Social Science Data Center/Roper Center.

245. Human Rights Internship and Portfolio  
Either semester. Three credits. Prerequisite: Consent of Director of Human Rights Minor.

A multi-disciplinary survey of American societies and cultures.

A component of the First Year Experience (FYE) program, this seminar course is intended to provide an opportunity to integrate the consideration of material from three courses through discussion, assignments, and projects. Students will have opportunities to enhance their academic and interpersonal skills.

A component of the First Year Experience (FYE) program, this seminar course is intended to provide an opportunity to integrate the consideration of material from three courses through discussion, assignments, and projects. Students will have opportunities to enhance their academic and interpersonal skills.

A component of the First Year Experience (FYE) program, this seminar course is intended to provide an opportunity to integrate the consideration of material from three courses through discussion, assignments, and projects. Students will have opportunities to enhance their academic and interpersonal skills.

A component of the First Year Experience (FYE) program, this seminar course is intended to provide an opportunity to integrate the consideration of material from three courses through discussion, assignments, and projects. Students will have opportunities to enhance their academic and interpersonal skills.

A component of the First Year Experience (FYE) program, this seminar course is intended to provide an opportunity to integrate the consideration of material from three courses through discussion, assignments, and projects. Students will have opportunities to enhance their academic and interpersonal skills.
Internship with a human rights-related agency, organization, or group, and preparation of a portfolio synthesizing the internship experiences with Human Rights Minor course work.

249. Violence: Sources and Alternatives
First semester. Three credits. Blank, Prewitt, Reed
Sources of violence in the individual, the home, the nation, and among nations are examined. Alternatives to the use of violence at each of these levels are explored.

250. Global Militarism and Human Survival
Second semester. Three credits. Two class periods (one 2-hour and one 1-hour). Laster
A consideration of the threat posed to humanity’s survival by a growing global militarism and the unprecedented destructiveness of nuclear weapons.

265. Seminar in American Studies
Second semester. Three credits.
An in-depth study of an event, historical period, or cultural production from an interdisciplinary perspective.

280. Library Research Methods
Either semester. Two credits. Two class periods. Open only with consent of instructor. Offered at the Waterbury Campus.
Specific instruction in the use of a university library and in the use of the bibliographic tools and methods that are an essential part of library research.

291. Interdisciplinary Honors Seminar
Either semester. Three credits. Open only with consent of instructor.
An interdisciplinary seminar designed for honors students and open to other qualified students. Topics vary from semester to semester. May be repeated once for credit with change of topic. Sponsored by the Office of Honors Programs.

293. Foreign Study
Either or both semesters. Credits and hours by arrangement. May be repeated for credit (to a maximum of 17). Consent of appropriate area studies director or major advisor required before departure. May count toward the major with consent of advisor.
Course work undertaken within approved Study Abroad programs, usually focusing on the history, culture, and society of a particular country.

294. The Bible
First semester. Three credits, which may be counted toward the related field requirement in History, Philosophy, or English. Sponsored by and listed under the English, History, and Philosophy Departments.
The literary, historical, and philosophical content, circumstances and problems of the Old and New Testaments.

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

298. Special Topics
Either semester. Credits and hours by arrangement. Open only with consent of instructor. May be repeated for credit.

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

---

Italian Literary and Cultural Studies (ILCS)

Consult the Modern and Classical Languages Departmental listing in this Catalog for requirements for Majors in Italian Literary and Cultural Studies. Consult the Departmental Handbook for courses offered in the appropriate semesters and further description of these courses.

145-146. Elementary Italian I and II
(Formerly offered as ITAL 145-146.) Both semesters. Four credits each semester. Four class periods and one 1-hour laboratory practice. Not open for credit to students who have had three or more years of Italian in high school, except with Departmental consent.

147-148. Intermediate Italian I and II
(Formerly offered as ITAL 147-148.) Both semesters. Four credits each semester. Four class periods and one 1-hour laboratory practice. Prerequisite: ILCS 146 or equivalent.

175-178. Intensive Italian I - IV
First and second semesters. Eight credits per semester. Two hours a day, four days a week, plus a two-hour laboratory practice. Open only with consent of the instructor. Not open for credit to students who have passed ILCS 145 through ILCS 148.
Intensive coverage of two years of Italian in two semesters. Intensive Italian 175-176 (Fall) covers the same material as ILCS 145-146; Intensive Italian 177-178 (Spring) covers the same material as ILCS 147-148.

*** 193. Foreign Study

213. Year Abroad in Italy: Preparation
(Formerly offered as ITAL 213.) Second semester. Three credits. Open only to students selected for the Year Abroad in Florence Program.
A comprehensive review of Italian language and civilization.

237. Italy Today
(Formerly offered as ITAL 237.) First semester. Three credits. Prerequisite: ILCS 148.
A survey of contemporary Italian political, social, economic and cultural life.

238. Italian Civilization in the Renaissance
(Formerly offered as ITAL 238.) Either semester. Three credits. Prerequisite: ILCS 148 or equivalent.
A survey of social, cultural and artistic trends in Italy during the Renaissance.

239. Italian Composition and Conversation I
(Formerly offered as ITAL 239.) First semester. Three credits. Prerequisite: ILCS 148 or equivalent.
Practice in written and oral composition. Syntax study.

240. Italian Composition and Conversation II
(Formerly offered as ITAL 240.) Second semester. Three credits. Prerequisite: ILCS 239 or equivalent.
Further practice in written and oral composition. Treatment of the finer points in syntax.

*** 293. Foreign Study

*** 295. Variable Topics

*** 298. Special Topics

299. Independent Study
(Formerly offered as ITAL 299.) Either or both semesters. Credits and hours by arrangement. Open only with consent of instructor. With a change in content, may be repeated for credit.

Florence Program
The Florence Program is open to sophomores, juniors, and seniors. Courses include intensive Italian, Italian

243. Main Currents of Italian Literature Through the Renaissance
(Formerly offered as ITAL 243.) First semester. Three credits. Prerequisite: ILCS 148 or equivalent.
The history of Italian literature through the Renaissance is traced through its main developments. The aim of the course is to acquaint the student with the principal authors, literary schools and trends.

244. Main Currents of Italian Literature After the Renaissance
(Formerly offered as ITAL 244.) Second semester. Three credits. Prerequisite: ILCS 148 or equivalent.
The history of Italian literature after the Renaissance is traced through its main developments. The aim of the course is to acquaint the student with the principal authors, literary schools and trends.

250. Italian Theatre of the Eighteenth Century
(Formerly offered as ITAL 250.) Second semester. Three credits. Prerequisite: ILCS 237 or 239 or 243 or equivalent.
Readings from Metastasio, Goldoni, and Alfieri.

251-252. Machiavelli, Michelangelo and Renaissance Literature
(Formerly offered as ITAL 251-252.) Both semesters. Three credits each semester. Prerequisite: ILCS 237 or 239 or 243 or equivalent.
Selected readings from the works of Poliziano, Leonardo da Vinci, Lorenzo de’ Medici, Michelangelo, Ariosto, Machiavelli, Castiglione, Tasso, and others.

253. Dante and His Time
(Formerly offered as ITAL 253.) Either semester. Three credits. Prerequisite: ILCS 237 or 239 or 243 or equivalent.
Selected readings from Dante, Petrarch, Compagni, Villani.

254. Boccaccio and His Time
(Formerly offered as ITAL 254.) Either semester. Three credits. Prerequisite: ILCS 237 or 239 or 243 or equivalent.
Readings from Boccaccio and others with special attention to the problems of social and sexual ethics.

261. Twentieth-Century Italian Literature
(Formerly offered as ITAL 261.) Either semester. Three credits. Recommended preparation: ILCS 237 or 239 or 240 or consent of the instructor. Bouchard
Major trends in twentieth-century Italian literature from the early modern period to contemporary times.

262. Nineteenth-Century Italian Literature
(Formerly offered as ITAL 262.) Either semester. Three credits. Recommended preparation: ILCS 237 or 239 or 240 or consent of the instructor. Bouchard
Nineteenth-century Italian drama, poetry, and narrative from the Napoleonic period to the years immediately following the conquest of Rome in 1870.

*** 293. Foreign Study

*** 295. Variable Topics

*** 298. Special Topics

299. Independent Study
(Formerly offered as ITAL 299.) Either or both semesters. Credits and hours by arrangement. Open only with consent of instructor. With a change in content, may be repeated for credit.
literature, and, with the consent of the director of the Program, any course offered by the University of Florence: Offered at the Florence campus

**Italian Studies**

*(in English)*

101. **The Italian Renaissance**
(Formerly offered as ITAL 101.) First semester. Three credits. A knowledge of Italian is not required. Taught in English. A survey of Italian Renaissance civilization, with emphasis on literature and intellectual life.

149. **Cinema and Society in Contemporary Italy**
(Formerly offered as ITAL 149.) Second semester. Three credits. Three class periods and one 2-hour laboratory period. Lectures in English. Films in Italian with English subtitles. A critical analysis of contemporary Italian society seen through the media of film and literature.

158. **Italian American Experience in Literature and Film**
Either semester. Three credits. Three class periods and one 2-hour laboratory period. Focuses on the Italian American experience as represented in a variety of fields, including literature and cinema.

*** 193. Foreign Study

255W. **Dante’s Divine Comedy in English Translation**
Either semester. Three credits. This course may not be counted toward the Italian Literary and Cultural Studies major or minor group. *Masciandaro*

Dante’s poem as a unique synthesis of Medieval culture. Emphasizes its integration of ethics, political thought, and theology with poetic imagination.

256W. **The Literature of the Italian Renaissance**
(Formerly offered as ITAL 256W.) Second semester. Three credits. Not open to students who have passed ILCS 251-252. This course may not be counted in the Italian Literary and Cultural Studies major group.

A survey, in English, of the major literary and philosophical currents of the Italian Renaissance. Selections from Boccaccio, Petrarch, Pico della Mirandola, Machiavelli, Castiglione, and others.

258. **Cinematic Representations of Italian Americans**
Either semester. Three credits. Three class periods and one 2-hour laboratory period.

Cinematic representations of Italian Americans in the works of major directors from the silent era to the present. Construction of and attempts to dislodge negative stereotypes of Italian American male and female immigrants.

260W. **Italian Cinema**
(Formerly offered as ITAL 260W.) Either semester. Three credits. Two class periods and one 2-hour laboratory period. Lectures in English. Films in Italian with English subtitles. *Bouchard*

Italian cinema from the silent era to the present. Its genres, such as epic film, melodrama, comedy “Italian-style,” “Spaghetti-Westerns,” and political cinema. Cinema as a reflection on and comment upon the social and political contexts of Italian history from pre-fascist Italy to modernization and beyond.

*** 295. Variable Topics

*** 296. Special Topics

*** See description at end of Italian Literary and Cultural Studies section.

---

**Japanese (JPN)**

*Head of Department: Professor David K. Herzberger*

*Department Office: Room 228, J.H. Arjona Building*

101-102. **Elementary Levels I and II**

103-104. **Intermediate Levels I and II**

101 and 103 are offered in the first semester, and 102 and 104 in the second. Please refer to the Critical Languages course descriptions in this publication. Consult the Program Director in Arjona 128 or at Ed.Benson@UConn.edu for more information.

**Journalism (JOUR)**

*Head of Department: Professor Maureen Croteau*

*Department Office: Room 422, Arjona Building*

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

101. **Introduction to Journalism**
Either semester. Three credits.

A survey of the principles, trends, attitudes and philosophies of journalism with emphasis on newspapers and magazines.

102. **The Press in America**
Either semester. Three credits.

The development of American print journalism from 18th century print shops to 21st century corporations; how journalists and their work have evolved and influenced American life.

200W. **Newswriting I**
(Formerly offered as JOUR 211.) Either semester. Three credits. One 75-minute lecture and one 2-hour laboratory plus field work. Prerequisite: JOUR 201 or 211. Open to sophomores. *Dufresne*

Provides in-depth explanations and demonstrations of what reporters can expect to find, and report, in the courts, schools, town halls, land use agencies and other civic offices, boards and commissions.

201W. **Newswriting II**
(Formerly offered as JOUR 221.) Either semester. Three credits. One 75-minute lecture and one 2-hour laboratory plus field work. Prerequisite: JOUR 200 or 211. Open to sophomores. *Dufresne*

Focuses on contemporary problems as privacy, good taste, community standards, effectiveness of the press and responsibility of the press.

212W. **Feature Writing**
Either semester. Three credits. Prerequisite: JOUR 201 or 211. Open to sophomores.

Emphasis on finding, developing and writing feature stories. Outside stories will be assigned weekly.

213W. **Magazine Journalism**
Either semester. Three credits. Prerequisite: JOUR 201. Recommended preparation: JOUR 212.

Students research, report and write, for publication, a magazine-length non-fiction article.

216. **Publication Practice**
Either semester. One to 3 credits. May be repeated for credit. Hours by arrangement. Open only with consent of instructor. *Worcester*

Students and faculty work together to research, write, edit and produce a publication.

219. **Daily Campus Critique**
First semester. One credit. One class period. Open only with consent of instructor. May be repeated only once for credit.

A weekly critique of the content of the student daily from news stories, through editorials to advertising copy and printing.

220. **Law of Libel and Communications**
Either semester. Three credits.

 Typical subjects: libel, slander, invasion of privacy, obscenity, legal problems of newsgathering, protecting the political process, protecting state secrets, protecting the public welfare.

230W. **Copy Editing I**
(Formerly offered as Journalism 214.) Either semester. Three credits. Prerequisite: JOUR 211 or 201.

Editing for grammar, style and content, headline writing, introduction to basic newspaper design concepts.

231C. **Copy Editing II**
Second semester. Three credits. Prerequisite: JOUR 230, *Croteau*

Emphasis on copy and picture selection, copy fitting, photo editing and computer-assisted editing, page layout and production.

233. **Opinion Writing**
First semester. One credit. Prerequisite: JOUR 201. One two-hour lab-lecture period. *Breen*

Writing for the editorial and op-ed pages.

255C. **Advanced Reporting Techniques**
First semester. Three credits. Prerequisite: JOUR 201, *Dufresne*

Using the Internet, databases, and other computer resources to research and report on the actions of courts, businesses, public agencies, and governments. Consideration of ethical questions.
240W. Newswriting for Radio and Television
Either semester. Three credits. Prerequisite: JOUR 200 or 211. Two 75-minute lab-lecture sessions plus a field trip. Application of newswriting techniques to the broadcast media.

241. Reporting and Editing TV News
Either semester. Three credits. Prerequisite: JOUR 240.
This is an advanced broadcast journalism class that teaches students how to gather, edit and deliver accurate, newsworthy information for television newscasts. Students develop the skills needed to report news and organize newscasts through actual experience in and out of class.

245. Specialized Journalism
Either semester. Three credits. Prerequisite: JOUR 200 or 211.
An introduction to specialized fields such as business, science, education, arts, sports, and entertainment reporting. Students will examine some of the best work in the fields and will consider ethical issues and other problems.

250. Professional Seminar
Three credits. Three hours. Prerequisite: JOUR 211 or 200, which may be taken concurrently (Also available for one credit. Two hours. No prerequisite.) May be repeated once for a maximum total of four credits.
Journalists discuss the economic, technological, sociological and ethical issues that challenge their profession.

293. Foreign Study
Either or both semesters. Credits and hours by arrangement. May be repeated for credit with permission of Department Head. Consent of Department Head required before the student’s departure. May count toward the major with consent of the advisor. Croteau

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

297. Supervised Field Internship
Either semester. One to three credits. Hours by arrangement. Prerequisite: JOUR 200, 201 and 220. Open only with consent of Department Head. Croteau
Students research, report and write for newspapers, news departments of radio and television stations, and public relations offices under supervision of professionals.

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

299. Independent Study
Either semester. Credits and hours by arrangement. Open only with consent of instructor. May be repeated for credit. Open to qualified students who present suitable projects for independent work in journalism.

Judaic Studies (JUDS)
Associate Director, Center for Judaic and Studies and Contemporary Life:
Professor Stuart S. Miller
Office: Room 154, Thomas J. Dodd Research Center and Room 220, Arjona Building
For more information, please refer to the “College of Liberal Arts and Sciences” section of this Catalog.

101. The Land of Israel from Biblical Times to the Present
(Also offered as HEB 101.) Either semester. Three credits. Offered in alternate years. Miller
An in-depth look at the history, culture and civilizations of the land of Israel. The importance of the land in Judaism and its significance for Christianity and Islam will be discussed. Lectures and discussion will be enhanced by slide presentations.

103. Literature and Civilization of the Jewish People
(Also offered as HEB 103.) Either semester. Three credits. Miller
The major concepts, personalities and literary works of the Hebraic tradition from the Biblical and Talmudic periods to the present.

104. Modern Jewish Thought
(Also offered as HEB 104.) Second semester. Three credits.
Nationalism, culture, ethics and philosophy in the writings of the major Jewish thinkers from Spinoza to the present. Emphasis will be placed on the work of Moses Mendelssohn, Nachman Krochmal, Ahad Haam, Hermann Cohen, Franz Rosenzweig, Martin Buber and Mordecai Kaplan.

201. Selected Books of the Hebrew Bible
(Also offered as HEB 201.) Either semester. Three credits. Prerequisite: INTD 294 or HIST 213 or HEB 103, which may be taken concurrently, or consent of instructor. A knowledge of Hebrew is not required. May be repeated with change of content and consent of instructor. Miller
Focuses on a biblical book (or books) and emphasizes its literary structure and content using modern approaches as well as midrashic and medieval exegesis. Historical and archaeological material introduced where relevant.

202. Sects and Movements in Judaism
(Also offered as HEB 202.) Either semester. Three credits. Offered in alternate years.
Varieties of Jewish expression and belief from Biblical times to the present. Topics include: the Dead Sea Sect, Pharisees, Sadducees, Karaites, Marranos, Hasidism and the Reform, Conservative, Orthodox and Reconstructionist movements of the modern era.

203. The Holocaust
(Also offered as HEB 203.) Either semester. Three credits. Miller
A discussion of the Holocaust to be preceded by an examination of the roots of anti-semitism and its effect upon the Jewish experience. Special emphasis will be given to the impact of the Holocaust on Jewish and Christian thought.

218. Palestine Under the Greeks and Romans
(Also offered as CAMS 256, HEB 218, and HIST 218.) Either semester. Three credits. Recommended preparation: HIST 213 or 214 or 216 or INTD 294 or HEB 202. Miller

Korean (KORE)
Head of Department: Professor David K. Herzberger
Department Office: Room 228, J.H. Arjona Building

101-102. Elementary Levels I and II

103-104. Intermediate Levels I and II

190. Perspectives on Latin America
Either semester. Three credits.
A multidisciplinary course including geography, indigenous peoples, colonization and nation formation; society, politics, economy, and culture of contemporary Latin America and its place in today’s world.

190W. Perspectives on Latin America

193. Foreign Study
Either or both semesters. Credits and hours by arrangement. May be repeated for credit (to a maximum of 15). Consent of Director of Latin American and Caribbean Studies required before departure.
Course work undertaken within approved Study Abroad programs, usually focussing on the history, culture, and society of a particular Latin American or Caribbean country or countries.

270. Latin American Popular Culture
Second semester, alternate years. Three credits. Mahan
Culture, subcultures, and culture industries in Latin America. Conditions that affect the mass production, dissemination and reception of entertainment products.

275. Cinema and Society in Latin America
Either or both semester. Variable credit up to a maximum of three credits. Hours by arrangement. With a change in content, this course may be repeated once for credit.
The aesthetic, social, and political significance of Latin American film.

284. Latin America
Either semester. Credits and hours by arrangement. Open only with consent of instructor and director of the Center for Latin American and Caribbean Studies.
This number covers courses in Latin American Studies taken at other Universities by special arrangement for University of Connecticut credit.

290. Latin American Studies Research Seminar
Either semester. Three credits. Prerequisite: Consent of instructor.

Special topics course in which majors and minors in Latin American Studies design, execute and write up original, library-based research on Latin America. Some readings may be in Spanish or Portuguese.

293. Foreign Study
Either or both semesters. Credits (to a maximum of 17) and hours by arrangement. Consent of Director of Latin American and Caribbean Studies required before departure. May count toward the major with consent of advisor.

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 and recommended preparation vary.

298. Special Topics
Either semester. Three credits. With a change in content, may be repeated for credit. Prerequisites and recommended preparation vary.

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

Management (MGMT)
Head of Department: Professor John F. Veiga
Department Office: Room 336, School of Business
For major requirements, see the School of Business section of this Catalog.

Courses in this department are open to juniors and seniors only with the exception of MGMT 198.

198. Contemporary Issues in the World of Management
Semester by arrangement. One credit. May be repeated in different sections in combination with MGMT 198, up to a maximum of three credits. May not be used to satisfy Junior-Senior level major requirements of the School of Business.

201. Managerial and Interpersonal Behavior
Either semester. Three credits. Prerequisites: ACCT 131, ECON 111 and 112, ENGL 110 or 111, or ENGL 105 and 109, MATH 106 or 114 or 116, STAT 100 or 110.

Topics covered include individual work motivation, interpersonal communications in organizations, team building and group processes, leadership, decision-making, and understanding and managing cultural diversity. Classes will emphasize interpersonal and leadership skill-building through the inclusion of exercises which rely on active participation of class members.

203. Development of American Business
Semester by arrangement. Three credits.

Historical development of business and business leadership, concentrating on changes in formulating and implementing top management policies. The total environment is considered as it affects business behavior. Case studies based on a variety of historical situations are used.

225. Second Language Acquisition.
Either semester. Three credits. Prerequisite: Ling 101, or 202, or consent of instructor. Bar-Shalom

The relationship between linguistic theory and second language acquisition. Effects of mother tongue and linguistic input. Pedagogical implications of second language acquisition research.

244W. Language and Culture
First semester. Three credits. Not open for credit to students who have passed ANTH 244 prior to Fall 1998. Anderson, Bar-Shalom

The study of language, culture, and their relationship. Topics include the evolution of the human language capacity; the principles of historical language change including reconstruction of Indo-European and Native American language families; writing systems; linguistic forms such as Pidgins and Creoles arising from languages in contact; the interaction between language and political systems, the struggle for human rights, gender, ethnicity, and ethnobiology.

293. Foreign Study
Either or both semesters. Credits and hours by arrangement. May be repeated for credit. Consent of Department Head required, normally to be granted prior to the student’s departure. May count toward the major with the consent of the advisor.

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 and recommended preparation vary.

Linguistics (LING)
Head of Department: Professor Diane Lillo-Martin
Department Office: Room 332, Arjona Bldg.

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

101. Language and Mind
Either semester. Three credits.

The special properties of human language and of the human mind that make verbal communication possible. Basic topics in the psychology of language.

102. Language and Environment
Second semester. Three credits. Anderson

The birth, spread, and death of languages. A basic survey of the effects of geography, society, and politics on language families.

193. Foreign Study
Either or both semesters. Credits and hours by arrangement. May be repeated for credit. Consent of Department Head or advisor may be required prior to the student’s departure.

Special topics taken in a foreign study program.

202. Principles of Linguistics
Either semester. Three credits. Open to sophomores.

A survey of theory, methods and findings of linguistic research: the relation between sound and meaning in human languages; social variation in language; language change over time; universals of language; the mental representation of linguistic knowledge.

205Q. Phonology
First semester. Three credits. Prerequisite: LING 202. Calabrese, van der Hulst

The analysis of sound patterns in language within a generative framework: distinctive features, segmental and prosodic analysis, word formation, the theory of markedness.

206Q. Syntax and Semantics
Second semester. Three credits. Prerequisite: LING 101 or 202. Beck, Boskovíc, Lasnik, Sharvit

The analysis of form and meaning in natural languages in a Chomskyan framework: surface structures, deep structures, transformational rules, and principles of semantic interpretation.

208W. The Linguistic Basis of Reading and Writing
Semester by arrangement. Three credits. Prerequisite: LING 202. Open to sophomores.

The relationship between writing systems and linguistic structures; the psycholinguistic basis of reading.

215C. Experimental Linguistics
Semester by arrangement. Three credits. Prerequisite: PSYC 132 and LING 101 or 202. Lillo-Martin, Snyder

Research methods and laboratory techniques for the study of language acquisition and/or sentence processing. Students design and conduct a study using a computer database of child speech.

225. Second Language Acquisition.
Either semester. Three credits. Prerequisite: Ling 101, or 202, or consent of instructor. Bar-Shalom

The relationship between linguistic theory and second language acquisition. Effects of mother tongue and linguistic input. Pedagogical implications of second language acquisition research.

244W. Language and Culture
First semester. Three credits. Not open for credit to students who have passed ANTH 244 prior to Fall 1998. Anderson, Bar-Shalom

The study of language, culture, and their relationship. Topics include the evolution of the human language capacity; the principles of historical language change including reconstruction of Indo-European and Native American language families; writing systems; linguistic forms such as Pidgins and Creoles arising from languages in contact; the interaction between language and political systems, the struggle for human rights, gender, ethnicity, and ethnobiology.

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

299. Independent Study
Either or both semesters. Credits and hours by arrangement. May be repeated for credit.
235. Entrepreneurship and Venture Management
Semester by arrangement. Three credits. Prerequisite: ACCT 200, FNCE 201, MGMT 201, MKTG 201. Senior standing preferred.
In this field course, students investigate the special problems of newly formed firms. Course emphasis is on the planning skills necessary for start-up operations. The course is designed to acquaint students with the unique strategic problems faced by such firms and to teach them how to evaluate new venture plans.

239. Managing a Diverse Workforce
Semester by arrangement. Three credits.
This course examines issues related to managing an increasingly diverse workforce. Diversity in the workplace may result from differences in individual characteristics such as gender, race, ethnicity, national origin, and physical ability/disability. Diversity-related issues with management implications to be examined include personal identity, recruitment and selection, work group interactions, leadership, career development and advancement, sexual harassment, work and family, accommodation of people with disabilities and organizational strategies for promoting equal opportunity and a positive attitude toward diversity among all employees.

245. Managerial Behavior in Cross-Cultural Settings
Semester by arrangement. Three credits. Open to Management majors only.
The objective of this course is to introduce the student to the work values and behaviors of individuals in countries around the world. Some of the topics presented in the cross-cultural comparisons discussed in this course will include: approaches to motivation, communication, decision making, and negotiation. Particular emphasis will be placed on the developed and developing parts of the world that are major players in today’s global economy.

250W. Management Communications
Semester by arrangement. Three credits. Open to Management majors only.
This course has two objectives: to acquaint the student with the functional importance of communication in business management, and to teach the techniques of oral and written communication.

265. The Dynamics of Organization
Semester by arrangement. Three credits.
Dynamics of organization; relationship between people and organization. The organization viewed as a system interacting with a changing environment, as a structure of organized human cooperation, as an instrument of management strategy. Experiential exercises and case studies used to gain a better understanding of organization strategy, design and structure.

265W. The Dynamics of Organization
271. Human Resources Management
Semester by arrangement. Three credits. Prerequisite: MGMT 201.
Study of the personnel function from the managerial perspective. Emphasizes human resources planning, recruitment, selection, employee and management development, and performance evaluation.

272. Career Development in Business
Either semester. One credit. Meeting once per week for one hour and fifty minutes for 6 weeks (first or second half of semester), plus 2 or 3 evenings or Saturday morning panel discussions. Prerequisite: Sixth or seventh semester standing. Open only to students in the School of Business.
Topics covered include: self-assessment, exploration of career information resources, informational interviewing, development of an individual career plan, development of job search strategies and skills, discussion of career transition issues, overview of the career life cycle, and introduction to career development in organizations.

273. Labor Relations
Semester by arrangement. Three credits. Prerequisite: MGMT 201.
Study of employer-employee relations in unionized settings, both public and private sectors. Covers such areas as the National Labor Relations Act, labor contract negotiation, and administration.

276. Compensation Analysis and Administration
Semester by arrangement. Three credits. Prerequisite: MGMT 271.
Provides a systematic study of compensation theory and practice including wage theory, job analysis, job design, job evaluation, wage survey, pricing of the job structure, wage incentives, profit sharing and fringe benefits.

276W. Compensation Analysis and Administration
278. Purchasing and Materials Management
Semester by arrangement. Three credits. Prerequisite: MGMT 201, MKTG 201, ACCT 131, FNCE 201, OPIM 203C and BLAW 271 or 275.
Purchasing and Materials (Strategic Supply) Management is concerned with the management of materials and control of material costs in business and institutional enterprises. It emphasizes purchasing as the primary materials activity. At the same time, it integrates the purchasing activity in the context of a total business operation, including marketing, engineering, production control, inventory management, finance, information management, strategic management and operations management.

281. Corporate Social Responsibility
Semester by arrangement. Three credits.
This course is designed to help the student relate business and its external culture, the social system, and the total environment. Develops an understanding of the role of the manager as the linking element between the business organization and the social environment.

281W. Corporate Social Responsibility
†289. Field Study Internship
Either or both semesters. One to six credits. Hours by arrangement. Prerequisite: Consent of instructor and Department Head. Open only to Management and Engineering majors.
This course is designed to provide students with an opportunity for field work relevant to one or more major areas within the Department. Students will work under the supervision of one or more professionals in the speciality 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.

290. Strategy, Policy and Planning
Either semester. Three credits. Prerequisite: ACCT 200, FNCE 201, OPIM 203 and 204, MGMT 201, MKTG 201, and either BLAW 271 or 275, or consent of instructor. Open only to School of Business students with senior class standing.

† Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).
An integrative analysis of the administrative processes of the various functional areas of an enterprise viewed primarily from the upper levels of management. The formulation of goals and objectives and selection of strategies under conditions of uncertainty as they relate to the planning, organizing, directing, controlling and evaluating policies and activities in each of the functional areas separately and jointly to achieve corporate objectives. Developing an integral business perspective is an integral part of the course.

291. Small Business Consulting
Semester by arrangement. Three credits. Hours by arrangement. Prerequisite: 7th semester or higher standing in the School of Business plus a minimum of one course from each of the following areas: ACCT, BLAW, FNCE, MGMT, MKTG and OPIM.
Application of small business management concepts to a consulting project in an on-going small business in Connecticut. Students will be required to take examinations on course content and submit a report on the consulting project.

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 the student’s departure.
Special topics taken in a foreign study program.

296W. Senior Thesis in Management
Either semester. Three credits. Hours by arrangement. Open only to Management and Engineering majors.
This course is designed to help the student relate business and its external culture, the social system, and the total environment. Develops an understanding of the role of the manager as the linking element between the business organization and the social environment.

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 management as mutually arranged between a student and an instructor.

Management and Engineering for Manufacturing (MEM)
Co-Directors: School of Business: Lakshman S. Thakur, Associate Professor
School of Engineering: Robert G. Jeffers, Associate Professor

151. Introduction to Management and Engineering for Manufacturing Program
Second semester. Three credits.
Introduction to the goals of engineering and management for manufacturing enterprises. Review of the history of technological development, including its effects on new products and processes. Written and oral communication skills will be developed.

210. Manufacturing Equipment Lab
Either semester. One credit. One and one-half hours of laboratory per week. Open to sophomores.
Introduction to machine shop equipment, metrology, general safety, and hands on experience in machining and fabrication of metals. Topics include:
introduction to instrumentation; knee miller, engine lathe, drill press, grinder, and sander operation; welding; clipping; and grinding.

211. Introduction to Manufacturing Systems
Second semester. Three credits. Prerequisite: STAT 110V. Open to sophomores.
Overview of manufacturing operations management and the systems used in controlling manufacturing enterprises including the concepts of global competition and manufacturing as a competitive weapon.

215W. Advanced Manufacturing Systems
Second semester. Four credits. Two three-hour laboratory periods. Prerequisite: ME 221 and MEM 211.
Capstone design course for the MEM Program. Design applications involving construction and analysis of manufacturing system models. Students submit write-ups for several small projects. One large project is completed by all students in the course, with a written report and oral presentation. Projects incorporate major concepts studied in prior courses.

221. Introduction to Products and Processes
First semester. Three credits. Prerequisite: MEM 211.
Overview of the factors affecting the design of products and the various processes used in their manufacture. An introduction to manufacturing processes and their capabilities and limitations. Value engineering, methods improvement and simplification techniques will be covered.

225. Advanced Products and Processes
First semester. Three credits. Prerequisite: MEM 221.
Introduction to advanced topics relevant to the design and manufacture of products. Special emphasis on the relationship between manufacturing products and processes. Student projects.

231. Computers in Manufacturing
Second semester. Three credits. Prerequisite: ECE 220 and MEM 211, which may be taken concurrently.
The utilization of computers and information systems in manufacturing, with special emphasis placed on Computer Integrated Manufacturing (CIM). The study of actual CIM applications will be incorporated.

†296. Manufacturing Internship
One or more summer semesters. No credits. Hours by arrangement. Prerequisite: Consent of instructor and MEM program director. May be repeated.
This course is designed to educate students in the MEM program with the realities of the manufacturing environment and to provide them with the opportunity to exercise problem-solving skills while fulfilling a need of the internship sponsor.

Marine Sciences (MARN)

Head of Department: Professor R.B. Whittatch
Department Office: Marine Sciences, Avery Point
For major requirements, see the College of Liberal Arts and Sciences section of this Catalog.

135. The Sea Around Us
Second semester. Three credits.
History of ocean exploration, interaction between the oceans and the atmosphere, impact of technology on the marine environment, climate modification and exploitation of ocean resources.

170. Introduction to Oceanography
Either semester. Three credits. Three class periods per week and two afternoon cruises per semester. A back-ground in secondary school physics, chemistry or biology is recommended.
Processes governing the geology, circulation, chemistry and biological productivity of the world’s oceans. Emphasis is placed on the interactions and interrelationships between physical, chemical, biological and geological processes that contribute to both the stability and the variability of the marine environment.

196. Oceanography Laboratory
Fall semester (Avery Point). One credit. Concurrent or past enrollment in MARN 170 (or equivalent) required. May be repeated for credit.
This course is complementary to but independent from Marine Sciences 170. This course will emphasize experiential learning of fundamental oceanographic concepts using hands-on exercises. Laboratory sessions will include a variety of observations, measurements and experiments that teach principles of oceanography.

210. Coastal Systems Science I
Second semester (Avery Point). Three credits. Prerequisite: MARN 170 and any two of the following: BIOL 107, 108, CHEM 127Q, 128Q, PHYS 121Q, 122Q, 131Q, 132Q. Open to sophomores. J. Kremer and Staff
Biological, chemical, physical, and geological structure and function of coastal systems; a worldwide survey with emphasis on important coastal habitats and processes.

211. Coastal Systems Science II
Either semester (Avery Point). Four credits. Three hours lecture and three hours laboratory. Prerequisites: MARN 170 and any two of the following: BIOL 107, 108, CHEM 127Q, 128Q, PHYS 121Q, 122Q, 131Q, 132Q. J. Kremer and Staff
Biological, chemical, physical and geological structure and function of coastal systems; a worldwide survey with emphasis on important coastal habitats and processes.

212C. Measurement and Analysis in Coastal Ecosystems
First semester (Avery Point). Four credits. Two 1-hour lectures and two 3-hour laboratories. Required field trips. Prerequisites: MARN 170 and any two of the following: BIOL 107, 108, CHEM 127Q, 128Q, PHYS 121Q, 122Q, 131Q, 132Q. J. Kremer
Examination of oceanographic processes in local coastal systems; collection and analysis of samples from field trips and lab experiments; data analysis using computers.

2200. Environmental Reaction and Transport
Second semester. Three credits. Prerequisite: CHEM 127 and one additional semester of CHEM, BIOL or PHYS; one semester of calculus (MATH 112, 115, 118 or 120) or concurrent enrollment in Calculus (115, 118, 120). Torgersen
An introduction to the chemical/biological reactions and transport dynamics of environmental systems. Mass balances, elementary fluid mechanics and the coupled dynamics of lakes, rivers, oceans, groundwater and the atmosphere as biogeochemical systems.

230. Coastal Circulation and Sediment Transport
First semester (Avery Point). Three credits. Prerequisite: MARN 210 and 211; MATH 112 or 115 or 118 or 120.
Circulation and mixing in estuaries and the inner continental shelf, including surface gravity waves, tides, and buoyancy and wind-driven circulation.

Coastal sediments, geomorphology, and processes of sedimentation, erosion and bioturbation. Required field trips.

235. Environmental Fluid Dynamics
First semester. Three credits. Recommended preparation: PHYS 122 or 132 or 142 or 152; and MATH 220 (may be taken concurrently). Bogden
Introduction to fluid dynamics with applications to coastal waters, estuaries, rivers, lakes, and ground water flows. Topics include waves, tides, turbulence, mixing, drag, lift, effects on organisms, and wind driven circulation.

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

240. Seminar on Marine Mammals
Joint program with Mystic Marinelife Aquarium. First semester. Three credits. One 3-hour class period; one field trip. Offered at Mystic Marinelife Aquarium. Prerequisite: one year college laboratory biology and permission of instructor.
Instructors from different areas of expertise discuss the natural history, evolution, anatomy, physiology, husbandry, and conservation of marine mammals. Current research is emphasized. (Special registration and fee: Contact Mystic Marinelife Aquarium, Mystic, CT 06355. 860-572-5955.)

241. Marine Invertebrate Biology: Adaptations and Community Structure
First semester (alternate years). Three credits. Prerequisites: BIOL 107 and 108. Recommended preparation: MARN 170 or consent of instructor. Ward
Comparative examination of major adaptations and functional responses of marine invertebrates to biotic and abiotic factors in the marine environment. Field trips required.

242. Environmental Physiology of Marine Animals
First semester (alternate years). Three credits. Prerequisites: BIOL 107 and 108. Recommended preparation: MARN 170 or consent of instructor. Ward
Introduction to the study of marine environmental physiology, behavioral and physiological adaptations of marine animals to different environments (intertidal, estuarine, coastal, oceanic); compensatory responses to changing ambient conditions; and basic animal energetics. Laboratory exercises focus on food consumption, energy transformations, and principles of physiological measurement.

244. Coastal Ecology
Joint program with Mystic Marinelife Aquarium, Summer. Three credits. Offered at Mystic Marinelife Aquarium. Prerequisite: One year college laboratory biology and permission of instructor.
A special introductory course providing students with theoretical as well as practical knowledge of ecological sampling techniques, estuarine productivity, and selected continental shelf communities. Laboratory portion of this course consists of a 5-day study cruise in coastal New England waters. (Special registration and fee: contact Mystic Marinelife Aquarium, Mystic, CT 06355. 860-536-4208.)
255W. Coastal Studies Seminar
Second semester (Avery Point). Two credits. Prerequisite: MARN 210, 211, and 212, or consent of instructor.
Scientific analysis of coastal zone issues and their interdisciplinary implications. Written analysis and discussion of readings from the primary literature.

256. Science and the Coastal Environment
Second semester (Avery Point). Three credits. Prerequisite: MARN 210, 211, and 212; or at least two of the following: MARN 270, 275, and 280. J. Kremer
Specific cases of multiple impacts on environmental resources and coastal habitats. Current scientific understanding as a basis for sociopolitical decision-making (e.g., land-use impacts on coastal processes in relation to zoning regulation and water-quality criteria).

260. Biological Oceanography
Second semester. Three credits. Prerequisite: MARN 270 and MARN 280W (both may be taken concurrently) or consent of instructor. Open only with permission of department head. D. M. Vischer, Whirlatch
An advanced course in biological processes in oceanic and coastal waters. Emphasis is on empirical and theoretical concepts of marine ecosystem dynamics, primary and secondary production and detrital cycling.

270. Descriptive Physical Oceanography
First semester. Three credits. Prerequisite: PHYS 122, 142 or 152; MATH 114 or 116. Bohlen
Ocean basin characteristics, properties of sea water, distribution of water masses, oceanic and atmospheric circulation, waves, tides, near-shore circulation, methods and instrumentation.

275W. Geological Oceanography
First semester. Three credits. Prerequisite: Marn 210, 211, and 212, or consent of instructor. Torgersten
Basic concepts in geological oceanography, plate tectonics and the role of ocean floor dynamics in the control of the Earth and ocean system.

280W. Marine Biogeochemistry
First semester. Three credits. Two 1-hour lectures. Prerequisite: CHEM 128, MATH 114 or 116, PHYS 122 or equivalents. Fitzgerald
Composition, origin and solution chemistry of sea water. Marine biogeochemical cycles of water, salt, carbon, nutrients, gases and trace elements. Effects of ocean circulation, biological cycles and crustal exchanges on the distribution and transfer of substances in the marine environment.

282. Coastal Pollution and Bioremediation
First semester (alternate years). Three credits. Two class periods, 1 two-hour lab period. Required preparation: BIO 107, 108 and CHEM 127-128 or consent of instructor. Visscher
Overview of processes and compounds leading to pollution in the nearshore marine environment. The impact of pollution on the marine foodweb and its response is emphasized. Alleviation of pollution through metabolism of organisms, including bacteria, seagrasses, and salt marshes.

294. Marine Biology
(Also offered as EEB 294.) First semester. Three credits. Two class periods and one 2-hour laboratory period. Prerequisite: One year of laboratory biology. Whitlatch
The study of the kinds and distributions of marine organisms. Particular attention is paid to biotic features of the oceans, organism-habitat and relationships and general ecological concepts influencing marine populations and communities. Field trips are required.

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

297. Internship in Marine Sciences
Either semester. Variable credits. With a change in topic, may be repeated for credit, not to exceed 3 credits. Recommended preparation: Nine credits of MARN courses at the upper division level. Consent of Instructor.
An internship under the direction of MARN faculty. Placements stress application of academic training. A journal of activities is required. One credit may be earned for each 40 hours of pre-approved activities in a semester to a maximum of three credits.

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

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

Marketing (MKTG)
Head of Department: Professor Susan Spiggle
Department Office: Room 349, School of Business
For major requirements, see the School of Business section of this Catalog.

201. Introduction to Marketing Management
Either semester. Three credits. Prerequisites: ACCT 131, ECON 111 and 112, ENGL 110 or 111, or ENGL 105 and 109, MATH 106, or 114 or 116, STAT 100 or 110.
An introduction to the marketing system, its foundations and institutions. Students are exposed to product, promotion, price, distribution decision areas, strategic alliances, relationship marketing, and total marketing quality.

208. Consumer Behavior
Either semester. Three credits. Prerequisites: MKTG 201 and either PSYC 133 or PSYC 135, or SOCI 107. Not open for credit to students who have passed, or are currently enrolled in, Marketing 209.
The analysis of consumer decision processes as they relate to marketing management decision areas. Several models of consumer behavior are studied as are the psychological phenomena of learning, motivation, and attitude development, and the sociological influences of social class, reference groups and culture.

208W. Consumer Behavior
Open to Marketing majors only.

209. Industrial Buyer Behavior
Either semester. Three credits. Prerequisite: MKTG 201 and either PSYC 133 or PSYC 135, or SOCI 107. Not open for credit to students who have passed, or are currently enrolled in, Marketing 208.
This course provides an analysis of industrial markets and develops the tools required to thoroughly analyze these markets for marketing strategies. Differences between consumer and industrial products and services will be emphasized. Emphasis will be on high technology products and services.

225. Integrated Marketing Communications
Either semester. Three credits. Recommended prerequisite: MKTG 201.
The design, coordination, integration, and management of marketing communications. The course focuses on advertising and sales promotion with an emphasis on the competitive and strategic value of communications in the marketplace.

225W. Integrated Marketing Communications
Open to Marketing majors only.

227. Product and Price Policies
First or second semester. Three credits. Prerequisite: MATH 106, or 114, or 116; STAT 100 or 110; MKTG 201.
Consideration in depth of the product and price variables as elements of marketing strategy and tactics. Emphasis will be placed on conceptual as well as decision-making aspects. The roles of technology, social change, innovation and creativity are included in the treatment of product. Institutional, behavioral, governmental and economic factors are included in the treatment of price.

241. Retail Management
First or second semester. Three credits. Prerequisite: MKTG 201.
A study of the management of retail operations, including buying, pricing, inventory control and selling.

252. Professional Selling
Either semester. Three credits. Prerequisite: MKTG 201.
This course focuses on the tactical and strategic aspects of the professional selling process with particular emphasis upon managing the complex sale. Topics include account entry strategies, effective investigative techniques, objection prevention, the client decision process, negotiation skills, and account development strategies. Learning tools will include: participant interaction, role plays, workgroups, and case studies.

253. Sales Force Automation
Either semester. Three credits. Prerequisite: MKTG 201 and 252.
This course focuses on using technology to maximize sales force efficiency. Its focus is on enhancing the selling process and includes such topics as: building customer databases, segmenting and targeting high-value customers, forecasting sales opportunities, and communicating with customers efficiently utilizing customer relationship management technology. Learning tools will include: group interaction, role plays, workgroups, case studies, and special projects.

254. National/Global Account and Sales Management
Either semester. Three credits. Prerequisite: MKTG 201 and 252.
This course focuses on managing large national/global accounts as well as the activities and problems of sales force management. Particular emphasis is placed on organizing the sales force, recruiting, training, compensation, motivation, forecasting, territory design, evaluation, and control. Learning tools include: interaction, role-playing, work groups, case studies, and outside business interactions.

255. Marketing on the Internet
First and/or second semester. Three credits. Prerequisite: MKTG 201.
Topics include comparisons of business models in physical space and cyberspace and integration of
marketing efforts among the world-wide-web, and other means of communications, distribution, and selling. This course relies on the Internet as a teaching tool. Students need access to a computer with an Internet Browser.

270. Global Marketing Strategy
First or second semester. Three credits. Prerequisite: MKTG 201; MKTG 208 or 209; MKTG 280 and senior class standing.
A study of the marketing concepts and analytical processes used in the development of programs in international markets. The course emphasizes comparative differences in markets, marketing functions, and political considerations. It includes the application of a systems approach to the evaluation of opportunity and to the solution of major global marketing problems. Emphasis is placed on the analysis and synthesis of marketing programs to determine the appropriate marketing mix for various international business enterprises.

280. Marketing Research
Either semester. Three credits. Prerequisite: MKTG 201 and OPM 203.
This course covers strategies and techniques for obtaining and using market information from consumer and business-to-business markets. Emphasis on: translating managerial problems into research questions, designing research, selecting alternate research methods, and analyzing and interpreting market research data. Students gain hands-on, computer based experience in analyzing market data.

282. Marketing Planning and Strategy
First or second semester. Three credits. Prerequisite: MKTG 201, 208 or 209, 280, and senior class standing.
The application of a systems approach to the evaluation of opportunity and to the solution of major problems from the perspective of the top marketing executive. Emphasis is placed on the analysis and synthesis of marketing programs to determine the appropriate marketing mix for various business enterprises.

282W. Marketing Planning and Strategy
†289. Professional Practice in Marketing
Either or both semesters. One to three credits. Hours by arrangement. Prerequisite: completion of Freshman - Sophomore level School of Business requirements and consent of instructor and Department Head.
This course is designed to provide students with an opportunity for supervised field work in relevant major areas within the Department. Students will work with one or more professionals in the field of marketing. 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

296W. Senior Thesis in Marketing
Either semester. Three credits. Hours by arrangement. Open only to Marketing Department Honor Students with consent of instructor and Department Head.

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 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 and Department Head.
Individual study of special topics as mutually arranged between student and instructor.

Mathematics (MATH)

Head of Department: Professor Charles Vinsonhaler
Department Office: Room 102, Mathematical Sciences Building

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

Students must pass the Q-course Readiness Test or Mathematics 101 before taking any “Q” courses.

101. Basic Algebra with Applications
Either semester. Three credits. This course does not meet distribution requirements or count toward the minimum credit requirement for graduation. Not open to students who have passed any Q-course.

Polynomials, exponents, Cartesian coordinate system, linear and quadratic equations, inequalities.

This course is required of all students who fail the Q-course readiness exam.

102Q. Problem Solving
Either semester. Three credits. Not eligible for course credit by examination. Not open for credit to students who have passed any mathematics course other than MATH 101, 103, 105, 107, 108, or 109. Vinsonhaler

An introduction to the techniques used by mathematicians to solve problems. Skills such as Externalization (pictures and charts), Visualization (associated mental images), Simplification, Trial and Error, and Lateral Thinking learned through the study of mathematical problems. Problems drawn from combinatorics, probability, optimization, cryptology, graph theory, and fractals. Students will be encouraged to work cooperatively and to think independently.

103Q. Elementary Discrete Mathematics
Either semester. Three credits. Not open for credit by examination. Not open for credit to students who have passed any MATH course other than MATH 101, 102, 105, 107, 108, or 109.

Problem solving strategies, solutions of simultaneous linear equations, sequences, counting and probability, graph theory, deductive reasoning, the axiomatic method and finite geometries, number systems.

105Q. Mathematics for Business and Economics
Either semester. Three credits.

Linear equations and inequalities, exponents and logarithms, matrices and determinants, linear programming. Applications.

106Q. Calculus for Business and Economics
Either semester. Three credits. (One credit for students who have passed MATH 113, 115, or 120.) Recommended preparation: MATH 105. Not open for credit to students who have passed MATH 118.

Derivatives and integrals of algebraic, exponential and logarithmic functions. Functions of several variables. Applications.

108V. Mathematical Modeling in the Environment
Either semester. Three credits. A solid background and good performance in high school algebra are highly recommended.

An interdisciplinary approach to environmental issues, such as: ground water contamination, air pollution, and hazardous materials handling. Emphasis on mathematical models, social and ethical implications, and physical and chemical principles. Includes a spread sheet program for water and air pollution data; a computer modeling package to analyze hazardous materials emergencies; creative use of the internet and field research.

109Q. Algebra and Trigonometry
Either semester. Three credits. Not open for credit to students who have passed MATH 107, 112, 115, or 120.

A review of algebra, simultaneous and quadratic equations, logarithms, the trigonometric functions, solution of triangles, trigonometric equations.

112Q. Introductory Calculus 1
Either semester. Four credits. Four class periods. Students cannot receive credit for MATH 112 and either MATH 113 or MATH 120. Students who have not passed the Calculus Readiness Test take this course rather than MATH 115 or MATH 120.

Limits, derivatives, and extreme values of algebraic functions, with supporting algebraic topics.

113Q. Introductory Calculus 2
Either semester. Four credits. Four class periods. Prerequisite: MATH 112. Students cannot receive credit for MATH 113 and either MATH 115 or MATH 120. May be used in place of MATH 107, 115, or 120 to fulfill any requirement satisfied by MATH 107, 115 or 120.

Limits, derivatives, and extreme values of trigonometric functions, with supporting trigonometric topics; anti-derivatives of algebraic and trigonometric functions; the definite integral and applications.

114Q. Introductory Calculus 3
Either semester. Four credits. Four class periods. Prerequisite: MATH 113. Note: MATH 115 is not adequate preparation for MATH 114. Not open for credit to students who have passed MATH 116 or 121. May be used in place of MATH 116 or 121 to fulfill any requirement satisfied by MATH 116 or 121.

The transcendental functions, formal integration, polar coordinates, infinite sequences and series, lines and planes in three dimensions, vector algebra.

115Q or V. Calculus I
Either semester. Four credits. Four class periods. Prerequisite: Passing score on the Calculus Readiness Test, or the former MATH 107. Students cannot receive credit for MATH 115 and either MATH 112, MATH 113, or MATH 120. Suitable for students with some prior calculus experience. May be used in place of MATH 112 or 120 to fulfill any requirement satisfied by MATH 112 or 120.

Limits, continuity, differentiation, antiderivative, definite integrals, with applications to the physical and engineering sciences. Sections with V credit integrate computer-laboratory activity.

116Q or V. Calculus II
Either semester. Four credits. Four class periods. Prerequisite: MATH 115 or 120, or advanced placement credit for calculus (a score of 4 or 5 on the Calculus AB exam or a score of 3 on the Calculus BC exam). Not open to students who have passed MATH 121. Substitutes for MATH 114 or 121 as a requirement.

Transcendental functions, formal integration, polar coordinates, infinite sequences and series, vector algebra and geometry, with applications to the physical sciences and engineering. Sections with V credit integrate computer-laboratory activity.
118Q. A Survey of Calculus with Applications I
Either semester. Three credits. Not open for credit to students who have passed MATH 106, 113, 115, or 120.

Derivatives and integrals of elementary functions including the exponential and logarithm functions; applications include optimization, marginal functions, exponential growth and decay, compound interest.

120Q. Enhanced Calculus I
Either semester. Four credits. Four class periods. Prerequisite: Passing score on the Calculus Readiness Test, or the former MATH 107. Students cannot receive credit for MATH 120 and either MATH 113 or 115. May be used in place of MATH 113 or 115 to fulfill any requirement satisfied by MATH 113 or 115. Intended to provide superior preparation for prospective mathematics, science and engineering majors. Recommended for those who have taken a semester of calculus in high school.

The subject matter of MATH 115 in greater depth, with emphasis on the underlying mathematical concepts.

121Q. Enhanced Calculus II
Either semester. Four credits. Four class periods. Prerequisite: MATH 120 or advanced placement credit for calculus (a score of 4 or 5 on the calculus AB examination or a score of 3 on the Calculus BC examination) or consent of instructor. Not open for credit to students who have passed MATH 114 or 116. May be used in place of MATH 114 or 116 to fulfill any requirement satisfied by MATH 114 or 116. Intended to provide superior preparation for prospective mathematics, science and engineering majors. Recommended for those who have taken a semester of calculus in high school.

The subject matter of MATH 116 in greater depth, with emphasis on the underlying mathematical concepts.

193. Foreign Study
Either or both semesters. Credits and hours by arrangement. May be repeated for credit (to a maximum of 15 for MATH 193 and 293 together). Consent of the Department Head or Undergraduate Coordinator required, normally before the student’s departure.

204Q. Introduction to Mathematical Modeling
Either semester. Three credits. Prerequisite: MATH 221; or MATH 211 and 227. Knowledge of a programming language is strongly recommended. Not open for credit to students who have passed MATH 304 or 305, CHEM 305, or PHYS 305.


210Q. Multivariable Calculus
Either semester. Four credits. Four class periods. Prerequisite: MATH 114, 116, or 121 or a score of 4 or 5 on the Advanced Placement Calculus BC exam. Not open for credit to students who have passed MATH 220. Open to sophomores.

Two- and three-dimensional vector algebra, calculus of functions of several variables, vector differential calculus, line and surface integrals.

211Q. Elementary Differential Equations
Either semester. Three credits. Prerequisite: MATH 114, 116, or 121. Not open for credit to students who have passed MATH 221. Open to sophomores.

Introduction to differential equations and their applications, linear differential equations, systems of first order linear equations, numerical methods.

213Q. Transition to Advanced Mathematics
Either semester. Three credits. Prerequisite: MATH 210 or 220 or consent of instructor. Open to sophomores. Not open for credit to students who have passed MATH 214 or CSE 254. Students intending to major in mathematics should ordinarily take this course or MATH 214 during the third or fourth semester.

Basic concepts, principles, and techniques of mathematical proof common to higher mathematics. Logic, set theory, counting principles, mathematical induction, relations, functions. Concepts from abstract algebra and analysis.

214Q. Introduction to Discrete Systems
Either semester. Three credits. Prerequisite: CSE 111 or 130 or consent of the instructor. Open to sophomores. Not open for credit to students who have passed MATH 213 or CSE 254. Students who intend to major in mathematics should ordinarily take this course or MATH 213 during the third or fourth semester.

Mathematical methods for characterizing and analyzing discrete systems. Modern algebraic concepts, logic, set theory, grammars and formal languages, and graph theory. Applications to the analysis of computer systems and computational structures.

215Q. Linear Algebra
Either semester. Three credits. (Two credits for students who have passed MATH 227.) Prerequisite: MATH 213 or 214.

Linear algebra and its applications; systems of equations, matrices, linear transformations, vector spaces, determinants, canonical forms, applications.

216Q. Abstract Algebra I
Either semester. Three credits. Prerequisite: MATH 213 or 214. Recommended preparation: MATH 215 or 227.

The fundamental topics of modern algebra including elementary number theory, groups, rings, polynomials and fields.

217Q. Abstract Algebra II
Either semester. Three credits. Prerequisite: MATH 216.

Topic chosen from modules, linear algebra, geometric algebra, extension fields, algebraic coding, algebraic combinatorics.

220Q. Enhanced Multivariable Calculus
Either semester. Four credits. Prerequisite: MATH 114 or 116 or 121. Open to sophomores. Not open to students who have passed MATH 210. MATH 220 satisfies any requirement met by MATH 210, and provides superior preparation for prospective mathematics, science, and engineering majors.

The subject matter of MATH 210 in greater depth, with emphasis on the underlying mathematical concepts.

221Q. Enhanced Differential Equations
Either semester. Three credits. Prerequisite: MATH 114 or 116 or 121. Open to sophomores. Not open to students who have passed MATH 211. MATH 221 satisfies any requirement met by MATH 211, and provides superior preparation for prospective mathematics, science, and engineering majors.

The subject matter of MATH 211 in greater depth, with emphasis on the underlying mathematical concepts.

223Q. Geometry
Either semester. Three credits. Prerequisite: MATH 113 or 115 or 120. MATH 113 may be taken concurrently. Open to sophomores.

Deductive reasoning and the axiomatic method. Euclidean geometry, parallelism, hyperbolic and other non-Euclidean geometries, geometric transformations.

224Q. Projective Geometry
Either semester. Three credits. Prerequisite: MATH 210 or 220.

Finite and infinite geometries as logical systems based on axioms. Synthetic and analytic projective geometry.

227Q. Applied Linear Algebra
Either semester. Three credits. Prerequisite: MATH 114, 116, or 121. Not open for credit to students who have passed MATH 215. Open to sophomores.

Systems of equations, matrices, determinants, linear transformations on vector spaces, characteristic values and vectors, from a computational point of view. The course is an introduction to the techniques of linear algebra with elementary applications.

231Q. Probability
Either semester. Three credits. Prerequisite: MATH 210 or 220, which may be taken concurrently with the consent of the instructor.

Introduction to the theory of probability. Discussion of some of the probability problems encountered in scientific and business fields.

232Q. Elementary Stochastic Processes
(Also offered as STAT 232Q.) Either semester. Three credits. Prerequisite: STAT 220 or 224 or 230 or MATH 231. Not open for credit to students who have passed STAT 235Q.

Conditional distributions, discrete and continuous time Markov chains, limit theorems for Markov chains, random walks, Poisson processes, compound and marked Poisson processes, and Brownian motion. Selected applications from actuarial science, biology, engineering, or finance.

235Q. Introduction to Mathematical Logic
Either semester, alternate years. Three credits. Prerequisite: MATH 213 or 214 or CSE 207. PHIL 211 is recommended.

Formalization of mathematical theories, elementary model theory with applications to algebra, number theory, and non-standard analysis. Additional topics: Elementary recursion theory and axiomatic set theory. Emphasis on the applications of logic to mathematics rather than the philosophical foundations of logic.

237Q. Theory of Computability
Either semester, alternate years. Three credits. Prerequisite: MATH 213 or 214 or CSE 207. PHIL 211 is recommended.

Finite automata and regular languages, pushdown automata and context-free languages and grammars. Turing machines, recursively enumerable sets and grammars, Church’s thesis, the halting problem, and other undecidable problems. Computational complexity and NP-completeness.

242W. History of Mathematics
Either semester, alternate years. Three credits. Prerequisite: MATH 210 and either MATH 221. This course may not be counted in any of the major groups described in the Mathematics Departmental listing.

A historical study of the growth of the various fields of mathematics.

247Q-248Q. Fundamentals of Algebra and Geometry
Either semester. Three credits each semester. Prerequisite: PSYC 132 and three credits of Mathematics other than MATH 101. Not open for credit to students who have passed MATH 210 or 211 or 221. This course may not be counted in any of the major groups described in the Mathematics Departmental listing.

The development of the number system with applications to elementary number theory and analytic geometry. This course is recommended for students in elementary education.
**250Q. Elements of Topology**
Either semester, alternate years. Three credits. Prerequisite: MATH 213 or 214.

- Metric spaces, topological spaces and functions, topological properties, surfaces, elementary topics in geometric topology.

**252Q. Introduction to Complex Variables**
(Also offered as Mathematics 352.) Either semester. Three credits. Prerequisite: MATH 210 and 211, or 221. MATH 252Q not open for credit to students who have passed MATH 352.

- Functions of a complex variable, integration in the complex plane, conformal mappings.

**255Q. Principles of Computer Graphics**
Either semester. Three credits. Prerequisite: CSE 111 or 130C, MATH 227 or 215, MATH 210, and consent of instructor. Not open for credit to students who have passed CSE 275.

- Representation of two- and three-dimensional data, internal representation of data structures, transformations, mapping of functions to graphics screen, graphics hardware. Programming projects assigned.

**258Q. Introduction to Number Theory**
Either semester, alternate years. Three credits. Prerequisite: MATH 213 or 214.

- Congruences, unique factorization, primitive roots, numerical functions, quadratic reciprocity and other selected topics, with emphasis on problem solving.

**272Q. Differential Equations for Applications**
Either semester. Three credits. Prerequisite: MATH 210 and 211, or 221. Not open for credit to students who have passed MATH 279Q.


**273Q-274Q. Analysis**
Either semester. Three credits each semester. Prerequisite: MATH 213 or 214, and 211 or 221.

- Introduction to the theory of functions of one and several real variables.

**277Q. Applied Analysis**
(Also offered as Mathematics 377.) Either semester. Three credits. Prerequisite: MATH 272. Offered in alternate years. MATH 277Q not open for credit to students who have passed MATH 279Q.

- Representation of two- and three-dimensional data, internal representation of data structures, transformations, mapping of functions to graphics screen, graphics hardware. Programming projects assigned.

**279Q. Partial Differential Equations**
(Also offered as Mathematics 378.) Either semester, alternate years. Three credits. Prerequisite: MATH 272 or its equivalent. MATH 278Q not open for credit to students who have passed MATH 378.

- Solution of first and second order partial differential equations with applications to engineering and the sciences.

**281Q. Numerical Analysis I**
Either semester. Three credits. Prerequisite: MATH 210Q, 211Q, and either 215Q or 227Q; and knowledge of at least one programming language.

- Analysis of numerical methods associated with linear systems, eigenvalues, inverses of matrices, zeros of non-linear functions and polynomials. Roundoff error and computational speed.

**282Q. Numerical Analysis II**
Either semester. Three credits. Prerequisite: MATH 281.

- Approximate integration, difference equations, solution of ordinary and partial differential equations.

**283Q. Calculus and Probability Problems**
Either semester. One or two credits. Hours by arrangement. Prerequisite: MATH 210 and 231.

- Problems in calculus and probability designed to help students prepare for the first actuarial examination.

**285Q. Financial Mathematics I**
(Also offered as MATH 365.) Either semester. Three credits. Prerequisite: MATH 114, 116, or 121.

- The mathematics of measurement of interest, accumulation and discount, present value, annuities, loans, bonds, and other securities.

**286Q. Introduction to Operations Research**
(Also offered as STAT 286Q and STAT 356.) Either semester. Three credits. Prerequisite: STAT 231 or 232. Not open for credit to students who have passed STAT 230 or 236.

- Introduction to the use of mathematical and statistical techniques to solve a wide variety of organizational problems. Topics include linear programming, network analysis, queuing theory, decision analysis.

**287Q-288Q. Actuarial Mathematics**
(Also offered as MATH 387-388.) Either semester. Three credits each semester. Prerequisite: MATH 231 or STAT 230; and MATH 285, which may be taken concurrently.

- Survival distributions, claim frequency and severity distributions, life tables, life insurance, life annuities, net premiums, net premium reserves, multiple life functions, and multiple decrement models.

**289. Financial Mathematics II**
Either semester. Three credits. Prerequisite: MATH 285. Also ACCT 131, which may be taken concurrently.

- The continuation of MATH 285Q. Measurement of financial risk, the mathematics of capital budgeting, mathematical analysis of financial decisions and capital structure, and option pricing theory.

**290. Field Study Internship**
Either or both semesters. One to three credits. May be repeated for credit (to a maximum of 6 credits). Consent of the Department Head, Director of the Actuarial Program, or the Undergraduate Coordinator required. Prerequisite: Completion of Freshman - Sophomore level requisite courses in the major.

**292W. Senior Thesis in Mathematics**
Either semester. Three credits. Open only by consent of Department Head or Departmental Honors Committee.

- The student should define a general subject area for the thesis before choosing a thesis advisor and seeking consent at the time of registration. The student should submit a written proposal for the senior thesis to the advisor by the end of the semester preceding enrollment for thesis credit.

**293. Foreign Study**
Either or both semesters. Credit and hours by arrangement. May be repeated for credit (to a maximum of 15 for MATH 193 and 293 together). Consent of the Department Head or Undergraduate Coordinator required, normally before the student’s departure. May count toward the major with consent of the Advisor and either the Department Head or Undergraduate Coordinator.

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

**296. Problem Seminar**
Either semester. One credit. One class period. Prerequisite: MATH 114, 116, or 121. Open to sophomores. This course, with a change of topic, may be repeated for credit.

- Problem sequences selected from algebra, geometry, calculus, combinatorics, and other branches of mathematics, designed to introduce mathematical concepts and to give experience in problem solving.

**297. Undergraduate Seminar**
Either semester. Three credits. Open only with consent of instructor. This course, with a change of topic, may be repeated for credit.

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

**299. Independent Study**
Either semester. Credits and hours by arrangement. Open only with consent of instructor. This course, with a change of topic, may be repeated for credit.

---

**Mechanical Engineering (ME)**

*Head of Department:* Professor Theodore L. Bergman

*Department Office:* Room 480, United Technologies Engineering Building

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

205. Introduction to Mechanical Engineering
Three credits. Prerequisite: CE 211 and PHYS 151Q, both of which may be taken concurrently. Open to sophomores.

- Introduction to Mechanical Engineering through application of engineering principles and computers in practical problem solving, design and manufacturing. Topics include elementary numerical analysis, overview of manufacturing processes, simplified engineering modeling and analysis of systems, and computer analysis and simulation. A design project throughout the course incorporates these topics; a presentation of project results is required.

214. Dynamics of Particles and Rigid Bodies
Second semester. Three credits. Prerequisite: CE 212.

- Kinematics and dynamics of particles. Motion relative to translating and rotating observers; inertial reference systems; central forces and orbits. Kinematics and dynamics of groups of particles and rigid bodies. Lagrangian description of motion.

217. Metal Cutting Principles
First semester. Three credits. Two class periods and one 2-hour laboratory period. Prerequisite: CE 287 and MTGY 202 which may be taken concurrently.

† Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).
218. Manufacturing Systems
Second semester. Three credits. Two class periods and one 2-hour laboratory period. Prerequisite: ME 217, which may be taken concurrently.
A study of process aspects of manufacturing with particular reference to metal joining and casting. Relationship between manufacturing process and product design. Basic elements of numerically controlled metal processing systems. Organization required to manufacture.

220. Dynamics of Mechanical Systems
Second semester. Three credits. Prerequisite: MATH 210 and 211, ME 205, and CE 215 or 212.

221. Manufacturing Automation
First semester. Three credits. Prerequisite: Consent of instructor. Not open to students who have passed ME 386.
Introduction to Computer Integrated Manufacturing (CIM), Fundamentals of automated manufacturing; Computer Numerical Control (CNC); production economics and optimization of production systems.

222. Production Engineering
Second semester. Three credits. Prerequisite: Consent of instructor. Not open to students who have passed ME 387.

224. Analysis and Design of Mechanisms
First semester. Three credits. Prerequisite: MATH 210 and 211.
Application of kinematics in the analysis and synthesis of mechanisms. Type and dimensional design of linkages, cams and gears based on motion requirements and kinetostatic force transmission, in contrast to the strength requirements. Graphical, analytical and computer methods in analysis and design of mechanisms. Design considerations in mechanism synthesis. Design project.

Both semesters. Three credits. Prerequisite: CSE 123, CE 287, MATH 210 and consent of instructor.
Introduction to computer-aided graphics, modeling and design. Applications of graphics software and hardware with mini- and micro-computer systems. Interactive computer graphic techniques. Extensive laboratory study of wire-frame and raster computer graphics. Static and dynamic graphic presentation methods.

227. Design of Machine Elements
First semester. Three credits. Prerequisite: ME 205 and CE 287.
Application of the fundamentals of engineering mechanics, materials and manufacturing to the design and analysis of machine elements.

228. Introduction to Fatigue in Mechanical Design
Second semester. Three credits. Prerequisite: CE 287 or consent of instructor. Not open to students who have passed ME 365.
Design calculation methods for fatigue life of engineering components. Crack initiation and crack propagation fatigue lives; introduction to current literature in the field. Emphasis on finite life prediction by strain life methods.

229. Machine Design
Second semester. Three credits. Prerequisite: CE 287. This course and CE 289 may not both be taken for credit.

230. Linear Automatic Control Systems
Semester by arrangement. Three credits. Prerequisite: MATH 210 and 211.
Consolidated treatment of system analysis including modelling of electromechanical, pneumatic, hydraulic, thermal, and mechanical systems and their components. Closed loop control concepts related to these systems. Stability, instability issues. Basic treatment of Routh analysis, root locus, Bode, and Nyquist criterion. A hands-on open-ended control design project.

233. Thermodynamic Principles
Second semester. Three credits. Prerequisite: CHEM 127Q, PHYS 151Q and MATH 210Q and 211Q which may be taken concurrently. Open to sophomores.
Introduction to the First and Second Laws of Thermodynamics. Thermodynamic properties of pure substances and ideal gases. Analysis of ideal and real processes – including turbines, pumps, heat exchangers, and compressors.

234. Applied Thermodynamics
First semester. Three credits. Prerequisite: ME 233 or CHEG 211.
Thermodynamic first and second law analysis of vapor and gas cycles, property relations for simple pure substances, properties of ideal gas mixtures, psychrometry, fundamentals of combustion thermodynamics, application of thermodynamics in the design of thermal engineering systems.

239. Pollution from Combustion
Either semester. Three credits. Prerequisite: ME 234.
Introduction to combustion processes and chemical kinetics. Mechanism of the formation of pollutants such as nitrogen oxides, carbon monoxide, soot, and unburned hydrocarbons in stationary and vehicular power plants.

240. Principles of Combustion
First semester. Three credits. Prerequisite: ME 234, and 250, or equivalent.
A first course in combustion introducing some basic chemical thermodynamics and chemical kinetics principles as a background for an elementary treatment of flame propagation in pre-mixed mixtures, diffusion flames, explosions and detonations. Some aspects of coal combustion will also be discussed.
Medical Laboratory Sciences
Programs (MLS)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Course Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>295</td>
<td>Special Topics in Mechanical Engineering</td>
<td>Semester, credits and hours by arrangement or as announced. Prerequisite and/or consent: ME 227.</td>
</tr>
<tr>
<td>299</td>
<td>Problems in Mechanical Engineering</td>
<td>Semester and hours by arrangement. Credits by arrangement, not to exceed four. Open only to seniors in mechanical engineering. This course, with a change in topic, may be repeated for credit.</td>
</tr>
<tr>
<td>296</td>
<td>Mechanical Engineering Undergraduate Seminar</td>
<td>Second semester. One credit. One class period. Open only to seniors in mechanical engineering. Presentation and discussion of advanced topics in mechanical engineering.</td>
</tr>
</tbody>
</table>

Medical Technology (MT)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Course Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>260</td>
<td>Clinical Immunology and Virology</td>
<td>Either semester. Three credits. Prerequisite: To enroll in the course the student must earn a “C” or better in MLS 208 or 208W, which may be taken concurrently. Open only to Medical Technology majors; others with consent of Medical Technology Program Director. Manual and automated methods for the biochemical analysis of blood and body fluids; principles of operation, maintenance, and troubleshooting of laboratory instruments. Evaluation of test results in normal and diseased states.</td>
</tr>
<tr>
<td>201</td>
<td>Infectious Disease Process I</td>
<td>Either semester. Four credits. One 2-hour lecture, 4 hours of laboratory. Prerequisite: CHEM 141 or MCB 203 or MCB 204 which may be taken concurrently. Open only to Medical Technology majors; others with consent of Medical Technology Program Director. Immune responses in normal and diseased states; methods for the detection of antigens and antibodies in blood and body fluids; introduction to virology and immunology methods for the diagnosis of viral diseases.</td>
</tr>
</tbody>
</table>

† Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).
260. Open only to Medical Technology majors; others with consent of Medical Technology Program Director.

Venipuncture and special phlebotomy techniques, safety, ethics, and management of phlebotomy services.

261. Phlebotomy Laboratory
Either semester. One credit. Prerequisite: To enroll in the course the student must earn a “S” or better in MT 260. Open only to Medical Technology majors; others with consent of Medical Technology Program Director.

Application of the theory and techniques learned in MT 260 to the clinical laboratory setting. Understanding work flow, scheduling, teamwork, and quality assurance in the general laboratory environment.

264. Hematology
Either semester. Three credits. Prerequisite: To enroll in the course a student must earn a “C” or better in MT 210. Open only to Medical Technology majors; others with consent of Medical Technology Program Director.

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
First semester. Four credits. Prerequisite: To enroll in the course a student must earn a “C” or better in MT 210. Open only to Medical Technology majors; others with consent of Medical Technology Program Director.

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
Second semester. Four credits. Prerequisite: To enroll in the course a student must earn a “C” or better in MT 266. Open only to Medical Technology majors; others with consent of Medical Technology Program Director.

Application of the theory and techniques learned in MT 252 and MT 266 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
Second semester. One credit. Prerequisite: To enroll in the course a student must earn a “C” or better in MT 213. Open only to Medical Technology majors; others with consent of Medical Technology Program Director.

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
First semester. Two credits. Prerequisite: To enroll in the course a student must earn a “C” or better in MLS 208 or 208W. Open only to Medical Technology majors; others with consent of Medical Technology Program Director.

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
Either semester. One credit. Prerequisite: To enroll in the course a student must earn a “C” or better in MT 272. Open only to Medical Technology majors; others with consent of Medical Technology Program Director.

Renal physiology, chemical and microscopic examination of urine, correlation of results with disease states, chemical analysis of feces.

274. Hematology Laboratory
Second semester. Three credits. Prerequisite: To enroll in the course a student must earn a “C” or better in MT 264. Open only to Medical Technology majors; others with consent of Medical Technology Program Director.

Application of the theory and techniques learned in MT 272 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.

275. Transfusion Services Laboratory
Second semester. Two credits. Prerequisite: To enroll in the course a student must earn a “C” or better in MT 270. Open only to Medical Technology majors; others with consent of Medical Technology Program Director.

Application of the theory and techniques learned in MT 270 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.

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

Application of the scientific method of inquiry to plan, implement, evaluate and report a study of a special topic or investigation of a special topic not covered in undergraduate medical technology courses.

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 designed primarily for students who wish to extend their knowledge in some specialized areas in the field of Medical Technology.

Metallurgy & Materials Engineering (MMAT)

Head of Department: Professor John Morral
Department Office: Room 111, Institute of Materials Science Building

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

(Metallurgy & Materials Engineering courses were formerly offered under the MTGY department abbreviation using the same course numbers.)

201. Materials Science & Engineering I
Both semesters. Three credits. Prerequisite: CHEM 128 or 130 and PHYS 122, 132, or 152.

Relation of crystalline structure to chemical, physical, and mechanical properties of metals and alloys. Testing, heat treating, and engineering applications of ferrous and non-ferrous alloys.

202. Materials Science & Engineering Lab
Both semesters. One credit. One 3-hour laboratory period. Prerequisite: MMAT 201, which may be taken concurrently.

Illustrative experiments on microstructure, phase equilibria, heat treatment and mechanical properties.

203. Materials Science & Engineering II
Semester by arrangement. Three credits. Prerequisite: MMAT 201.

Structures, properties and processing of ceramics, polymers, and composites. Further development of the properties of these materials and of metals, including electrical, thermal, magnetic and optical behaviors. Case studies in materials selection.

204. Chemical Metallurgy
Semester by arrangement. Three credits. Prerequisite: CHEM 128, PHYS 151. Devereux.

Principles of chemical thermodynamics, reaction kinetics, and electrochemistry. Applications to interfacial phenomena, extraction and refining, and corrosion and electro-deposition.

205. Introduction to Mechanical Metallurgy
Semester and hours by arrangement. Three credits. Prerequisite: MMAT 201 or 203.

Elements of plastic deformation of metals and the role of crystal structure. Strengthening mechanisms. Fracture; including fatigue, stress corrosion and creep rupture. Test methods. Forming of metals.

206. Defects in Metals and Semiconductors
Semester by arrangement. Three credits. Prerequisite: MMAT 201 or 203. Galligan.

Equilibrium and non-equilibrium defects in crystals, their influence on various metallurgical and semiconducting properties of materials. Interrelationship of equilibrium defects to non-equilibrium defects and the influence on various properties of materials.
207. Failure Analysis  
Second semester. Three credits. Prerequisite: MMAT 201.  
Methods for determining the nature and cause of materials failure in structures and other mechanical devices. Analysis of case histories.

211. Structure and Properties of Alloys  
Semester by arrangement. Three credits. Prerequisite: MMAT 201 or 203. Clapp  
Microstructures of alloys and relationships between microstructure and properties.

217. Extractive Metallurgy  
Semester by arrangement. Three credits. Prerequisite: CHEM 128 or 130. Devereaux  
Pertinent engineering principles. General introduction to important extractive processes. Overall concepts of separation.

219. The Metallurgy of Welding  
Either semester. Three credits. Prerequisite: MMAT 201 or 203. Kattamis  
Basic metallurgical principles applied to welding and brazing processes. Effects of welding on material. Treatment and properties of welded joints. Welding defects and quality control.

222. Materials Processing – Metals  
First semester. Three credits. Prerequisite: MMAT 201 or 203.  
Achievement of desired dimensional, physical and chemical properties with manufacturing economy. Solidification, powder methods, joining, deformation, and surface treatments. Field trips.

229. Physical Ceramics  
Semester and hours by arrangement. Three credits. Prerequisite: CHEM 128 or 130 and PHYS 152. Kattamis  
Microstructure of crystalline ceramics and glasses and role of thermodynamics and kinetics on its establishment. Effect of process variables on microstructure and ultimately on mechanical, chemical and physical properties.

230. Introduction to Composite Materials  
Either semester by arrangement. Three credits. Prerequisites: MMAT 205 or MMAT 266.  

232. Introduction to High Temperature Materials  
Semester by arrangement. Three credits. Prerequisite: MMAT 201 or 203, or consent of the instructor.  
Plastic deformation of metals and other solid materials at elevated temperatures. Dislocation mechanisms; creep processes; oxidation. Strengthening mechanism, including ordering and precipitation hardening.

234. Materials Protection  
Semester by arrangement. Three credits. Not open for credit to students who have passed MTG 343. Greene  

236. Materials Characterization  
Semester by arrangement. Three credits. Two class periods and, every other week, a 3-hour laboratory period. Laboratory sections in addition to those initially listed will be arranged. Principles and experimental methods of optical, electron, and x-ray examination of engineering materials. Emphasis on use of x-ray analysis, with introduction to electron microscopy, Auger spectroscopy, scanning electron microscopy, and microanalysis.

238. Alloy Casting Processes  
Second semester by arrangement. Three credits. Prerequisites: MMAT 203 or MMAT 265 and MMAT 255 or equivalent.  
Principles of alloy solidification are discussed and applied in the context of sand, investment, and die casting; continuous and direct chill casting; electroslag and vacuum arc remelting, crystal growth, rapid solidification, and laser coating.

243. Introduction to Structure, Properties, and Processing of Materials I  
First semester. Two credits. Co-requisites: CHEM 128 and MATH 110. Not open for credit to students who have passed MMAT 201. Open to sophomores.  
Principles underlying the selection of materials and the characterization of micro- and atomic structure will be introduced, with emphasis on atomic and molecular structure, crystallography, solid solutions, binary phase diagrams, mass mass transport, cross linking, entanglement, and the relation of microstructure to properties.

244. Introduction to Structure, Properties, and Processing of Materials II  
Second semester. Three credits. Prerequisites: MMAT 243 or MMAT 201. Open to sophomores.  
Principles underlying the selection of materials and the control of microstructure through processing will be introduced, with emphasis on injection molding, extrusion, casting, particulate processing, electrochemistry, corrosion, refining, vapor processing, processing-property relations.

255. Transport Phenomena in Materials Processing  
First semester. Four credits. Three hours lecture and two hours laboratory. Co-requisites: MMAT 265 and MATH 210Q.  
Mechanisms and quantitative treatment of mass, energy, and momentum transfer will be applied to design and analysis of materials processing. Increasingly complex and open-ended engineering design projects will be used to illustrate principles of diffusion; heat conduction, convection, and radiation, and fluid flow.

256. Applied Thermodynamics of Materials  
Second semester. Three credits. Prerequisites: ME 233 or CHEG 263 and MMAT 265.  
Thermodynamic principles will be applied to the behavior and processing of materials. Topics covered will include solution thermodynamics: activity and activity coefficients; phase equilibrium; electrochemistry; slag metal and gas metal reactions.

265. Structure-Property Relations I: Phase Transformation Kinetics and Applications  
First semester. Three credits. Prerequisite: PHYS 152Q. Corerequisite: MMAT 243 or MMAT 210.  
Principles and applications of phase transformations to control microstructure and materials properties. In depth, quantitative coverage will include atomic and molecular arrangements; lattices; point, line, and surface defects; cross links, entanglements, glasses, diffusion; kinetics of nucleation and growth; and thermal treatments to control microstructure.

266. Structure-Property Relations II: Strengthening and Toughening Mechanisms  
Second semester. Three credits. Prerequisite: MMAT 265  
Principles and applications of strengthening and toughening mechanisms will be treated quantitatively with emphasis on line defects, microplasticity, displacive and disfusional transformations, fillers, sintering, creep, and creep rupture.

276. Materials Processing II: Thermal Mechanical  
Fundamental principles of materials processing and their quantitative application to process design will be illustrated for deformation processes: forging, rolling, drawing, extrusion, injection molding, powder compaction and sintering.

277. Materials Processing II: Thermal Fluid  
Fundamental principles of materials processing and their quantitative application to process design will be illustrated for materials processes involving liquids and gases: crystal growth, zone refining, shape casting, continuous casting, refining, welding, and vapor deposition.

283. Materials Characterization Laboratory I  
First semester. Three credits. Co-requisite: MMAT 243. Not open for credit to students who have passed MMAT 202. One 3-hour laboratory period. Open to sophomores.  
Principles of materials characterization and materials selection illustrated by hands-on experience with microscopy, testing, and analysis of design criteria for selection of materials for engineering systems (reverse engineering).

284. Materials Processing Laboratory  
Principles of materials processing will be illustrated by hands-on experience with qualitative and quantitative microscopy, testing, and reverse engineering, with experiments on polymer extrusion and injection molding, alloy casting, cluting, particle compaction, sintering, forging, welding, and electrodeposition.

285. Mechanical Behavior Laboratory  
First semester. One credit. Co-requisite: MMAT 265. Three hours laboratory.  
Characterization of mechanical properties of materials and fundamentals of materials deformation and fracture processes will be experienced through hands-on projects with tensile, rheological, cyclic, and high temperature testing; drawing; forging; extrusion; rolling; and hot pressing.

286. Materials Characterization Laboratory II  
Second semester. One credit. Prerequisite: MMAT 265. One 3-hour laboratory period.  
Hands-on experience with materials
characterization will be gained through work shops on 
X-ray fluorescence and diffraction, scanning electron 
microscopy, electronic and magnetic property 
measurement, and failure analysis.

287. Capstone Design Project I
First semester. Two credits. Four hours practicum. 
Prerequisites: MMAT 266 and MMAT 276.

Seniors working in teams with faculty and industry 
mentors wolve open ended projects in design of 
materials, products, and processes. Oral and written 
reports are required in each semester. For students with 
high academic standing the BSE and MS projects may 
overlap.

288. Capstone Design Project II
Second semester. Two credits. Four hours practicum. 
Prerequisites: MMAT 266 and MMAT 276.

Seniors working in teams with faculty and industry 
mentors wolve open ended projects in design of 
materials, products, and processes. Oral and written 
reports are required in each semester. For students with 
high academic standing the BSE and MS projects may 
overlap.

298. Special Topics in Metallurgy
Both semesters. Three credits. Prerequisite: Consent of 
Instructor. With a change in topic this course may 
be repeated for credit.

299. Introduction to Research
Both semesters. Credits and hours by arrangement. 
Prerequisite: Consent of Instructor. With a change in 
topic this course may be repeated for credit. Some 
sections of this course are graded Satisfactory/Un-
satisfactory.

Methods of research and development. Laboratory 
investigation. Correlation and interpretation of 
experimental results. Writing of technical reports.

Military Science (MISI)

Head of Department: Lieutenant Colonel Charles P. 
Lynch
Department Office: ROTC Office, Army, 28 North 
Eagleville Road

131. General Military Science I
Either semester. One credit. One class period. 
Organization of the Army, basic soldier skills; 
ropes, knots, and tarpauling; individual physical fitness; 
land navigation; time management; role of regular 
Army, Reserve and National Guard; M16 rifle.

132. General Military Science I
Either semester. One credit. One class period. 
Organization and equipment of small military units, 
fundamentals of marksmanship and military instruction 
techniques. Leadership lab as announced. Army 
customs and traditions; land navigation; heat and cold 
survival; tactical communications; military correspon-
dence; leadership/professional ethics; branches of 
Army; encoding and decoding messages.

133. General Military Science: Air Rifle 
Marksmanship
Both semesters. One credit. One class period, two hours 
lecture and laboratory. May be taken only once for 
credit.

Air Rifle Marksmanship will provide an introduction to the fundamentals of rifle marksmanship, 
the safe and proper use, and care of the rifle, the 
elements of competitive shooting, and the psychology 
of shooting.

145. General Military Science II
Either semester. One credit. One class period and lead-
ership laboratory.

Map reading, mountaineering, principles of war.

146. General Military Science II
Either semester. One credit. One class period and lead-
ership laboratory.

Emergency First Aid, leadership, military 
instruction techniques.

252. General Military Science III
First semester. Three credits. One 3-hour class period 
and leadership laboratory. One weekend field training 
exercise. Prerequisite: Completion of the basic course in 
Army staff organization, unit administration and 
management, logistics, military intelligence, leadership 
seminar, the international system, and strategic doctrine.

297. General Military Science IV
First semester. Three credits. One 3-hour class period 
and leadership laboratory. One weekend field training 
exercise. Prerequisite: MISI 252.

Army staff organization, unit administration and 
management, logistics, military intelligence, leadership 
seminar, the international system, and strategic doctrine.

Modern and Classical Languages

Head of Department: Professor David K. Herzberger
Department Office: Room 228, J.H. Arjona Building

101-102. Elementary Levels I and II

103-104. Intermediate Levels I and II

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

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.

201. Gene Expression
Second semester. Three credits. Recommended prepa-
rations: MCB 200 or 210 or 229. Open to sophomores.

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 also be corequisite.) Open to 
seniors. Not open for credit to students who have 
passed MCB 204.

203. Biochemistry
First semester. Five credits. Four class periods and 
one 3-hour laboratory. Prerequisite or corequisite: 
CHEM 244. Recommended preparation: MCB 210 
or MCB 229. Not open for credit to students who 
have passed MCB 203. Teshcke

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. Human Metabolism and Disease
Second semester, alternate years. Two credits. Pre-
requisite: MCB 203 or 204, or consent of instructor. Albert

A thorough analysis of the inter-relationships of

Modern Greek (MGRK)

Head of Department: Professor David K. Herzberger
Department Office: Room 228, J.H. Arjona Building

101-102. Elementary Levels I and II

103-104. Intermediate Levels I and II

Teschcke

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. Prerequisite or corequisite: 
CHEM 244. Recommended preparation: MCB 210 
or MCB 229. Not open for credit to students who 
have passed MCB 203. Teshcke

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.

205. Human Metabolism and Disease
Second semester, alternate years. Two credits. Pre-
requisite: MCB 203 or 204, or consent of instructor. Albert

A thorough analysis of the inter-relationships of
metabolic pathways in connection with human health and disease, including inherited metabolic diseases and the role of hormones in metabolic pathways.

206. **Fundamentals of Structural Biology**
First semester. Three credits. Prerequisite: BIOL 107 or CHEM 128, or consent of instructor. Yeagle
An introduction to principles underlying the structure and function of the molecules guiding life processes. These principles will be applied to proteins, DNA/RNA and membranes as well as to the energetics of life processes.

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, radioactive assay, 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. Braswell
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 or corequisite: MCB 204 or 203 or consent of instructor. Knox
Correlation of three-dimensional molecular architecture with biochemical function in proteins, nucleic acids, and large assemblies such as viruses and ribosomes. Folding motifs and domains; molecular ancestry/homology; molecular recognition at the atomic level, as in DNA/protein complexes; structural basis of enzyme specificity and catalysis. Structure prediction from sequence; principles of structure determination by x-ray diffraction, NMR and CD spectroscopy, and electron microscopy. X-ray laboratory and graphics demonstrations.

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. Lynes
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 and Functional Genomics**
Second semester. Three credits. Prerequisite: MCB 200 or 213. Recommended preparation: MCB 204 or 203. R. O’Neill
Methods and applications of genetic engineering, including gene manipulation and transfer techniques in prokaryotes and eukaryotes. Emphasis on applications of recombinant DNA technology in elucidation of gene function. Consideration of recent technological developments in molecular genetics, such as cloning, gene therapy, the patenting and release of genetically engineered organisms, and societal issues related to these developments.

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 three hour laboratory session. Prerequisite: MCB 200. 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. Recommended preparation: MCB 204; 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, archaea, 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.
The principles of heredity and their implications for society.

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 or corequisite: MCB 219, or six credits of college biology and consent of instructor. Not open for credit to students who have passed MCB 223.
Analysis of principles of morphogenesis and differentiation.

220W. **Laboratory in Developmental Biology**
(Formerly offered as MCB 223.) Second semester. Four credits. Two 3-hour laboratory periods and two discussion/recitation periods. Prerequisite or corequisite: MCB 219, or two semesters of college biology and consent of instructor.

221. **Introduction to Molecular Evolution and Bioinformatics**
First semester. Three credits. Recommended preparation: At least one 200 level course in MCB. Open to sophomores. Gogarten
Evolution of biomolecules, and application to molecular data analysis and the design of new molecules. Topics include prebiotic chemistry, origin of cells, selfish genes, molecular innovations, data bank searches, alignment of sequence and 3-D protein structures. Course includes lectures, discussions and computer lab exercises.

222W. **Human Disease and the Development of Therapeutic Agents**
First semester. Three credits. Recommended preparation: one 200 level course in MCB. Kendall
Molecular basis of human disease and strategies for developing therapeutic treatments. Applications of genetic, cellular, and biochemical information in treating disease states. Especially appropriate for students interested in biomedical research and the health profession.

224. **Experiments in Bacterial Genetics**
Second semester. Three credits. Two 3/1/2 hour laboratory/lecture periods. Prerequisite: MCB 213. Prerequisite or corequisite: MCB 217 or 229. 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 2-1/2-hour laboratory period. Prerequisite or corequisite: CHEM 141 or 243. Recommended preparation: BIOL 107 or equivalent. Open to sophomores. Sage, Terry, Vinopal
Biology 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.
232C. Microcomputer Applications in Molecular and Cell Biology
First semester. Three credits. One 1-hour lecture and two 3-hour laboratories. Recommended preparation: MCB 200 or 204 or 210 or 213 or 229. Braswell
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
Second 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
First semester. Two 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 ecology and physiology 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
Second 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. Leadbetter
Discussion of current research in molecular and cellular biology. Focus on 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.

259. Plant Physiology
First session. Three credits. Three 1-hour class periods. Recommended preparation: BIOL 108 (or 110) and CHEM 128.
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, long-distance and trans-membrane transport, selected biochemical pathways, phytohormones, photomorphogenesis and movements in plants.

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

290. Forensic Application of DNA Science
Second semester. Three credits. Recommended preparation: a course in genetics. Strausbaugh
DNA analysis in forensic science, with emphasis on molecular genetic technology in criminal investigations and issues surrounding the use of DNA evidence. Team-taught with forensic practitioners.

292W. Senior Research Thesis in Molecular and Cell Biology
Either semester. Three credits. Hours by arrangement. Prerequisite or corequisite: Three credits of MCB 299. 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. With a change in content, may be repeated for credit. Prerequisites and recommended preparation vary.

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

299. Independent Study
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.

Music (MUSI)

Head of Department: Professor Robert F. Miller
Department Office: Room 230, Music Building
For major requirements, see the School of Fine Arts section of this Catalog.

†101. Convocation, Concert and Recital Repertoire
Required of all music majors every semester of residence. No credit. Maker, Larrabee

108. Varsity Band
Either semester. One credit. Two laboratory periods. Open only with consent of instructor. May be repeated for credit. Mills
Repetory, rehearsal techniques, preparation and presentation of performances in support of the University community.

109. Marching Band
First semester. One credit. Three laboratory periods. Open only with consent of instructor. May be repeated for credit. Mills
Repetory, rehearsal techniques, preparation and presentation of marching band shows.

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

110. Band
Either semester. One credit each semester. Three laboratory periods. Open only with consent of instructor. May be repeated for credit. Wind Ensemble, Symphony Band, Concert Band. Mills, Renshaw
Repetory, rehearsal technique, preparation and presentation of concerts.

111. Chorus
Either semester. One credit each semester. Three laboratory periods. Open only with consent of instructor. May be repeated for credit. Concert Choir, Chamber Singers, University Chorale. Bagley
Choral repertoire from all periods, concentration on vocal and choral techniques as related to musical styles, preparation and presentation of concerts.

112. Orchestra
Either semester. One credit each semester. Three laboratory periods. Open only with consent of instructor. May be repeated for credit. Sacco
Standard symphonic repertoire, technique of orchestral routine, preparation and presentation of concerts.

113. Chamber Ensemble
Semester by arrangement. One credit each semester. Three laboratory periods. Open only with consent of instructor. May be repeated for credit.
Preparation and presentation of concerts.

114. Voices of Freedom Gospel Choir
Either semester. One credit. One 2-hour laboratory period. Open only with consent of instructor. May be repeated for credit.
Preparation and presentation of concerts.

115. Jazz Ensemble
Either semester. One credit. Two laboratory periods. Open only with consent of instructor. May be repeated for credit.
Jazz repertoire, rehearsal techniques, preparation and presentation of concerts.

116. Small Ensemble
Either semester. One credit. Two laboratory periods. Open only with consent of instructor. May be repeated for credit. As a requirement for credit, the student must participate in MUSI 110, 111, or 112.
Small ensemble music under the direction of a conductor. Preparation and presentation of concerts.

117. Women’s Choir
Either semester. One credit. Two 1 1/2 hour laboratory periods. Open only with consent of instructor. May be repeated for credit.
Choral repertoire from all styles, concentration on vocal and choral techniques as related to musical styles, preparation and presentation of concerts.

118. Collegium Musicum
(Formerly offered as MUSI 220.) Either semester. One credit per semester. One lecture period, two laboratory periods. Open only with consent of instructor. May be repeated for credit. Bellingham
Performance practices, iconography, notation, instrumentation in vocal and instrumental music before 1700. Preparation and participation in historically authentic performance.
119. Opera Workshop
(Formerly offered as MUSI 221.) Either semester. One credit each semester. Three laboratory periods. Open only with consent of instructor. May be repeated for credit. McClain
Performance practices. Preparation and participation in scenes from operatic repertoire.

121. Secondary Applied Music
Either semester. One credit each semester. May be repeated for credit. Ensemble required with conditions stated under MUSI 122. Open only with consent of instructor and department head.

122. Applied Music
Bn (Bassoon), Co (Cello), Ct (Clarinet), Em (Euphonium), Fe (Flute), Fn (French Horn), Gr (Guitar), Hp (Harp), Oe (Oboe), On (Organ), Pn (Percussion), Pp (Piano), Se (Saxophone), Ss (String Bass), Tb (Trombone), Tt (Trumpet), Ta (Tuba), Vi (Viola), Vn (Violin), Vc (Viole).

Either or both semesters. One to 3 credits each semester. May be repeated for credit. Participation in an appropriate ensemble, MUSI 110, 111, or 112, is required each semester for students registered in MUSI 122 unless exception is made by the department head. Open to qualified students. Before registering for the course, students must obtain an audition with the department and obtain the consent of the department head. Open only with consent of instructor.

A fee of $70 for one-half-hour lesson per week or $135 for a one-hour lesson per week per semester is charged all students receiving private instrumental or vocal instruction.

123. Class Instruction in Piano
Either or both semesters. One credit each semester. Two class periods and required practice. May be repeated for credit. Open only with consent of instructor. Clark

124. Applied Accompanying
One credit per semester. One class period per week by arrangement. Open only with consent of instructor. This course is intended for students whose area of emphasis is keyboard. An audition is required for all other students.

Performance class in accompanying skills.

125. Applied Music Techniques
Bs (Bass), Ps (Percussion), Sg (String), Ve (Voice), Wd (Woodwind).

Either semester. One credit. Two laboratory periods. May be repeated for credit. Open only with consent of instructor. Performance and teaching techniques.

126. Introduction to Diction for Singers
First semester. One credit. Two one-hour laboratory periods. Prerequisite: concurrent registration in applied voice study under MUSI 122, 222, or 323. McClain
An introduction to the International Phonetic Association (IPA) symbols with special application to the study of English diction for singers.

127. Italian Diction for Singers
Second semester. One credit. Two one-hour laboratory periods. Prerequisite: MUSI 126 and concurrent registration in applied voice study under MUSI 122, 222, or 323.

A continuing study of the IPA symbols with their special application to the study of Italian diction for singers.

128. German Diction for Singers
First semester. One credit. Two one-hour laboratory periods. Prerequisite: MUSI 126 and concurrent registration in applied voice study under MUSI 122, 222, or 323. McClain
A continuing study of the IPA symbols with their special application to the study of German diction for singers.

129. French Diction for Singers
Second semester. One credit. Two one-hour laboratory periods. Prerequisite: MUSI 126 and concurrent registration in applied voice study under MUSI 122, 222, or 323.

A continuing study of the IPA symbols with their special application to the study of French diction for singers.

130. Honors Harmony I
First semester. Four credits. Three class periods and two 1-hour laboratory periods. Prerequisite: Open only with consent of instructor. Kaminsky
Continuation of honors harmony I.

131. Honors Harmony II
Second semester. Four credits. Three class periods and two 1-hour laboratory periods. Prerequisite: MUSI 135. Kaminsky
Continuation of Honors Harmony I.

132. Introduction to Improvisation
Either semester. One credit. One laboratory period. Open only with consent of instructor. May be repeated once for credit.

Basic jazz theory and the elements of improvisation.

133. Harmony I
First semester. Four credits. Three class periods and two 1-hour laboratory periods. Open only with consent of instructor. Not open for credit to students who have passed MUSI 135. Kaminsky
Writing and analysis of tonal harmony; relation to melody and counterpoint. Elementary score reading; sight-singing; melodic and harmonic dictation; introduction to counterpoint; model composition and elements of form.

134. Harmony II
Second semester. Four credits. Three class periods and two 1-hour laboratory periods. Prerequisite: MUSI 145. Not open for credit to students who have passed MUSI 136. Kaminsky
Continuation of MUSI 145.

135. Fundamentals of Music I
Either semester. Three credits. Maker
Basic skills in note reading, rhythm, meter, pitch symbols, scales, key-signatures, intervals, and triads. No previous training is required.

136. Fundamentals of Music II
Second semester. Three credits. Prerequisite: MUSI 153 or consent of instructor. Lazovsky
Traditional harmonic principles, four-part writing, sight singing and melodic dictation.

137. Introduction to Ear Training
Second semester. Three credits.

Music reading, sight-singing, and dictation.

138. Non-Western Music
Either semester. Three credits. Intended primarily for students who are not music majors. Not open for credit to students who have passed MUSI 292W.

Folk, popular, and classical musics of selected non-Western cultures, with an emphasis on the distinctive characteristics of each culture.

139. Music Appreciation
Either semester. Three credits. No previous training is required. Not appropriate for students who have previously passed MUSI 193 or 194. Not intended for students with previous musical experience.

An approach toward intelligent listening, illustrated by recordings.

140. Introduction to Music History I
First semester. Three credits. Not intended for music majors.

Music history in relation to other arts from the early Christian era to J.S. Bach (1750). Some background in music fundamentals or performance is highly recommended.

141. Introduction to Music History II

Music history in relation to other arts from the mid 18th Century to the present. Some background in music fundamentals or performance is highly recommended.

142. Practicum in Music
Either or both semesters. Credits and hours by arrangement. Open only with consent of instructor. May be repeated for credit.

143. Music, History, and Ideas
Either semester. Three credits. Open only with consent of instructor.

Relationships of musical styles to cultural and intellectual backgrounds.

144. The Composer and the Composer's World
Either semester. Three credits. Prerequisite: MUSI 286 or consent of instructor. May be repeated for credit with a change in content.

Selected works in relation to the musical institutions, musical style, social, intellectual and political milieu, and biography of composer(s).

145. Music of the Church
First semester. Three credits. Prerequisite: MUSI 286 or consent of instructor.

Plain song, mass, motet, cantata, oratorio, and other forms of church music.

146. Music of the Theater
Second semester. Three credits. Prerequisite: MUSI 286 or consent of instructor.

Opera, ballet, and other types of music for the theater.

147. Music of the World
Second semester. Three credits. Prerequisite: MUSI 286 or consent of instructor.

Concerto, symphony, symphonic poem, and other forms of music for orchestral ensembles.

148. Orchestral Music
First semester. Three credits. Prerequisite: MUSI 286 or consent of instructor.

String quartet, trio sonata, and other forms of music for various small ensembles.

† Students taking this course will be assigned a final grade of S (satisfactory) or U (unsatisfactory).
215W. Chamber Music

216. Solo Literature
Second semester. Three credits. Prerequisite: MUSI 286 or consent of instructor.
Keyboard music, the art song, and other types of music for instrumental or vocal soloists.

217. A History of Jazz
Either semester. Three credits. Prerequisite: MUSI 146.

222. Applied Music, Advanced Course
Either or both semesters. Credits and hours by arrangement. Ensemble required with conditions stated under MUSI 122. Prerequisite: Advanced standing in performance as recommended by a faculty jury, recommendation by an instructor in this department, and consent of the Department Head. May be repeated for credit.
A continuation of MUSI 122 for students with proven ability. Fees for this course are at the same rate as described for MUSI 122.

225. Vocal Literature I
First semester. Two credits. Two class periods. Corequisite: MUSI 222 and consent of instructor.
Continuation of Honors Harmony II, including physical aspects of conducting, reading of full and condensed scores.

226. Vocal Literature II
Second semester. Two credits. Two class periods. Corequisite: MUSI 222 and consent of instructor.
Musical structure and expression; melodic, harmonic, rhythmic and contrapuntal relationships; style analysis.

228. Vocal Literature IV
Second semester. Two credits. Two class periods. Corequisite: MUSI 222 and consent of instructor.
Classical Period Songs; German Lied.

229. Instrumental Pedagogy and Literature
Either semester. One or two credits. One or two instrumental hours per week. Corequisite: MUSI 222 (upperclass level). May be repeated for credit to a maximum of four semesters. Open only with consent of instructor.

232. Conducting I
Either semester. Two credits. Prerequisite: MUSI 146. Renshaw
Physical aspects of conducting, reading of full and condensed scores.

233. Conducting II: Choral
Either semester. Two credits. Prerequisite: MUSI 232. Bagley

234. Conducting II: Instrumental
Either semester. Two credits. Prerequisite: MUSI 232. Renshaw

235. Honors Harmony III
First semester. Four credits. Three class periods and two 1-hour laboratory periods. Prerequisite: MUSI 136. Open to sophomores. Continuation of Honors Harmony II, including writing and analysis of harmonic and formal analysis.

236. Honors Harmony IV
Second semester. Four credits. Three class periods and two 1-hour laboratory periods. Prerequisite: MUSI 235. Open to sophomores. Bass Continuation of Honors Harmony II, including writing and analysis of harmonic and formal analysis.

238. Jazz Improvisation and Performance
Either semester. One credit. One laboratory period. Prerequisite: MUSI 133 or consent of instructor. May be repeated for credit.
Advanced jazz theory, styles, and ensemble techniques.

239. Jazz Arranging I
First semester. Two credits. Two class periods. Prerequisite: MUSI 146 or equivalent and consent of instructor.
Arranging and composition of chamber jazz ensembles and big band.

240. Jazz Arranging II
Second semester. Two credits. Two class periods. Prerequisite: MUSI 239 and consent of instructor.
Continuation of MUSI 239.

241. Jazz: Theory and Performance
Either semester. Two credits. Two class periods. Prerequisite: MUSI 146 and consent of instructor. Open to sophomores.
Performance, improvisation, arranging, and ensemble techniques.

245. Harmony III
First semester. Four credits. Three class periods and two 1-hour laboratory periods. Prerequisite: MUSI 146. Open to sophomores. Not open for students who have passed MUSI 235. Bass

246. Harmony IV
Second semester. Four credits. Three class periods and two 1-hour laboratory periods. Prerequisite: MUSI 245. Open to sophomores. Not open for credit to students who have passed MUSI 236. Bass

250. Introduction to Electronic Composition
Either semester. Three credits. Prerequisite: MUSI 264 or consent of instructor.
Composition by synthesizer and computer.

251. Composition I
First semester. Three credits. Prerequisite: MUSI 246 or consent of instructor.
Creative writing in the smaller forms. Extensive analysis and discussion.

252. Composition II
Second semester. Two credits. Prerequisite: MUSI 251 and consent of instructor.

253. Composition III
Either or both semesters. Two credits. Hours by arrangement. May be repeated for credit. Prerequisite: MUSI 252 and consent of instructor.
Individual instruction in musical composition.

257. Form and Analysis I
Either semester. Three credits. Prerequisite: MUSI 246. Not open for credit to students who have passed MUSI 236 with a grade of “B” or better.
Musical structure and expression; melodic, harmonic, rhythmic and contrapuntal relationships; style analysis.

258. Form and Analysis II
Either semester. Three credits. Prerequisite: MUSI 257. Continuation of MUSI 257. Emphasis on the larger works of the 19th-century and 20th-century styles.

258W. Form and Analysis II
Either semester. Three credits. Prerequisite: MUSI 245 and consent of instructor. Maker

MUSIC 159

260. Acoustics and the Perception of Music
Either semester. Three credits. Prerequisite: Pass Q-Course Readiness Test or MATH 101.
Science of music, using basic quantitative techniques.

262. Elementary Descriptive Acoustics
Either semester. Three credits. Prerequisite: PSYC 132.
Introduction to music perception, learning and development.

264. Electronic Music Techniques
Either semester. Three credits. Open only with consent of instructor.
Theory and application of standard electronic music systems and techniques of sound synthesis.

265. Music Communications
First semester. Three credits. Prerequisite: MUSI 262 and 263.
Communication between performer and listener in music.

266. Musical Tests and Measurements
Either semester. Three credits. Prerequisite: MUSI 246 (Harmony IV) or equivalent and consent of instructor.
Significant aspects of musical evaluation, with emphasis on the uses and limitations of standardized music tests of achievement and aptitude and problems of musical performance evaluation.

276C. Microcomputers in Music Education
Either semester. Two credits. Two laboratory/discussion periods. Open only with consent of instructor.
Uses of micro-computers in the school music program.

271. Seminar: The Life and Works of Individual Composers
Either semester. Three credits. Prerequisite: MUSI 286 and one MUSI 200-level W course. Open only with consent of instructor. With a change in content, may be repeated once for credit.

272. Seminar: Style Periods in Music History
Either semester. Three credits. Prerequisite: MUSI 286 and one MUSI 200-level W course. Open only with consent of instructor. With a change in content, may be repeated once for credit.

273. Seminar in Music Education
Either semester. One or two credits. One or two class periods. Open only with consent of instructor. With a change in content, may be repeated once for credit.

274. Seminar: History of Musical Forms
Either semester. Three credits. Prerequisite: MUSI 286 and one MUSI 200-level W course. Open only with consent of instructor. With a change in content, may be repeated once for credit.

275. Orchestration I
Second semester. Three credits. Prerequisite: MUSI 245 and consent of instructor. Junda

279. Individual Composers
Either semester. Three credits. Prerequisite: MUSI 286 and one MUSI 200-level W course. Open only with consent of instructor. With a change in content, may be repeated once for credit.

286. Elementary Descriptive Acoustics
Either semester. Three credits. Prerequisite: PSYC 132.
Traditional approaches to music perception, learning and development.

287. Microcomputers in Music Education
Either semester. Two credits. Two laboratory/discussion periods. Open only with consent of instructor.
Uses of micro-computers in the school music program.

291. Seminar in Music Education
Either semester. One or two credits. One or two class periods. Open only with consent of instructor. With a change in content, may be repeated once for credit.

294. Seminar: Individual Composers
Either semester. Two credits. Prerequisite: MUSI 286 and one MUSI 200-level W course. Open only with consent of instructor. With a change in content, may be repeated once for credit.

295. Seminar: History of Musical Forms
Either semester. Three credits. Prerequisite: MUSI 286 and one MUSI 200-level W course. Open only with consent of instructor. With a change in content, may be repeated once for credit.

296. Microcomputers in Music Education
Either semester. Two credits. Two laboratory/discussion periods. Open only with consent of instructor.
Uses of micro-computers in the school music program.

297. Seminar: The Life and Works of Individual Composers
Either semester. Three credits. Prerequisite: MUSI 286 and one MUSI 200-level W course. Open only with consent of instructor. With a change in content, may be repeated once for credit.

298. Seminar: Style Periods in Music History
Either semester. Three credits. Prerequisite: MUSI 286 and one MUSI 200-level W course. Open only with consent of instructor. With a change in content, may be repeated once for credit.

299. Seminar in Music Education
Either semester. One or two credits. One or two class periods. Open only with consent of instructor. With a change in content, may be repeated once for credit.

301. Seminar: Individual Composers
Either semester. Two credits. Prerequisite: MUSI 286 and one MUSI 200-level W course. Open only with consent of instructor. With a change in content, may be repeated once for credit.

302. Seminar: History of Musical Forms
Either semester. Three credits. Prerequisite: MUSI 286 and one MUSI 200-level W course. Open only with consent of instructor. With a change in content, may be repeated once for credit.

303. Microcomputers in Music Education
Either semester. Two credits. Two laboratory/discussion periods. Open only with consent of instructor.
Uses of micro-computers in the school music program.
276. Orchestration II
First semester. Three credits. Prerequisite: MUSI 275. Maker
Scoring problems, score reading, and study of scores in the standard literature.

277. Counterpoint I
Either semester. Three credits. Prerequisite: MUSI 246. Two- and three-voiced textures in the principal 16th-century styles: Josquin, Lassus, Palestreina.

278. Counterpoint II
Either semester. Three credits. Prerequisite: MUSI 277.

279Q. Twentieth Century Theory and Analysis
Either semester. Three credits. Prerequisite: MUSI 246 and MUSI 257. With consent of instructor, MUSI 257 may be taken concurrently. Bass
Analytical techniques appropriate to selected styles of twentieth century music. Problems in twentieth century counterpoint and composition.

281. Vocal Pedagogy
Either semester. Two credits. Two class periods. Prerequisite: MUSI 222 and consent of instructor. Vasil
Vocabulary, methodology and practical application of pedagogical techniques.

283. Marching Band Techniques
First semester. Two credits. Two class periods. Open only with consent of instructor. Mills
Scoring for the outdoor band, administration, marching and maneuvering.

284. Music History and Literature Before 1700
(Formerly Offered as MUSI 287.) First semester. Three credits. Prerequisite: MUSI 146 or consent of instructor. Open to sophomores. Bellingham
Medieval, Renaissance, to High Baroque periods. Score study, development of notation, and relation to other artistic traditions.

285. Music History and Literature 1700-1830
First semester. Three credits. Prerequisite: MUSI 287. Open to sophomores. Leading composers, genres, elements of style, form and harmony, musical institutions and aesthetics in the High Baroque, Pre-classic, and Classic periods.

286. Music History and Literature 1830 to Present
Second semester. Three credits. Prerequisite: MUSI 285. Open to sophomores. The romantic period and the Twentieth Century.

290. Theory Review
First semester. Three credits.
An overview of traditional undergraduate theory. Intended for graduate students in Music.

291. Procedures in Historical Research
Either semester. Three credits. Prerequisite: MUSI 286 and one MUSI 200-level W course. Open only with consent of instructor.
A project-oriented approach to bibliographic tools and research methods applicable to the historical study of music.

292W. Music in World Cultures
Either semester. Three credits. Not open for credit to students who have passed MUSI 190. Prerequisite: MUSI 286 and consent of instructor.
Comparison of musical concepts, styles, and performance practice in the social context of various cultures.

295. Music of the Twentieth Century
Either semester. Three credits. Prerequisite: MUSI 286.

297. Senior Recital
Required of all Bachelor of Music performance majors. No credit.

298. Special Topics
Either semester. Credits and hours by arrangement. Open only with consent of instructor. May be repeated for credit.
Classroom course in a special topic as announced in advance for each semester.

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

Natural Resources Management and Engineering (NRME)

Department Head: Professor David B. Schroeder
Department Office: Room 308, W.B. Young Building

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

100. Environmental Science
First semester. Three credits. Two class periods and one 3-hour laboratory period. Neumann
An introduction to basic concepts and understanding of Natural Resources Systems and the effects of society on the environment.

110. Introduction to Natural Resources
First semester. One credit. Open only to lower division students or by consent.
An introduction to the field of renewable resources. Field trips required.

130. Environmental Conservation
Second semester. Three credits. Barclay
Overview of conservation policy development from colonial period to present and development of the environmental movement in the U.S. Discussion of the context and complexity of some contemporary environmental policy issues.

204. Wetlands Biology and Conservation
Second semester, alternate years (even). Three credits. Three class periods and one weekend field trip. Recommended preparation: BIOL 107 and 108 or consent of instructor. Clausen
Principal wetland habitats of North America are surveyed, and the relationship of wildlife associations to biological and physical features of wetlands is reviewed. Emphasis is placed on issues relating to wetlands conservation and management.

205. Stream Ecology
Second semester. Three credits. Prerequisite: Biology: EEB 244.
A broad overview of stream ecology will be presented. Emphasis will be placed on the biota and the application of ecosystem and community ecology to running water habitats. Human influences on stream systems will also be discussed.

208. Introduction to Aquaculture
Either semester. Three credits. Two class periods, one 2-hour laboratory. Prerequisite: BIOL 107 or 108 or consent of instructor.
Basic principles and practice of environmentally compatible aquaculture. Emphasis on commercial aquaculture production including concepts and principles of various re-circulation systems, species, and culture techniques. Application of biotechnology will also be covered.

210. Air Pollution
First semester. Three credits. Prerequisite: NRME 241 or consent of instructor. Miller
The meteorology, effects and controls of air pollution.

211. Watershed Hydrology
Second semester, alternate years (even). Three credits. Recommended preparation: NRME 242 or ENGR 150, or consent of instructor. Open to sophomores.

214. Dendrology
First semester. Three credits. Prerequisite: NRME 217 or consent of instructor. Recommended preparation: Prior course work in ecology. Must be taken with another P course in NRME to equal one W course.

217. North American Wildlife
First semester. Three credits. Prerequisite: BIOL 107. Open to sophomores. Ortega
An introduction to wildlife conservation programs and resource values. The distribution, life history and status of those birds and mammals whose populations man is attempting to preserve, reestablish, or to control are examined.

232P. Wildlife Management
Second semester. Three credits. Prerequisite: NRME 217 or consent of instructor. Recommended preparation: Prior course work in ecology. Must be taken with another P course in NRME to equal one W course.

233. Wildlife Management Techniques
First semester, alternate years. Two credits. One 4-hour laboratory period. Prerequisite: EEB 200. Open only with consent of instructor. One or more field trips will be required.

Collection and reporting of biological data upon which wildlife conservation decisions are based.

235P. Principles of Fishery Management
Second semester. Four credits. Three class periods and one 2-hour laboratory period. Prerequisite: EEB 200 and one course in statistics, or consent of instructor. Must be taken with another P course in NRME to equal one W course.

Principles and practices of fisheries management with applications to biota, habitat, and human users to produce desirable fish populations and communities. Selected topics include harvest regulations, fish population dynamics, stocking concepts, age and growth, and habitat management.
237. Introductory Remote Sensing
First semester. Three credits. Two class periods and one 2-hour laboratory period. Open to only CANR students and GEOG major or with consent of instructor. Cicco
The principles of the interpretation of remote sensing imagery acquired from aircraft and satellite platforms will be studied. Various applications of remote sensing will be discussed.

238V. Advanced Remote Sensing
Second semester. Three credits. Two class periods and one 2-hour laboratory period. Prerequisite: NRME 237. Open only with consent of instructor. Cicco
The principles of quantitative remote sensing, image processing and pattern recognition will be studied. Computer-assisted data analysis techniques will be used.

239W. Natural Resources Planning and Management
Second semester. Three credits. Prerequisite: Senior standing or consent of instructor. Clausen
Concepts and methods of planning for the allocation, management and utilization of terrestrial and aquatic ecosystems. Techniques and methods of managerial decision making. Written technical reports required.

240. Environmental Law
First semester. Three credits.
An overview of environmental law including the common law principles of nuisance, negligence, and trespass. Students will become acquainted with legal research techniques; emphasis will be on federal, state, and municipal programs addressing clear air, clean water, hazardous waste, inland wetlands, coastal zone management, and prime agricultural farm land and aquifer protection.

241. Meteorology
First semester. Three credits. Yang
A survey course in meteorology at the introductory level covering weather and climate processes.

242. Natural Resources Measurements
First semester. Four credits. Two class periods and two 2-hour laboratories. Field trips required. Open to sophomores. Miller
Principles and instrumentation used in the measurement of environmental conditions and processes.

246. Water Quality Management
First semester, alternate years (odd). Three credits. Recommended preparation: NRME 211 or NRME 260P or consent of instructor. Clausen
An introduction to all aspects of water quality problems relating to the many beneficial uses of water, including the physical, chemical, and biological properties.

247P. Public Lands Wildlife Management
Second semester. Three credits. Recommended preparation: NRME 217, 232P, EEB 244. Open only with consent of instructor. Must be taken with another P course in NRME to equal one W course. Ortega
Applied natural resources management in different ecosystems (forestslands, grasslands, and drylands). Meet one hour per week for background readings from current literature. Two short research papers and presentation to the class. Required field trip last two weeks of May. Students are responsible for cost of field trip.

251C. Computer Utilization in Agriculture and Natural Resources
Second semester. Three credits. Two class periods and one two-hour laboratory.
Instruction in the utilization of microcomputer technology in a variety of natural resources management and engineering applications, such as forest mensuration, water runoff and soil erosion estimation, land use planning, ecological modeling, and general problems from commercial agriculture. Skills will be developed in the use of popular programming languages, such as BASIC and FORTRAN, and commercial packages, including spreadsheets, data base managers, computer graphics and application-specific software.

252. Geographic Information Science for Natural Resources Management
Second semester. Four credits. Three class periods and one two-hour laboratory period. Prerequisite: NRME 242, MATH 112P, Recommended preparation: PHYS 121Q. Open only to natural resource majors or with consent of instructor. Meyer
Introduction to geodetic and cartographic principles underlying the creation of accurate maps. Particular emphasis is given to mapping topography and natural areas. Topics include: horizontal and vertical geodetic datums, the geoid, map projections, coordinate systems, global positioning systems (GPS), GIS data modeling with regional database management systems, and digital terrain models.

256. Natural Resources Modeling
First semester. Three credits. Prerequisite: MATH 112Q or higher. Open only to natural resource majors except by consent of instructor. Warner
Applications of conservation of mass, energy and momentum in modeling natural resources systems. Defining systems; determining flows and storages; interactions and feedback mechanisms within systems. Problem oriented course including computer solutions using spreadsheets or modeling programs.

260P. Soil and Water Management and Engineering
Second semester, alternate years (odd). Three credits. Two class periods and one 3-hour laboratory. Recommended preparation: NRME 211 or CE 265. Must be taken with another P course in NRME to equal one W course. Warner
Floodplain management, erosion and erosion control, reservoir management, storm water control, watershed management, and on-site sewage treatment systems. Written technical and laboratory reports, use of spreadsheets and field work required, some field trips.

271. Environmental Meteorology
Second semester, even numbered years. Three credits. Recommended preparation: NRME 241. Yang
Applied meteorology in environmental science and engineering. Solar energy, winds and air pollution, atmospheric-hydrologic interactions, agricultural and forest meteorology, and biometeorology.

280P. Forest Management
Second semester, alternate years (odd). Four credits. Two class periods and one 4-hour laboratory period. Prerequisite: NRME 214. (Not open for credit to students who have passed NRME 230 and NRME 231.) Must be taken with another P course in NRME to equal one W course. Broderick, Schroeder
An introduction to forest mensuration, ecology, silviculture, and multiple-use management. Field trips required.

285. Forest Ecology
First semester alternate years (even). Three credits. Two class periods and one 3-hour laboratory. Prerequisite: NRME 214 or consent of instructor. Forest stand dynamics and ecosystem function including tree response to local and regional site factors individually and in community interactions with other species, and the role of forest stands in ecosystem function (e.g., habitat diversity, interactions among ecosystems, nutrient cycling). Laboratory will be outside or in computer lab.

287. Field Study Internship
Either semester or summer. One to six credits. Hours by arrangement. Open only to Junior - Senior students with consent of advisor and department head. This course may be repeated provided that the sum total of credits earned does not exceed six.
This course is designed to acquaint students through actual work experience with research and management activities not available on campus. Students will work with professionals in an area of concentration. Student evaluation will be based upon the recommendation of the field supervisor and a detailed written report submitted by the student.

295. Seminar
Second semester. One credit. May be repeated for credit. Open only with consent of instructor.

298. Special Topics
Either semester. 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. Credits and hours by arrangement. May be repeated for credit. Open only with consent of instructor.

Nursing (NURS)

Dean: Laura Cox Dzurec
Office: Room 111, Storrs Hall
For major requirements, see the School of Nursing section of this Catalog.

110. Introduction to Health
First semester. Three credits.
An interdisciplinary course that provides an introduction to the intrinsic and extrinsic factors that influence health. Includes approaches to health promotion and disease prevention, study of leading causes of illness, injury and death in a university community, and cultural practices and beliefs about health. Examples of topics covered include: sexuality and sexually transmitted diseases, assessment of genetic history, healing practices to enhance wellness.

111. Humanizing Health Care: Nursing’s Past, Present and Future
Second semester. Three credits.
This course is designed to explore the history of health care in the United States as it relates to nursing. Historical imperatives, dealing with such issues as gender related constraints and other social, political and economic factors will be identified. Both external and internal forces that shape the substance of nursing education, practice and research and reinforce its mission to society will be analyzed.

112. Health Care Delivery System
Second semester. Three credits.
An historical and contemporary exploration of the American health care delivery system: its evolution and development, legal and regulatory perspectives, roles of all providers and finances. A comparison with socialized health care will be made.
202. The Basis of Scientific Inquiry
Either semester. Three credits. Prerequisite: PHIL 104. Open to sophomores. This course will acquaint the learner with issues salient to an understanding of science as a source of knowledge. Perspectives on scientific truth, the nature of science, and the science in modern culture will be presented.

204. Clinical Science I
First semester. Three credits. Open to Nursing majors only. Prerequisite: CHEM 127Q and 128Q; PNB 264, PNB 265 concurrent or prerequisite. Open to sophomores. Critical examination of concepts from microbiology, pathophysiology, and pharmacology as they relate to health care of individuals throughout the lifespan. Emphasis will be placed on microbiology and anti-infectives.

205. Theoretical Foundations of Nursing I
First semester. Two credits. Prerequisite: PHIL 212, SCI 240 or NURS 202. An exploration of the empirical way of knowing in nursing. Selected models and theories illustrating an empirical approach will be analyzed.

206. Theoretical Foundations of Nursing II
Second semester. Two credits. Prerequisite: NURS 205, 217, or RN license. An exploration of the existential way of knowing in nursing. Selected models and theories illustrating an existential approach will be analyzed.

207. Clinical Science II A
Second semester. Three credits. Prerequisite: PNB 264 and NURS 204; PNB 265 concurrent. Open to sophomores. Critical examination of concepts from pathophysiology, pharmacology and nutrition as they relate to preventative health care of adults. Emphasis will be placed on nutritional aspects of preventative health care.

211C. Information Systems in Health Care
Either semester. Three credits. Two class periods and two hours of laboratory. Open to sophomores. Concepts of problem-solving and decision-making will be used to explore the basic elements of information processing. Applications of computerized information processing in health care will be examined.

212. Clinical Science for Sub-acute and Chronically Ill Adults
First semester. Three credits. Prerequisites: NURS 110, 111, 112, 204, 207 and 221. Critical examination of concepts of pharmacology, microbiology, nutrition and pathophysiology as they relate to nursing care of adults with sub-acute and chronic health problems and their families.

213W. Nursing Research
First semester. Three credits. Prerequisite: CHEM 127Q, 128Q; PNB 264, 265; PHYS 101; NURS 204. Open to Nursing majors only. Concepts from pathophysiology, pharmacology, and normal and therapeutic nutrition as they relate to the nursing care of adults with acute non-life threatening health problems.

216. Adult Health I

217. Practicum: Adult Health I
First semester. Five credits. Fifteen laboratory hours. Prerequisites: Co-requisites: NURS 214 and 216. Application of functional health patterns to the care of adults with acute, non-life threatening and/or life modifying health problems. Focus is on psychomotor, communication and decision-making skills basic to nursing.

218. Nursing Science for Adults with Sub-Acute and Chronic Health Issues
First semester. Three credits. Prerequisites: NURS 110, 111, 112, 207 and 221. Critical examination of theory, research and expert clinical practice supportive of nursing with adults experiencing sub-acute and chronic health problems and their families.

219. Practicum with Sub-acute and Chronically III Adults
First semester. Six credits. Prerequisites: NURS 110, 111, 112, 204, 207, 221; NURS 212, 218 concurrent. Nursing and interdisciplinary care of person and family with sub-acute and chronic health issues.

220. Historical and Contemporary Topics in Nursing
Either semester. Three credits. Open to non-majors only with the consent of the instructor. Contemporary topics in nursing will be explored from historical and phenomenological perspectives. The ideas and actions of individuals, the genesis and impact of various professional issues, and pervasive themes throughout nursing will be examined.

221. Health Assessment through the Lifespan
Second semester. Three credits. Prerequisites: PNB 264; PNB 265 concurrent. Open to Nursing majors only. Open to sophomores. In this course, students will acquire the knowledge, skills, and values needed for assessing individuals through the lifespan. Supervised laboratory sessions will provide opportunity to practice newly acquired skills.

224. Clinical Science III
Second semester. Four credits. Prerequisite: NURS 214. Concepts from pharmacology, microbiology, nutrition and pathophysiology as they relate to the nursing care of adults with life modifying, life threatening health problems.
240. Epidemiology in Nursing Practice: Clinical Science V-A
Either semester. One credit. Prerequisites: NURS 227 or RN license.
An introduction to the principles of epidemiology used in nursing practice.

241. Community Health Nursing
Analysis of theories from nursing and related disciplines for application to community health nursing. Provide the basis for clinical decision-making for individuals, families, and groups.

242. Clinical Science in Psychiatric-Mental Health Nursing Practice: Clinical Science V-B
Either semester. One credit. Prerequisite: NURS 218 or RN license.
Concepts from microbiology, pharmacology, nutrition and pathophysiology as they relate to psychiatric-mental health nursing.

243. Psychiatric-Mental Health Nursing
Analysis of theories from nursing and related disciplines for application to psychiatric-mental health nursing. Focus is on nursing processes for clinical decision-making for individuals, families, and groups.

248. Community Health Nursing Practice
Either semester. Three credits. Prerequisites: NURS 213 or 213W, 220 or 220W, 226 and 227.
Clinical application of theory from nursing and related disciplines to individuals, families and community groups in a variety of community health settings. Focus is on nursing care applied throughout the wellness illness continuum in collaboration with other members of the health care team.

249. Psychiatric-Mental Health Nursing Practice
Focus is on the application of nursing theory, the Caring-Praxis Model and therapeutic communication to psychiatric-mental health nursing. Emphasis is on a) application of the lived experience persons with mental illness; b) self-reflective abilities and their significance to affecting the nurse patient encounter; c) therapeutic use of self; and d) actualizing intuitive and rational ways of knowing in responding to the mental health and/or psychiatric illness experience.

250. Nursing Leadership in the 21st Century
Second semester. Three credits. Prerequisites: NURS 219, 239, 259, 269, and 279; NURS 289 concurrent. Open to Nursing majors only.
An in-depth analysis of the components that facilitate new nursing graduates to become leaders at the patient bedside, within interdisciplinary groups, and in the community. Emphasis is on communication, leadership, social disclosure and social justice to benefit the client and the discipline.

252. Clinical and Nursing Science for Nursing Care of Childrearing Families
Both semesters. Four credits. Prerequisites: NURS 212, 218, 219; NURS 232 concurrent. Open to Nursing majors only.
This course builds on students’ understanding of microbiology, pharmacology, nutrition and pathophysiology as these sciences relate to childrearing families. Emphasis is on development of clinical decision making skills related to nursing care of childrearing families with a particular focus on anticipatory guidance, prevention, intervention and health restoration.

253. Professional Nursing Practice: Leadership, Management and Financial Issues
Second semester. Two credits.
Designed to examine and prepare individuals for the lived experience of nursing as a business. The course addresses management, leadership and fiscal skills as they relate to health care delivery and the profession of nursing.

259. Practicum with Childrearing Families
Both semesters. Three credits. Prerequisites: NURS 212, 218, 219; NURS 252 concurrent. Open to Nursing majors only.
This course provides experience in the application of principles of nursing used in the care of infants, children, adolescents and their families. Clinical placements will be settings such as day care centers, childbirth education classes, schools, clinics, group homes, women’s health centers and agencies providing acute and chronic care.

262. Clinical Science for Psychiatric and Mental Health Nursing
Both semesters. Two credits. Prerequisites: NURS 212, 218 and 219; NURS 263 concurrent. Open to Nursing majors only.
Biochemical, neural activity, functional and structural aspects of the brain, cognition, mental health and illness (behavioral health) are overviewed. The psychopharmacology and nutrition of behavioral health is addressed. Psychopharmacological issues will consist of how to offer a safe and effective biochemical environment for a person (group or family) with mental health (behavioral health) issues. Psychological, sociological, and physiological integrity will be addressed for behavioral health.

263. Nursing Science for Psychiatric and Mental Health Nursing
Both semesters. Two credits. Prerequisites: NURS 212, 218, 219; NURS 262 concurrent. Open to Nursing majors only.
The role of nursing, in regard to psychiatric and social parameters of any person, family or group with a medical or psychiatric illness is examined. Major elements are the use of therapeutic communication, critical thinking, and the nursing process to examine multiple therapeutic interventions. This course stresses assessment of health and mental illness in populations that will be the focus of interventions in a professional nurse’s career. Students will be exposed to knowledge that explicates how to provide a safe and effective environment in diverse milieus; how to promote health and support growth and development issues through the lifespan; how to assist persons in coping and adaptation and how to reduce risks in population of interest.

269. Practicum for Psychiatric and Mental Health Nursing
Both semesters. Three credits. Prerequisites: NURS 212, 218, 219; NURS 262 and 263 concurrent. Open to Nursing majors only.
This course entails the clinical application of theory from nursing and related disciplines to mental health and illness (behavioral health). The focus is on psychiatric illness, critical thinking, communication skills, the nursing process in persons with a primary or secondary/adjunctive illness. The target of nursing care is the individual, family, group or community.

270. Public Health Nursing
Both semesters. Three credits. Open to Nursing majors only.
Theories from nursing and public health are examined within the context of aggregate/population based care. Primary, secondary and tertiary approaches are used to promote the health of selected population/community.

272. Clinical Science for Adults with Acute Illness
Both semesters. Two credits. Prerequisites: NURS 212, 218 and 219; NURS 273 concurrent. Open to Nursing majors only.
Critical examination of pharmacology, microbiology, nutrition and pathophysiology as they relate to nursing care of adults experiencing acute, life threatening problems.

273. Nursing Science for Acutely Ill Adults
Both semesters. Two credits. Prerequisites: NURS 212, 218 and 219; NURS 272 and 279 concurrent. Open to Nursing majors only.
Critical examination of theory, research and expert clinical practice supportive of nursing with adults experiencing acute life-threatening health problems.

279. Practicum with Acutely Ill Adults
Both semesters. Three credits. Prerequisites: NURS 212, 218, 219; NURS 272 and 273 concurrent. Open to Nursing majors only.
Nursing and interdisciplinary care of acutely ill persons and their families.

289. Capstone Practicum
Second semester. Six credits. Prerequisites: NURS 219, 239, 259, 269 and 279; NURS 250 concurrent. Open to Nursing majors only.
This course is the capstone clinical practicum and seminar taken in the final semester of the baccalaureate program. The course is designed to provide the student with opportunities to apply knowledge and skills from all required courses to special clinical situations. The student works with a clinical preceptor in the development, implementation and evaluation of objectives specific to clinical emphasis area.

292. Health Perspectives on Alcohol and Other Drug Abuse
Either semester. Three credits. Open to non-nursing majors.
An interdisciplinary examination of the health consequences of alcohol and other drug abuse across the lifespan with emphasis on: epidemiology; pharmacology; theoretical models; strategies for prevention and treatment; needs of special populations; and, ethical, political and legal ramifications.

292W. Health Perspectives on Alcohol and Other Drug Abuse
Either semester. Credits and hours by arrangement. Open only with consent of instructor. With a change in content, this course may be repeated for credit.

299. Independent Study
Either semester. Credits and hours by arrangement. Open only with consent of instructor. Primarily for qualified students who wish to extend their knowledge by investigating special problems in nursing. With a change in content, this course may be repeated for credit.
Nutritional Sciences (NUSC)

Head of Department: Professor Carol J. Lammi-Keefe
Department Office: Room 214, Roy E. Jones Building

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

160. The Science of Food
(Also offered as ANSC 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.

165. Fundamentals of Nutrition
Either semester. Three credits.

An introduction to the principles and concepts of nutrition with emphasis on the nature and function of carbohydrates, fats, proteins, minerals and vitamins, and their application to the human organism.

166. Food, Culture and Society
Second semester. Three credits. Furr

Social, cultural, and economic factors affecting food intake and nutritional status. Includes contemporary topics such as world food problems, hunger in the United States, dieting and eating disorders, health foods and vegetarianism.

167. Honors Colloquium in Nutrition
First semester. One credit. One 2-hour laboratory period every other week. Consent of instructor required. Clark

Lectures, discussions, and laboratory exercises to complement topics from NUSC 165. Primarily for, but not restricted to, honors students.

200. Nutrition and Human Development
First semester. Three credits. Recommended preparation: NUSC 165. Open to sophomores. Ferris

Nutritional needs and consequences of nutritional deficiencies throughout the life cycle: periconception, pregnancy, lactation, childhood, adolescence and aging. Maternal and child public health issues in the developed and developing world.

212. Principles of Food Science
Second semester. Three credits. Recommended preparation: MCB 203 or 204. Zhao

Chemical, physical, microbiological, and legal aspects of food production, preservation and processing. Safety, aesthetics and nutrition topics included.

213. Principles of Food Science Laboratory
Second semester. Two credits. One class period and one 2-hour laboratory period. Consent of instructor required. Recommended preparation: NUSC 212. Fernandez

Study of the composition of food and the physical and chemical changes that occur during preparation and/or processing that affect taste, palatability, shelf-life, and nutrient content.

235. Food Composition and Preparation Laboratory
First semester. One credit. One 3-hour laboratory period. Prerequisite: NUSC 165 and concurrent registration in NUSC 233. Recommended preparation: CHEM 141 or 243. Enrollment restricted to Nutritional Sciences and Allied Health Dietetic majors. Open to others by consent if space is available. Fernandez

Laboratory techniques related to composition of foods, and the physical and chemical changes that occur during preparation.

236. Principles of Nutrition
Second semester. Three credits. Prerequisite: NUSC 165. Recommended preparation: PNB 250 or 265, MCB 203 or 204. Clark

Function and metabolism of carbohydrates, proteins, fats, minerals, and vitamins.

241. Nutritional Assessment
Second semester. One credit. One class period and one 2-hour laboratory every other week. Prerequisite: NUSC 200. Recommended preparation: MCB 203 or 204, PNB 250 or 265. Enrollment restricted to Nutritional Sciences and Kinesiology majors. Clark

Anthropometric, clinical, and biochemical techniques for assessment of human nutritional status.

250. Nutrition for Exercise and Sport
Second semester. Three credits. Prerequisite: NUSC 165 and Biology: PNB 250 or 265. Rodriguez

Basic nutrition principles. Physical activity, exercise, sport performance and consequences of nutritional ergogenic aids.

260. Readings in Human Nutrition
First semester. Two credits. Two class periods. Prerequisite: NUSC 200.

Readings dealing with utilization and metabolism of nutrients in the human body, with particular emphasis on understanding research methodology.

265. Medical Nutrition Therapy
First semester. Three credits. Prerequisite: NUSC 241. Recommended preparation: Biology: MCB 203 or 204. Rodriguez


266. Medical Nutrition Therapy Recitation
First semester. One credit. Prerequisite: NUSC 241. NUSC 265 must be taken concurrently. Rodriguez

Case studies and presentations. Medical terminology. Practical aspects of medical nutrition therapy administration.

267. Principles of Community Nutrition
First semester. Three credits. Prerequisite: NUSC 200 which may be taken concurrently. Perez-Escamilla

Role of community structures, agencies, services and the professional nutritionist in community health.

270W. Food Services Systems Management I
Second semester. Three credits. Two class periods and one 2-hour laboratory/discussion period. Recommended preparation: AH 244 or MGMT 201, NUSC 233, 235. Shanley

Quantity food procurement, preparation and distribution; recipe standardization; sanitation and safety; portion and quality control; food cost control; computer applications; and personnel management.

272C. Food Service Systems Management II
First semester. Three credits. Two class periods and one 2-hour laboratory/discussion period. Prerequisite: NUSC 270W. Shanley

Institutional menu development; cost and budgeting; recipe analysis and adaption; equipment layout and design; personnel management; communications skills; computer applications; marketing and merchandising; food delivery systems.

275. Experience in Food Service Systems Management
Either semester. One to six credits. Prerequisite: NUSC 270W. Consent of instructor required. May be repeated for credit. No more than six credits of experience or independent study may apply toward the major. Shanley

Application of principles of food service management. Supervised placement.

281. Experience in Community Nutrition
Either semester. One to six credits. Prerequisite: NUSC 165. Recommended preparation: NUSC 267. Consent of instructor required. May be repeated for credit. No more than six credits of experience or independent study may apply toward the major. Ferris, Perez-Escamilla

Supervised field work with community nutrition education or problem-solving. Readings and reports.

295. Seminar
Second semester. One credit. One class period. Prerequisite: NUSC 200. May be taken twice.

Review, evaluation, and oral and written presentation of contemporary nutrition issues.

296W. Senior Thesis in Nutrition
Either semester. Three credits. Hours by arrangement. Enrollment limited to Nutritional Sciences honors students. Consent of honors advisor and department head required.

298. Special Topics
Either semester. Credits and hours by arrangement. May be repeated for credit with a change of topic. Consent of instructor required.

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

299. Independent Study
Either semester. One to three credits. Consent of instructor and department head required. No more than six credits of experience or independent study may apply toward the major.

Individual study and research with faculty. Written report.

Operations and Information Management (OPIM)

Head of Department: Professor James R. Marsden
Department Office: Room 372, School of Business

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

Courses in this department are open to juniors and seniors only.

203C. Business Information Systems
Either semester. Three credits. Prerequisite: ACCT 131. Open only to School of Business students; others with the consent of the Operations and Information Management Department Head.

Information needs of managers, the structure of the information systems required to fill these needs, systems development, business computing technology, and management applications within major business functional subsystems.

204. Operations Management
Either semester. Three credits. Prerequisite: OPIM 203.

Introduction to concepts, models, and information
systems applicable to the planning, design, operation and control of systems which produce goods and services. Topics include process design, facility locations, aggregate planning, inventory control, and scheduling.

#205. Introduction to Database Management
Either semester. Three credits. Prerequisite: OPIM 203C or equivalent. Consent of Department Head and BGS Mentor is required. Cannot be used toward fulfilling MIS major requirements.

Introduction to the development and implementation of database applications. Topics covered include costs and benefits of database approach, database design lifecycle, conceptual database design, the relational data model, data administration, database security, database backup and recovery, and database management system selection and implementation. Students participate in the hands-on design and implementation of a small database using the relational architecture.

#206. Business Application Programming
Either semester. Three credits. Prerequisite: OPIM 203C or equivalent. Consent of Department Head and BGS Mentor is required. Cannot be used toward fulfilling MIS major requirements.

Development of business application software using structured and object oriented programming techniques. The emphasis is on programming logic, rapid application development techniques and personal productivity tools. Topics include program design techniques, programming constructs, interface development techniques, event driven programming, file and database processing, and object linking and embedding.

#207. Internet Technologies and Electronic Commerce
Either semester. Three credits. Prerequisite: OPIM 205, OPIM 206. Consent of Department Head and BGS Mentor is required. Cannot be used toward fulfilling MIS major requirements.

This course introduces Internet technology and tools from the perspective of business users. The focus is on providing knowledge base and functional tools for students as workers in the 21st Century. The specific technologies covered in the class will depend upon state-of-the-art at the time of class offering. However, some of the general concepts include: HTML, client side programming such as Javascript or VBScript, dynamic content creation and management, electronic business process management, security concerns and solutions, and regulatory/public policy issues. A significant part of the course will involve hands-on training.

#208. System Development and Process Management
Either semester. Three credits. Prerequisite: OPIM 205, OPIM 206. Consent of Department Head and BGS Mentor is required. Cannot be used toward fulfilling MIS major requirements.

The course covers the system development life cycle of business information systems. Topics include business process reengineering, detailed process modeling and data modeling techniques, project management concepts, system architecture, testing and implementation considerations. The potential system issues and relevant up-to-date technologies are also explored in the class. Students participate in a project using supportive software tools.

210. Operations Research for Information Systems Analysis
Either semester. Three credits. Prerequisite: OPIM 203C (may be taken concurrently.)

The philosophy and techniques of Operations Research, including problem definition, modeling, and solution in the context of analysis, design, and implementation of computer-based information systems.

211. Systems Analysis and Design
Either semester. Three credits. Prerequisite: OPIM 203C, 220, 221, 222. Open to MIS majors only.

System development methodologies for business information systems. Project management concepts, hardware and software technology, and organizational considerations are explored. Students participate in a system development project.

212. Advanced Information Technologies
Either semester. Three credits. Prerequisite: OPIM 203C, 220, 221, 222. Open to MIS majors only.

Depends knowledge of application development tools for the design of decision oriented information systems. Emphasis will be placed on emerging tools and techniques relevant for modern organizational information needs.

220. Business Software Development
Either semester. Three credits. Prerequisite: OPIM 203C (may be taken concurrently). Open to MIS majors only.

The development of computer software for business information processing. Topics include flowcharting, pseudocode, programming with a business oriented computer language, file processing concepts, and on-line and batch processing.

221. Business Data Base Systems
Either semester. Three credits. Prerequisite: OPIM 203C (may be taken concurrently). Open to MIS majors only.

Development and implementation of database applications for business. Topics include: data modeling, relational database concepts, query languages, hands-on design and implementation of a relational database system, database administration, non-relational database models, distributed architectures, and advanced object bases.

222. Network Design and Applications
Either semester. Three credits. Prerequisite: OPIM 203C (may be taken concurrently.) Open to MIS majors only. Open only to juniors and seniors.

Principles and applications of business telecommunications emphasized. Course covers important network systems as well as crucial techniques in building these systems. Students participate in network design and implementation project.

223. Advanced Business Application Development
Three credits. Prerequisite: OPIM 203C, 220, 221, and OPIM 222. Open to MIS majors only. Open only to juniors and seniors.

Course designed to cover structured and object-oriented programming methodologies for developing business applications. Program design techniques and logic emphasized. Students participate in a business application design and implementation project.

230. Management of Production/Operations Systems
Second semester. Three credits. Prerequisite: OPIM 204.

In-depth study of the problems and models applicable to the design, operation and control of systems which produce goods and services. Students will learn to define, relate to, and solve production and operations problems using such media and methods as cases, projects, simulations, behavioral and quantitative models.

252. Industrial Quality Control
Semester by arrangement. Three credits. Prerequisite: STAT 100 or 110, and OPIM 204.

The economic control and assurance of quality and reliability with emphasis on management of the quality function. Included are: a conceptual treatment of statistical methods in quality control; control of quality during manufacture and at delivery of finished goods; planning for quality control and reliability; quality management, to include organization, economics, systems and procedures.

289. Field Study Internship
Either or both semesters. One to six credits. Hours by arrangement. Prerequisite: Completion of Freshman-Sophomore School of Business Requirements and consent of instructor and Department Head.

Designed to provide students with an opportunity for field work relevant to one or more major areas within the Department. 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 the student’s departure. These credits must be awarded for regularly scheduled work at a recognized foreign university in the field of information systems or in the student’s Applications Area; if in the Applications Area the consent of both the Department Head and the Head of the Applications Area is required. Prior to taking the course the student must sign up for the course in advance as a course in that Applications Area. No credits can be counted toward required courses in the MIS major.

Special topics taken in a foreign study program.

296W. Senior Thesis in Operations and Information Management
Either semester. Three credits. Hours by arrangement. Open only to OPIM Department Honors Students with consent of instructor and department head.

296. 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 operations management, operations research and information management as announced in advance for each semester.

299. Independent Study
Either semester or both semesters. Credits by arrangement, not to exceed six in any semester. Open only with consent of instructor and Department Head.

Individual study of special topics in operations management, operations research and information management as mutually arranged between a student and an instructor.

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