488 Humor Writing for Print, Broadcast (3)
Prereq: jr or sr, perm. Theory and techniques of writing humor for newspapers, magazines, speech- es, and other media.

489 Journalism Workshop (1–4)
Selected topics of journalism and mass communica-

490 Independent Study (1–4, max 15)
Prereq: written proposal and perm. See title.

491 Research in Journalism and Communications (1–15)
Prereq: perm.

492 Seminar (1–5)
Prereq: perm. Selected topics of current signifi-
cance. May be repeated with different topics to 12 hrcs.

Latin
See Foreign Languages and Literatures.

Latin American Studies
See International Studies.

Law Enforcement Technology (LET)
The following courses for the A.A.S. in law enforce-
ment technology are available on the Chillicothe, Lancaster, and Southern campuses:

100 Introduction to Law Enforcement Technology (3)
Philosophy and history of law enforcement; over-
view of crime and police problems; organization and jurisdiction of local, state, and federal law enforce-
ment agencies; survey of professional career opportuni-
ties and qualifications required.

105 Ethics and Legal Issues (4)
Provides a fundamental basis of knowledge concern-
ing contemporary law enforcement ethical and legal issues such as use of force, corruption, professional behavior, code of ethics, ethical dilemmas, and historical cases of ethical misconduct.

110 Police Role in Crime and Delinquency (3)
Extent and distribution of crime and delinquen-
cy, with special emphasis on basic factors and con-
ditions contributing to problem; some case study and evaluation of community resources in prevention and control of crime; overview of role of school, family, religious institutions, law enforce-
ment agencies, courts, and correctional institutions. Part law enforcement agencies play in juvenile delinquency control, organization and functions of related juvenile agencies, laws governing handling of juvenile offenders, and brief resume of juvenile court and its jurisdiction.

120 Constitution, Criminal, and Civil Law (3)
Prereq: 100. Study of U.S. Constitution and amend-
ments thereto by text material and case method system; major emphasis on freedom of speech, search and seizure, arrest and detention, interro-
gation and confession, self-incrimination, right to counsel, double jeopardy, and due process situations.

130 Interviewing and Report Writing (3)
Examination of interviewing and interrogation procedures. Overuse of law enforcement for obtaining information, plus practical experience in use of methods. Mechanics of writing reports, including interviewing techniques and taking statements, writing descriptive narratives, and report revision.

140 Introduction to Criminalistics (3)
Survey of systematic collection of evidence and po-
etialities and recommendations of applied science to criminal investigation. Includes demon-
stration of techniques used in processing criminal evidence and practical experience in solved crime scene processing, crime lab methods, and forensic science. Students with little or no previous laboratory experience, will receive an overview of actual laboratory analyses performed on physical evidence as if submitted to a crime laboratory. The student will acquire knowledge through conducting experiments regarding best practices of a crime laboratory. The student will discover the importance of maintaining the integrity of physical evidence, quantities required to conduct analyses, and how to prepare physical evidence for court presentation. Credit not allowed for both 140 and 145. 3 lec., 2 lab.

150 Police Patrol Operations (3)
Focus on patrol function. Examination of pur-
poses, methods, techniques, and types of patrol. Overview of support services, examination of various police services and public assistance, and analysis of deployment procedures and practices as related to overall mission of police patrol.

200 Procedures, Rules, and Test of Evidence (4)
Prereq: 120 or Instruction designed to ac-
quire of officer with court system in Ohio, its func-
tions, authority, and duties. Explains workings of all courts of records and provides description of mayor's courts which are only courts not of record in State of Ohio. Kinds and degrees of evidence. Admissibility of evidence in criminal trial, materiality and competency of evidence. Distinction between admissions and confessions; exceptions to hearsay rule; types of evidence.

210 Cybernetics (3)
Application and use of computers and/or auto-
nated systems for rapid storage and retrieval of information. Types of electronic data processing systems and their compatibility with contemporary police operations.

215 Cybernetics and Principles of Information Competency (4)
Examination of the application and use of computers and/or automated systems for rapid storage and retrieval of information. Students will explore the types of electronic data processing systems and their compatibility with contemporary police operations. Students are introduced to the five Information Competency Principles to develop the skills necessary to achieve information competency. Students will apply information competency to criminal justice research developing skills through library research, practice in MLA and APA documentation. Credit not allowed for both 210 and 215. 3 lec. 2 lab.

220 Court Procedures and Processes (3)
Case preparation, officer testimony and demeanor in court, effective preparation and presentation of criminal evidence, trial procedures, utilization of written notes, and reaction to cross examination.

230 Police Community Relations (3)
Nature of relationships between police and vari-
ous segments of community; racial and/or ethnic relations represent a partial list of administrative functions, authority, and duties. Explains workings of police, patrol, investigation, communications, statistics, and records.

240 Law Enforcement, Administration, and Supervision (3)
Prereq: 100. Principles of law enforcement agency administration. Organization, planning and research, management, personnel management, training, and public relations. Administrative functions in vice control, crime delinquency prevention and control, patrol, investigation, communications, statistics, and records.

245 Law Enforcement, Administration, and Leadership (4)
Prereq: 100. Examination of the principles of law enforcement agency administration. Organization, planning and management, personnel management, training, and public relations represent a partial list of administrative topics covered. Administrative functions covered include, patrol, investigation, communications, statistics, and records. The role leadership plays in a contemporary law enforcement organization. Police promotional assessments and how to perform to your maximum potential. Credit not allowed for both 240 and 245.

250 Vice and Narcotic Control (3)
Prereq: 140. Exploration of history, identification, and effects of narcotics. Narcotic and vice law as it exists and penal statutes affecting control of narcotics and vice studied.

255 Criminal Justice Research Methods (4)
Introduction to criminal justice research methodology, emphasizing the development of practical reasoning skills necessary for the comprehension and critical evaluation of criminal justice statistical information. The student will develop knowledge of Internet surveys, research ethics, research methodology and design, and data analysis.

260 Criminal Investigation (3)
Fundamentals of investigation; crime scene search and recording; collection and preservation of physical evidence, scientific aids, modus operandi, sources of information, interviews and interrogation, case preparation and management. Students with little or no previous laboratory experience, will receive an overview of actual laboratory analyses performed on physical evidence as if collected at the crime scene for submission to a crime laboratory. Credit not allowed for both 260 and 265. 3 lec. 2 lab.

265 Introduction to Criminal Investigation
The purpose of this course is to provide law enforcement students an introduction to the fundamentals of crime investigation; crime scene search and recording; collection and preservation of physical evidence, scientific aids, modus operandi, sources of information, interviews and interrogation, case preparation and management. Students with little or no previous laboratory experience, will receive an overview of actual laboratory analyses performed on physical evidence as if collected at the crime scene for submission to a crime laboratory. Credit not allowed for both 260 and 265. 3 lec. 2 lab.

270 Arrest, Search, and Seizure (3)
Prereq: 260. In-depth discussion of moral and legal obligations in use of police weapons. Includes legal provisions, safety precautions, and restrictions in use of firearms. Advanced theories and methods of search and seizure, police combat shooting, all-weather firing, and new developments in police weaponry. Training for student in lawful methods of seizure and discussion of search of persons, places, and things, with emphasis on legality. Applicable court decisions and rulings presented and discussed.

275 Law Enforcement and the Deaf (4)
Prereq: 100. Principles of law enforcement agency administration. Organization, planning and research, management, personnel management, training, and public relations. Administrative functions in vice control, crime delinquency prevention and control, patrol, investigation, communications, statistics, and records.

280 Traffic Enforcement, Education, and Engineering (3)
Prereq: 100. Law relating to registration of motor vehicles, driver’s license, Vehicle Code sections most often encountered and violated, regulation and traffic control, traffic accident investigation, traffic accident report forms; types and uses.

290 Special Problems (3)
Provides opportunity for students to explore topics of interest on individual basis, or in structured courses developed as common interest arises.

Library Science
See Education—Curriculum and Instruction.

Linguistics (LING)

270 The Nature of Language (5) (25)
Nontechnical introduction to the basic nature of human language: its sound patterns, structure of words and sentences, nature of meaning, children’s acquisition of language, animal communica-

275 Introduction to Language and Culture (4)
Prereq: soph or above. Study of similarities and differences of language behavior in variety of cultural contexts.

280 Language in America (4)
Prereq: soph or above. Analysis of similarities
and differences in language behavior in America, including dialects and immigrant languages.

330 Introduction to Psycholinguistics (4)
Prereq: 270 or 350 or 351 (or concurrent) or perm. Study of linguistic behavior and psychological mechanisms responsible for it.

350 Introduction to Linguistics (5)
Prereq: jr or sr; credit not given for both 270 and 350. Technical introduction to linguistic principles and methods of description in the areas of phonetics, phonology, morphology, syntax, and semantics.

351 Fundamentals of Linguistics (5)
Prereq: 270 or HSSL 208; credit not given for both 350 and 351. General course in fundamental linguistic principles; duality of patterning; phonetics/phonology; syntax/semantics; morphology.

360 Sounds of World Languages (4)
Prereq: 270 or 351 or HSSL 208 or SP 437 or FR 437. Articulatory and acoustic description of English and other languages of the world through work with native speakers.

390 Language of Women and Men (4)
Prereq: jr or perm. American speech as used by women and men in terms of linguistic and social factors.

395 Introduction to Area Linguistics (3–5)
Prereq: perm. Investigation of linguistic characteristics of specific group or subgroup of languages within Malayo-Polynesian or African families.

410 Language Teaching Practicum (3)
Prereq: 475 and 480. Practice in the teaching of English as a second or foreign language with faculty supervision.

412 Internship in TESOL (1-5)
Prereq: perm. Practice in ESL teaching, instructional support, and/or program administration.

440 Introduction to Bilingualism (4)
Prereq: 270 or 350 or 351 (or concurrent) or perm. Introduction to bilingual theories from psychological, sociological, educational, and linguistic perspectives.

451 Computers for Language Teaching I (4)
Prereq: 270 or 350 or 351 (or concurrent) or perm. Introduction to computers for language teaching; software selection, and creation of supplemental computer-assisted language learning (CALL) materials.

452 Computers for Language Teaching II (4)
Prereq: 451 and 480 or ML 445 or perm. Creation of CALL materials using programming languages.

453 Computers for Language Teaching III (4)
Prereq: 452. Developing a comprehensive CALL package.

460 Phonology (5)
Prereq: 270 or 350 or 351 (or concurrent) or perm. Introductory course in analysis of sound systems of natural languages.

470 Syntax (4)
Prereq: 270 or 350. Introduction to theory and application of grammatical analysis of natural languages.

475 Theories of Language Learning (4)
Prereq: 270 or 350 or 351. Introduction to research in second language acquisition and its implications for language teaching methodology.

480 TEFL Theory and Methodology (4)
Prereq: 475 or concurrent. Second language teaching theory and methodology, with emphasis on teaching English as foreign language.

481 Methods and Materials in TESL (4)
Prereq: 475 or concurrent. Introduction to methods, textbooks, and materials useful in the teaching of English in second language contexts and specifically in the public schools.

482 Materials in TEFL (4)
Prereq: 475 or concurrent. Theory and practice of analysis, evaluation, and creation of instructional materials for teaching English as a foreign language.

483 Testing in TESL (4)
Prereq: 480 or 481 or concurrent or perm. Evaluation and writing of language test items appropriate for testing language proficiency and competency in specific skill areas. Entry and exit testing for public school ESL programs also discussed.

485 Historical Linguistics (4)
Prereq: 460. Study of genealogical classifications of languages, and of historical change in language systems.

490 Sociolinguistics I (4)
Prereq: 270 or 350 or 351. Observation and analysis of similarities and differences of language behavior in variety of linguistic and sociocultural contexts.

491 Sociolinguistics II (4)
Prereq: 490. Introduction to relationships between interlocking systems of language and social grouping.

495 Directed Research (4)
Prereq: perm. Independently directed project on a particular topic of interest in linguistics; required of all majors. 2 credits in winter, 2 credits in spring.

496 Field Methods (4)
Prereq: 460. Methods of eliciting, transcribing, organizing, and analyzing linguistic data.

499 Special Studies in Linguistics (1–3)
Prereq: perm. Independent study of particular area of interest in linguistics.

Management (MGT)

100 Managing (2)
Introduces the basic concepts of management and the basic functioning of business. In addition, students develop an understanding of current issues confronting managers in business and nonprofit organizations. Emphasis on starting to develop the skill to reason like a manager.

191 Workshop in Management (1-4)
Provides traditional and nontraditional students with specialized course offerings directed toward identified needs. Activities offering short courses, workshops, and institutes involving intensified instruction in pertinent management areas.

202 Management (4)
Prereq: soph. Analysis of and practice in solving problems facing managers and administrators using concepts and principles from behavioral sciences and other applicable disciplines.

240 Introduction to Management and Organization (4)
Prereq: soph; College of Business majors only. Provides an introductory coverage of topics in management. The course offers an early focus on teamwork and group dynamics to assist students when they take the integrated cluster. The course also includes specific assignments designed to enhance COB majors’ Electronic Student Portfolios. No credit for both 202 and 202.

298 Internship (1)
Prereq: perm. Internship experience that provides opportunities to learn by participating in day-to-day activities of a business concern for at least four consecutive weeks. Intended for experience following the sophomore year.

350 Creativity and Innovation Management (4)
Prereq: jr. Examination of the role of creativity and innovation in business and society; focus on the management of the innovation process. Students will explore personal creativity, management practices that increase creativity, the relationship between creativity and innovation, and the process of innovation in a business setting.

398 Internship (1–4)
Prereq: perm. Internship experience that provides opportunities to learn by participating in day-to-day activities of a business concern for at least four consecutive weeks. Intended for experience following the sophomore year.

430 Management Systems—Decision Making (4)
Prereq: 202 or 240 or perm. Decision making and problem solving in organizations from managerial perspective.

462 Women in Management (4)
Prereq: junior. This course explores a variety of social-psychological research on gender issues that affect work behaviors in today’s rapidly changing workforce. Emphasis is placed on student activities, research of pertinent topics, readings, reports, online dialogue, and incorporates community service learning.

480 Managing Transformations and Organizational Change (4)
Prereq: 340. Examines theories, concepts, and applications relating to change leadership in the modern workplace. Focus on internal processes of organizational transformation, change, and development. Designed to improve leadership potential through understanding change models and strategies, resistance to change and change leadership roles in the context of a dynamic, uncertain, and ever-changing external environment.

484 International Comparative Management (4)
Prereq: yr. Survey and analysis of similarities and differences in management systems, structures, and styles, as well as evaluation of changes and their impact in selected groups of countries.

486 Business World of Asia (4)
Prereq: 202 or 240 or sr. or perm. Examines the current business environment of Asia from the perspective of contemporary history, culture, religion, political economy, geography, and current events. Emphasis is given to developing awareness of global information resources and prospects for active business involvement in Asia. Students are encouraged to develop special expertise in one of the Asian countries, to network with another for broader understanding, and to pursue in-depth areas of special personal interest.

490 Strategic Business Leadership (4)
Prereq: MGT 340, MGT 350, and in examination of the leadership theories in the context of the strategic business challenges of increased global competition, advances in technology, and the importance of intellectual capital. The focus is on the executive ability to make strategic choices that generate superior performance within and by organizations. Tier III equivalent course.

491 Seminar (3–5)
Prereq: jr or perm. Selected topics of current interest in management and organizational behavior area.

492 Management Thought (4)
Prereq: yr. Review of development of managerial theories from 5000 B.C. to present with consideration of their application to current organizational settings.

494 Management Research (4)
Prereq: 12 hrs of management courses. Practical application of research methods in behavioral sciences to management problems, emphasizing research available and its use in decision making and in solving managerial problems.

497 Independent Research (1–4)
Prereq: perm. Research in selected fields of management and organizational behavior under direction of faculty member.

497H Independent Research (1–4)
Prereq: 3.3 g.p.a., written proposal, and perm. Independent research. Course content selected by professor and student.
Courses / Marketing

299

Marketing (MKT)

101 Consumer Survival in the Marketplace (4)
How a consumer can adapt himself or herself to modern marketing environment to improve satisfaction derived from spending his or her money.

202 Marketing Principles (4)
This course provides a broad understanding of marketing activities, decisions, and terms with an emphasis on the practices and problems of marketing managers and the analysis of the marketing environment.

240 Introduction to Marketing Management (3)
Prereq: No credit for both 240 and 202. This course provides an introductory coverage of topics in marketing. The course offers an early focus on the elements of the marketing mix to assist students when they take the integrated cluster. The course also includes specific assignments designed to enhance COB majors’ understanding of marketing activities and strategies.

258 Skills for Professional Development (4)
Focuses on developing personal skills such as time management, networking, telephone use, computer etiquette, business etiquette, positive thinking, and business writing. Introduces career planning, interviewing, and mapping the informal organization. Topics chosen by instructor.

298 Internship (1–4)
Prereq: perm. Internship experience that provides on-site exposure to general business operations and procedures. Intended for experiences following the freshman year.

358 Professional Selling Techniques (4)
Prereq: 202; marketing major or perm. The course combines personal selling theory with actual practice. Students learn skills needed for successful careers in sales and marketing.

379 Marketing Research (5)
Prereq: 220; QBA 201 or equiv. statistics course. This course provides an introduction to the field of marketing research for effective decision-making. Students will learn techniques involved in collection, tabulation, and analysis of marketing information.

398 Internship (1–4)
Prereq: perm. Internship experience that provides opportunities to learn by participating in day-to-day activities of a business concern for at least four consecutive weeks. Intended for experience following the sophomore year.

404 Logistics and Supply Chain Management (4)
Prereq: 202; ACCT 102, preference to majors. Problems encountered by manufacturer in establishing and maintaining effective distribution channels are examined. The course is designed to provide an understanding of the role of marketing in the international/global business environment.

420 Services Marketing (4)
Prereq: 202 or perm. This course reflects the increasing proportion of GNP taken up by the service sector. Industries that do not sell a physical good as their main offering to the public are examined. These could include the recreations industry, government agencies, financial institutions, and professional (legal, medical) services.

425 Business to Business Marketing (4)
Prereq: 202. This course introduces the field of business-to-business (B2B) marketing. The course answers the questions: What is business marketing? In what markets does it occur? Topics include: Organizational buyer behavior, methods of assessing business market opportunities, and business marketing strategies.

441 International Marketing (4)
Prereq: 202; preference to majors. This course focuses on understanding the major issues facing international/global marketing managers today through the application of marketing principles in the international/global business environment.

444 Consumer Behavior (4)
This course illustrates the practical importance of understanding consumers’ knowledge and attitudes, incorporating various approaches for assessing such knowledge and
attitudes. It identifies major factors that influence how consumers process and learn marketing information and considers various techniques marketers can use to influence consumer attitudes and behavior.

450 Management of Promotion (4)  
Prereq: 202; preference to majors. This course integrates communication theory, concepts and research with in-depth treatment of the following elements of the promotional mix: advertising, sales promotion, public relations, and point-of-purchase communications.

455 Achieving Customer Satisfaction and Service Excellence (4)  
Prereq: 202. This course teaches students how companies can retain their current customers and develop long-term profitable relationships with them.

458 Sales Management (4)  

463 Marketing Strategy (4)  
Prereq: 202 of MKT including 202 and 379. This capstone course focuses on the integration of marketing knowledge accumulated as a marketing major. It includes situation analysis and development of strategic marketing plans. Consideration is given to the complex dynamic environment in which all marketing activities take place. Tier III equivalent course.

491 Seminar (1–4)  
Prereq: perm. Selected topics of current interest in marketing area.

493 Readings (1–4)  
Prereq: perm. Readings in selected fields of marketing. Topics selected by student in consultation with faculty member.

497 Independent Research (1–4)  
Prereq: perm. Research in selected fields of marketing under direction of a faculty member.

498 Internship (1–4)  
Prereq: perm.

Materials Management Technology (MMT)

The following courses for the proposed A.A.S. in materials management technology are available only on the Lancaster campus:

101 Introduction to Materials Management (4)  
Introduction to career of materials management, covering roles and responsibilities of the materials manager and how they relate to manufacturing processes.

189 Special Topics (1-3, max 9)  
Prereq: 101. Special topics that are current and relevant to the materials management field. May be repeated.

200 Computer Applications in Materials Management (4)  
Computer applications in materials management, including the use of data bases for inventory control, purchasing, and other electronic information. Also covers computer applications for electronic communications. 2 lec, 4 lab.

250 Shipping and Warehousing (3)  
Prereq: 101. Shipping and warehousing of materials from point of origin to point of destination, emphasizing packaging, transportation, and storage. 2 lec, 2 lab.

262 Plant Layout and Material Handling (3)  
Prereq: 101. Basic principles of plant facilities layout in relation to the flow of material through the workplace, including study of material handling system to move material in bulk or containers to and from the manufacturing processes. 2 lec, 2 lab.

263 Process Control (3)  
Prereq: Tier I MATH Analysis of basic principles of quality control, including frequency distribution, sampling inspection, and charts and gauges related to inspection. Field trips part of lab activity. 2 lec, 2 lab.

264 Production Scheduling (3)  
Various established techniques of scheduling, analyzing, and improving production operations. Focuses on detailed study of applications for CPM, PERT, MRPII, and other production systems. 2 lec, 2 lab.

270 Introduction to Organizational Behavior (4)  
Types of behavior organizations exhibit and human relationship skills. Covers face-to-face discussion, dialogue over the phone, and other communication skills.

289 Independent Study (1-5, max 5)  
Prereq: 101. Study of a particular topic pertinent to the major, supervised by a faculty member. May be repeated. 1-5 lec, 2-8 lab.

290 Externship (4)  
Prereq: 101, 200, 250, 262, 263. Performance of materials manager duties in a supervised, unpaid experience, working 28 hours/week with local businesses. Efforts are made to rotate experience.

Mathematics (MATH)

101 Basic Mathematics (4)  
Prereq: placement level Dev1. Developmental course in arithmetic and elementary algebra for students with unusually weak backgrounds. Credit applies as hours toward graduation but meets no other college requirement. No credit to student who has passed higher-level mathematics course.

102 Elementary Algebra (4)  
Prereq: 101 or placement level Dev2. Developmental course in algebra for students with unusually weak backgrounds. A maximum of 8 credit hours of developmental courses may be applied for graduation. Meets no other college requirement. Not credit to student who has passed higher-level mathematics course. Available on regional campuses.

See General Education Requirements in the Graduation Requirements—University Wide section for quantitative skills requirements.

109 Consumer Mathematics (4)  
Prereq: 101 or placement level 1. (formerly 151) Applications of elementary mathematics to day-to-day problems. Special emphasis on consumer topics such as compound interest, mortgages, and lease plans. Scientific calculator required. Does not apply to arts and sciences requirements. No credit to those with credit for course 105.

113 Algebra (5)  
Prereq: 101 or placement level 2. Topics in algebra including functions, linear equations and systems, polynomials, rational and radical expressions, quadratic equations, exponential and logarithmic functions, and inequalities. Graphing calculators are employed. No credit to those with credit for 117 or 263A.

115 Pre-Calculus (5)  
Prereq: 113 or placement level 2. Graphs, inverses, and operations of functions. Study of polynomial, rational, exponential, logarithmic, and trigonometric functions. Additional topics from trigonometry and analytic geometry. Recommended only for students intending to enroll in the 263 calculus sequence.

117 Elementary Applied Mathematics (4)  
Prereq: placement level 1. Topics from intermediate algebra such as functions and graphs, systems of linear equations, 3x3 determinants, factorization, quadratic equations and inequalities, exponents and radicals, and logarithms. Available by correspondence and on some regional campuses. Students cannot earn credit for both this course and 113.

118 Elementary Applied Mathematics (4)  
Prereq: 117. Topics from trigonometry and analytic geometry including coordinate geometric functions and their graphs, vectors and oblique triangles, trigonometric identities, j-operator, straight lines, conic sections, and translation of axes. Available by correspondence and on some regional campuses. Students cannot earn credit for both 118 and any of: 115, 116, or 130.

120 Elementary Topics in Mathematics (4)  
Prereq: placement level 1. 120-121-122 is a sequence for majors in elementary education and related fields. Emphasizes number systems and related properties, 121 and 122 focus on topics related to elementary curriculum including geometry, algebra, statistics, and probability. Satisfies Tier I requirement for elementary education majors only. Does not apply to Arts and Sciences natural science requirements.

121 Elementary Topics in Mathematics (4)  
Prereq: 120. Continuation of 120. Does not apply to Arts and Sciences natural science requirements.

122 Elementary Topics in Mathematics (3)  
Prereq: 121. Continuation of 120-121. Does not apply to Arts and Sciences natural science requirements.

147 Introductory Game Theory (4)  
Prereq: 101 or placement level 1. The course introduces mathematical models dealing with situations of conflict, whether actual or recreational. Topics include matrix representation of games, two-person and n-person games, zero and nonzero-sum games, Nash equilibria, cooperation and the prisoner's dilemma. Application to topics such as warfare, business decision, football, environmental policy, evolution, voting, and poker will be considered.

150 Finite Mathematics (4)  
Prereq: 113 or placement level 2. (formerly 250A) Set theory, logic, vectors and matrices; linear programming.

163A Introduction to Calculus (4)  
Prereq: 113 or placement level 2. Presents a survey of basic concepts of calculus. For students who want an introduction to calculus, but do not need the depth of 263A-C. No credit to students who have completed 163A and either of 263A or 263B.

163B Introduction to Calculus (3)  
Prereq: 163A. Continuation of 163A. Note: Students cannot earn credit for both 163B and either of 263B or 266B.

211 Elementary Linear Algebra (4)  
Prereq: 113 or placement level 2. Solutions to linear systems, matrices and matrix algebra, determinants, n-dimensional real vector spaces and subspaces, bases and dimension, linear mappings, matrices of linear mappings, symmetric matrices and eigen­vectors, diagonalization. Emphasis is on techniques and computational skills. No credit to students who have completed 110 or 211.

250 Introduction to Probability and Statistics I (4)  
Prereq: 113 or placement level 2. (formerly 250B) Organization and description of data. Estimation, central tendency, dispersion, probability, concept of random variables, binomial and normal probability distributions. No credit for 250B if already credit for 450A, PSY 120, PSY 121, PSY 221, ISE 304, or ISE 305.

251 Introduction to Probability and Statistics II (4)  
Prereq: 250. Testing hypotheses, linear regression and correlation, and analysis of variance. Students in business administration should enroll in more specialized QBA 251 if already credit for 450B, QBA 201, PSY 121, PSY 221, or ISE 306.

263A Calculus I (4)  
Prereq: 115 or placement level 3. Limits and differentiation, including trigonometric functions. Applications of the derivative. NOTE: Students cannot earn credit for both 263A and either of 163A or 266A.

263B Calculus II (4)  
Prereq: 263A or 266B. Integration, logarithmic, exponential, and other transcendental functions; indeterminate forms, improper integrals, and techniques of integration. NOTE: Students cannot earn credit for both 263B and either 163B or 266B.
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263C Calculus III (4) (2N)
Prereq: 263B or 266B. Continuation of 263A-B. Parametric equations, polar coordinates, infinite series, and vectors.

263D Calculus IV (4)
Prereq: 263C. Continuation of 263A-C. Multidimensional topics, partial differentiation, multiple integrals.

266A Calculus with Applications to Biology I (4) (2N)
Prereq: 115 or placement level 3. Introduction to dynamical systems, limits, and derivatives in the context of biological applications. Students cannot earn credit for both 266A and either of 163A or 263A.

266B Calculus with Applications to Biology II (4) (2N)
Prereq: 266A. Continuation of 266A. Integral calculus and the analysis of differential equations in the context of biological applications. No credit for 266B if already credit for 163B or 263B.

297T Mathematics Tutorial (1-15)
(fall) Special program for students of unusual ability.

298T Mathematics Tutorial (1-15)

299T Mathematics Tutorial (1-15)
Prereq: 299T. Orientation to mathematical topics related to teaching of mathematics on secondary school level. Not counted toward math major or minor or in Arts and Sciences 200L.

300 History of Mathematics (4)
Prereq: math major, jr or sr. Survey of main lines of mathematical development in terms of contributions made by great mathematicians.

301 Intermediate Analysis (4)
Prereq: 263D and 306, or perm. Rigorous study of limits, continuity, and differentiability of functions of 1 real variable.

397T Mathematics Tutorial (1-15)
(fall) Special program for students of unusual ability.

398T Mathematics Tutorial (1-15)
Prereq: 397T. (winter) Continuation of 397T. See 397T for description.

399T Mathematics Tutorial (1-15)

406 Foundations of Mathematics II (4)
Prereq: 306. Introductory topics in set theory and axiomatic development of real number system.

407 Number Theory (4)
Prereq: 307, 263C. Topics in number theory.

410 Mathematics Theory (4)
Prereq: 263D. Matrix algebra, determinants, solutions of linear systems, eigenvalues and eigenvectors, matrix functions and applications to differential equations, Jordan canonical form, inner products diagonalization and generalized inverses. Intended primarily for students interested in mathematics, engineering, and sciences.

411 Linear Algebra (4)
Prereq: 306. (fall) Vector spaces and linear transformations, characteristic values, quadratic forms, dual spaces, normal forms, and Jordan canonical form.

412 Introduction to Algebraic Coding Theory (4)
Prereq: 211 or 410. Encoding and decoding for error correction. Linear codes over finite fields and syndrome decoding. Cyclic codes, Hamming codes, BCH and Reed-Solomon codes.

413 Introduction to Modern Algebra (4)
Prereq: 314 or 411. (winter) Groups, permutation groups, subgroups, normal subgroups, quotient groups, conjugacy classes, and class equation formula and its applications to p-groups. Fundamental theorem on homomorphisms.

413B Introduction to Modern Algebra (4)

419 Topics in Geometry (1-5, max 10)
Prereq: perm. When demand is sufficient, course in some phase of geometry will be offered under this number.

440 Vector Analysis (4)

441 Fourier Analysis and Partial Differential Equations (4)
Prereq: 340 and 263D. Representation of functions as sums of infinite series of trigonometric functions, Bessel functions. Legendre polynomials, or other sets of orthogonal functions. Use of such representations for solution of partial differential equations dealing with vibrations, heat flow, and other physical phenomena.

442 Theory of Linear and Nonlinear Programming (4)
Prereq: 211 or 410, and 263D; computer programming experience is desirable. Minimization of functions subject to equality and inequality constraints, Kuhn-Tucker theorem, algorithms for function minimization, such as steepest descent and conjugate gradient and Newton function methods. (Not a course in computer programming.)

443 Mathematical Modeling and Optimization (4)
Prereq: 263D, 340, and 411 or 410. Investigation of differential equation and/or discrete optimization models in biological, social, and environmental contexts. Application of numerical optimization and differentiation; numerical solutions to differential equations; numerical methods for matrix inversion, determination of eigenvalues, and solutions of systems of equations.

445 Advanced Numerical Methods (4)
Prereq: 441, 444. (winter) Numerical methods for solutions of ordinary and partial differential equations (credit for only 1 of 445 or ET 445).

446 Numerical Linear Algebra (4)
Prereq: 410 and any CS course numbered 200 or above. Polynomial interpolation and approximation; numerical integration and differentiation; numerical solution to differential equations; numerical methods for matrix inversion, determination of eigenvalues, and solutions of systems of equations.

448 Introduction to Waves and Waves with Applications (4)
Prereq: 410 or 411, and 441 or 444, and CS 210 or 220. An elementary introduction to Fourier and wavelet analysis and its application in engineering, such as data analysis and signal and image analysis. Focus on understanding basic mathematical concepts and methodology, developing related numerical algorithms and their implementation. Prior experience with computer software and computer algebra systems, such as the matlab toolbox and basic computer programming skills are required.

449 Advanced Differential Equations (4)
Prereq: 340, and 410 or 411. Introduction to theory of ordinary differential equations and representation of solutions as sums of infinite series of trigonometric functions, Bessel functions. Legendre polynomials, or other sets of orthogonal functions. Use of such representations for solution of partial differential equations dealing with vibrations, heat flow, other physical phenomena.

450A Theory of Statistics (4)
Prereq: 263C. (fall) Topics in the 450A-B-C sequence include probability distributions of one and several random variables, conditional probability and independence, exponential and normal densities, the central limit theorem, sampling theory, estimation, testing hypotheses, regression and correlation, and analysis of variance.

450B Theory of Statistics (4)
Prereq: 450A. (winter) Continuation of 450A. See 450A for description.

450C Theory of Statistics (4)
Prereq: 450B. (spring) Continuation of 450A-B. See 450A for description.

451 Stochastic Processes (4)
Prereq: 450C. Markov chains, Poisson process, birth and death processes, queueing, and related topics.

452 Statistical Computing (4)
Prereq: 450B. Introduction to computational statistics; Monte Carlo methods, bootstrap, data partitioning methods, EM algorithms, probability density estimation, Markov Chain Monte Carlo methods.

455 Basic Principles of Actuarial Science (4)
Prereq: 450A. Basic concepts of risk theory and utility theory, applied calculus and probability models for the analysis of claims, frequency and severity of distributions, loss distributions, premium determination, insurance with deductible, reinsurance, and self-insurance.
456 Theory of Interest and Life Contingencies (4)
Prereq: 450A. Theory of interest and contingent payment models. Mathematical models for the actuarial price or value of a future set of payments contingent on some random event(s); life insurance, life annuities, benefit reserves.

460A Advanced Calculus (4)
Prereq: 205B. (Fall) Critical treatment of functions of one or several variables. Topics in the 460A-B-C sequence include the basic topological features of Euclidean spaces, a careful study of limits and continuity, Riemann-Stieltjes integration, uniform convergence, and multidimensional differentiation and integration.

460B Advanced Calculus (4)
Prereq: 460A. (Winter) Continuation of 460A. See 460A for description.

460C Advanced Calculus (4)
Prereq: 460B. (Spring) Continuation of 460B-A. See 460A for description.

470 Complex Variables (4)
Prereq: 263D. Analytic and harmonic functions. Cauchy integral and residue theorems, contour integration, Taylor and Laurent expansions, conformality, and linear transformations with applications.

480A Elementary Point Set Topology (4)

480B Elementary Point Set Topology (4)
Prereq: 480A. (Spring) Introduction to general topological spaces.

486 Introduction to Bioinformatics (4)
Prereq: grade of 2.0 or better in 263B or 266B. Major topics and techniques in bioinformatics, including homology searches, sequence alignment, gene finding, phylogenetic trees. The course combines biological, computational, and statistical approaches to the extraction of information from large sets of biomolecular data.

490 Selected Topics in Mathematics (1-5)
Prereq: perm of instructor and chair. When demand is sufficient, course in some phase of mathematics will be offered under this number. (May be repeated for credit.)

491 Studies in Mathematics (1-15)
Prereq: 6 hrs of 400-level courses, s or Jr in Honors Tutorial College, or perm of chair and instructor. Selected topics in mathematics studied under guidance of instructor particularly interested in field. (May be repeated for credit.)

497 Mathematics Tutorial (1-15)
(fall) Special program for students of unusual ability.

498 Mathematics Tutorial (1-15)

499 Mathematics Tutorial (1-15)

Medical Assisting Technology (MAT)
The following courses for the A.A.S. in medical assisting technology are available only on the Lancaster campus.

101 Introduction to Medical Assisting (2)
Introduction to the career of medical assisting. Roles and responsibilities of a medical assistant; overview of the medical assisting profession; the safety, liability, professional, and interpersonal relationships necessary in the medical field.

140 Medical Terminology for the Medical Assistant (3)
Understanding and usage of medical terms used in the allied-health field. Emphasis on the spelling of, definition of, and creation of medical terms through the understanding of prefixes, suffixes, and root words. Terminology learned through body system knowledge. Credit cannot be earned for both 140 and OTEC 141M.

150 Medical Transcription and the Medical Assistant (3)
Prereq: 140 or concurrent, OTEC 121. Application of medical transcription rules to typical medical documents, including those used in both hospitals and ambulatory-care settings. Covers proper use and correct spelling of medical terminology, as well as increased production of documents.

170 Administrative Medical Assisting (4)
Prereq: 101, OTEC 121. Introduction to the office and current administrative practices. Topics include confidentiality and the daily practices of the medical assistant.

201 Clinical Techniques (4)
Prereq: 101, BID 103. Introduction to medical laboratory theory and practice in preparation for physical examination. Patient and exam room preparation, vital signs testing, taking histories, aseptic techniques, infection control, and universal precautions are studied. 3 lec, 2 lab.

202 Clinical Techniques II (4)
Prereq: 201. Theory and practice in minor hematology, laboratory tests, urinalysis, administering medications, pharmacology, and venipuncture. Covers concepts of general and government regulations, and the processes of sterilization, quality control, and vision and blood testing. 2 lec, 4 lab.

203 Clinical Techniques III (4)
Prereq: 202. Theory and practice in assisting with minor office surgery, office procedures, and diagnostic procedures. Operation, maintenance, and inventory control of equipment and supplies required of a medical assistant. 2 lec, 4 lab.

210 Law and Ethics for Medical Assisting (2)
Prereq: 101. Introduction to the law and ethics as they apply to allied health fields. Topics include practicing in a medical office, professional liability and medical malpractice, informed consent, medical ethics, documentation and reporting, and licenses and accreditation.

230 Insurance Billing and Coding for the Medical Assistant (4)
Prereq: 140, 170. Theory and application of skills necessary to process insurance forms in the health care setting. Covers major nationwide medical insurance programs and extensive study and use of ICD-9-CM and CPT coding.

250 Computerized Office Procedures for the Medical Assistant (4)
Prereq: 170, 230. Theory and application of skills necessary to manage administrative duties in a medical office. Emphasis is on computer applications and tasks such as scheduling and billing.

290 Special Topics (1-5, max 5)
Prereq: 101. Special topics current and relevant to the medical assisting field.

291 Independent Study (1-5, max 5)
Prereq: 101. Independent study of a particular topic pertinent to the medical assisting field under the direction of a faculty member.

295 Externship (3)
Prereq: 203. Practical experience as a medical assistant in a supervised unaided clinical experience. Student performs administrative and clinical procedures and develops professional attitudes. Student works 30 hours each week during the quarter enrolled.

Medical Technology
See Preparation for Clinical Laboratory Science under Arts and Sciences or Biological Sciences under Courses of Instruction.

Microbiology
See Biological Sciences.

Military Science (MSC)

Army ROTC
Regional Campus Students can participate in the two-year program by attending advanced courses at the Athens campus.

101 Fundamental Military Leadership Concepts (1)
Prereq: Fr or Sr. (Fall) Broad overview of the tradition of the Army as an institution of government. Introductory course to the Army’s Reserve Officer Training Corps (ROTC) and overview of the curriculum that can prepare you as a second lieutenant in the U.S. Army. Increases self-confidence through activities in basic drill, physical fitness, razzle, and rifle. Teaches fundamental concepts of leadership in a profession in both classroom and outdoor laboratory environment. 1 hr and a required 2-hr lab, 110L, plus optional participation in a 1-hr session for physical fitness and one weekend exercise.

102 Fundamental Military Concepts and Basic Leadership I (1)
Prereq: Fr or Sr. (Winter) Provides an understanding of selected basic soldier skills that are essential to the Army’s ability to win on the modern battlefield. Develops communication and leadership skills to improve individual performance and group interaction. Reinforces self-confidence through participation in basic drill, physical fitness, and a water survival exercise. Provides hands-on training of basic individual skills both in the classroom and outdoor laboratory environment. 1 hr and a required 2-hr lab, 110L, plus optional participation in a 1-hr session for physical fitness and a weekend exercise.

103 Basic Military Leadership II (1)
Prereq: Fr or Sr. (Spring) Provides additional skills and hands-on experiences and allows the student to practice what was taught in the classroom. Offers insight into a military organization and builds self-confidence and teambuilding skills.

201 Advanced Military Leadership (2)
Prereq: Fr or Sr. (Fall) Continues basic skills by applying teamwork as a small group. Teaches the fundamentals of land navigation and basic life-saving techniques. Enhances survival awareness through lectures, films, and participation. Includes a one-day orienteering course, which occurs on a weekend during the quarter. 2-hr-a-week course with a required Leadership Lab, MSC 210L, one day a week. The course also includes rappelling and rifle familiarization, which may not occur during inclement weather.

202 Military Leadership, Tactics, and Operations (2)
Prereq: Fr or Sr. (Fall) Uses ethics-based leadership skills to develop individual abilities and contribute to the building of effective teams of people. Develops skills in oral presentations and military correspondence. Presents the fundamentals of military leadership and their application to team development. Teaches the basic duties of the commissioned and noncommissioned officer. This course is a 2-hr-a-week course with a required Leadership Lab, MSC 220L, once a week.

203A Military Tactics and Officerhood II (2)
Prereq: Fr or Sr, (Spring) Introduction to individual and team development of military tactics in small unit operations. Includes use of radio communications, movement techniques, issue and operation order, securing the safety, liability, and security of the unit. Includes rappelling and rifle familiarization, which may not occur during inclement weather.

210L Leadership Laboratory (1)
Prereq: Concurrent with 201, 202, 203. Provides additional skills and hands-on experiences and allows the student to practice what was taught in the classroom. Offers insight into a military organization and builds self-confidence and teambuilding skills.
230 Leaders Training Course (4)
28-day summer off-campus training program that qualifies students for direct entry to advanced ROTC course. Transportation to and from camp, uniforms, meals, and housing paid for by Army.

301 Small Unit Leadership (3)
Prereq: perm. Study of basic leadership principles, the Army decision-making process, small unit tactics, and required individual skills. Course includes intrinsic leadership practical exercises. A 2-hr-a-week lab, three 1-hr sessions of physical training a week, and a required weekend field training exercise are required parts of the course.

302 Small Unit Leadership and Operations (3)
Prereq: 301. Continuation of 301 developing from squad to platoon level organization and tactics, as well as an increased complexity in leadership positions. Labs, physical training, and a field training exercise are required as part of the course.

303 Small Unit Operations (3)
Prereq: 302. Continuation of PLT level operations with an increased emphasis on the dynamics of leadership to include the ethical decision-making process and the laws of war. The course also makes final preparations for the student to attend their summer training. Labs, physical training, and a field training exercise are required as part of the course.

310A Advanced Leadership Laboratory (1)
Prereq: enrollment in 301. (Fall) Designed to allow you to actually practice what is taught in the classroom by using a hands-on approach.

310B Advanced Leadership Laboratory (1)

310C Advanced Leadership Laboratory (1)
Prereq: enrollment in 303. (Spring) Continuation of 310A-B. See 310A for description.

330 National Advanced Leadership Camp (4)
Prereq: 303. 32-day field training session conducted at Ft. Lewis, Washington. Exposure to barracks life and daily leadership activities of future commissioned officers in field and garrison. Transportation to and from camp, uniforms, meals, and lodging paid for by the Army.

401 Military Leadership, Management, and Ethics (3)
Prereq: 303. Provides opportunity to plan, conduct, and evaluate activities of the Army cadet organization. Assesses organizational cohesion and development strategies to improve it. Develops confidence in skills to lead people, manage resources, and plan and execute complex small-organization operations. Teaches application of various Army policies and programs. Two hours a week and a required Leadership Lab, MSC 410, plus participation in three 1-hr sessions for personal and organizational physical fitness.

402 Military Leadership, Management, Ethics, and Law (3)
Prereq: 401. Continuation of 401. Increased emphasis on critical thinking skills and ability to quickly identify and resolve complex leadership issues.

403 Transition from Cadet to Lieutenant (3)
Prereq: 401A (Spring) U.S. in contemporary world scene. Includes study of other major factors in the world arena.

410A Advanced Leadership Laboratory (1)
Prereq: enrollment in 401. (Fall) Allows you to plan and conduct training events such as drill and ceremony and land navigation.

410B Advanced Leadership Laboratory (1)
Prereq: enrollment in 402. (Winter) See 410A for description.

410C Advanced Leadership Laboratory (1)
Prereq: enrollment in 403. (Spring) See 410A for description.

490 Special Problems (1-5, max 15)
Prereq: perm. Provides continuing military education on individual basis. Provides advanced and specialized training depending upon needs of individual and department.
Courses / Music

355 Euphonium (1–4)  J. Smith.
356 Trombone (1–4)  C. Hayes.
357 Tuba (1–4)  J. Smith.
358 Percussion (1–4)  R. Braun.
359 Class Piano (2)  Prereq: 243 with minimum grade of C, and 103.
360 Class Piano (2)  Prereq: 359.
361 Class Piano (2)  Prereq: 360.
370 Practicum in Music (1–2, max 12)  J. Smith. May be repeated.
372 Advanced Functional Skills (2)  Prereq: jr in piano. (fall) Instruction to provide greater facility in handling basic functional keyboard skills. Emphasis on transferring these skills to actual situations encountered as music educators and/or music therapists.
375A English Diction for Singers (1)  J. Climer. Emphasis on teaching techniques, methods, and materials for teaching elementary music. For elementary education majors only. See 458G for description.
375B Italian Diction for Singers (1)  Prereq: ITAL 111. See 375A for description.
375C German Diction for Singers (1)  Prereq: GER 111. See 375A for description.
375D French Diction for Singers (1)  Prereq: FRE 111. See 375A for description.
377A Jazz Improvisation I (2)  Prereq: C or better in 103. Bastin. Learning and applying through improvisation the Ionian, Dorian, and Mixolydian modes, the ii-V7-I progression, and culminating with a final project utilizing the song form.
377B Jazz Improvisation II (2)  Prereq: C or better in 377A. Bastin. Learning and applying through improvisation the whole tone, diminished and blues scales, the Aeolian and Location modes, the ii-V7-I progression, and culminating with a final project utilizing the form.
379 Performance Preparation (2)  J. Climer. Preparation in developing strategies for preparing physically and psychologically to achieve maximum potential in musical performance.
450 Accompanying (1, max 3)  Prereq: 125, 205, P. Jarijanz, J. Climer, and Huang. Basic beat patterns, technique of baton, and use of left hand. Experience in conducting choral and small instrumental ensembles in works suitable for school groups.
456A Instrumental Conducting (3)  Prereq: 205, 455, J. Climer. Experience in conducting from full score; includes band and orchestral works suitable for high school groups.
456B Choral Conducting (3)  Prereq: 205, 455. P. Jarijanz. Specialized conducting techniques for choral groups, including experience in conducting works suitable for high school and college groups.
457A Solo Repertoire of String Instruments (1)  Prereq: 323. Survey of student’s major performance instrument literature.
457B Solo Repertoire of Woodwind Instruments (1)  Prereq: 323. See 457A for description.
457C Solo Repertoire of Brass Instruments (1)  Prereq: 323. See 457A for description.
457D Solo Repertoire of Vocal Music (1)  Prereq: 323. See 457A for description.
457F Solo Repertoire of Percussion Instruments (1)  Prereq: 323. See 457A for description.
457G Keyboard Repertoire I (2)  Prereq: 125. A comprehensive study of the keyboard repertoire from 400 through 1750, including major works of Baroque composers.
457K Keyboard Repertoire II (2)  Prereq: 125. A comprehensive study of the piano repertoire from 1750 through 1950, including major works of classical and romantic composers.
457L Keyboard Repertoire III (2)  Prereq: 125. Twentieth century piano repertoire beginning with works from the impressionistic period and including major works of composers to the present.
458A String Instrument Pedagogy (2)  Teaching techniques and use of selected materials for various levels of ability. Includes practical experience in teaching string instruments.
458B Woodwind Instrument Pedagogy (2)  See 458A for description—woodwind instruments.
458C Brass Instrument Pedagogy (2)  See 458A for description—brass instruments.
458D Vocal Pedagogy (2)  See 458A for description—voice.
458E Class Piano Pedagogy (2)  M. Stewart. Practical teaching techniques unique to class piano instruction, particularly in electronic lab. Examination of useful materials for various levels of ability. Includes some experience in classroom teaching.
458F Percussion Instruments Pedagogy (2)  See 458A for description—percussion instruments.
458G Piano Pedagogy (2)  (Fall) G. Berenson. Provides creative teaching strategies for piano teachers, teaching philosophies, objectives, and procedures discussed and applied to group and private piano instruction. Includes teaching techniques for working with students of all ages and levels.
459B Choral Conducting II (3)  Prereq: 456B. P. Jarijanz.
495* Jr. Recital (1)  Prereq: Music major, permission of applied instructor AND junior classification in applied music. Public performance of repertoire representative of a variety of historical and stylistic periods. Tier III equivalent course, but both 495 and 496 must be taken to receive Tier III equivalent credit.
496* Sr. Recital (3)  Prereq: Music 495 AND senior level classification in applied music. Public performance of repertoire representative of a variety of historical and stylistic periods. Tier III equivalent course, but both 495 and 496 must be taken to receive Tier III equivalent credit.
497 Recital (1–2)  Prereq: 456B. P. Jarijanz.
499* Music Fundamentals (3)  Prereq: 160 with minimum grade of C. Methods of teaching elementary music. For elementary education majors only.
501 Music in the Elementary/Middle School (3)  Prereq: jr standing in music education. A study of procedures for planning, implementing, administering, and evaluating instrumental music programs in elementary and middle schools. Also included is a survey of appropriate teaching materials and current technology.
502 Teaching Instrumental Music in the Elementary/Middle School—Laboratory Band (1, max 4)  Prereq: jr standing in music education. Prepares the prospective instrumental music educator for competence and adequacy in executing an ensemble music rehearsal at the elementary/middle school level. Includes personnel, and score preparation.
503 Secondary School Vocal Techniques and Materials (3)  Prereq: jr standing in music education. Literature and rehearsal techniques for secondary school bands and orchestras, including administration of the high school instrumental music program.
504 Secondary School Vocal Techniques and Materials (3)  Prereq: jr standing in music education. (Spring) Literature and rehearsal techniques for high school choral groups.
505 Teaching of Music in the Elementary Grades (3)  Prereq: jr standing in music education. (Fall) Methods and materials for elementary music for music majors only.
506A Introduction to Orff Schulwerk (2)  Introduction to music, materials, instruments, and pedagogy used in Orff teaching.
506B Early Childhood Music Education (3)  Prereq: jr standing in music education. Introduces music majors to the methods and materials for teaching music to preschool children.
507A Marching Band Techniques (2)  Prereq: jr standing in music education. (Spring) Techniques for preparation of high school and college marching band performance.

261B Lower Strings Methods and Materials (2)  Prereq: soph in music education/music therapy. Instruction in lower string instruments with emphasis on teaching techniques, methods, and materials.
262 Music in Early Childhood (3)  Methods and materials for aesthetic development of preschool children. Exploration of reading readiness and vocal, rhythmic, listening activities.
263A Percussion Methods and Materials (2)  Prereq: soph in music education/music therapy. Instruction in percussion instruments with emphasis on teaching techniques, methods, and materials.
265E Trumpet Methods and Materials (2)  Prereq: soph in music education/music therapy. Instruction in trumpet with emphasis on teaching techniques, methods, and materials.
265F Horn/Trombone Methods and (2)  Prereq: soph in music education/music therapy. Instruction in horn and trombone with emphasis on teaching techniques, methods, and materials.
265G Euphonium/Tuba Methods and Materials (2)  Prereq: soph in music education/music therapy. Instruction in euphonium and tuba with emphasis on teaching techniques, methods, and materials.
266F Flute/Saxophone Methods and Materials (2)  Prereq: soph in music education/music therapy. Instruction in flute and saxophone with emphasis on teaching techniques, methods, and materials.
266M Clarinet Methods and Materials (2)  Prereq: soph in music education/music therapy. Instruction in clarinet with emphasis on teaching techniques, methods, and materials.
266K Double Reed Methods and Materials (2)  Prereq: soph in music education/music therapy. Instruction in double reed instruments with emphasis on teaching techniques, methods, and materials.
26EL Teaching Instrumental Music in the Elementary/Middle School (3)  Prereq: jr standing in music education. A study of procedures for planning, implementing, administering, and evaluating instrumental music programs in elementary and middle schools. Also included is a survey of appropriate teaching materials and application of current technology.
26E1 Teaching Instrumental Music in the Elementary/Middle School—Laboratory Band (1, max 4)  Prereq: jr standing in music education. Prepares the prospective instrumental music educator for competence and adequacy in executing an ensemble music rehearsal at the elementary/middle school level. Includes personnel, and score preparation.
26F Secondary School Vocal Techniques and Materials (3)  Prereq: jr standing in music education. Literature and rehearsal techniques for secondary school bands and orchestras, including administration of the high school instrumental music program.
26S Secondary School Vocal Techniques and Materials (3)  Prereq: jr standing in music education. (Spring) Literature and rehearsal techniques for high school choral groups.
26E Teaching of Music in the Elementary Grades (3)  Prereq: jr standing in music education. (Fall) Materials and methods for elementary music. For music majors only.
266A Introduction to Orff Schulwerk (2)  Introduction to music, materials, instruments, and pedagogy used in Orff teaching.
266B Early Childhood Music Education (3)  Prereq: jr standing in music education. Introduces music majors to the methods and materials for teaching music to preschool children.
264 Marching Band Techniques (2)  Prereq: jr standing in music education. (Spring) Techniques for preparation of high school and college marching band performance.
### Courses / Music

#### Jazz Ensemble Methods (2)

#### General Music in the Junior High School (3)
Prereq: jr standing in music education. (winter) Materials and methods; listening program; changing voice.

#### Music History and Literature

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>Music Theory II (3)</td>
<td>3</td>
<td>Prepr. C or better in 101. Continuation of 101. See 101 for description.</td>
</tr>
<tr>
<td>103</td>
<td>Music Theory III (3)</td>
<td>3</td>
<td>Prepr. C or better in 102. Continuation of 101 and 102. See 101 for description.</td>
</tr>
<tr>
<td>104</td>
<td>Dictation and Sight Singing I (1)</td>
<td>1</td>
<td>Prepr. 104 with a minimum grade of C. Should be taken concurrently with 102. See 104 for description.</td>
</tr>
<tr>
<td>105</td>
<td>Dictation and Sight Singing II (1)</td>
<td>1</td>
<td>Prepr. 105 with a minimum grade of C. Should be taken concurrently with 103. See 104 for description.</td>
</tr>
<tr>
<td>106</td>
<td>Dictation and Sight Singing III (1)</td>
<td>1</td>
<td>Prepr. 105 with a minimum grade of C. Should be taken concurrently with 103. See 104 for description.</td>
</tr>
<tr>
<td>107</td>
<td>Computer Skills for Musicians (2)</td>
<td>2</td>
<td>Provides a basic overview of computer technology and terminology and introduces various software tools specifically for musicians.</td>
</tr>
<tr>
<td>108</td>
<td>Computer Skills for Musicians, Nonmajors (2)</td>
<td>2</td>
<td>See 178 for description.</td>
</tr>
<tr>
<td>109</td>
<td>Technology for Music Educators (2)</td>
<td>2</td>
<td>Provides the prospective music educator with technology knowledge, skill, knowledge of software, and methods for using technology in the music classroom.</td>
</tr>
<tr>
<td>110</td>
<td>Literature of Orchestral Music (3)</td>
<td>3</td>
<td>Prepr. 102. History of music with survey of musical literature, 1600–1750. No credit to those with credit for CA 322.</td>
</tr>
<tr>
<td>111</td>
<td>Literature of Organ Music (3)</td>
<td>3</td>
<td>Prepr. 102. History of music with survey of musical literature, 1600–1750. No credit to those with credit for CA 322.</td>
</tr>
<tr>
<td>112</td>
<td>Literature of Piano Music (3)</td>
<td>3</td>
<td>Prepr. 102. History of music with survey of musical literature, 1600–1750. No credit to those with credit for CA 322.</td>
</tr>
<tr>
<td>113</td>
<td>Literature of Vocal Music (3)</td>
<td>3</td>
<td>Prepr. 102. History of music with survey of musical literature, 1600–1750. No credit to those with credit for CA 322.</td>
</tr>
<tr>
<td>114</td>
<td>Literature of Opera (3)</td>
<td>3</td>
<td>Prepr. 102. History of music with survey of musical literature, 1600–1750. No credit to those with credit for CA 322.</td>
</tr>
<tr>
<td>115</td>
<td>Literature of Band Music (3)</td>
<td>3</td>
<td>Prepr. 102. History of music with survey of musical literature, 1600–1750. No credit to those with credit for CA 322.</td>
</tr>
<tr>
<td>116</td>
<td>Folk Music in the United States (3)</td>
<td>3</td>
<td>Introduction to selected types of folk music in U.S. and Canada.</td>
</tr>
<tr>
<td>117</td>
<td>Jazz History (3)</td>
<td>3</td>
<td>Study of jazz styles to 1970.</td>
</tr>
</tbody>
</table>

#### Independent Studies in Music

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>414</td>
<td>Senior Thesis (2)</td>
<td>2</td>
<td>Prepr. sr. Preparation of senior project.</td>
</tr>
<tr>
<td>418A*</td>
<td>Sr. Thesis I (2)</td>
<td>2</td>
<td>BM5114 or BM5116; no credit if 414. Independent research in music theory or music history, or major creative work in music composition; working toward a senior-level thesis or composition final project. * Tier III equivalent course, but both 418A and 418B must be taken to receive Tier III equivalent credit.</td>
</tr>
<tr>
<td>418B*</td>
<td>Sr. Thesis II (2)</td>
<td>2</td>
<td>Prepr. Music 418A; no credit if 414. Independent research in music theory or music history, or major creative work in music composition; completing a Senior thesis. Continuing MUS 418A. * Tier III equivalent course, but both 418A and 418B must be taken to receive Tier III equivalent credit.</td>
</tr>
<tr>
<td>498</td>
<td>Independent Project (1-6)</td>
<td>1-6</td>
<td></td>
</tr>
<tr>
<td>499</td>
<td>Independent Readings in Music (1-12)</td>
<td>1-12</td>
<td></td>
</tr>
</tbody>
</table>

#### Music Theory and Composition

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>201</td>
<td>Music Theory IV (3)</td>
<td>3</td>
<td>Prepr. 201 with a minimum grade of C. Harmonic and contrapuntal practices of 18th, 19th, and 20th centuries, including structural analysis of small and large forms.</td>
</tr>
<tr>
<td>202</td>
<td>Music Theory V (3)</td>
<td>3</td>
<td>Prepr. 202 with a minimum grade of C. Continuation of 201 and 202. See 201 for description.</td>
</tr>
<tr>
<td>203</td>
<td>Music Theory VI (3)</td>
<td>3</td>
<td>Prepr. 202 with a minimum grade of C. Continuation of 201 and 202. See 201 for description.</td>
</tr>
<tr>
<td>204</td>
<td>Dictation and Sight Singing IV (2)</td>
<td>2</td>
<td>Prepr. 106 with a minimum grade of C. Should be taken concurrently with 201.</td>
</tr>
<tr>
<td>205</td>
<td>Dictation and Sight Singing V (2)</td>
<td>2</td>
<td>Prepr. 204 with a minimum grade of C. Continuation of 204.</td>
</tr>
<tr>
<td>206</td>
<td>Dictation and Sight Singing VI (2)</td>
<td>2</td>
<td>Prepr. 205 with a minimum grade of C. Continuation of 204 and 205. See 204 for description.</td>
</tr>
<tr>
<td>304</td>
<td>Instrumentation (3)</td>
<td>3</td>
<td>Prepr. 203. (fall) Technical characteristics of instruments of band and orchestra. Arranging for small ensembles.</td>
</tr>
<tr>
<td>305</td>
<td>Orchestration I (3)</td>
<td>3</td>
<td>Prepr. 203, 304. (winter) Scoring for instrumental ensembles with emphasis on intra- and cross-orchestration. Writing of transcriptions and sound reductions.</td>
</tr>
<tr>
<td>306</td>
<td>Orchestration II (3)</td>
<td>3</td>
<td>Prepr. 305. (spring) Continuation of 305. See 305 for description.</td>
</tr>
<tr>
<td>307</td>
<td>Choral Arranging (3)</td>
<td>3</td>
<td>Prepr. 303. Arranging for standard vocal ensembles with and without accompaniment.</td>
</tr>
<tr>
<td>308</td>
<td>Composition, Nonmajor (2)</td>
<td>2</td>
<td>Prepr. Non-composition major; 203, 206. Introduction to 20th-century compositional techniques. Writing smaller compositions.</td>
</tr>
<tr>
<td>309</td>
<td>Composition, Major (2)</td>
<td>2</td>
<td>Prepr. Composition major. See 308 for description.</td>
</tr>
</tbody>
</table>

**402A** Advanced Styles (3)
Prereq: 203 with minimum grade of C. (offered alternate years) Analysis of Medieval and Renaissance music.

**402B** Advanced Styles (3)
Prereq: 203 with minimum grade of C. (offered alternate years) Analysis of 20th-century music.

#### Music Therapy

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>180</td>
<td>Music Therapy Practicum I (1–2)</td>
<td>1–2</td>
<td>Prepr. in music therapy. Selected field experience in approved clinical facilities; field evaluation of student.</td>
</tr>
<tr>
<td>181</td>
<td>Introduction to Music Therapy (3)</td>
<td>3</td>
<td>(fall) Introduction to clinical practice of music therapy; clinical observation.</td>
</tr>
<tr>
<td>182</td>
<td>Recreational Music Instruments and Materials (3)</td>
<td>3</td>
<td>Prepr. music major. Guitar and nonsymphonic classroom instruments; special instrumental methods for disabled.</td>
</tr>
</tbody>
</table>
280 Music Therapy Practicum II (1–3) Prereq: soph in music therapy. Selected field experiences in approved clinical facilities; field evaluation of student.

281 Observation, Evaluation, and Research in Music Therapy (3) Prereq: soph. (Spring) Observation and evaluation skills development through classroom videotapes and field data collection and analysis; tests and evaluations; research methods and their application to clinical investigations. 2 lec, 1 lab.

282 Music Therapy Activities for Classroom and Clinic (3) Prereq: soph. (Winter) Development of skills in treatment, as well as planning and conducting activities. Emphasis is given to the planning of activities as part of music therapy intervention. 1 lab.

283 Music Therapy Practicum IV (1–3) Prereq: sr in music therapy. Selected field experience in approved clinical facilities; field evaluation of student.

381 Psychological Foundations of Music (3) Prereq: jr standing in music therapy/music education. Basic study of acoustics, ear and hearing, and psycho-physiological processes involved in music behavior.

382 Psychological Foundations of Music II (3) Prereq: 381. Theory of music therapy, survey of current literature relevant to music therapy, and the influence of music on behavior, physiology, emotions, learning, and work performance; experimental procedures for applying music therapy.

480 Music Therapy Practicum IV (1–3) Prereq: sr in music therapy. Selected field experience in approved clinical facilities; field evaluation of student.

481 Music Therapy Principles and Techniques I (3) Prereq: jr standing in music therapy. Problems of exceptional children and therapist strategies and techniques for remediation; terminology; treatment settings; traditional and current psychotherapeutic and behavioral approaches.

482 Music Therapy Principles and Techniques II (3) Prereq: 481. Problems in psychiatry and rehabilitation; therapist strategies and techniques for remediation; terminology; treatment settings; traditional and current psychotherapeutic and behavioral approaches.

483 Music Therapy Principles and Techniques III (3) Prereq: 481. Problems in psychiatry and rehabilitation; therapist strategies and techniques for remediation; terminology; treatment settings; traditional and current psychotherapeutic and behavioral approaches.

489 Clinical Training in Music Therapy (1) Prereq: 483. Six months as full-time music therapy intern at AMTA-approved clinical training facility following completion of yr.

115 Communication in Nursing (1) Prereq: admission to AD nursing program. Explores the concepts of effective communication and the application of these concepts to the nursing process with clients across the lifespan. A caring therapeutic nurse-patient relationship depends upon effective communication. As a master teacher, the nurse addresses the nursing roles of communicator, direct patient care provider, and manager of clients with safety, physiological, psychological, and health promotion/learning needs. Critical thinking skills and effective communication are required by the nurse to successfully meet the health needs of the client.

120 Assessment of the Middle and Older Adult (2) Prereq: admission to AD nursing program. Focuses on the assessment of emotional safety, level of physiological and psychosocial integrity, and health promotion and maintenance practices of middle and older adults. Major emphasis is placed on the three roles of the AD nurse as they relate to the assessment of middle and older adults.

121 Assessment of the Neonate through Young Adult (2) Prereq: C or better in 115, 120, 130; BIOS 130; CHEM 121. Focuses on the assessment of environmental safety, level of physiological and psychosocial integrity, and health promotion and maintenance practices of the neonate through young adult. The student will function as a member of the health care team, including the nurse, family, and other caregivers. Critical thinking and caring are essential for effective nursing assessment. Assessment activities occur in simulated settings.

130 Pharmacology in Nursing I (1) Prereq: admission to AD nursing program. Assists the student in making sound nursing judgments associated with medication administration. Basic principles of drug administration are taught to enable the student to think critically and to administer medications in a safe and caring manner. Emphasis is on nursing implications of common drug therapy to adult populations. The student will learn to administer non-parenteral medication with concern for safety, precision, and attention to important physiological factors. Simulations will occur in the campus laboratory.

131 Pharmacology in Nursing II (2) Prereq: C or better in 110, 115, 120, 130; BIOS 130; CHEM 121. Builds on 130. Students will learn to administer parenteral drug administration. Emphasis is on nursing implications of drug administration across the life span. Simulations will occur in the campus laboratory.

132 Pharmacology in Nursing III (2) Prereq: C or better in 111, 112, 131; BIOS 131; HCFN 128. Enables the student to make sound nursing judgments associated with medication administration across the lifespan. Principles of initiating and delivering medications by the IV route are taught. Advanced topics to be covered are care of clients with central lines, administration of blood products, TPNs, and chemotherapy. Simulations will occur in the campus laboratory.

210 Health Alterations I (7) Prereq: C or better in 111, 121, 131; BIOS 131; HCFN 128. Focuses on nursing care related to acute and chronic alterations in the physiological needs of nutrition, fluid balance, elimination, oxygenation, and body temperature regulation. The student will learn to function as a member within the discipline of nursing, as a provider of care, and as a member of the nursing team. Emphasis will be placed on establishing a caring relationship between the client, family, and nurse. The nurse will use critical thinking skills to promote health and well-being.

211 Health Alterations II (7) Prereq: C or better in 210, 132; BIOS 201. Focuses on nursing care related to acute and chronic alterations in the physiological needs of oxygenation perfusion and ventilation. The student will continue to develop as a member within the discipline of nursing, and as a provider and manager of care for adults. Emphasis will be placed on establishing a caring relationship between the client, family, and nurse. The nurse will use critical thinking skills to promote health and well-being.

212 Health Alterations III (7) Prereq: C or better in 211; PSY 101. Focuses on nursing care related to acute and chronic alterations in the physiological needs of the older adult. Emphasis will be placed on establishing a caring relationship between the client, family, and nurse. The nurse will use critical thinking skills to promote health and well-being.

220 Maternal, Newborn, and Women's Health Alterations (5) Prereq: C or better in 111, 121, 131; BIOS 131; HCFN 128. Emphasizes the use of critical thinking, problem-solving, and critical thinking skills as a foundation for the AD nurse in delivering care to the childbearing client and to women with alterations in reproductive health. The student will function as a member within the discipline of nursing as a provider/manager of care and promoter of health and well-being. The student will use critical thinking skills to promote health and well-being.

240 Child and Adolescent Health Alterations (5) Prereq: C or better in 111, 121, 131; BIOS 131; HCFN 128. Focuses on the roles of the AD nurse as a member within the discipline of nursing, providing care for infants, children, and adolescents with health alterations. Emphasis will be placed on establishing a caring relationship between the child, family, and nurse. The nurse will use critical thinking skills to promote health and well-being.

260 Transition to Nursing Practice (10) Prereq: C or better in 212, 220, 230, 240; SOC 101. Focuses on facilitating the transition to entry-level nursing. This capstone course further refines critical thinking, caring skills, and the roles of the nurse in providing care across the lifespan. Topics such as client care environment, client and family, managing client, managing others, and professional development will be included.

290A-Z Current Issues in Nursing (1–5, max 15) Prereq: perm. Series of elective short courses for nursing students at OU-Zanesville. RNs and allied health professionals from the local area may enroll.


Baccalaureate Program for RNs (NRSE)

300 Transitions in Nursing (5) Prereq: B.S.N. major or RN. Focus on issues related to transition from technical to professional nursing. History and development of nursing as a profession; professional practice and the nursing process; nursing theories; nursing research; general systems theory. Ohio University's School of Nursing's philosophy and conceptual framework. 5 lec.

303 Health and Safety in Early Childhood Development (3) Prereq: HFC5 160 or PSY 273. Health and safety knowledge and skills needed in working with children under the age of five years. Includes communicable disease, first aid, environmental safety, and child abuse content. 3 lec.

305 Introduction to School Nursing (4) Prereq: 300. Historical overview of school nursing in the U.S., plus current responsibilities of school nurse in implementing a school health program. 4 lec.
310 Health Appraisal I (4)  
Prereq: 300 or concurrent. Focus on developing cephalocaudal nursing assessment skills and the ability to draw valid inferences from the data collected. 3 lec, 3 lab.

315 Pain Management for Nursing (4)  
Prereq: licensed RN; CS 120 or equivalent. Assists RNs in drawing from historical perspective of pain, management to current concepts underlying the pathophysiology and treatment of pain. Pharmacological and psychosocial approaches to acute and chronic pain management addressed from holistic client and family perspectives. This course may be taught on the Internet. 4 lec.

325 Health Interventions in Nursing (5)  
Prereq: 300 or concurrent. Concept of health and its relationship to nursing intervention strategies. Theoretical and practical aspects of teaching/learning and counseling emphasized. 5 lec.

330 Family Nursing (4)  
Prereq: 300 or concurrent. Focus on nursing care of family system throughout the life cycle. Synthesis of family theory and application of the nursing process to families. 3 lec, 3 lab.

335 Ethical and Legal Issues in Nursing (4)  
Prereq: 300 or concurrent. Critical analysis of the relationships between ethics and the law with close attention given to the issues and decisions that impact professional nursing practice. 4 lec.

340 Community Health Nursing (4)  
Prereq: 300 or concurrent. Nursing care of aggregate systems within a community. Topics include community health nursing roles and basic concepts of community health. Implementation of population focused care through the nursing process, collaboration, and interdisciplinary skills. 3 lec, 3 lab.

405 Research: Critique and Methodology (4)  
Prereq: 300 or concurrent; PSY 120 or 221 or MATH 251 or QBA 201. Research in nursing practice. Topics include interrelationships among theory, practice and research; theory and science in nursing; nursing research; models and behavior at various organizational levels discussed. Critical management strategies introduced. 4 lec.

415 Restorative Nursing (4)  
Prereq: 405 or concurrent. Nursing care of individuals, families, and groups experiencing alterations in health and the responses to those changes throughout the life cycle. Concepts addressed include loss, pain, crisis, coping, quality of life. Emphasis on decision making, learning objectives and strategies for NIJE 425. 4 lec.

416 Management Issues in Nursing (4)  
Prereq: 300 or concurrent. Nursing management through use of a systems approach. Leadership models and behavior at various organizational levels discussed. Critical management strategies introduced. 4 lec.

425 Clinical Applications in Nursing (4)  
Prereq: 415. Examination of selected nursing situations and independent clinical professional nursing roles. 3 lec, 3 lab.

445 Strategic Planning in Nursing Care (4)  
Prereq: 405, 416, 425. Application of strategic planning concepts to professional nursing practice. Topics addressed are assessment of organizational system and implications for change, accountability and quality assurance; power and influence. Active involvement as change agent and implementation of planned changing project. Clinical experience in a variety of settings. 3 lec, 3 lab.

455 Excellence in Nursing (4)  
Prereq: Sr. or jun. of NIJE 300/400 courses. Synthesis course designed to enhance student's knowledge of professional nursing. Past and present issues and trends in nursing examined. Emerging trends and futuristic nursing studied. Content varies depending upon student needs and interests as well as events occurring in discipline of nursing. Approved Tier III equivalent. 4 lec.

461A School Nurse Seminar: Early Childhood (1)  
Prereq: 305 or concurrent; school nurse. Health care issues in school settings that impact children between the ages of 3 and 8 years (preschool-third grade). 1 lec.

461C School Nurse Practice: Early Childhood (4)  
Prereq: licensed RN, malpractice insurance. Practice as a school nurse in settings with children between the ages of 3 and 8 years. Learner will work with a preceptor who is a certified/licensed school nurse. 12 lab.

462A School Nurse Seminar: Middle Childhood (1)  
Prereq: 305: 462C concurrent; school nurse. Health care issues in school settings that impact children between the ages of 9 and 13 years (grades 4-8). 1 lec.

462C School Nurse Practice: Middle Childhood (4)  
Prereq: 305: 462C concurrent; school nurse. Malpractice insurance. Practice as a school nurse in elementary and middle schools (grades 4-8). Learner will work with a preceptor who is a certified/licensed school nurse. 12 lab.

463A School Nurse Seminar: Late Childhood (1)  
Prereq: 305; 463C concurrent; school nurse. Health care issues in school settings that impact children between the ages 14 and 20 years (grades 9-12 and early college). 1 lec.

463C School Nurse Practice: Late Childhood (4)  
Prereq: licensed RN, malpractice insurance. Practice as a school nurse in secondary and post-secondary schools. Learner will work with a preceptor who is a certified/licensed school nurse. 12 lab.

490 Independent Study (1-5)  
Prereq: perm. Student chooses a topic of specific interest with the assistance of a faculty member.

491 Current Topics (1-5)  
Prereq: Ohio RN licensure.

492A-Z Special Topics (1-4)  
Prereq: perm. Studies in selected topic of nursing when significant professional issues arise.

Office Technology (OTE)  
The following courses for the A.A.B. in office technology are available on the Chillicothe, Lancaster, and Southern campuses. Some elective courses are unique to a particular campus. Under University College, see the Colleges and Curricula section for some elective courses that are of professional quality.

307 Courses / Office Technology

141M Medical Terminology (2)  
Prereq: 121 or concurrent. Introduction to professional medical terminology utilizing complete production units concerning legal correspondence and documents.

172M Medical Support and Procedures II (3)  
Prereq: 171M. Emphasizes machine transcription utilizing complete production units concerning medical correspondence and documents, such as case histories, articles, and hospital reports.

189 Independent Study (1-5, max 10)  
Prereq: perm. Studies in selected subject areas related to office technology field. May be repeat­ed up to 5 credit hours.

200 Desktop Publishing I (3)  
Prereq: 121. Emphasized use of software in desktop publishing. Covers publishing information, graphic design basics, and pre­press student to produce newsletters, brochures, catalogs, etc., that are of professional quality.

201 Desktop Publishing II (3)  

221 Dictation/Transcription (4)  
Prereq: 121 and 130. Development of machine transcription skills for taped dictation.

225 Communication Processing I (3-4)  
Prereq: 121 or concurrent. Introduction to professional communication processing. Emphasis will vary by campus.

226 Communication Processing II (3-4)  
Prereq: Continuation of 225. Emphasizes advanced applications.

227 Communication Processing III (3)  
Prereq: 226. Designed to introduce students to a variety of software—including integrated hard­ware and software evaluation processes—using the microcomputer.

230 Business Communication II (4)  
Prereq: 130 or ENG 150 or higher placement. Extensive development of written communication for business, industry, and professions. Emphasizes composition of letters, memos, and reports.

231 Business Calculations (4)  
Prereq: MATH 101, 102, or higher placement. Practical mathematical calculations typical of a business situation. Concentration on problem-solving techniques necessary to perform calculations accurately and efficiently.

248 Administration of Record Systems (3)  
Prereq: 130 or concurrent. Construction and improvement of records and information management within business enterprises. Includes concepts of record creation, maintenance, and disposition through systems analysis; forms management, protection methods.

258 Stress Management for Office Personnel (3)  
Prereq: 121. Enhancement of skills as they relate to the world of medical work.

272 Administrative Procedures II (4)  
Prereq: 171. Continuation of 171. Emphasis on current office practices as well as critical thinking and problem solving skills, including business protocols in managing information, transmission, and exchanges in general office work expectations.

275 Legal Support and Procedures I (3)  
Prereq: 171. Emphasis on current office practices as well as critical thinking and problem solving skills, including business protocols in managing information, transmission, and exchanges in general office work expectations.

286 Information System Design (3)  
Prereq: 171. Emphasis on current office practices as well as critical thinking and problem solving skills, including business protocols in managing information, transmission, and exchanges in general office work expectations.

288 Information Systems (3)  
Prereq: 171. Emphasis on current office practices as well as critical thinking and problem solving skills, including business protocols in managing information, transmission, and exchanges in general office work expectations.

290 Information Technology (4)  
Prereq: 171. Emphasis on current office practices as well as critical thinking and problem solving skills, including business protocols in managing information, transmission, and exchanges in general office work expectations.

291 Information Management (4)  
Prereq: 171. Emphasis on current office practices as well as critical thinking and problem solving skills, including business protocols in managing information, transmission, and exchanges in general office work expectations.

292 Information Security (4)  
Prereq: 171. Emphasis on current office practices as well as critical thinking and problem solving skills, including business protocols in managing information, transmission, and exchanges in general office work expectations.
Courses / Office Technology

Ohio Program of Intensive English (OPIE)

Credit hours listed for OPIE are not applicable to degree requirements. English as a Second Language (ESL) classes are designed to provide students with instruction and practice in reading and writing for academic purposes.

21 Elementary Core Skills (12)
Prereq: perm. This 12-hour core component of a full-time (20 hours/week) course in English as a second language for students at the elementary level whose ultimate aim is academic study. Four hours of classroom instruction are designed to provide students with instruction in reading and vocabulary. Students build their vocabulary by learning new words and learning to determine the meaning of words from context clues and word analysis. Prereq: perm. Twelve-hour core component of a full-time (20 hours/week) course of study in English as a second language for students preparing for academic study at the college level. Students incorporate understanding of grammatical structures, appropriate vocabulary, and organization of paragraphs in developed essays. More emphasis is placed on rhetorical modes and developing editing skills. Reading comprehension and critical thinking development is emphasized along with the improvement of reading rate. Students learn to synthesize the various skills and strategies to which they have been exposed. Listening and speaking skills activities rely more heavily on academic task simulations and university-level expectations.

31 Advanced Core Skills A (12)
Prereq: perm. The Advanced Core Skills A is a 12-hour CORE component of a full-time (20 hours/week) course of study in English as a second language for students preparing for academic study at the college level. Students incorporate understanding of grammatical structures, appropriate vocabulary, and organization of paragraphs in developed essays. Students will engage in a variety of reading, writing, listening, and speaking activities, as well as academic and professional development, with a specific focus on academic work. Prereq: perm. This core component of either full-time or part-time study of English as a second language for students whose ultimate aim is full-time academic study. Four hours of classroom instruction are designed to provide students with instruction and practice in reading and speaking while engaging in academic work. Prereq: perm. This course will focus on improving students' academic reading, composition, and presentation skills by introducing them to work as a cultural phenomenon, to the history of work in the U.S., and to American cultural values and beliefs about work.

51 Academic Core Skills 1 (8)
Prereq: perm. Academic Core Skills 1 is a part-time integrated core in English as a second language for students who are also permitted to take one academic course. Eight hours of classroom instruction (two hours a day, two days a week) focus on the development of academic English language skills including reading, listening, and speaking, study skills, and academic performance skills needed for success in an academic program in the U.S. Listening and speaking skills will also be addressed, and grammar will be addressed as needed.

52 Americans at Work (4)
Prereq: perm. This course focuses on improving students' academic reading, composition, and presentation skills by introducing them to work as a cultural phenomenon, to the history of work in the U.S., and to American cultural values and beliefs about work.

53 Adventures in Mythology (4)
Prereq: Students in this four-hour per week course will study current issues through the use of news-related listening materials, reading, and class discussions. These discussions of current events will provide the primary means for student improvement by enabling students to learn to speak in a relevant and engaging context.

58 College Vocabulary (4)
Prereq: This course is designed to engage students in reading, writing, listening, and using it accurately and fluently for academic purposes.

61 Academic Core Skills 3 (8)
Prereq: This course is a part-time support course(s) in English as a Second Language for students who are also permitted to take two academic courses. Eight hours of classroom instruction (two hours a day, four days a week) are designed to provide students with high-level language skills development, with a specific focus on American English and American culture.

63 Academic Core Skills 2 (8)
Prereq: Academic Core Skills 2 is a part-time integrated core in English as a second language for students who are also permitted to take one or two academic courses simultaneously. Eight hours of classroom instruction (two hours a day, four days a week) are designed to provide students with high-level language skills development, with a specific focus on academic reading and writing, and as well as academic performance and study skills. Students also work on academic listening and speaking skills.
They will increase their ability to use a variety of grammatical patterns and structures to express original ideas in writing. They will increase their ability to synthesize, summarize, and paraphrase information from articles and academic texts. Students will perform various academic writing tasks such as writing persuasive essays and integrating paraphrased or summarized sources into a text. They will increase their ability to use a variety of grammatical patterns and structures to express original ideas in writing.

### Philosophy (PHIL)

#### 101 Fundamentals of Philosophy (4) (2H)
Survey of selected basic problems, concepts, and methods in philosophy.

#### 120 Principles of Reasoning (4) (1M)
Basic concepts of logic and techniques for judging the validity of arguments introduced. System for symbolizing arguments and deriving conclusions from premises employed. Some of following topics also covered: informal fallacies in reasoning, syllogistic or Aristotelian logic, Venn diagrams, truth tables. Most sections are traditional lecture/test format, some taught in computer-assisted format, others use self-paced approach.

#### 216 Philosophy of Science Survey (3) (2H)
Nontechnical survey of types, testing, and credibility of hypotheses; methods of experimental inquiry; measurement; laws, theories, and their role in explanation, concept formation.

#### 231 Philosophy of Sport (4)
Prereq: soph. Philosophical exploration into nature, meaning, purposes, values, and ethics of sport. Topics include goods and evils of competition, nature of sports experience, winning and losing, aesthetic and ethical dimensions of sport, ultimate athlete, scholastic athletics, philosophy of physical education, concept of sportmanship, etc.

#### 232 Philosophy of Art (4) (2H)
Conceptual analysis of common assumptions, attitudes, theories, and ideas about arts, their criticism, and appreciation.

#### 235 Business Ethics (4)
Prereq: soph. Examination of moral reasoning as it pertains to institutions and practices of contemporary business. First half is devoted to basic ethical concepts and analysis of basis for acceptable ethical theory, investigation of role of government and society in their relationship to business, and value assumptions behind competing social and political systems business personnel encounter in today's global marketplace. Second half examines specific case studies.

#### 240 Social and Political Philosophy (4) (2H)
Introduction to major philosophical theories concerning nature of social and political communities including those offered by Plato, Aquinas, Hobbes, Locke, Mill, and Rawls. Consideration of some significant specialized problems in social and political theory including distributive justice, civil disobedience, liberty, punishment, etc.

#### 250 Philosophy of Mind (4)
Mind-body problem; concept of self; human-machine relationship problem; science of other minds.

#### 260 Philosophy of Religion (4) (2H)
Problems in the nature of religion, existence and the nature of God; problem of evil, immortality, and religious language.
412 Philosophy of Biology (5)
Prereq: BIOS 172 or BIOB 111. An analysis of such issues as the structure of theory in biology, whether or not differences from other sciences; whether species exist, natural selection, how taxonomy should be done, and whether biology raises any ethical issues.

413 Philosophy and Freudian Analysis (5)
Prereq: PSY 332 or 333. The philosophical and scientific presuppositions of Freudian psychology (including Freud’s methodology) will be identified and subjected to rigorous philosophical analysis. Freud’s early thought on hysteria, dreams, sexuality, and psychoanalysis will be emphasized. Recent attacks on the legitimacy of psychoanalysis will be examined. Alternative schemes for understanding human behavior will also be discussed.

414 Analytic Philosophy (5)
Prereq: 4 philosophy courses. Selected topics in contemporary Anglo-American philosophy.

416 Philosophy of Science (4)
Prereq: 3 philosophy courses. Selected problems in logic and methodology of sciences.

417 Philosophy of Logic (4)
Prereq: 320 or 502. Provides a survey of issues in the philosophy of logic. Topics include formal theories of truth, logical and semantical paradoxes, modal logic, conditionals, interpretations of quantifiers, and philosophical implications of Godel’s incompleteness theorems.

418 Plato (5)
Prereq: 4 philosophy courses, including 310.

419 Aristotle (5)
Prereq: 4 philosophy courses, including 310. 420 Symbolic Logic II (4)
Prereq: 320 or 502 or MATH 306 (or equiv) or CS 300. Continuation of 320. Focuses on the completeness of first-order logic, Godel’s incompleteness theorems, axiomatic set theory, and Cantor’s and Dedekind’s theories of the infinite.

425 Philosophical Problems in Quantum Physics (4)
Prereq: 3 courses from PHIL, PHYS, CHEM, MATH, CS, or engineering. Interpretation and paradoxes of quantum theory. Topics include the problem of measurement, the Bohr-Einstein debates, Schrödinger’s cat paradoxes, the Einstein-Podolsky-Rosen paradox, and Bell’s Theorem and its implications.

426 Philosophy of Space and Time (4)
Prereq: 3 courses from PHIL, PHYS, CHEM, MATH, CS, or engineering. In addition to classical topics, issues in the philosophy of space and time that are greatly influenced by the emergence of Einstein’s theory of relativity will be discussed. Topics to be covered include the nature of geometry and its relation to the world, absolute vs. relational theories of space, time, and space-time, and Zeno’s paradoxes of motion and extension. Contemporary and classical thinkers will be examined.

427 Philosophy of Mathematics (4)
Prereq: 3 courses from PHIL, PHYS, CHEM, MATH, CS, or engineering. An in-depth examination of a major work in the philosophy of mathematics of or of a particular concept that plays a central role in mathematical philosophy, such as the concept of number, the concept of mathematical proof, and the concept of the mathematical infinite.

428 Continental Rationalism (5)
Prereq: 4 philosophy courses, including 312. (alternate yrs) Descartes, Spinoza, Leibniz.

429 British Empiricism (5)
Prereq: 4 philosophy courses, including 312. (alternate yrs) Locke, Berkeley, Hume.

430 Contemporary Ethical Theory (5)
Prereq: 4 philosophy courses, including 330, 240, 330, or 442. Significant current literature in selected topics in moral, social, political, and legal philosophy.

431 History of Aesthetic Theory (5)
Prereq: 4 philosophy courses. Readings from Plato to Dewey and relation of these theories to selected arts and recent criticism.

432 Problems in Aesthetics (5)
Prereq: 9 hrs philosophy, literature, or art. A variety of philosophical issues surrounding the arts and aesthetics drawn from contemporary sources will be discussed. Topics include the nature of art, expression, interpretation, evaluation, and art and knowledge.

434 Metaphysics (4)
Prereq: 4 philosophy courses including 130 or 240 or 430. The study of metaphysics is the study of the nature of the arts and scientific judgments. What are we doing when we make ethical judgments? Is it right to think that ethical judgments are capable of being true or false? If so, in virtue of what? We can also wonder about the nature of moral motivation. Does a judgment that something is morally wrong automatically entail that one has a motive not to do it? This course will be a survey of readings on these two questions.

438 Kant (5)
Prereq: 4 philosophy courses, including 312. Kant’s Critique of Pure Reason with attention given to his ethical theory.

440 Contemporary Social Philosophy (5)
Prereq: 339 or 442 and 3 other philosophy courses. Consideration of any number of various issues in contemporary, social, political, and legal philosophy. Possible topics: theories of distributive justice, culpability, causality and responsibility, legal and moral rights, etc.

442 Philosophy of Law (5)
Prereq: 3 philosophy courses or perm. Consideration of nature and justification of law and examination of some specialized topics in philosophy of law, including theories of responsibility, injustice, disobedience, theories of punishment, liberty, etc.

444 Philosophy of Marxism (5)
Prereq: 4 philosophy courses. Philosophical inquiry into classical and contemporary Marxist thought stressing Marx, Engels, Lenin, Stalin, Mao, and several contemporary Marxists such as Praxis group of Yugoslavia.

448 Pragmatism (4)
Prereq: 4 philosophy courses. Peirce, James, Dewey, and other American thinkers.

450 Theory of Knowledge (5)
Prereq: 4 philosophy courses, including 312. Critical examination of various views of what knowledge is and how it is attained.

451 Metaphysics (5)
Prereq: 4 philosophy courses, including 310 or 312. Discussion of basic philosophical issues such as: conceptual schemes and the external world, causation, universals, determinism and freedom, the nature of the mind, etc.

458 Contemporary European Philosophy (5)
Prereq: 4 philosophy courses, including 358 and 468. Phenomenology and existentialism as seen in Husserl, Heidegger, Scheler, Hartman, Dilthey, Cassirer, Geheim, Wittgenstein, Camus, Marcel, Merleau-Ponty, and Ricoeur.

468 Phenomenology (5)
Prereq: 4 philosophy courses, including 312. Method and philosophy of phenomenological movement from Husserl to Merleau-Ponty.

475 Chinese Philosophy (5)
Prereq: 4 philosophy courses, including 371. Major Chinese philosophers and schools of thought from earliest times to present.

476 Indian Philosophy (5)
Prereq: 4 philosophy courses, including 371. Major Indian philosophers and schools of thought from earliest times to present.

140 Observational Astronomy Laboratory (1)
Prereq: 2 courses in Planetary Science 2 (or perm). Students enrolled in PSC 100. 2 lab.

149 Introduction to Planetary Science (3)
Prereq: 4 hrs PSC or GEOL or perm. Selected courses will examine the relationship of the solar system to the universe beyond our solar system. Topics (chosen by instructor) may include historical astronomy, the sun, stars and galaxies, the Big Bang, and the evolution of the universe. No prereq, but familiarity with basic algebra and geometry is beneficial. Students should enroll in PSC 100. 4 lab.

491 Seminar in Philosophy (1–15, max 15)
Prereq: 5 philosophy courses. Selected problems.

492 Applied Ethics (5)
Prereq: 2 courses from 130, 235, 330, 331, 430. An examination of the relationship of applied ethics as a branch of philosophy, a survey of major areas within applied ethics (medical, business, journalistic, etc.), and a consideration of selected problems in each area.

497 Philosophy Tutorial (1–10)
Prereq: Honors Tutorial College students only. (fall) 3rd-yr tutorial studies in philosophy.

498 Philosophy Tutorial (1–10)
Prereq: Honors Tutorial College students only. (winter) 3rd-yr tutorial studies in philosophy.

499 Senior Thesis (3–15)
Prereq: perm. Must be enrolled in each of three senior quarters to achieve honors in philosophy. Research and writing of long philosophical paper.

499 Philosophy Tutorial (1–10)
Prereq: Honors Tutorial College students only. (spring) 3rd-yr tutorial studies in philosophy.

Physical Education
See Recreation and Sport Sciences—Physical Education Activity

Physical Therapy (PT)

259A Introduction to Physical Therapy (2)
(fall, spring). Designed for those students who are considering physical therapy as a career option. Presentations and topics of discussion will attempt to bring the student to an understanding of the physical therapy profession and the requirements for entry into the profession. 2 lec.

259B Introduction to Physical Therapy Clinical Experience (3)
For students who are considering physical therapy as a career, presentations and direct observation of evaluation and treatment of patients through Ther- apy Associates will help identify the various roles and settings for physical therapists. 1 lec, 4 lab.

Physics and Astronomy

Astronomy (ASTR)

100 Survey of Astronomy (4N) (2N)
General introduction to astronomy with an emphasis on the structure of the universe beyond our solar system. Topics (chosen by instructor) may include historical astronomy, the sun, stars and galaxies, interstellar matter, black holes, the “Big Bang” theory, and the evolution of the universe. No prereq, but familiarity with basic algebra and geometry is beneficial. Students should enroll in PSC 100. 4 lec.

100D Moons and Planets: The Solar System (4N) (2N)
General introduction to astronomy, with emphasis on our solar system and other planetary systems. Topics (chosen by instructor) may include historical astronomy, the sun, the surfaces, interiors, and atmospheres of the planets, comets, asteroids and meteor impacts, planets and their other stars, and the origin of life. No prereq, but familiarity with basic algebra and geometry is beneficial. Students should enroll in PSC 100. 4N (2N).

140 Observational Astronomy Laboratory (1) (2N)
Experience with telescopes and locating stars, planets, and deep-sky objects in the night sky. Also covers major constellations, seasonal variations, lunar cycles, and, when appropriate, eclipses and comets. Meets at night only. Students should enroll in PSC 140. 2 lab.

200 Introduction to Planetary Science (3) (2N)
Prereq: 4 hrs PSC or GEOl or perm; MATH 113 or equiv; no credit for both ASTR 200 and PSC 200. An introduction to the physical processes
behind the formation and evolution of planets, moons, asteroids, and comets. Topics will include formation of the Solar System, planetary atmospheres, volcanism, meteor impacts, and cratering. Students should enroll in PSC 200.

205 Life on Other Worlds? (3) (2N)
Prereq: 4 or MATH 113 or equiv; no credit for both ASTR 205 and PSC 205. An exploration of ideas relating to the possibility that life exists elsewhere in the universe, both on planets and moons within our solar system, and within other planetary systems. The course begins by considering our planet's formation and the conditions which may have led to life appearing here, then moves outward. Students should enroll in one of PSC 200 for description. Includes electricity, magnetism, heat, atomic and nuclear physics. Introduction to relativativity and quantum phenomena. 4 lec.

200 Survey of Astronomy (4) (2N)
Prereq: PHYS 253, MATH 263C. Physical foundations of astronomical observation and theory. Time and coordinate systems, orbits, celestial mechanics, radiation mechanisms, and spectra. Telescopes and instrumentation. Introduction to the physical properties of stars, galaxies, and interstellar matter. Overview of cosmological distance measurements and the "hot big bang" model.

310 Astronomy Laboratory (1–3)
Prereq: PHYS 305 and perm. Repeated enrollment. Telescope observations and other laboratory studies dealing with astronomy, telescopes, and instrumentation. 2 lec, 2 lab.

401 Stellar Astrophysics (3)
Prereq: 305, MATH 340, MATH 440. The physics of stellar atmospheres and interiors. Mathematical treatments of radiative transfer, hydrodynamics, and stellar structure; stellar atmospheres and spectra; stellar interiors; and nuclear energy sources. Stellar evolution, red giant stars, pulsating variables; physical of degenerate gases, white dwarfs, neutron stars, pulsars, black holes.

402 Galactic and Interstellar Astrophysics (3)
Prereq: 305, MATH 340 and 440. Structure and evolution of the Milky Way galaxy and the interstellar medium. Stellar populations and orbits of stars in the galaxy; galactic dynamics, evolution of the galaxy; interstellar clouds; Physics of the interstellar gas, absorption and emission processes, HI and HII regions, molecular clouds. Hydrodynamic instabilities, star formation; supernova explosions and shock waves.

403 Extragalactic Astrophysics and Cosmology (3)

410 Observational Astronomy (1) (2N)
Prereq: 305. Modern techniques and instrumentation. Planning and execution of observational programs; data acquisition, reduction, and analysis; presentation of scientific results. 2 lec, 2 lab.

450 Studies in Astronomy (1–3, arranged)
Prereq: 305 and perm.

Physical Science (PSC)

100 Survey of Astronomy (4) (2N)
Prereq: 4 or MATH 113 or equiv; no credit for both ASTR 205 and PSC 205. An exploration of ideas relating to the possibility that life exists elsewhere in the universe, both on planets and moons within our solar system, and within other planetary systems. The course begins by considering our planet's formation and the conditions which may have led to life appearing here, then moves outward. Students should enroll in one of PSC 200 for description. Includes electricity, magnetism, heat, atomic and nuclear physics. Introduction to relativativity and quantum phenomena. 4 lec.

201 Introduction to Physics (5) (2N)
Prereq: 201 or 251. (winter, spring) No credit for both ASTR 205 and PSC 205. An exploration of ideas relating to the possibility that life exists elsewhere in the universe, both on planets and moons within our solar system, and within other planetary systems. The course begins by considering our planet's formation and the conditions which may have led to life appearing here, then moves outward. Students should enroll in one of PSC 200 for description. Includes electricity, magnetism, heat, thermodynamics, waves, and sound. 3 lec, 2 lab, 1 rec.

301 Modern and Quantum Physics (4) (2N)
Prereq: 253 and MATH 263A or 266A. Classical physics with calculus and vectors. Capacitors, electric current and circuits, magnetism and magnetic fields, electric induction, A.C. circuits, electromagnetic waves, geometrical optics, interference, and diffraction of light. 3 lec, 2 lab, 1 rec.

425 General Physics (5) (2N)
Prereq: ASTR 205 or MATH 263B or 266A. Classical physics with calculus and vectors. Fluids, simple harmonic motion, wave mechanics and phenomena, thermodynamics, electrodynamics. 3 lec, 2 lab, 1 rec.

303 Computer Simulation Methods in Physics (4)
Prereq: PHYS 251 and MATH 263B or 266B. Provides overviews of classical mechanics, relativistic, and contemporary physics. Films and current science news will be used to search for student interest in future study.

251 General Physics (5) (2N)
Prereq: C– or better in MATH 263A or 263B or 263C. Classical physics with calculus and vectors. Newtonian mechanics, rotational dynamics, gravitation. 3 lec, 2 lab.

252 General Physics (5) (2N)
Prereq: PHYS 251 and MATH 263B or 266B. Classical physics with calculus and vectors. Fluids, simple harmonic motion, wave mechanics and phenomena, thermodynamics, electrodynamics. 3 lec, 2 lab, 1 rec.

201 Physics Seminar (1)
Provides overviews of classical mechanics, relativistic, and contemporary physics. Films and current science news will be used to search for student interest in future study.

251 General Physics (5) (2N)
Prereq: C– or better in MATH 263A or 263B or 263C. Classical physics with calculus and vectors. Newtonian mechanics, rotational dynamics, gravitation. 3 lec, 2 lab.

252 General Physics (5) (2N)
Prereq: PHYS 251 and MATH 263B or 266B. Classical physics with calculus and vectors. Fluids, simple harmonic motion, wave mechanics and phenomena, thermodynamics, electrodynamics. 3 lec, 2 lab, 1 rec.

270 Special Studies (1–4)
Prereq: perm. Special studies in physics under supervision of faculty member.

272 Electronics Laboratory (2)
Prereq: 253 and phys major or perm. (winter) Circuit analysis, electronic measurements, semiconducting devices and instrumentation from DC to microwaves. 4 lab.

273 Electronics Laboratory (2)
Prereq: 272 and phys major or perm. (spring) Circuit analysis, electronic measurements, semiconducting devices and instrumentation from DC to microwaves. 4 lab.

297T Physics Tutorial (1–15)
Prereq: Honors Tutorial College students only. (fall) 1st-yr tutorial studies in physics.

298T Physics Tutorial (1–15)
Prereq: Honors Tutorial College students only. (winter) 1st-yr tutorial studies in physics.

299T Physics Tutorial (1–15)
Prereq: Honors Tutorial College students only. (spring) 1st-yr tutorial studies in physics.

300 Computer Simulation Methods in Physics (4)
Prereq: phys major or perm. Introduction to scientific programming (e.g., Java, C++, etc.), particularly to the methods of computer simulations, with a special emphasis on problems in physics. 2 lec, 4 lab.

311 Mechanics (4)

312 Mechanics (4)
Prereq: 311. (winter) Continuation of 311. Many-particle systems, rigid body dynamics, Lagrangian methods, and small oscillations.

351 Modern and Quantum Physics (4)
Prereq: 253. Introduction to relativativity and quan­tum theory. Particle and wave propagation, 3­dimensional hydrogen atom.

352 Modern and Quantum Physics (4)
Prereq: 351. Quantum effects, nuclear and parti­cle physics, statistical physics, molecular and solid state physics; astrophysics, general relativatiy, and cosmology.