BIO 351. BIOCHEMISTRY 3 sh
In this survey of biochemistry as it relates to the physiology of organisms, study includes biochemical methodology, buffers, proteins (structure, function and synthesis), enzymes, bioenergetics, anabolism and catabolism of carbohydrates and lipids, and metabolic regulation. Three class hours, one laboratory per week. Prerequisites: CHM 211, 212, 213, 214. (BIO 351 is cross-listed with CHM 351.) Offered fall of odd-numbered years.

BIO 352. BIOCHEMISTRY LABORATORY 1 sh
Experiments in this study of laboratory techniques and principles of biochemistry as it relates to the physiology of organisms include biochemical methodology, buffers, proteins (structure, function and synthesis), enzymes, bioenergetics, anabolism and catabolism of carbohydrates and lipids, and metabolic regulation. Corequisite: BIO 351. (BIO 352 is cross-listed with CHM 352.) Offered fall of odd-numbered years.

BIO 371. SPECIAL TOPICS SEMINAR 2-4 sh
Each seminar – a nonlaboratory discussion course for biology majors – focuses on one biological topic determined by faculty interest. Offered winter.

BIO 442. AQUATIC BIOLOGY: THE STUDY OF INLAND WATERS 4 sh
Aquatic Biology considers the chemical, physical and biological properties of freshwater ecosystems including streams, rivers, ponds and lakes. Topics include the geomorphology of inland waters, thermal stratification, nutrient cycles, community metabolism, plankton community dynamics, seasonal succession and eutrophication resulting from human activities. Weekly laboratory meetings provide hands-on experience with the field techniques of freshwater scientists. Prerequisites for biology major: BIO 221, 222; CHM 111, 112, 113, 114 or CHM 115/116. Prerequisites for environmental studies major: BIO 112, 114, 215; CHM 111,112, 113, 114 or CHM 115/116. Junior standing or consent of instructor. Offered spring of even-numbered years.

BIO 452. GENERAL ECOLOGY 4 sh
Students explore ecological principles at population, community and ecosystem levels in this study of the interrelationships of organisms with their biotic and abiotic environments. Three lecture hours, one laboratory per week. Prerequisites for biology major: BIO 221, 222; CHM 111, 112, 113, 114 or CHM 115/116. Prerequisites for environmental studies major: BIO 112, 114, 215; CHM 111,112, 113, 114 or CHM 115/116. Junior standing or consent of instructor. Offered fall.

BIO 462. SENIOR SEMINAR 2 sh
This course provides students with the opportunity to conduct both individual and group literature research projects of their own choosing based on recently published scientific papers. Students participate in group discussions of the current literature, research and write a scientific review paper, and develop a formal oral presentation. Recommended for senior year. Offered fall.

BIO 471. SPECIAL TOPICS SEMINAR 2-4 sh
Each seminar – a nonlaboratory discussion course for biology majors – focuses on one biological topic determined by student and faculty interest. Must have instructor’s consent.

BIO 481. INTERNSHIP IN BIOLOGY 1-4 sh
Advanced-level work experience in a biological field is offered on an individual basis when suitable opportunities can be arranged. Prerequisite: permission of department.

BIO 499. RESEARCH 1-4 sh
Students from all levels conduct laboratory and/or field research under the direction of the biology faculty. Maximum eight semester hours total credit. Prerequisite: permission of the biology faculty.

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Business Administration

The Martha and Spencer Love School of Business mission statement.

To provide instruction and experiences for our students so they graduate with the knowledge, skills and character essential for responsible business leadership in the 21st century.

Chair, Department of Business Administration: Associate Professor Valle
Professors: Burbridge, Honeycutt, Noer
Associate Professors: Baxter, Burpitt, Manring, Nienhaus, O’Mara, Paul, Powell, Schuette, Stevens, Strempke
Assistant Professors: Buechler, Cort, Hodge,Yap

The study of Business Administration at Elon University begins with a solid grounding in the traditional liberal arts and sciences. This preparation is an integral part of becoming an informed, responsible and capable business leader. An Elon education emphasizes the development of the whole person – mind, body and spirit. Business Administration courses at Elon University advance that commitment by emphasizing business knowledge acquisition, skill development through hands-on learning and experiential activities and the development of discipline, integrity and an ethic of service.

Students majoring in Business Administration at Elon University take courses in a common core representing the functional business disciplines (e.g., accounting, finance, management, marketing, MIS, etc.). They also have the opportunity to develop specialized knowledge in one of five areas of concentration: Finance, International Business, Management, Management Information Systems and Marketing.

Our coursework emphasizes active learning and appreciative inquiry. Rather than dictate a set of principles to be memorized, our programs emphasize the integration of business knowledge and the application of that knowledge to organizational problems. We emphasize hands-on learning through internships, co-op experiences, service learning and classroom instruction which engages students in the study and practice of business. Students also develop skills in written and oral communications, team-building and problem solving, and decision-making in our increasingly global business environment.

The Bachelor of Science in Business Administration (BSBA) program at Elon University emphasizes academic challenge, mature intellectual development and a lifetime of learning. Our graduates go on to leadership positions in business and industry in for-profit and not-for-profit organizations. Our graduates are prepared for a variety of assignments because they possess an extensive array of knowledge, skills and abilities.

A major in Business Administration requires the following:

At least 50% of the business credit hours required for the degree (B.S. in Business Administration) must be earned at Elon University.

- MTH 116 Applied Mathematics with Calculus 4 sh or
- MTH 121 Calculus and Analytic Geometry I
- ECO 201 Principles of Economics 4 sh
- ECO 203 Statistics for Decision-Making 4 sh
- ECO 301 Business Economics 4 sh
- ACC 201 Principles of Financial Accounting 4 sh
- ACC 212 Principles of Managerial Accounting 4 sh
- CIS 211 Management Information Systems 4 sh
- BUS 202 Business Communications 4 sh
BUS 221 Legal Environment of Business 2 sh
BUS 311 Principles of Marketing 4 sh
BUS 323 Principles of Management and Organizational Behavior 4 sh
BUS 326 Operations Management 4 sh
BUS 465 Business Policy 4 sh
FIN 343 Principles of Finance 4 sh

Sixteen to twenty semester hours of a concentration 16-20 sh

TOTAL 70 - 76 sh

Concentrations

Finance 16 sh

One course from the following:

One 300/400 level course from the Studies in Arts and Sciences course offerings (Expression, Civilization, Society or Science). The 300/400 level Studies in Arts and Sciences course selected must be taken in addition to the upper-level GST and Advanced Study courses already required, and it may not also count for any other course in the student's program of study. Advisors may assist students in selection of an appropriate course which should enhance the subject matter of the student's concentration.

FIN 413 Advanced Managerial Finance
FIN 421 Investment Principles
FIN 419 Financial Services
FIN 471 Seminar: Special Topics

Marketing 16 sh

One course from the following:

One 300/400 level course from the Studies in Arts and Sciences course offerings (Expression, Civilization, Society or Science). The 300/400 level Studies in Arts and Sciences course selected must be taken in addition to the upper-level GST and Advanced Study courses already required, and it may not also count for any other course in the student's program of study. Advisors may assist students in selection of an appropriate course which should enhance the subject matter of the student's concentration.

Three courses from the following:

BUS 413 Integrated Marketing Communications
BUS 414 Marketing Research
BUS 415 Consumer Behavior
BUS 416 Global Marketing
BUS 417 Business-to-Business Marketing
BUS 419 Sales Management

Management 16 sh

One course from the following:

One 300/400 level course from the Studies in Arts and Sciences course offerings (Expression, Civilization, Society or Science). The 300/400 level Studies in Arts and Sciences course selected must be taken in addition to the upper-level GST and Advanced Study courses already required, and it may not also count for any other course in the student's program of study. Advisors may assist students in selection of an appropriate course which should enhance the subject matter of the student's concentration.

A minor in Business Administration requires the following courses:

BUS 304 Introduction to Marketing 4 sh or
BUS 311 Principles of Marketing (prerequisite BUS 202)
BUS 303 Introduction to Managing 4 sh or
BUS 323 Principles of Management and Organizational Behavior (prerequisite BUS 202)
ACC 201 Principles of Financial Accounting 4 sh
FIN 303 Introduction to Finance 4 sh
ECO 201 Principles of Economics 4 sh

TOTAL 20 sh
BUS 202. BUSINESS COMMUNICATIONS 4 sh
In addition to studying the theory and principles of good oral and written communications, students practice making oral presentations and writing business reports, letters and memoranda. Prerequisites: ENG 110 and sophomore standing. Offered fall and spring.

BUS 221. LEGAL ENVIRONMENT OF BUSINESS 2 sh
A number of laws influence business decisions and activities. Matters relating to competitive conduct, consumer protection, accounting and financial reporting, public communications and the natural environment are regulated by widely known federal agencies. Most states also have counterpart commissions that set additional standards and rules for business regulation. U.S. businesses enjoy a remarkably free legal environment compared to many other developed markets, and certainly more free than centrally controlled economic systems. This course explores these aspects of the U.S. business scene, with comparisons across states and other nations where appropriate. Its focus is on the legal environment, not on the legal processes, torts or case law. Its appropriate audience is the business student who needs a broad, general understanding of how we govern ourselves in the marketplace. Offered fall and spring.

BUS 303. INTRODUCTION TO MANAGING 4 sh
For non-majors and business administration minors, this introductory course examines universal business processes such as goal-setting, planning, decision-making, motivation, human resource management and control which are utilized by both not-for-profit and government organizations. Sophomore standing required. No credit for both BUS 303 and BUS 323. Offered fall, winter and spring.

BUS 304. INTRODUCTION TO MARKETING 4 sh
For non-majors and business administration minors, this introductory course examines marketing principles which are applied by all organizations. Sophomore standing required. No credit for both BUS 304 and BUS 311. Offered fall, winter and spring.

BUS 311. PRINCIPLES OF MARKETING 4 sh
This study of the marketing and distribution of goods and services includes buyer behavior, the marketing functions, commodity and industrial markets, merchandising considerations, price policies and governmental regulation of competition. Prerequisites: ECO 201 and BUS 202. Sophomore standing required. No credit for both BUS 304 and BUS 311. Offered fall and spring.

BUS 323. PRINCIPLES OF MANAGEMENT AND ORGANIZATIONAL BEHAVIOR 4 sh
This course will prepare the student for the challenges of management and leadership in the dynamic new workplace of the 21st century. The course examines the central role of management in the efficient and effective production of goods and services. Students will learn how strategic and operational planning, job and organizational structure design and human behavior affect operations in manufacturing and service industries. Organizational behavior topics include leadership and ethics, motivation and rewards, communication and teams, and teamwork. The global dimensions of management are also emphasized. Prerequisite: BUS 202. Sophomore standing required. No credit for both BUS 303 and BUS 323. Offered fall and spring.

BUS 326. OPERATIONS MANAGEMENT 4 sh
As a primary business function, operations plays a vital role in achieving a company’s strategic plans. Since the operations function produces the goods and services, it typically involves the greatest portion of the company’s people and capital assets. Customer service, product/service delivery, product/service quality and overall organizational effectiveness depend on excellence in operations. This course covers manufacturing and service operations, planning and control. Operations strategy, demand forecasting, supply chain management, facility location and design, e-commerce, capacity planning, inventory systems, scheduling and quality control are topics included in the course.

Prerequisites: ECO 203, CIS 211, BUS 323 or 303. Sophomore standing required. Offered fall and spring.

BUS 365. BUSINESS ADMINISTRATION APPLICATIONS 4 sh
Topics vary yearly in the study of applications of business administration principles and theories in various business situations. Sophomore standing required.

BUS 366. FIELD EXPERIENCE IN BUSINESS 4 sh
This course revolves around visits to diverse local businesses and analyses of the businesses visited. Prerequisite: permission of instructor. Sophomore standing required.

BUS 413. INTEGRATED MARKETING COMMUNICATIONS 4 sh
This course focuses on the management of the communication aspects of marketing strategy. Elements of advertising, personal selling, direct marketing and public relations are included. The study of marketing communications includes a review of concepts from economics, behavioral sciences and social sciences, which play a role in creating, executing and evaluating promotional programs. Topics include setting communications objectives and budgets, media planning, and creative strategy, all in the context of an integrated communication program. Emphasis will be placed on appreciating the scope, strengths and weaknesses of these marketing communication tools, and particularly on how they can and should be used together. Prerequisite: BUS 311. Offered spring.

BUS 414. MARKETING RESEARCH 4 sh
Students apply various research methods used in business to gather and analyze marketing data. Possible effects and implications of the analyses are discussed in terms of the marketing and decision-making processes of businesses. Prerequisites: BUS 311 and ECO 203. Offered spring.

BUS 415. CONSUMER BEHAVIOR 4 sh
This course for the marketing concentration focuses on exploring and understanding consumer behavior. Emphasis is placed on developing an appreciation for the scope of the topic, understanding the essentials underlying consumer behavior, and developing an ability to relate such understanding to important issues faced by marketing practitioners. Traditional research-oriented topics include perception, memory, affect, learning, persuasion, motivation, behavioral decision-theory, and environmental (e.g., social and cultural) influences. All topic presentations will include a discussion of practitioner-oriented managerial implications. Prerequisite: BUS 311. Offered fall.

BUS 416. GLOBAL MARKETING 4 sh
This course for the marketing concentration is designed to explore the scope of global marketing. The course examines the impact the global environment has upon marketing decisions and strategy formulations. Through analyses of different types of markets, students will develop an understanding and appreciation of how the world is “shrinking” and the influence this has on U.S. businesses, individuals, households and institutions. Students will monitor the global environment and report their findings on specific regions of the world to the class. The intent is to make students more aware of the global environment and its impact on U.S. businesses. Prerequisite: BUS 311. Offered fall.

BUS 417. BUSINESS-TO-BUSINESS MARKETING 4 sh
This course for the marketing concentration focuses on exploring and understanding business-to-business (B2B) marketing. The study of business-to-business marketing provides an opportunity for students to synthesize their knowledge of B2B or industrial marketing with other, highly-related business disciplines (accounting, finance and management) in order to move products through the supply chain from producer to the ultimate consumer. Business-to-business relationships, interfaces, strategies, problems and
BUS 419. SALES MANAGEMENT 4 sh
The sales management course is an analysis of professional selling practices with emphasis on the selling process and sales management, including the development of territories, determining potentials and forecasts and setting sales quotas. Prerequisite: BUS 311. Offered spring.

BUS 424. RESPONSIBLE LEADERSHIP 4 sh
This course addresses the characteristics, behaviors and responsibilities required of contemporary organizational leaders. While focusing on the traditional topics (individual differences and traits of leaders, behaviors of leaders, role of power, types and styles of leadership and theories of motivation), the student will also be introduced to some nontraditional approaches (nontraditional metaphors, leadership as an art and individual differences of followers and followership) to understanding leaders and leadership. The responsibilities of leadership will be specifically addressed in relationship to the concepts of organizational success and effectiveness, social responsibility and ethical decision-making. Prerequisite: BUS 323. Offered fall and spring.

BUS 425. HUMAN RESOURCE MANAGEMENT 4 sh
Effective human resource management is critical to the long-term value of an organization and ultimately to its success and survival. All aspects of human resource management – including how organizations interact with the environment; acquire, develop and compensate human resources; design and measure work – can help organizations meet their competitive challenges and create value. This course looks at the role of strategic human resource planning, recruitment and selection, performance management, developing and compensating human resources, the legal environment and employee relations, collective bargaining and labor relations, using technology to increase HRM effectiveness and global issues in HRM. Prerequisite: BUS 323. Offered fall and spring.

BUS 426. ORGANIZATIONAL IMPROVEMENT 4 sh
This course will introduce the students to material which will cover basic productivity improvement techniques, application of these techniques in his/her work place, teaching coworkers these techniques, leading work teams in problem-solving activities and managing an organizational productivity improvement program. Prerequisite: BUS 323. Offered fall.

BUS 427. ADVANCED ORGANIZATIONAL BEHAVIOR 4 sh
This course addresses the impact of individual, group and organizational influences in human behavior within organizations. Building on the organizational behavior topics introduced in BUS 323, the focus of this course is on acquiring in-depth knowledge and developing interpersonal skills through the study and application of theories and concepts related to understanding and predicting human behavior in organizations. Personality, perception, job design and goal-setting, appraisal, group dynamics, decision-making, cooperation and conflict, organizational structure and culture, power and organizational politics, organizational learning, innovation and change management, and organizational development are topics included in the course. Prerequisite: BUS 323. Offered fall and spring.

BUS 428. ENTREPRENEURSHIP/INTRANPRENEURSHIP 4 sh
This course addresses how to go into business and several of the unique problems and circumstances encountered in establishing and operating a small business. Emphasis is also placed on the role of entrepreneurship in large firms through the study of “intrapreneurship.” Special emphasis focuses on why small businesses fail and what entrepreneurs can do to minimize the influence of these forces. Family-owned business management is included as one type of small business covered. Prerequisite: BUS 323.
Another key feature of the program is the introduction and use of instrumentation in the first-year general chemistry sequence and its continued emphasis throughout the chemistry curriculum. Student participation in assisting in laboratory and recitation instruction is strongly advised and supported.

A Bachelor of Science (ACS certified) degree in Chemistry requires the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHM 111</td>
<td>General Chemistry I</td>
<td>3 sh</td>
</tr>
<tr>
<td>CHM 113</td>
<td>General Chemistry I Lab</td>
<td>1 sh</td>
</tr>
<tr>
<td>CHM 112</td>
<td>General Chemistry II</td>
<td>3 sh</td>
</tr>
<tr>
<td>CHM 114</td>
<td>General Chemistry II Lab</td>
<td>1 sh</td>
</tr>
<tr>
<td>CHM 211</td>
<td>Organic Chemistry I</td>
<td>3 sh</td>
</tr>
<tr>
<td>CHM 213</td>
<td>Organic Chemistry I Lab</td>
<td>1 sh</td>
</tr>
<tr>
<td>CHM 212</td>
<td>Organic Chemistry II</td>
<td>3 sh</td>
</tr>
<tr>
<td>CHM 214</td>
<td>Organic Chemistry II Lab</td>
<td>1 sh</td>
</tr>
<tr>
<td>CHM 311</td>
<td>Quantitative Analysis</td>
<td>4 sh</td>
</tr>
<tr>
<td>CHM 332</td>
<td>Physical Chemistry I</td>
<td>4 sh</td>
</tr>
<tr>
<td>CHM 461</td>
<td>Seminar</td>
<td>1 sh</td>
</tr>
<tr>
<td>MTH 121</td>
<td>Calculus &amp; Analytic Geometry I</td>
<td>4 sh</td>
</tr>
<tr>
<td>PHY 111</td>
<td>General Physics I</td>
<td>4 sh</td>
</tr>
<tr>
<td>PHY 112</td>
<td>General Physics II</td>
<td>4 sh</td>
</tr>
</tbody>
</table>

(Physics 113 and 114 may be substituted for Physics 111 and 112.)

Six semester hours from chemistry (at least 4 sh at the 300-400 level) 6 sh

**TOTAL** 44-48 sh

A minor in Chemistry requires the following courses:

<table>
<thead>
<tr>
<th>Course Code</th>
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</tr>
<tr>
<td>CHM 112</td>
<td>General Chemistry II</td>
<td>3 sh</td>
</tr>
<tr>
<td>CHM 114</td>
<td>General Chemistry II Lab</td>
<td>1 sh</td>
</tr>
<tr>
<td>CHM 115</td>
<td>Advanced General Chemistry (3 sh)</td>
<td></td>
</tr>
<tr>
<td>CHM 116</td>
<td>Advanced General Chemistry Lab (1 sh)</td>
<td></td>
</tr>
<tr>
<td>CHM 205</td>
<td>Inorganic Chemistry</td>
<td>4 sh</td>
</tr>
<tr>
<td>CHM 211</td>
<td>Organic Chemistry I</td>
<td>3 sh</td>
</tr>
<tr>
<td>CHM 213</td>
<td>Organic Chemistry I Lab</td>
<td>1 sh</td>
</tr>
<tr>
<td>CHM 212</td>
<td>Organic Chemistry II</td>
<td>3 sh</td>
</tr>
<tr>
<td>CHM 214</td>
<td>Organic Chemistry II Lab</td>
<td>1 sh</td>
</tr>
<tr>
<td>CHM 125</td>
<td>Chemical Literature</td>
<td>1 sh</td>
</tr>
<tr>
<td>CHM 311</td>
<td>Quantitative Analysis</td>
<td>4 sh</td>
</tr>
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<td>CHM 332</td>
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<td>4 sh</td>
</tr>
<tr>
<td>PHY 112</td>
<td>General Physics II</td>
<td>4 sh</td>
</tr>
</tbody>
</table>

**TOTAL** 20-24 sh

A Bachelor of Arts Degree in Chemistry/Chemical Engineering: See requirements listed in Engineering.

**CHM 101. BASIC CONCEPTS IN CHEMISTRY** 3 sh

The course is designed to meet the math/science general studies requirement for non-science majors. The material covered includes atomic structure, chemical changes, descriptive chemistry of selected elements, introduction to organic chemistry and how chemistry applies to consumer products and the environment. No credit given to students with prior credit for CHM 111. No credit for major/minor. Corequisite: CHM 102. Offered fall, winter, spring.

**CHM 102. BASIC CONCEPTS IN CHEMISTRY LABORATORY** 1 sh

Laboratory exercises are based upon selected foundational concepts covered in CHM
<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Credits</th>
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</tr>
</thead>
<tbody>
<tr>
<td>CHM 111</td>
<td>GENERAL CHEMISTRY I</td>
<td>3 sh</td>
<td>This course introduces fundamental principles of chemistry with special emphasis on developing skills in quantitative reasoning. Topics include stoichiometry, nomenclature, gases, atomic structure and periodicity, theories of chemical binding and thermodynamics. Prerequisite: High school chemistry. Corequisites: MTH 111 or higher and CHM 113. Offered fall and spring.</td>
</tr>
<tr>
<td>CHM 112</td>
<td>GENERAL CHEMISTRY II</td>
<td>3 sh</td>
<td>The study of fundamental chemical principles continues with chemical kinetics, liquid/solid states, chemical equilibrium (gas phase and acid/base), thermodynamics and electrochemistry. Prerequisite: CHM 111. Corequisite: CHM 114. Offered spring.</td>
</tr>
<tr>
<td>CHM 113</td>
<td>GENERAL CHEMISTRY I LABORATORY</td>
<td>1 sh</td>
<td>The experiments offered familiarize students with basic laboratory techniques and complement topics discussed in CHM 111. Corequisite: CHM 111. Offered fall and spring.</td>
</tr>
<tr>
<td>CHM 114</td>
<td>GENERAL CHEMISTRY II LABORATORY</td>
<td>1 sh</td>
<td>This course involves laboratory applications of concepts and principles discussed in CHM 112. Prerequisites: CHM 111, 113. Corequisite: CHM 112. Offered spring and fall.</td>
</tr>
<tr>
<td>CHM 115</td>
<td>ADVANCED GENERAL CHEMISTRY</td>
<td>3 sh</td>
<td>This course explores fundamental principles of chemistry with an emphasis on understanding chemical concepts and quantitative reasoning. It consists of a brief review of stoichiometry, nomenclature, gases, thermodynamics, atomic structure and periodicity and more extensive coverage of chemical kinetics, electrochemistry, equilibrium systems, liquid/solid states and nuclear chemistry. This course is available for students who scored 4 or 5 on the AP chemistry exam and for students with exemplary scores on the Toledo exam. Prerequisites: High school chemistry. Corequisite: CHM 116. Offered fall.</td>
</tr>
<tr>
<td>CHM 116</td>
<td>ADVANCED GENERAL CHEMISTRY LAB</td>
<td>1 sh</td>
<td>This course involves laboratory applications of concepts and principles discussed in CHM 115 including mass spectrometry, atomic spectroscopy, molecular modeling, stoichiometry, thermochromy, chemical kinetics, electrochemistry, equilibrium systems and liquid and solid states. Corequisite: CHM 115. Offered fall (for CHM 115 only).</td>
</tr>
<tr>
<td>CHM 125</td>
<td>CHEMICAL LITERATURE</td>
<td>1 sh</td>
<td>This writing-intensive course is centered around an in-depth study of the different ways in which new discoveries in chemistry are communicated to members of the profession. Topics include primary and secondary sources: journals, monographs, patents, communications and reviews as well as foremost references such as Chemical Abstracts, The Ring Index and Science Citation Index. Both classical and online search methods will be integrated into the required writing assignments. Prerequisite: CHM 211 or permission of instructor.</td>
</tr>
<tr>
<td>CHM 205</td>
<td>INORGANIC CHEMISTRY</td>
<td>4 sh</td>
<td>This course will be an introduction to the field of inorganic chemistry with emphasis on nuclear chemistry, classical coordination chemistry, solid state chemistry, the periodic relationships of the elements and chemical bonding, the origin of the elements and the chemistry of hydrogen and oxygen. It will also serve as an introduction to the use of physical methods of structure determination of inorganic compounds by magnetic and spectral techniques including magnetic susceptibility, UV/VIS and IR. spectroscopy, NMR, spectroscopy and mass spectrometry. Three hours lecture, three laboratory hours per week. Prerequisites: CHM 112/114 or CHM 115/116. Offered spring.</td>
</tr>
<tr>
<td>CHM 211</td>
<td>ORGANIC CHEMISTRY I</td>
<td>3 sh</td>
<td>Organic Chemistry introduces students to the chemistry of carbon compounds, including nomenclature, the influence of structure on physical/chemical properties, reaction mechanisms, stereochemistry, conformational analysis, synthesis and characteristic reactions of different organic compounds. Prerequisites: CHM 112/114 or 115/116. Corequisite: CHM 213. Offered fall.</td>
</tr>
<tr>
<td>CHM 212</td>
<td>ORGANIC CHEMISTRY II</td>
<td>3 sh</td>
<td>Continuing the study of organic chemistry, this course emphasizes compounds containing oxygen or nitrogen and culminates with a survey of lipids, carbohydrates and proteins. Prerequisites: CHM 211/213. Corequisite: CHM 214. Offered spring.</td>
</tr>
<tr>
<td>CHM 213</td>
<td>ORGANIC CHEMISTRY I LABORATORY</td>
<td>1 sh</td>
<td>Laboratory work includes determination of physical properties, separation of mixtures, some structure identification and synthesis of selected organic compounds. Prerequisites: CHM 112/114 or 115/116. Corequisite: CHM 211. Offered fall.</td>
</tr>
<tr>
<td>CHM 214</td>
<td>ORGANIC CHEMISTRY II LABORATORY</td>
<td>1 sh</td>
<td>Procedures include microscale synthetic methods, molecular modeling via IBM-PC and qualitative organic analysis. Prerequisites: CHM 211, 213. Corequisite: CHM 212. Offered spring.</td>
</tr>
<tr>
<td>CHM 305</td>
<td>ENVIRONMENTAL CHEMISTRY</td>
<td>4 sh</td>
<td>Environmental Chemistry provides a survey of chemical topics applying to selected pollutants in the air, water and soil. Such topics include production and diffusion, photochemical processes, techniques for analysis, acid/base and redox chemistry, environmental and biological effects. Laboratory work includes acid/base and buffer chemistry, analysis of heavy metal pollutants sampling techniques and resistance of selected materials to certain pollutants. No credit toward B.S. degree. Prerequisites: CHM 211/213. Offered spring of alternate years.</td>
</tr>
<tr>
<td>CHM 311</td>
<td>QUANTITATIVE ANALYSIS</td>
<td>4 sh</td>
<td>This course introduces chemical methods of quantitative analysis, including classical, volumetric and selected instrumental methods, a discussion of error and uncertainty in measurements, and elementary statistics. Discussion also covers the underlying physical and chemical theories and laws with emphasis on chemical equilibrium. Prerequisites: CHM 111-114 or CHM 115/116. Offered fall.</td>
</tr>
<tr>
<td>CHM 321</td>
<td>INSTRUMENTAL ANALYSIS</td>
<td>4 sh</td>
<td>Instrumental Analysis offers theory and practice of instrumental methods, with emphasis placed on spectroscopic (UV/VIS, IR, NMR, AA) and mass spectrometric methods of analysis. Prerequisites: CHM 311, and CHM 211-214. Offered spring.</td>
</tr>
<tr>
<td>CHM 332</td>
<td>PHYSICAL CHEMISTRY I</td>
<td>4 sh</td>
<td>The mathematical development of the physical principles in chemistry is explored. Topics include development and application of the laws of thermodynamics, equations of states, kinetic molecular theory, elementary electrochemistry and equilibria. Laboratory experiments are designed to complement lectures and include studies of phase relationships, calorimetry and gas laws. Three hours lecture and three hours lab per week. Prerequisites: CHM 111-114 or CHM 115/116; MTH 121; PHY 112 or 114. Offered fall.</td>
</tr>
<tr>
<td>CHM 334</td>
<td>PHYSICAL CHEMISTRY II</td>
<td>4 sh</td>
<td>The principles of quantum mechanics are developed and illustrated by use of simple systems. Spectroscopic techniques are investigated as tools for probing structure and properties of molecules. Other topics include kinetics and group theory. Laboratory experiments are designed to complement lectures and include studies of reaction kinetics, laser spectroscopy, UV-VIS spectroscopy and computational techniques. Three hours lecture, three laboratory hours per week. Prerequisites: CHM 332, MTH 221, PHY 114. Offered spring.</td>
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CHM 351. BIOCHEMISTRY  
This is a survey of biochemistry as it relates to the physiology of organisms. Topics include biochemical methodology, buffers, proteins (structure, function and synthesis), enzymes, bioenergetics, anabolism and catabolism of carbohydrates and lipids and metabolic regulation. Prerequisites: CHM 211-214. (CHM 351 is cross-listed with BIO 351.) Offered fall.

CHM 352. BIOCHEMISTRY LABORATORY  
This laboratory investigates the rates of enzyme-catalyzed reactions, including the effect of enzyme inhibitors; the isolation/purification/analysis of proteins, lipids and carbohydrates; and some analytical techniques used in clinical chemistry laboratories. Techniques employed include affinity chromatography, electrophoresis, gas chromatography, UV-visible spectrometry and polarimetry. Prerequisites: CHM 211-214. Corequisite: CHM 351. (CHM 352 is cross-listed with BIO 352.) Offered fall.

CHM 431. ADVANCED INORGANIC CHEMISTRY  
This course will begin with an accelerated review of the history of inorganic chemistry, atomic structure and simple bond theory. It will then proceed with an in-depth introduction into symmetry and group theory with applications to the description of chemical bonding in molecular orbital theory. Acid-Base and Donor-Acceptor Chemistry and the descriptive chemistry of the main group elements will be followed by an in-depth survey of organometallic chemistry. The continued application of physical methods of structure determination of inorganic compounds by magnetic and spectral techniques including magnetic susceptibility, UV/VIS and IR spectroscopies and NMR spectrometry will be presented throughout the course. Prerequisites: CHM 205, 211-214 and CHM 334. Offered fall.

CHM 432. PHYSICAL ORGANIC CHEMISTRY  
The study and applications of Hückel molecular orbital theory toward the understanding of the mechanisms of selected chemical reactions. The focus will be on empirical methods to derive mechanisms including linear free energy relationships and reaction kinetics. Techniques to be covered include photoelectron spectroscopy (PES) and computational chemistry (CC). Prerequisite: CHM 334.

CHM 461. SEMINAR  
Students make presentations after they do individual library research. Student seminars are supplemented with seminars by practicing scientists. All chemistry-oriented students are encouraged to attend. Credit for junior and senior majors only or by permission of the instructor. Completion of this course satisfies the oral competency requirement for the B.S. and B.A. major in Chemistry. Course is two semesters in length with 0.5 sh each semester. Students must take both semesters. Offered fall and spring.

CHM 471-479. SPECIAL TOPICS IN CHEMISTRY  
Advanced topics offered to meet the needs and interests of students include methods in forensic and medicinal chemistry, nuclear chemistry, nuclear magnetic resonance spectrometry, advanced organic or polymer chemistry. Prerequisites: CHM 212/214.

CHM 481. INTERNSHIP  
Students gain advanced level work experience in a chemical field. Internships are offered on an individual basis when suitable opportunities can be arranged. Prerequisite: permission of department.

CHM 491. INDEPENDENT STUDIES  
In collaboration with a chemistry faculty member, students undertake experimental or theoretical investigations. Prerequisite: Approval of department chair. Offered fall, winter, spring.

CHM 499. RESEARCH  
1-3 sh

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Classical Studies

Coordinator: Professor Gill

Classical Studies is an interdisciplinary program of studies in the languages, history, culture and heritage of the ancient and early modern world. This program gives students an opportunity for concentrated study of “Classical” ideas and practices, which form an important part of Western civilization. In addition, the program examines the ways that these ideas and practices have influenced, and been modified by, later generations. A minor in Classical Studies can serve as a valuable complement to many fields, providing depth and context for a student’s other courses, encouraging analytical study of primary sources and allowing the pleasure of reading some of Western civilization’s greatest works.

A minor in Classical Studies requires the following:

Twenty semester hours taken from the list below and/or from other approved courses. At least eight of these semester hours must be at or above the 300-level. Courses must be chosen from at least three departments.

Acceptable courses in Classical Studies include:

- ART 221 Art and History: Prehistory to the Present 4 sh
- ART 343 Renaissance Art History 4 sh
- CLA 110 Introduction to Classical Studies 4 sh
- ENG 221 British Literature I 4 sh
- ENG 321 Classical Literature 4 sh
- ENG 322 Medieval Literature 4 sh
- ENG 323 Renaissance Literature 4 sh
- FNA 265 Studies in Italy/ELR 4 sh
- FNA 313 British Art and Architecture 4 sh
- GRK 110 Beginning Greek 4 sh
- GRK 210 Intermediate Greek 4 sh
- GRK 310 Advanced Greek 4 sh
- HST 111 Europe and the Mediterranean World to 1660 4 sh
- HST 323 Making of the English Nation to c.1660 4 sh
- LAT 121 Beginning Latin I 4 sh
- LAT 122 Beginning Latin II 4 sh
- MUS 315 The Music of Ancient Times through Mozart 4 sh
- PHL 331 Ancient Philosophy 4 sh
- PHL 332 Medieval Philosophy 4 sh
- PHL 355 Philosophy of Religion 4 sh
- POL 300 Introduction to Political Thought 4 sh
- REL 111 The Old Testament Story 4 sh
- REL 112 Introduction to the New Testament 4 sh
- REL 321 Archaeology of the Ancient Near East 4 sh
- REL 322 Old Testament Prophets 4 sh
- REL 324 Book of Job 4 sh