

# CHMY - CHEMISTRY

CHMY 104 Preparation for Chemistry. Term Typically Offered: Fall Prerequisite(s): Basic knowledge of algebra is recommended; if you do not have this knowledge, please consult with instructor. Corequisite(s): CHMY 106. 4cr. (3 lec/1 other/wk) Prepares students to succeed in the one-semester CHMY 121 or two-semester CHMY 141/CHMY 143 College Chemistry series by developing necessary mathematical and scientific problem-solving skills. The primary goal of the course is to help students attain the tools necessary to learn chemistry through developing the knowledge and skills required to look at the world at the atomic scale. Students will review relevant algebra skills, refine study habits critical to learning chemistry, and develop thinking patterns used to solve chemical problems, such as recognizing mathematical relationships in data and manipulating mental models to explain macroscopic phenomena. The course will explore and explain several of the theories and concepts of chemistry for incoming students. The focus of CHMY 104 will be chemically relevant algebra, the scientific method, periodic table interpretation, chemical nomenclature, balancing chemical equations, stoichiometry, and gas laws. Each topic will include a special focus on the procedural math associated with related problem-solving tasks. The course consists of three 1-hour face-to-face lectures per week plus a more personal 1-hour integrated recitation each week. The recitation will focus primarily on problem recognition, interpretation, and solving skills. Lecture Hours 3 Department: Sciences - Biology & Phys Sci	4 Credits	
CHMY 106 Preparation for Chemistry Lab. Term Typically Offered: Fall Corequisite(s): CHMY 104. 1cr. Designed to develop analytical and critical thinking skills as well as laboratory practices and techniques to reinforce CHMY 104 lecture material. This course will cover correct identification and use of common laboratory equipment, practical application of common concepts in chemistry (significant figures, periodic trends, titration, balanced chemical equations, unit conversion, and dimensional analysis), simple chemical relationships (density, ideal gas law, heat/calorimetry), and the utility and correct procedures in keeping a laboratory manual. Lab Hours 2 Department: Sciences - Biology & Phys Sci	1 Credit	
CHMY 121 Intro to General Chemistry. Term Typically Offered: Fall, Spring, Summer Prerequisite(s): M 095 or equivalent. Covers the fundamental definitions of chemistry, structure, chemical equations, solutions, equilibrium, oxidation-reduction, and acid/base chemistry. This is primarily a course for pre-nursing and allied health students. Lecture Hours 3 Department: Sciences - Biology & Phys Sci	3 Credits	
CHMY 122 Intro to Gen Chem Lab. Term Typically Offered: Fall, Spring, Summer Corequisite(s): CHMY 121. Provides laboratory experiences that complement and extend the lecture materials. Lab Hours 1 Department: Sciences - Biology & Phys Sci	1 Credit	
CHMY 123 Intro to Organic & Biochem. Term Typically Offered: Spring, Summer Prerequisite(s): CHMY 121 and CHMY 122. Covers the basic functional groups, nomenclature and reactions of organic chemistry and provides an overview of biomolecules, biocatalysis and metabolism with clinically relevant correlations. Lecture Hours 3 Department: Sciences - Biology & Phys Sci	3 Credits	
CHMY 141 College Chemistry I. Term Typically Offered: Fall, Spring Prerequisite(s): M 095 or satisfactory math placement score. Corequisite(s): CHMY 142. 4cr. (3 lec/1 other/wk) Introduces the student to the fundamental concepts of chemistry, including: elements and compounds, the periodic table, atomic structure, chemical equations, stoichiometry, solution concentrations, gas laws, heat and energy, quantum theory, and chemical bonding. Primarily intended for science majors/minors, pre-engineering, and allied health students. The course consists of three 1-hour face-to-face lectures per week plus a 1-hour integrated recitation each week. Lecture Hours 3 Department: Sciences - Biology & Phys Sci	4 Credits	
CHMY 142 College Chemistry I Lab. Term Typically Offered: Fall, Summer Corequisite(s): CHMY 141. Lab to accompany CHMY 141. Introduces the tools and techniques of experimental chemistry such as weighing, solution preparation, titration and standardization. Lab Hours 1 Department: Sciences - Biology & Phys Sci	1 Credit	
CHMY 143 College Chemistry II. Term Typically Offered: Spring, Summer Prerequisite(s): CHMY 141 and CHMY 142. Corequisite(s): CHMY 144. 4cr. (3 lec/1 other/wk) Introduces the student to the additional fundamental concepts of chemistry, including: molecular geometry, solutions and condensed phases, chemical and phase equilibria, kinetics, thermodynamics, and electrochemistry. The course consists of three 1-hour face-to-face lectures per week plus a 1-hour integrated recitation each week. Lecture Hours 3 Department: Sciences - Biology & Phys Sci	4 Credits	
CHMY 144 College Chemistry II Lab. Term Typically Offered: Spring, Summer Prerequisite(s): CHMY 142. Corequisite(s): CHMY 143. Lab to accompany CHMY 143. Introduces qualitative analysis and other topics to complement the lecture material. Lab Hours 1 Department: Sciences - Biology & Phys Sci	1 Credit	
CHMY 145 College Chemistry Recitation. Term Typically Offered: Fall, Spring Corequisite(s): CHMY 141 or CHMY 143. Provides a small class environment where students can ask questions that require answers too extensive or too specific for the lecture setting. The course is designed to enhance the CHMY 104/CHMY 141/CHMY 143 lecture experience by actively engaging students in real life chemical problem solving. Students will use their newly acquired chemistry skill sets to solve multi-faceted chemical problems in small group settings. Students can ask questions about lecture material or homework assignments and receive more individual attention. Lecture Hours 1 Department: Sciences - Biology & Phys Sci	1 Credit	

CHMY 170 Applied Brewing Chemistry. Term Typically Offered: Fall Introduces the fundamental aspects of malting and fermentation chemistry. Some basic chemical principles will be presented, followed by explanations of the underlying chemistry of steps in the brewing process and quality control monitoring. This course includes laboratory exercises. Department: Sciences - Biology & Phys Sci	3 Credits	CHMY 321 Organic Chemistry I. Term Typically Offered: Fall Prerequisite(s): CHMY 143 and CHMY 144. Corequisite(s): CHMY 322. Covers the nomenclature, structure, reactions and reaction mechanisms of organic functional groups - alkanes through alcohols. Lecture Hours 3 Department: Sciences - Biology & Phys Sci	3 Credits
CHMY 211 Elements of Organic Chemistry. Term Typically Offered: Spring Prerequisite(s): CHMY 143, CHMY 144. Covers the unique characteristics of carbon, bonding, structure, reactions, nomenclature, and a look into the major organic functional groups. This is a one-semester introduction to organic chemistry. Department: Sciences - Biology & Phys Sci	3 Credits	CHMY 322 Organic Chemistry Lab I. Term Typically Offered: Fall Corequisite(s): CHMY 321. Introduces the common techniques used in an organic chemistry lab, including crystallization, extractions, distillations, chromatography, and synthesis. Lab Hours 1 Department: Sciences - Biology & Phys Sci	1 Credit
CHMY 212 Elements of Organic Chem Lab. Term Typically Offered: Spring Prerequisite(s): CHMY 143, CHMY 144. Corequisite(s): CHMY 211. Introduces the basic techniques used in an organic chemistry lab including crystallization, extraction, distillation, chromatography, and synthesis. Lab Hours 1 Department: Sciences - Biology & Phys Sci	1 Credit	CHMY 323 Organic Chemistry II. Term Typically Offered: Spring Prerequisite(s): CHMY 321 and CHMY 322. Corequisite(s): CHMY 324. Continuation of CHMY 321. Covers the functional groups: aromatics, aldehydes, ketones, acids, acid derivatives, and amines. Also introduces organic spectroscopy. Lecture Hours 3 Department: Sciences - Biology & Phys Sci	3 Credits
CHMY 291 Special Topics. Prerequisite(s): determined as needed. Provides students with an opportunity to take courses not required in any curriculum for which there is a particular need, or given on a trial basis to determine acceptability and demand before requesting a regular course number. Department: Sciences - Biology & Phys Sci	1-12 Credits	CHMY 324 Organic Chemistry Lab II. Term Typically Offered: Spring Corequisite(s): CHMY 323. Continuation of CHMY 322. Provides additional techniques and skills common in an organic chemistry lab, including synthesis and spectroscopic techniques. Lab Hours 1 Department: Sciences - Biology & Phys Sci	1 Credit
CHMY 292 Independent Study. Prerequisite(s): Consent of instructor and department chairperson. Provides an opportunity for freshman and sophomore students to explore material not covered by regular Chemistry courses. A contract describing this study must be completed at the time of enrollment. Department: Sciences - Biology & Phys Sci	1-4 Credits	CHMY 371 Phys Chem-Qntm Chm & Spctrscopy. Term Typically Offered: Fall (odd years) Prerequisite(s): CHMY 323, M 171, M 172 and PHSX 232. Corequisite(s): CHMY 372. Introduces the fundamental concepts of quantum mechanics, atomic and molecular structure, chemical bonding, and the theoretical basis of experimental spectroscopy. Lecture Hours 3 Department: Sciences - Biology & Phys Sci	3 Credits
CHMY 294 Seminar/Workshop. Department: Sciences - Biology & Phys Sci	1-8 Credits	CHMY 372 Physical Chemistry Lab I. Term Typically Offered: Fall (odd years) Corequisite(s): CHMY 371. Demonstrates and amplifies concepts presented in CHMY 371. Lab Hours 1 Department: Sciences - Biology & Phys Sci	1 Credit
CHMY 298 Internship/Cooperative Educ. Provides university credit for a sophomore work experience in the area of Chemistry, supervised by faculty. Learning agreement must be completed prior to registration (restricted). Department: Sciences - Biology & Phys Sci	1-9 Credits	CHMY 373 Phys Chem-Kntcs & Thrmdynmcs. Term Typically Offered: Spring (even years) Prerequisite(s): M 171, M 172, PHSX 232, CHMY 143. Corequisite(s): CHMY 374. Introduces the fundamental concepts of equilibrium, thermodynamics equilibria, and phenomenological kinetics. Lecture Hours 3 Department: Sciences - Biology & Phys Sci	3 Credits
CHMY 311 Analytical Chem-Quant Analysis. Term Typically Offered: Fall Prerequisite(s): CHMY 143 and CHMY 144. Corequisite(s): CHMY 312. Covers the theoretical foundations of quantitative chemical analysis, as well as an introduction to fundamental instrumental techniques. Lecture Hours 3 Department: Sciences - Biology & Phys Sci	3 Credits	CHMY 374 Physical Chemistry Lab II. Term Typically Offered: Spring (even years) Corequisite(s): CHMY 373. Demonstrates and amplifies concepts presented in CHMY 373. Lab Hours 1 Department: Sciences - Biology & Phys Sci	1 Credit
CHMY 312 Analytical Chem Lab-Quant Anlysis. Term Typically Offered: Fall Prerequisite(s): CHMY 144. Corequisite(s): CHMY 311. Lab to accompany CHMY 311 covering gravimetric, titrimetric, electrochemical and spectrometric analysis techniques. Lab Hours 1 Department: Sciences - Biology & Phys Sci	1 Credit		

CHMY 401 Advanced Inorganic Chemistry. Term Typically Offered: Spring (even years) Prerequisite(s): CHMY 143 and CHMY 144. Corequisite(s): CHMY 402. Covers the chemistry of the main group and transition elements. The course includes group theory and its application to modern bonding theories. These bonding theories will be used to explore topics in coordination, organometallic, and bioinorganic chemistries. Lecture Hours 3 Department: Sciences - Biology & Phys Sci	3 Credits	CHMY 491 Special Topics. Prerequisite(s): determined as needed. Provides students with an opportunity to take courses not required in any curriculum for which there is a particular need, or given on a trial basis to determine acceptability and demand before requesting a regular course number. Department: Sciences - Biology & Phys Sci	1-12 Credits
CHMY 402 Advanced Inorganic Chem Lab. Term Typically Offered: Spring (even years) Prerequisite(s): CHMY 143 and CHMY 144. Corequisite(s): CHMY 401. Includes advanced techniques in inorganic synthesis, spectroscopy, and computational chemistry. Lab Hours 1 Department: Sciences - Biology & Phys Sci	1 Credit	CHMY 492 Independent Study. Prerequisite(s): Consent of instructor and department chairperson. Provides outstanding students an opportunity for research in chemistry. A contract describing the study must be completed at the time of enrollment. Department: Sciences - Biology & Phys Sci	1-3 Credits
CHMY 411 Advanced Organic Chemistry. Term Typically Offered: Fall (odd years) Prerequisite(s): CHMY 323 and CHMY 324. Corequisite(s): CHMY 412. Covers additional and more advanced topics in organic synthesis, reaction mechanisms, and spectroscopy. Lecture Hours 3 Department: Sciences - Biology & Phys Sci	3 Credits	CHMY 494 Seminar/Workshop. Prerequisite(s): senior standing in a science major or consent of the instructor. Students are expected to research and give an hour seminar on a topic from chemistry or a closely related field, and write a paper on the topic as if for publication. Department: Sciences - Biology & Phys Sci	1-8 Credits
CHMY 412 Advanced Organic Chemistry Lab. Term Typically Offered: Fall (odd years) Corequisite(s): CHMY 411. Provides exposure to more advanced techniques used in organic synthesis and the spectroscopy used for structure determination. Lab Hours 1 Department: Sciences - Biology & Phys Sci	1 Credit	CHMY 498 Internship/Cooperative Educ. Provides university credit for a work experience in the area of Chemistry, supervised by faculty. Learning agreement must be completed prior to registration (restricted). Department: Sciences - Biology & Phys Sci	1-9 Credits
CHMY 421 Advanced Instrument Analysis. Term Typically Offered: Spring (odd years) Prerequisite(s): CHMY 311 and CHMY 371. Corequisite(s): CHMY 422. Covers the foundations of modern instrumental analysis theory and techniques. Techniques studied include instrumental design, atomic and molecular spectroscopy, electrochemistry and chromatography. Lab required. Lecture Hours 3 Department: Sciences - Biology & Phys Sci	3 Credits	CHMY 499 Senior Thesis/Capstone. Term Typically Offered: Fall, Spring Prerequisite(s): Senior standing in Chemistry. 1cr. (1 other/wk) Integrates and synthesizes knowledge and experience developed through the various courses in the chemistry program. Provides students opportunities to learn about current research in various scientific fields by attendance at seminars presented by science faculty, guest speakers, or classmates. Students will learn how to present research data and/or scientific journal articles, as well as participate in discussions and critiques of scientific presentations. Also provides a forum for students to present results of independent research projects or topics as assigned. Department: Sciences - Biology & Phys Sci	1 Credit
CHMY 422 Adv Instrument Analysis Lab. Term Typically Offered: Spring (odd years) Prerequisite(s): CHMY 312. Corequisite(s): CHMY 421. Lab to accompany and demonstrate the techniques covered in CHMY 421. Lab Hours 2 Department: Sciences - Biology & Phys Sci	2 Credits		
CHMY 490 Undergraduate Research. Prerequisite(s): consent of instructor. Students will carry out a contained research project under the supervision of a faculty member, including library and experimental research as appropriate, analysis of the results and the submission of a formal research report upon completion of the project. Department: Sciences - Biology & Phys Sci	1-3 Credits		