Washington College course list for WashU p rerequisites

** Please see Washington University program webpage for the definitive list of course requirements

Washin gton University Requirement	Washington College Equivalent with Course Descriptions
Chemistry : one semester of general chemistry with lab	CHE 120. Chemical Principles of Organic Molecules. This one-semester course provides a foundation in the fundamental principles of chemical structure and reactivity of organic molecules. Key topics include atomic and molecular strhigh-level language (s MATLAB preferred for Biomedical Engineering, Chemical Engineering and Mechanical Engineering)
	CSI 201. Computer Science I. The objectives of this course are threefold: (a) to introduce problem-solving methods and algorithmic development; (b) to teach an object-oriented programming language; and c) to teach how to design, code, debug, and document programs in an object-oriented environment using techniques of good programming style. OR PHY 252. Scientific Modeling and Data Analysis. This course serves as a focused introduction to programming for scientists and engineers. Topics include algorithm development, statistical tests, the fast Fourier transform (FFT), simulating the dynamics of systems represented by coupled ordinary differential equations (e.g. planetary motion via Runge-Kutta methods), numerical integration, root finding, fitting functions to experimental data, and the creation of publication-quality graphics. Students choose and complete an independent research project on a topic related to their major. This course enables students to integrate computation into advanced courses in theoretical and/or experimental science. Programming language: Python.
English Composition : one course, acceptable examination scores, or college certification of proficiency	FYS. 101. First Year Seminar. Washington College's First-Year Seminar program introduces new college students to the excitement of critical inquiry and learning, and to the key academic skills required for sustained collegiate success. FYS courses cover a wide range of topics, but all share three essential elements: the passion of a dedicated instructor, a small-seminar format where students contribute and learn from each other, and a sustained focus on careful reading, sound research, thoughtful discussion, and clear writing—the 'habits of critical inquiry' at the heart of liberal education. All FYS courses introduce students to library research and information literacy; offer instruction on the writing process, rhetorical knowledge, and academic conventions; and include significant research, writing, revision, and presentation work. FYS courses satisfy the W1 .7 (es)-2.7 (e)152 (or)17Eop2 1e

Mathematics : a calculus sequence which includes exposure to multivariable calculus and a separate course in differential equations (linear algebra or matrix algebra strongly recommended)	MAT 111. Differential Calculus Analytic geometry, the derivative and differential, elementary functions, limits, continuity, and

Discipline -specific requirement for Biomedical Engineering: one semester of biology that covers cellular, molecular and developmental biology and a second semester of general chemistry with lab	BIO 111. General Biology I. This course provides an introduction to living systems. Topics studied include biomolecules, cell structure and function, metabolism, genetics and molecular biology. The laboratory complements the lecture and also provides an introduction to experimentation and communication of experimental results. These courses are designed for students with a strong interest in the biological sciences. CHE 140. Reactions of Organic Molecules. CHE 140 builds upon the fundamental principles discussed in CHE 120. Chemical Principles of Organic Molecules. This course will focus on the reactivity of organic molecules, including aliphatic and aromatic hydrocarbons, their halogenated derivatives, and molecules containing heteroatoms such as oxygen, nitrogen, and sulfur, alone or those incorporated in biologically relevant molecules. Particular emphasis is placed on the structure and function of organic molecules important in biological systems as well as the discussion of reaction mechanisms. Students will also be exposed to chemical synthesis and the use of modern spectroscopic techniques for the determination of molecular structure. This course will meet for three hours of lecture and three hours of lab per week. Prerequisites. Chemistry 120. OR CHE 220. Quantitative Chemical Analysis. This one-semester course is intended to provide an introduction to analytical methods utilized in chemistry. Both classical and instrumental methods of analysis are considered. A detailed treatment of simple and complex chemical equilibria with particular emphasis on acid-base, oxidation-reduction, and precipitation equilibria is presented as a basis for the classical gravimetric and titrimetric methods. The instrumental techniques include electroanalytical, UV-visible molecular spectroscopy, atomic spectroscopy, and chromatography. Other topics include a review of intermolecular forces and states of matter. Three hours of lecture and three hours of laboratory work each week. Offered every semester. Prerequisite: Chemistry 120.
Discipline specific requirement for Chemical Engineering & Environmental Engineering : one semester of biology that covers cellular, molecular and developmental biology, a second semester of general chemistry with lab, and one semester of organic chemistry with lab (a second semester of organic chemistry, physical chemistry, and a course on energy and environment from a scientific point of view are strongly recommended)	See Biomedical engineering above. CHE 340. Synthesis of Organic Molecules. Organic Mechanisms and Synthesis delves deeper into the concepts from Reactions of Organic Molecules (CHE 140). In this course, students will learn about modern organic reactions, their mechanisms, and the application of these reactions in organic synthesis. Students will also be exposed to polymer and supramolecular chemistry, with a focus on the synthesis and properties of these compounds and their applications. The laboratory component of this course will provide students the opportunity to learn techniques that are required for the synthesis and characterization of organic, inorganic, and organometallic compounds, as well as teach students how to think strategically about the chemical reactions needed to complete a chemical synthesis. This course will meet for three hours of lecture and three hours of lab per week. Prerequisite. Chemistry 140. Co-requisite: Chemistry 220. ENV 314. Energy and the Environment. This course explores general topics of energy generation, distribution, and use, as well as the many ways that the energy industry affects the environment. Topics include fossil fuels, heat engines, renewable energy sources, global effects of energy use, politics and energy policy, nuclear energy, and energy conservation. Prerequisite: ENV 101.
Discipline Specific Requirement for Computer Science & Computer Engineering : a second computer programming course Note: Computer Science and Data Science majors only are not required to complete chemistry or differential equations.	CSI 202. Computer Science II. The objectives of this course are twofold: (a) to study data structures, such as stacks, queues, trees, dictionaries, tables, and graphs, their efficiency, and their use in solving computational problems; and (b) to gain proficiency in an object-oriented programming language. Exercises in that language will provide an opportunity to design and implement the