



STEM Dual Enrollment Course Offerings

- 1 **Introduction to Engineering** **ES 101** 2 Credits
This course introduces the various disciplines of engineering, with emphasis on learning concepts and practicing skills are used in engineering and the engineering technology fields. It is designed to develop students' ability to identify and practice the different types of engineering problem solving, make effective written communications and oral presentations, and understand the professional, ethical, and social responsibilities of an engineer. Feasibility and project management concepts are also introduced.
- 2 **Intro to Engineering & Avionic Tech** **ES 102** 2 Credits
Same as ES101 with a concentration on avionics for students pursuing an Aerospace Engineering Degree.
The course expands student awareness of Avionics technology; by introducing several types of flight instruments, navigation, communication and electronic systems mounted in aircraft.
- 3 **General Chemistry I** **CH 111** 4 Credits
This course is for science, pre-professional, and engineering majors. It covers basic concepts and introductory inorganic chemistry. Topics include: stoichiometry, solubility, atomic and molecular structure, gases, solid structure, quantum mechanics, chemical formulas, reactions, solutions, enthalpy, and bonding theory. Solutions to numerical problems are stressed throughout. Laboratory experiments reinforce theoretical principles.
- 4 **Biology I** **BS 101** 4 Credits
This course explores the basic study of the principles underlying the science of cells and organisms. Included are topics related to biochemistry, cell structure and function, effects of the physical environment on cells, genetics, genetic engineering, heredity, evolution, and selected biological problems. Laboratory experiments include investigations of physical and chemical life processes, analysis of cellular components, cellular functions, cell reproduction, and heredity.
- 5 **Biology II** **BS 102** 4 Credits
This course explores the basic study of representative organisms of the five kingdoms, with an emphasis on classification, differential features, and reproduction. For the plant and animal kingdoms, it covers fundamentals of development, physiological control systems, organ systems, nutrition, movement, ecology, and selected biological problems of representative organisms. The laboratory sessions include dissections and experimental studies of selected representative organisms for all kingdoms.
- 6 **Computer Concepts and Applications** **CIS 101** 3 Credits
This course provides the level of knowledge necessary to function as a fluent computer user in today's technological society. Topics include computer terminology, computer hardware and software capabilities, what makes a computer powerful, the societal impact of computers, ergonomics, ethical computing behavior, information privacy, and computer security. Class time and open lab are used to complete hands-on projects encompassing Microsoft Windows, Microsoft Office (Word, Excel, and PowerPoint), as well as an information literacy project focusing on effective use of the Web. Students with no computing experience are encouraged to complete a computing keyboarding course (CIS 103) before taking this course. For non-majors only.



- 7 **Programming Fundamentals** **CIS 108** 3 Credits
This course introduces the students to the core of programming basics. Topics include data types, control structures, algorithm development, and program design with functions via the Python programming language. It discusses the fundamental principles of Object-Oriented Programming, as well as in-depth data and information-processing techniques. Students will analyze, design, and solve problems. They will explore real-world software development challenges and create practical and contemporary applications.
- 8 **Introduction to Graphic Design** **GD 110** 3 Credits
This course trains students to apply the principles and elements of design to create original work in advertising, editorial, and promotional print materials and presentations. Students will explore typography and how it relates to the layout and design of information, as well as portfolio presentation and preparing work for print. Students will be exposed to software used by graphic designers including Adobe PhotoShop, Illustrator, Fireworks, and QuarkXPress.
- 9 **College Algebra** **MA 108** 3 Credits
This course covers the study and application of the concept of sets, relations, functions, and the real number system. Topics include polynomials, rational expressions, and radicals. Emphasis is placed on solving polynomial and rational equations as well as linear systems, and graphing linear, quadratic, exponential, logarithmic, and rational functions.
- 10 **Pre-Calculus Mathematics** **MA 109** 4 Credits
This course prepares students for calculus. Topics include the study of functions, and emphasis is placed on the properties of inverse, trigonometric, and exponential functions and analytic geometry.
- 11 **Environmental Science** **SC 104** 4 Credits
This course explores the science principles associated with environmental studies and the causes of environmental problems. Topics include air, land, and water resources, energy, ecological principles, waste management, and human impact on the environment. The laboratory component will include the scientific method, collection and analysis of data, field study methods, computer simulations, and field trips.

Passaic County Community College
STEM Program

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