Dearborn STEM Early College Academy

High School Course Catalog

2019-20



Dear Students and Families,

This Course Catalog is an important document to review in planning your high school academic path. It contains all classes offered, graduation requirements, and the goals of each academic department.

Dearborn STEM Academy has an increasing number of options for our students. After reviewing the course catalog you should consult with your guidance counselor and teachers to determine the correct path of study for your Dearborn STEM Academy career. Your guidance counselor will work closely with you to ensure that you are meeting all DSA graduation requirements. Your guidance counselor will also work with you to ensure you are meeting the Massachusetts Competency Determination (MCAS) in Mathematics, English Language Arts, and Science.

Our ultimate academic goal at DSA is your preparedness for college and career. This process works best if it involves parents/guardians as well as the school teaching and support staff. DSA is full of caring adults to help you through this process. Each student has a chance to sit with our guidance counselor to finalize his/her requests for next school year.

Final responsibility for planning your high school program rests with you the student and your family. The opportunities are here at Dearborn STEM Academy. We hope you take advantage of them.

Sincerely,

**Darlene Marcano, Co-Principal for Academics**

**Dana Brown, Co-Principal for Operations**

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**Dearborn STEM Academy Graduation Requirements**

**4 years/credits** of English (Grade 9, 10, 11, 12 English, or ESL 1, 2, 3) or approved Early College-Dual Enrollment equivalent

**4 years/credits** of Mathematics or approved Early College-Dual Enrollment equivalent

**3 years/credits** of Science, one of which must be Biology (with lab requirement)

**3 years/credits** of Social Sciences – United States History I, II & World History or

**2 years/credits** of Wellness (3 half-year units of Physical Education and one half-year of Health)

**2 years/credits** from the following disciplines: Technology Education, Fine & Performing Arts, other electives as offered

\*\*Students planning on attending college should strongly consider taking two years of a foreign language. Spanish is offered at DSA.

## Science Department

**Anatomy and Physiology** Course code: 557

Length: Year Long Credits: 1

Grade: 11th and 12th Grade Prerequisites: 10th Grade Biology

Course Requirements:

1) A demonstrated commitment to learning, academics, and scholarly behavior.

2) Students must commit to attend weekly visits to Harvard Medical Center to take part in medical emergency simulations in a hospital setting and medical skills tutorials. Failure to attend these will result in removal from the course.

Description:

This course is designed for, but not limited to, students interested in investigating or eventually pursuing a career in the field of healthcare and/or medicine. Given the difficult nature of the course and its pace, it is recommended that students carefully examine their level of commitment to their education and desire to pursue a health care profession before signing up for this course.

The course first includes a 5 unit long study of infectious diseases, their effect on human beings, the natural defenses humans have against these diseases, as well as the types of medications, vaccines, and other treatments doctors use heal and bring comfort to patients in a hospital setting. Here students learn the basis of disease, the

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**Early College Classes**

### WENTWORTH INSTITUTE OF TECHNOLOGY

**Math 1000 College Math 1 (**4 Credit Hours)

Algebra and trigonometry, including algebraic fractions, systems of linear equations, quadratic equations, literal equations, word problems and their solutions, right triangles, and vectors. Applications will be stressed. Prerequisite: High School Algebra II.

Required for: management, facilities management, construction management, computer networking, architecture, and computer information systems majors.

**Math 1500 Precalculus (**4 Credit Hours)

Topics include: polynomial and rational functions, exponential and logarithmic functions, trigonometric functions, parametric equations, analytic trigonometry, multivariable systems, and applications and modeling. Prerequisite: MATH 100 College Math I.

Required for: construction management, computer science & networking, architecture, and computer information systems majors.

**Math 2300 Discrete Math (**4 Credit Hours)

Topics of this course to be chosen from: elementary logic, sets, permutations and combinations, induction, relations, digraphs, functions, trees, Warshall's Algorithm, and Boolean algebra. Prerequisite: MATH 1500 Precalculus or MATH 1065 College Math C.

**MATH1750 Engineering Calculus 1** (4 credits)

Limits, continuity, differentiability, the limit definition of the derivative, differentiation, linearization and some integration of algebraic and transcendental functions, implicit differentiation. Intended for engineering majors or advanced technology students.

Required Course for applied mathematics majors and for computer science majors.

**COMP 1000 Computer Science 1 (**4 Credit Hours)

An introductory course covering the fundamental concepts and skills of programming in a high-level language. Emphasis is placed on problem solving, algorithm development, program design and structure, code documentation and style, and testing and debugging. Topics include hardware and software systems, data types and variables, device/file input and output, flow control and functions, use of basic data structures, as well as principles and applications of object-oriented programming.

**COMP 1050 Computer Science 2 (**4 Credit Hours)

This course is an advanced introduction to computer science. It focuses on object-oriented programming. Topics include abstraction and encapsulation, classes and methods, objects and references, overloading, inheritance, polymorphism, interfaces, console/file input/output, dynamic data structures, generics, and GUI applications. Prerequisite: COMP1000

**COMP 1100 Introduction to Networks (**4 Credit Hours)

This course provides an introduction to networking and computing systems including operating systems, technical aspects of the Internet and internetworking.

**COMP 1150 Routing and Switching (**4 Credit Hours)

This course introduces the students to routing, packet forwarding, and switching technologies. Both static routing and dynamic routing protocols are covered as well as basic switching concepts. Students will learn how to configure industry standard networking equipment. Prerequisite: COMP 1100 Introduction to Networks.

**COMP 1200 Computer Organizations (**4 Credit Hours)

This course covers binary number and codes, logic elements, combinational and sequential logic, architectural design of a computer using these elements, and introduces concepts such as process and memory management. Prerequisite: COMP1000 Computer Science I; Corequisite: MATH 2300 Discrete Math.

**COMP 2650 Databases (**4 Credit Hours)

Concepts and methods for the design, creation, querying, and management of relational database management systems. Covers modeling the conceptual and logical organization of databases, including the entity-relationship model; the relational data model and SQL; as well as functional dependencies and normal forms. Students will further strengthen their database skills by developing a substantial project with a team. Prerequisite: COMP1050 Computer Science II; MATH2300 Discrete Math

**BIOL 1100 Cell and Molecular Biology (**4 Credit Hours)

This course introduces basic principles of cellular and molecular biology. Topics include: properties of life, organic molecules, general features of cells, membrane structure, synthesis and transport, introduction to energy, enzymes and metabolism, cell respiration, photosynthesis, cell communication, extracellular matrices, cell junctions, tissues, nucleic acid structure, DNA replication and chromosome structure, gene expression and regulation, mutation, the eukaryotic cell cycle, mitosis and meiosis, viruses and bacteria.

**ENGR1000 Introduction to Engineering** (3 Credits)

This course develops the skills needed during the students study of engineering. Topics include task/time management, effective use of notes, engineering research, oral and written communications, problem-solving techniques, ethics and professional responsibility and Institute resources. In the laboratory, students work in teams to complete a variety of engineering tasks.

**MANF1000 Manufacturing Process** (4 credits)

This course is designed to provide a basic understanding of present-day manufacturing processes. Through lectures, demonstrations, and practical applications, the student will be introduced to various manufacturing processes. Topics will include machine tools, welding, casting, sheet metal, and an introduction to numerical control programming.

**MECH2300 Engineering Graphics** (3 credits)

Basic concepts of engineering graphics, design and sketching, tolerance analysis and ANSI standard drawings are explored using CAD.

**MANF2000 Computer Aided Manufacturing** (3 credits)

Students will utilize PC based industrial CAM software and Computer Numerical Control machines to produce machine tool programs and parts.

### **BUNKER HILL COMMUNITY COLLEGE**

**BUS-101 Introduction to Business** (3 credits)

This course is a survey of the purpose, role, and responsibility of business in a capitalistic society, including an introduction to the major areas of business such as: Finance, Management, Economics, and Marketing. This course provides a basic foundation for the student who will specialize in some aspect of business in college, and it also provides the opportunity for non-business majors to learn about the business in which they will someday be both producers and consumers. This course will also enable students to explore career options in business, define a career path, and make connections between classroom learning and the larger business community. This course will fulfill the Learning Community Seminar requirement for first time, full-time students, to assist the student in making a successful transition from our unique urban community into an academic environment. The course will aid students in learning insights, skills, and attitudes necessary to develop academic success strategies for personal and career goals achievement.

Prerequisites: Grade of C or better in Academic Reading I (ESL098) and Academic Writing III (ESL099) or Reading Skills II (RDG095) and Writing Skills (ENG090) or exemption by placement testing.

**ENG-095 Writing Skills II** (Developmental)

This course develops language skills needed to communicate effectively in college study, in the professions, and in the business world. The course includes sentence formation, applied grammar, spelling, mechanics, and paragraph development. Note: Students must pass the Basic Writing Competency Exam in order to receive a passing grade for this course. The course does not satisfy the college writing requirement for graduation.

Prerequisite: Grade of C or better in Writing Skills I (ENG090) or placement.

**ENG-111 College Writing I** (3 credits)

This course emphasizes writing as a process, from planning and drafting through revising and editing. Using personal experience, readings, and other sources, students write unified, coherent, well-developed essays and practice paraphrasing, summarizing, and using sources responsibly. To be eligible to take College Writing II (ENG112), students must earn a grade of C or better for this course. The course meets General Education College Writing Requirement Area 1.

Prerequisite: a Grade of C or better in Writing Skills II (ENG095) and Academic Reading III (ESL098) or Reading Skills II (RDG095) or placement.

**ENG-112 College Writing II** (3 credits)

This course focuses on the research paper, the longer essay, argumentation, critical writing, and reading. The course meets General Education "College Writing" Requirement Area 1.

Prerequisite: Grade of C or better in College Writing I (ENG111).

**NHP-180 Medical Terminology** (3 credits)

This course provides instruction in the development of basic medical terminology. Competency in medical terminology promotes effective communication among members of the healthcare team.

**SOC-101 Principles of Sociology** (3 credits)

This course covers an introduction to the concepts and theories of society and social institutions. The course meets General Education Individual and Society Requirement Area 2.

Prerequisite: Academic Reading III (ESL098) or Reading Skills II (RDG095) or co-enrollment in integrated courses or exemption from reading requirement by placement testing.

**PSY-101 Principles of Psychology** (3 credits)

This introductory psychology course covers a survey of information and theory. Topics include the brain and behavior, research methods, learning, consciousness, motivation, emotion, human growth and development, personality, abnormal behavior, and psychotherapy, social cognition and understanding. The course meets General Education "Individual and Society" Requirement Area 2.

Prerequisite: Academic Reading III (ESL098) or Reading Skills II (RDG095) or co-enrollment in integrated courses, or exemption by placement testing.