



Department of Teaching & Learning
Parent/Student Course Information

Engineering Technology II
(AT 8347)
Grades 10 - 12
Three Credits, One Year

Counselors are available to assist parents and students with course selections and career planning. Parents may arrange to meet with the counselor by calling the school's guidance department.

COURSE DESCRIPTION

The courses in engineering and technology provide opportunities for students to acquire skills and knowledge necessary for technological literacy, entry-level careers and lifelong learning. Students learn Virginia's 21 Workplace Readiness Skills within the content area. Those who are completing a two-year sequence have the opportunity to verify their knowledge of the workplace readiness skills through an industry assessment. Engineering Technology is for students interested in a career in engineering, robotics, manufacturing or industrial management. From automobiles to airplanes, cell phones to computers, stereos to ships, it all has to be designed, engineered and produced. This two-year program provides students with foundational skills in STEM areas such as: engineering technology, robotics, computer integrated manufacturing, materials science and physics. U Teach engineering is a primary program of engineering study.

CERTIFICATION

Students prepare for the National Occupational Competency Testing Institute (NOCTI) assessment in Pre-Engineering/Engineering Technology.

STUDENT ORGANIZATION

Skills USA is a co-curricular organization for all students enrolled in the trade and industrial education program. Participation in this organization provides opportunities for leadership development and through competitive events at the local, regional and state levels. Students are highly encouraged to participate.

PREREQUISITE

Engineering Technology I

OPTIONS FOR NEXT COURSE

None

REQUIRED STUDENT TEXTBOOK

None

COMPETENCIES FOR ENGINEERING TECHNOLOGY II

Demonstrating Workplace Readiness Skills: Personal Qualities and People Skills

- 1 Demonstrate positive work ethic.
- 2 Demonstrate integrity.
- 3 Demonstrate teamwork skills.
- 4 Demonstrate self-representation skills.
- 5 Demonstrate diversity awareness.
- 6 Demonstrate conflict-resolution skills.
- 7 Demonstrate creativity and resourcefulness.

Demonstrating Workplace Readiness Skills: Professional Knowledge and Skills

- 8 Demonstrate effective speaking and listening skills.
- 9 Demonstrate effective reading and writing skills.
- 10 Demonstrate critical-thinking and problem-solving skills.
- 11 Demonstrate healthy behaviors and safety skills.
- 12 Demonstrate an understanding of workplace organizations, systems and climates.
- 13 Demonstrate lifelong-learning skills.
- 14 Demonstrate job-acquisition and advancement skills.
- 15 Demonstrate time-, task- and resource-management skills.
- 16 Demonstrate job-specific mathematics skills.
- 17 Demonstrate customer-service skills.

Demonstrating Workplace Readiness Skills: Technology Knowledge and Skills

- 18 Demonstrate proficiency with technologies common to a specific occupation.
- 19 Demonstrate information technology skills.
- 20 Demonstrate an understanding of Internet use and security issues.
- 21 Demonstrate telecommunications skills.

Examining All Aspects of an Industry

- 22 Examine aspects of planning within an industry/organization.
- 23 Examine aspects of management within an industry/organization.
- 24 Examine aspects of financial responsibility within an industry/organization.
- 25 Examine technical and production skills required of workers within an industry/organization.
- 26 Examine principles of technology that underlie an industry/organization.
- 27 Examine labor issues related to an industry/organization.
- 28 Examine community issues related to an industry/organization.
- 29 Examine health, safety and environmental issues related to an industry/organization.

Addressing Elements of Student Life

- 30 Identify the purposes and goals of the student organization.
- 31 Explain the benefits and responsibilities of membership in the student organization as a student and in professional/civic organizations as an adult.
- 32 Demonstrate leadership skills through participation in student organization activities, such as meetings, programs and projects.
- 33 Identify Internet safety issues and procedures for complying with acceptable use standards.

Applying the Engineering Design Process to Areas of the Designed World

- 34 Identify real-world problems related to the areas of the designed world.
- 35 Design an engineering solution to a real-world problem for each of the areas in the designed world.
- 36 Examining Ethics in the Technological World

- 37 Define risk and safety.
- 38 Describe the three types of accidents (i.e., procedural, engineered, systemic).
- 39 Identify major precursors of accidents.
- 40 Evaluate the safety of designs.
- 41 Compare professional and personal ethics.
- 42 Identify ethical theories (i.e., utilitarianism, duty, rights and virtues).
- 43 Research a real-world case study.

Examining Systems

- 44 Apply the core concepts of technology and engineering.
- 45 Maintain documentation (e.g., sketches, notes, reports).
- 46 Apply the steps of the design process to solve an engineering problem.
- 47 Identify the impact of a design solution on industry, economy, society and environment.
- 48 Building an Engineering Team for a Project
- 49 Organize an engineering project team.
- 50 Identify the steps in a team's life cycle.
- 51 Deliver effective, constructive feedback.
- 52 Interpret constructive criticism.
- 53 Resolve conflict within a team.
- 54 Identify active-listening techniques.
- 55 Explain the benefits of active listening.
- 56 Explain how the corporate engineering culture influences formal and informal communication.

Demonstrate formal and informal professional communication.

- 57 Explain the benefits of multiple perspectives and diverse skills in solving real-world problems.
- 58 Explain the importance of generating consensus for the project idea to team members.
- 59 Identify ways to motivate, coach, counsel, and reward individuals and teams.
- 60 Perform a team peer review.
- 61 Perform evaluations (e.g., self-evaluation, management evaluation).
- 62 Identify the components of a well-written goal.
- 63 Working with Case Studies
- 64 Identify the benefits of case study analysis.
- 65 Perform a case study analysis.

Managing an Engineering Design Project

- 66 Explain the influence of the Project Management Institute (PMI) on engineering.
- 67 Define the five phases of a project life cycle.
- 68 Identify the objectives of a project.
- 69 Estimate the available resources for a project.
- 70 Allocate resources.
- 71 Demonstrate the use of project management tools.
- 72 Prioritize the procedures to complete a project.
- 73 Assign tasks to team members.
- 74 Track progress.
- 75 Analyze results.
- 76 Describe the balance among quality, time, and money.

Using Logic and Problem-Solving Techniques

- 77 Reverse engineer a product, process or idea.
- 78 Define algorithm.
- 79 Create an algorithm to solve an engineering problem.

- 80 Solve a problem, using a linear programming process or device.
- 81 Explain the benefits of modeling and simulation.
- 82 Create a model or simulation for an engineering product, process or idea.

Delivering Formal Proposals and Presentations

- 83 Create a proposal for an engineering project.
- 84 Document a project proposal, using a technical-writing style.
- 85 Create a multimedia presentation of a finished proposal.

Identifying Product and Process Trends

- 86 Assess the economics of product and system life cycles.
- 87 Assess a new product or system currently entering the market.
- 88 Describe the factors necessary for changes in technology.
- 89 Define forecasting.
- 90 Research current technological trends.

Aaron C. Spence, Ed.D., Superintendent
Virginia Beach City Public Schools
2512 George Mason Drive, Virginia Beach, VA 23456-0038

Produced by the Department of Media and Communications for the
Department of Teaching and Learning.
For further information please call (757) 263-1070.

Notice of Non-Discrimination Policy

Virginia Beach City Public Schools does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation/gender identity, pregnancy, childbirth or related medical condition, disability, marital status, age, genetic information or veteran status in its programs and activities and provides equal access to the Boy Scouts and other designated youth groups. School Board policies and regulations (including, but not limited to, Policies 2-33.4-4, 5-7, 5-19, 5-20, 5-44, 6-7, 6-33, 7-48, 7-49, 7-57 and Regulations 2-33.1, 4-4.1, 4-4.2, 4-4.3, 4-6.1, 5-44.1, 7-11.1, 7-17.1 and 7-57.1) provide equal access to courses, programs, counseling services, physical education and athletic, vocational education, instructional materials and extracurricular activities.

To seek resolution of grievances resulting from alleged discrimination or to report violations of these policies, please contact the Title VI/Title IX Coordinator/Director of Student Leadership at (757) 263-2020, 1413 Laskin Road, Virginia Beach, Virginia, 23451 (for student complaints) or the Section 504/ADA Coordinator/Chief Human Resources Officer at (757) 263-1133, 2512 George Mason Drive, Municipal Center, Building 6, Virginia Beach, Virginia, 23456 (for employees or other citizens). Concerns about the application of Section 504 of the Rehabilitation Act should be addressed to the Section 504 Coordinator/ Executive Director of Student Support Services at (757) 263-1980,

2512 George Mason Drive, Virginia Beach, Virginia, 23456 or the Section 504 Coordinator at the student's school. For students who are eligible or suspected of being eligible for special education or related services under IDEA, please contact the Office of Programs for Exceptional Children at (757) 263-2400, Laskin Road Annex, 1413 Laskin Road, Virginia Beach, Virginia, 23451.

Alternative formats of this publication which may include taped, Braille, or large print materials are available upon request for individuals with disabilities. Call or write The Department of Teaching and Learning, Virginia Beach City Public Schools, 2512 George Mason Drive, P.O. Box 6038, Virginia Beach, VA 23456-0038. Telephone 263-1070 (voice); fax 263-1424; 263-1240 (TDD) or email at Charles.Hurd@vbschools.com.

vbschools.com
your virtual link to Hampton Roads' largest school system



VIRGINIA BEACH CITY PUBLIC SCHOOLS
CHARTING THE COURSE

No part of this publication may be produced or shared in any form without giving specific credit to Virginia Beach City Public Schools.

(Revised August 2018)