

Torrington High School Science and Technology Courses that received Grant Support.

***= new courses that were developed and added as part of the grant project**

#= new dual enrollment course with Northwestern

***UCONN BIOTECHNOLOGY (HS873W08) 1 credit, grades 10-12 (SC, STEM, CAP)**

Prerequisite: Biology. The purpose of this class is to introduce students to biological techniques that would be learned in the college setting. Students will acquire skills such as gel electrophoresis, DNA extraction, PCR, DNA analysis, Bioinformatics, disease prevention and cures, and bacteriological skills. This is an inquiry based, problem solving course in which students will refine their researching, presenting, and problem solving skills. The UCONN grade may differ from the THS grade. A UConn grade of 75 or over for this course will result in 3 UCONN credits for SPSS 3230. This course will have a fee associated with it and will be due to UCONN at the responsibility of the student and family. Financial assistance may be available through UCONN. This course may be used to meet a student's MBDA (Capstone) graduation requirement. In order to meet this requirement, a student must complete a research based paper, a portfolio, and must complete a presentation. This course can only meet one graduation requirement: either STEM or MBDA (Capstone).

#AP ENVIRONMENTAL SCIENCE Video Description (HS422W08) 1 credit, grades 11-12 (SC, STEM) Prerequisites: 85 or higher in Honors Biology and Geometry or teacher recommendation. Provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving or preventing them. Through NWCC Dual Enrollment, students may earn college credit for Introduction to Environmental Science (EVS 100) at NWCC through the successful completion of this course. In order to receive the AP designation in this class, students in this course will take the AP exam in May, for which they may earn college credit depending on their score on the exam. There is a fee associated with the test. TPS will cover half the cost of the exam and the student/family will cover the remainder. Financial assistance is available, please see your school counselor for details. If the student chooses not to take the exam, they will receive Honors weighting.

PLANT SCIENCE (HS426W04) 0.5 credit credit, grades 11-12 (SC, STEM, CAP) Prerequisite: 2.0 credits in Science, including Biology or Integrated Science. This course is aimed at students who prefer active involvement with hands-on experiences, and who like working with plants. Students considering careers in horticulture, landscaping, botany, farming, or gardening will find this course especially useful. The course will include sections on photosynthesis, growth and structure of flowering plants, classification and identification of plants, the place of plants in the food chains of the biosphere, poisonous and medicinal plants, and a study of the importance of rainforests. Students will be given opportunities to demonstrate their knowledge using projects involving plants and will be directly involved in beautification of the school campus. This course may be used to meet a student's MBDA (Capstone) graduation requirement. In order to meet this requirement, a student must complete a research based paper, a portfolio, and must complete a presentation. This course can only meet one graduation requirement: either STEM or MBDA (Capstone).

*CHEMISTRY IN THE COMMUNITY (HS455W04) 0.5 credits, grades 10-12 (SC, STEM) Prerequisite- Foundations in Science, Integrated Science, or Biology Chemistry in the Community™ (ChemCom™) is a first-year high school chemistry course that teaches chemistry concepts through societal issues involving water, air, petroleum, and food. The course uses real-world examples to expose students to concepts in forms of matter, chemical bonding, and reactions, to explore problems in materials science, environmental chemistry, organic chemistry, biochemistry, and industrial chemistry.

#AP CHEMISTRY (HS451W08) 1 credit, grade 11-12 (SC, STEM) Prerequisite: Biology (H), Chemistry (H), and Algebra II (H) and recommendation of sending Science teacher. Physics is strongly recommended. This course is designed to be an equivalent of a general chemistry course taken in college. Students will attain a depth of understanding of fundamentals and a reasonable competence in dealing with chemical problems. The course contributes to the development of the students' abilities to think clearly and to express their ideas, orally and in writing, with clarity and logic. The emphasis will be on chemical calculations and the mathematical formulation of principles, and laboratory work. Students in this course will take the AP Chemistry exam in May, for which they may earn college credit depending on their score on the exam. There is a fee associated with the test. The school will cover half the cost of the exam and the student/family will cover the remainder. Financial assistance is available, please see your school counselor for details. Through NWCC Dual Enrollment, students may earn college credit for Concepts of Chemistry (CHE 111) at NWCC through the successful completion of this course. In 45

order to receive the AP designation in this class, students in this course will take the AP exam in May, for which they may earn college credit depending on their score on the exam. There is a fee associated with the test. TPS will cover half the cost of the exam and the student/family will cover the remainder. Financial assistance is available, please see your school counselor for details. If the student chooses not to take the exam, they will receive Honors weighting.

UCONN ECE BIOLOGY 1107 PRINCIPLES OF BIOLOGY I (HS449W08) 1 credit, grades 10-12 (SC, STEM) Prerequisite: Biology or above a 90 in Integrated Science The UCONN ECE Biology course is designed to be the equivalent of a college introductory biology course for those majoring in biology. This college course differs significantly from the usual high school course with respect to the kind of textbook, range and depth of topics, and kind of laboratory work done. The time and effort required of students includes about 3 hours outside of class per hour of class work. The course aims to provide students with the conceptual framework, factual knowledge, and analytical skills necessary to prepare for a successful college experience. T

WOODWORKING TECHNOLOGY I Video Description (HS744W00) 0.5 credit, grades 9-12 (STEM) This course introduces students to woodworking tools and machines used in maintaining the home, building home furnishings and for construction work. Students develop skills in the use of various equipment and some practice in building projects for home use. Correct and safe use of machines is emphasized, and students are required to produce one or more simple projects per marking period.

WOODWORKING FOR WOMEN I Video Description (HS734W00) 0.5 credit, grades 9-12 (STEM) This course introduces female students to woodworking tools and machines used in maintaining the home, building home furnishings and for construction work. Students develop skills in the use of various equipment and some practice in building projects for home use. Correct and safe use of machines is emphasized, and students are required to produce one or more simple projects per marking period. ❖

WOODWORKING TECHNOLOGY II Video Description (HS745W04) 0.5 credit, grades 10-12 (STEM) Prerequisite: Woodworking Technology I or Woodworking for Women. This course takes over where the prerequisite course leaves off. Students will now learn to set up the various woodworking machines to produce more advanced assignments. The students will have opportunities to work with materials like oak, walnut and cherry. During the second

half of the class students can choose from an assortment of projects to produce a more individualized project.

#*INTRO TO SOLDERING (HS752W00) 0.5 credits, grades 10-12 (STEM) 26 The purpose of this course is to provide students with an introduction to the soldering manufacturing profession. Students who take the soldering course will learn industrial metalworking techniques by which hot metal is used to fuse materials together. They will demonstrate the ability to hand solder through hole and surface mount components and learn how to wire terminals. Students will receive an overview of component identification and value interpretation. They will also become knowledgeable of the methods and acceptance criteria for soldering electronic assemblies. This course and experience may lead to employment with local manufacturers.

*ROBOTICS Video Description (HS761W04) 1 credit, grades 9-12 (STEM) Are you a problem solver and have a natural curiosity of how things work? Are you creative and interested in innovation? Are you a team player and love learning? You just might have an engineering mindset. Engineers use a unique mode of thinking based on seeing everything as a system. They see structures that aren't apparent to the average person. They know how to design under constraints and understand trade-offs. In this year-long course, students will focus on four core areas: engineering design process, performing essential engineering calculations, coding, and discovery while building a robot. By the end of this course you will be able to define how and why we use robots in society along with how to analyze and generate solutions to robotics problems. You will be able to document the design process and demonstrate problem solving abilities all while you design, build and program robots.

*INTRODUCTION TO ENGINEERING (HS692W06) 1 credit, grades 11-12 (STEM)
Prerequisite: 75 or higher in Algebra II (H) or 85 or higher in Algebra II (CP). Students taking Algebra II (H) concurrently may take this course with prior approval of the Intro to Engineering teacher. This course offers interested students an opportunity to learn about engineering as a potential course of study in college, and as a possible rewarding career. STEM fields are where many of the in-demand, high-paying jobs of the future will be found, and Engineering puts the E in STEM. Students will learn about the applied science and math skills and design techniques that are used in the engineering profession, as they apply these skills to hands-on projects. Students will also gain a good understanding of the various engineering disciplines, to help them determine which area of study they may be interested in pursuing. The course will include hands-on engineering design and model

construction projects, a research project/presentation, and presentations by outside speakers who are practicing engineers in various disciplines.

*CONSTRUCTION TECHNOLOGY Video Description (HS729W04) 1 credit, grades 11-12 (STEM) Prerequisite: Woodworking Technology I or Teacher Recommendation. This course involves students with the tools, materials, and technologies used in the construction industries. Students will develop skills required to be an informed homeowner and provide a base from which to build the expertise necessary to compete in this thriving environment. Students will be given hands-on practice in the design and building of construction projects. Correct and safe use of tools and processes is strongly emphasized, and students are required to actively participate in all the activities.

*DRONES Video Description (HS801W04) 0.5 credit, grades 9-12 (STEM) This semester-long course focuses on the technology and innovation surrounding drones. Students will learn about the use, ethics, and operation involved in this technology, along with exploring the real world application of these devices. Students will be involved in both independent research and hands-on learning experiences such as coding and flying specific missions.

*APPLIED STEM (HS764W04) 0.5 credit, grades 10-12 (STEM) - (Semester 2 only) This course will focus on authentic STEM projects with an emphasis placed on the scientific and engineering methods naturally embedded into the course activities. In this class, students will engage in two quarter-long activities that include running a complete maple sugaring operation, followed by an introduction to CNC operations with a unit that includes laser engraving. The design, engineering, and business practices driven by the “hands-on” activities will give students the opportunity to apply math, technology, and science content skills previously learned in other classes.

CAPSTONE- (HS248W00) (90 hours-0.5 credit), grades 11-12, (STEM) The THS Capstone course is made up of one semester to support students as they design and carry out a Capstone project of their choice, from start to completion. Throughout the course, students will demonstrate their mastery of the skills that a TPS graduate should possess. The Capstone gives students an opportunity to choose an area of study that they are interested in or already passionate about while demonstrating their progress on the skills that all Torrington Public School students should possess. Students will design, record, and present their own personalized project, while earning school credit and making a meaningful contribution to the THS and local community that matters to you.

CAREER INTERNSHIP - (HS248W00) (90 hours-0.5 credit), grades 11-12, (STEM)

Prerequisite: Teacher/counselor recommendation. The Career Internship Program will enable students to gain valuable career/work experience in a real-life setting. By helping to foster independence and decision-making skills, this program will provide an opportunity for a smooth transition from high school to college/work. Participating businesses will serve as mentors to young persons, by exposing them to the routines and challenges of the business world. Students may be eligible to earn a stipend upon completion of internship. This course is grant funded and subject to availability. May not run based on grant funding. Students interested in this course should see