TECHNOLOGY EDUCATION

The Technology Education program in the New Britain Public Schools is intended to help students to become technologically literate citizens. Through the use of systems and processes students will explore the world of technology and assist in developing solutions to society's technological problems. The knowledge and skills acquired through these experiences will enable students to actively participate in shaping their future and prepare them for the 21st century. Program goals are:

1. Evaluate the effects of existing and emerging technologies on people and the environment over time.
2. Recognize the scope of technology and evaluate the impact and influence technology has on society, culture and the environment – past, present and future.
3. Develop and use strategies for adjusting to new technologies and changing interactions among science, technology and society.
4. Develop cognitive and psychomotor problem-solving skills through applied research, design, production, operation and analysis of technological systems (informational, physical and biological).
5. Safely and effectively use resources, processes, concepts and tools of technology.
6. Create devices for solving problems, using creativity and concepts of design and technology.
7. Understand the influences of technology on consumer and career choices.

*Technology here is defined as the use of knowledge and resources to modify the natural environment, satisfy human needs, solve problems and extend human capabilities which improve the quality of life on earth.

NON-TRADITIONAL ENROLLMENTS:
The Career & Technical Education staff at New Britain High School encourages female students to enroll in Technical Education classes. Technical Education classes at New Britain High School provide equitable and inclusive opportunities for all students.

THE NEW BRITAIN HIGH SCHOOL STEM IN TECHNOLOGY EDUCATION

Students who have an interest in exploring the STEM (Science, Technology, Engineering, and Mathematics) professions can choose to follow one of two STEM Pathways; Pathway 1- Project Lead The Way Pre-Engineering Curriculum, or Pathway 2- which begins with Explorations in STEM Careers and is one of several offerings which will include additional courses that may lead to certification.

Students involved in the NBHS STEM Technology Academy will be involved in any or all of the following activities:

- Career exploration
- Field trips to STEM facilities
- Laboratory experiences
- Job shadowing
- Service learning
- Other as identified by students, teachers, mentors and related stakeholders

The Academy of Information Technology & Engineering (AOITE) prepares students for career opportunities in programming, database administration, web design and administration, digital networks, and other areas in the expanding digital workplace. In addition, Juniper Networks has agreed upon a program of study, linked to NAF assessments, that will qualify students for its professional training program and earn a Juniper certificate. This Academy also answers an acute need for engineers in this country by educating high school students in the principles of engineering, and providing content in the fields of electronics, biotech, aerospace, civil engineering, and architecture. Academies use curriculum from Project Lead The Way, Inc. (PLTW), They also benefit from support provided by National Action Council for Minorities in Engineering (NACME).

802 <u>EXPLORATIONS IN STEM CAREERS</u> **Accelerated** **1 Credit**

Grade 9, 10

This foundation course introduces students to career opportunities in STEM, technology and engineering. The need for skilled workers trained in the different science, technology, engineering, and mathematics (STEM) fields is increasing dramatically. Topics to be covered in this course include, but are not limited to, basic concepts, processes and skills of technology and engineering; an overview of the varied STEM occupations; engineering design and modeling and engineering systems; and desktop publishing applications. This course is recommended for students who have an interest in technology but need more exploration to choose a pathway such as engineering, manufacturing, graphics.

HIGH SCHOOL PRE-ENGINEERING CURRICULUM: PROJECT LEAD THE WAY (PLTW)

This is a four-year sequence of courses which, when combined with traditional mathematics and science courses in high school, introduces students to the scope, rigor and discipline of engineering prior to entering college. In addition, students will benefit greatly from the knowledge and logical thought processes that result from taking some or all of the courses provided in the curriculum.

PLTW's flexible course sequences and our introduction of new courses recognize the importance of recruiting and retaining all students in our program, students' math and science sequences, and their career goals by dividing our courses into three groups: Foundation, Specialization, and Capstone. PLTW courses provide equitable and inclusive opportunities for all academically qualified students without regard to gender or ethnic origin.

RECOMMENDED SEQUENCE OF COURSES

PROJECT LEAD THE WAY PROGRAM (PLTW):

Grade 9: or 10
- Principles of Engineering

Grade 9 or10
- Introduction To Engineering Design

Grade 11 or 12

Select one:
- Computer Integrated Manufacturing (Specialization)
- Civil Engineering and Architecture (Specialization)

821 <u>INTRODUCTION TO ENGINEERING DESIGN</u> (PLTW) **Honors*** **1 Credit**

Grades 9, 10, 11, 12

Prerequisites: Concurrent enrollment in accelerated or higher science and math
(see College Career Pathways section)

*Students may receive college quality points for receiving at least an 80% average in the course and 70 or above on the college credit exam. This is a foundation course that teaches problem-solving skills using a design development process. Models of product solutions are created, analyzed, and communicated using 3D solid modeling computer design software.

841 <u>PRINCIPLES OF ENGINEERING</u> (PLTW) **Honors*** **1 Credit**

Grades 9, 10, 11, 12

Prerequisites: Concurrent enrollment in accelerated or higher science and math
Principles of Engineering qualifies for one-half honors credit as part of the 3-credit graduation requirement for a physical science course.

*Students may receive college quality points for receiving at least an 80% average in the course and 70 or above on the college credit exam. This course helps students understand the field of engineering/engineering technology. Exploring various technology systems and manufacturing processes assists students in learning how engineers and technicians use math, science, and technology in an engineering problem-solving process to benefit people.

851 <u>COMPUTER INTEGRATED MANUFACTURING</u> (PLTW) **Honors*** **1 Credit**

Grades 11, 12

Prerequisites: Concurrent enrollment in accelerated or higher science and math.
Introduction to Engineering Design (PLTW) and Metals 2 is recommended.

*Students may receive college quality points for receiving at least an 80% average in the course and 70 or above on the college credit exam. CIM is a specialization course that applies principles of prototyping, robotics, and automation. It builds on the solid modeling skills developed in Introduction to Engineering Design. Students use computer-controlled equipment to solve problems by constructing models of their three-dimensional designs. Students are also introduced to the fundamentals of robotics and to how this equipment is used in an automated environment. Students evaluate their design solutions using various techniques and modifications before they produce the prototype.

861 CIVIL ENGINEERING AND ARCHITECTURE (PLTW) **Honors*** **1 Credit**

Grades 11, 12

Prerequisites: Concurrent enrollment in accelerated or higher science and math.
Introduction to Engineering Design or CADD 2
(see College Career Pathways section)

*Students may receive college quality points for receiving at least an 80% average in the course and 70 or above on the college credit exam. Students will use *Rivet* which is a state of the art 3D design software package form Autodesk to solve real world problems and communicate solutions to hands-on projects and activities. This specialization course covers topics such as the roles of civil engineers and architects, project planning, site planning, building design, project documentation and presentation.

816 AUTOMOTIVE TECHNOLOGY 1 **Accelerated** **1 Credit**

Grades 10, 11, 12

This class offers students the opportunity to learn how to solve problems with tools. Lab safety will be emphasized, and hand tool skills will be focused on, with some power tool skills as well.

The class will be centered around a year-long small-engine project (i.e., lawnmower engine). Students will disassemble, clean, sandblast, paint, reassemble, and run their engine project. Worn or broken parts will be replaced, and students will need to purchase a gasket set ($5--$20) to run their engine. Students can then take their running engine home, or sell it, as they wish. *Students are strongly encouraged to find a used small engine for this class, running or not.* This is a great class for any career, as the ability to repair broken items will benefit students throughout their lives, regardless of their vocation.

817 AUTOMOTIVE TECHNOLOGY 2 **Accelerated** **2 Credits**

Grades 10, 11, 12

Prerequisite Automotive Technology 1

This class offers students the opportunity to further develop their mechanical problem-solving skills.
Lab safety will be emphasized, and both hand and power tool skills will be developed. The class will be centered around automotive theory, and automotive repair, though students may work on any mechanical project, including Senior Capstone Projects, with the Instructor's permission. *Students are strongly encouraged to bring projects to class that they can work on, for extra credit.* This is a great class for any career, as the ability to repair broken items will benefit students throughout their lives, regardless of their vocation.

843 METALS PROCESSING 1 **Standard** **1 Credit**

Grades 10, 11, 12

This course is a comprehensive study and exploration of the processes and operations related to the manufacturing of metal products. Emphasis will be placed in the fundamentals of working with metals using both hand and power tools. Experiences will expose students but not limit to sheet metal processing, foundry, precision measuring and machine operations. The metals processing course provides students with a general introduction to the material processing and management components of a manufacturing enterprise. The content and activities reflect the Connecticut Career Clusters of Construction: Technologies and Design and Technologies: Manufacturing, Communications, and Repair.

846 METALS PROCESSING 2 **Accelerated** **1 Credit**

Grades 10, 11, 12

Metals Processing 2 is a continuation of Metals Processing 1 with greater complexity. Emphasis will be placed on expanding existing skills and acquiring new processes of working with metals. Experiences will build upon previous concepts with relation to career planning and technological awareness in the manufacturing field. Development of a conceptual understanding of the mechanical processes of separating, forming and combining through hands-on activities. The student uses the managed sequence of manufacturing processes to convert a designer's conceptualization into a product that is manufactured.

853 GRAPHIC COMMUNICATIONS 1 **Standard** **1 Credit**

Grades 10, 11, 12

Communications is a major industry in our world. More than half of the American population is involved with the generation, manipulation, storage, transmission, or marketing of information. Students will be introduced to the world of desktop publishing and the field of computer generated art. Adobe Photoshop and Adobe Illustrator are used to prepare the students for a career within this profession. The students learn terminology, technical systems, and processes used by the industry and with the graphics school run business Canes Customs.

856 GRAPHIC COMMUNICATIONS 2 **Accelerated** **1 Credit**

Grades 11, 12

This is a continuation of Graphic Communication 1 with more advanced levels of work in the printing industry. Including running school based graphics business Canes Customs. Emphasis on advanced desktop publishing techniques, advanced digital artwork introduction to Adobe Photoshop and introduction to Internet web design using Macromedia MX and animation using Macromedia Flash.

873 CONSTRUCTION **Standard** **½ Credit**

Grades 9, 10, 11, 12

Students will be introduced to computer aided drawing in 3D Kitbuilder and Google Sketch Up. They will use West Point Bridge Builder to create blueprints then create model bridges. Courses to take following Construction 1 include but not limited to Construction 2 or Principles of Engineering offered in STEM.

876 CONSTRUCTION 2 **Accelerated** **1 Credit**

Grades 10, 11, 12

Construction 2 course provides students with a working understanding of the key elements associated with designing, planning, and constructing a structure on-site. Students learn major concepts through hands-on activities, using contemporary construction tools and materials. Activities involve a variety of types of construction, such as utility sheds, outdoor furniture, and other wood-based projects. Emphasis is placed on student understanding of the major concepts of construction technology as well as the interrelationship of management and production. The content and activities reflect the Connecticut Career Pathway of Design/Pre-Construction.

884 GRAPHIC ARTS (AOITE) **Accelerated** **½ Credit**

Grades 9, 10, 11, 12

Students will learn terminology, technical systems, and processes used by the graphics industry with sample activities that support those understandings. The main programs used will be Adobe Illustrator, along with Adobe Indesign and Adobe Photoshop programs. Students will complete a portfolio using digital photography and the Internet.

886 WEB SITE DESIGN 1 (AOITE) **Accelerated** **½ Credit**

Grades 9,10, 11, 12

Web Design provides a hands-on introduction to designing, building, and launching websites. First students learn how the World Wide Web works, and they examine successful websites. Then they learn the basics of HTML coding and create their own web pages. From there, students explore various web development tools, the principles of design, usability and accessibility issues, and web-based publishing tools. Finally, students get a chance to discover what types of web design careers exist today.

888 WEB SITE DESIGN 2 **Accelerated** **½ Credit**

Grades 10, 11, 12

Prerequisite: Web Site Design 1

This course continues the work begun in Web Site Design 1 and introduces more sophisticated software programs used in web site creation.

894 DIGITAL VIDEO PRODUCTION SCHOOL NEWS (AOITE) **Accelerated** **½ Credit**

Grades 10, 11, 12

Digital Video Production provides a hands-on introduction to digital video. The course guides students through all phases of digital video production, including pre-production and planning, executing and managing a video shoot, and editing and post-production techniques. Students focus on script writing and interviewing techniques to create stories for Hurricane Happenings, the school newscast. Finally, students have a chance to discover the types of careers that exist in digital media and design today.

896 DIGITAL VIDEO PRODUCTION DOCUMENTARY **Accelerated** **½ Credit**

Grades 10, 11, 12

Digital Video Production provides a hands-on introduction to digital video. The course guides students through all phases of digital video production, including pre-production and planning, executing and managing a video shoot, and editing and post-production techniques. Students focus on the creation of documentary type video. They will have the opportunity to enter contests and publish to You Tube. Finally, students have a chance to discover the types of careers that exist in digital media and design today.