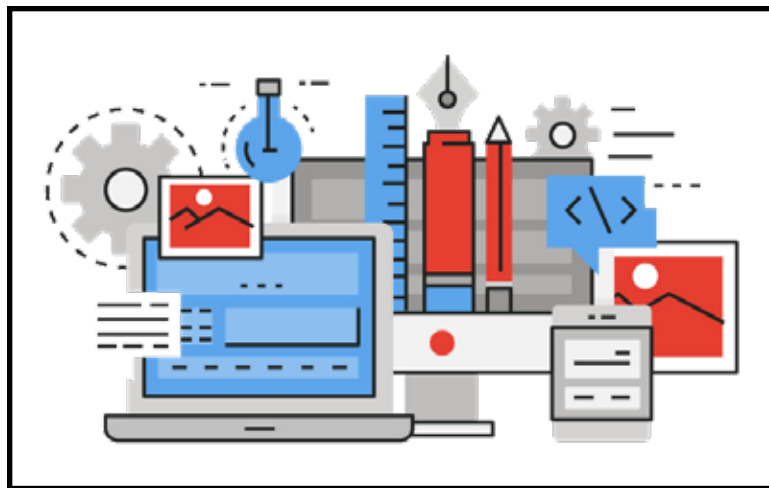


CHIPPEWA VALLEY SCHOOLS

Career and Technical Education



DESIGN TECHNOLOGY

The Design Technology Program is a planned series of three career preparation courses. These courses provide students with an in depth, sequenced educational experience in mechanical design. Beginning with a course in Technical Design, students learn the basics of visualization and design. This course is followed by Mechanical Design and Engineering Design. A fourth year course of Research and Development allows for in depth hands Project Based Learning (PBL) with state of the art manufacturing equipment. All courses and methods are progressive, concurrent with energy and green industry, and relevant to CTE standards. The Mechanical Design Pathway is part of the cluster called Science, Technology, Engineering, and Mathematics (STEM).

Examples of Careers:

- Aerospace Industrial Designer
- Application Developer
- Architect
- Architectural and Civil Drafters
- Automotive Industrial Designer
- CAD Designer
- CAD Technician
- Civil Engineer
- Electrical / Electronics Drafter
- Electrical / Electronics Engineers
- Electrical Engineer
- Industrial Design Engineer
- Industrial Designer
- Industrial Engineer
- Industrial Packaging Designer
- Injection Mold Designer
- Interior Designer
- Manufacturing Sales Service
- Mechanical Drafter
- Mechanical Engineer
- Mobile Developer
- Packaging Science Engineer
- Product Development Manager
- Project Architect / Engineer
- Project Manager
- Small Business Entrepreneur
- Urban Designer / Planner

Examples of Degrees, Certificates and/or Certifications

- Associate of Applied Science
 - Product Development
- Bachelor of Science
 - Engineering
 - Automotive Engineering
 - Electrical Engineering
 - Mechanical Engineering
- Bachelor of Science
 - Architecture
- Bachelor of Science
 - Industrial Design
- Masters of Engineering

Classes can meet the following graduation requirements:

Visual and Performing Arts Credit

World Language Credit

Senior Math–Related Credit

Articulation — Earn College Credits

Students successfully completing the CTE State–approved program may be eligible for tuition free credit.

Instructors:

Mr. Miguel Garcia
mgarcia@cvs.k12.mi.us
586.723.2856

Mr. David Powell
dpowell@cvs.k12.mi.us
586.723.2563

Fab Lab

Patrick DiNunzio
pdinunzio@cvs.k12.mi.us
586.723.2846

Mr. Michael Lemanski
mlemanski@cvs.k12.mi.us
586.723.2857



NOTICE OF NONDISCRIMINATION It is the policy of Chippewa Valley Schools not to discriminate on the basis of race, color, religion, national origin or ancestry, gender, age, disability, height, weight or marital status in its programs, services, activities, or employment. Inquiries related to nondiscrimination policies should be directed to: Civil Rights Coordinator, Assistant Superintendent of Human Resources, Chippewa Valley Schools Administration, 19120 Cass Avenue, Clinton Township, MI 48038 Phone: 586–723–2090 / Nondiscrimination inquiries related to disability should be directed to: Section 504 Coordinator, Director of Special Services, (same address) Phone: 586–723–2180

EXAMPLES OF CAREERS:

- Aerospace Industrial Designer
- Application Developer
- Architect
- Automotive Industrial Designer
- CAD Designer
- CAD Technician
- Civil Engineer
- Electrical and Electronics Drafter
- Electrical Engineer
- Industrial Design Engineer
- Industrial Packaging Designer
- Injection Mold Designer
- Manufacturing Sales / Service
- Mechanical Drafter
- Mechanical Engineer
- Mobile Developer
- Packaging Science Engineer
- Product Development Manager
- Project Engineer
- Project Manager
- Small Business Entrepreneur



EXAMPLES OF DEGREES, CERTIFICATES AND/OR CERTIFICATIONS


- Associate of Applied Science
 - Product Development
- Bachelor of Science (B.S.) Engineering
 - Electrical Engineering
 - Mechanical Engineering
 - Automotive Engineering
- Bachelor of Science
 - Industrial Design
- Bachelor of Science
 - Architecture
- Masters of Engineering



DESIGN PROGRAM FOCUS AREAS

- 3D Solid Modeling
- Computer Aided Design (CAD)
- Hydraulic Powered Robotics
- LEGO Robotics
- Mechanical Design
- Projects and Fabrication
- Prototyping

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 Learning that works for Michigan

DESIGN TECHNOLOGY



INSTRUCTORS:

CHIPPEWA VALLEY HIGH SCHOOL

Mr. David Powell

dpowell@cvs.k12.mi.us

586.723.2563

DAKOTA HIGH SCHOOL

Mr. Miguel Garcia

mgarcia@cvs.k12.mi.us

586.723.2856

Mr. Michael Lemanski

mlemanski@cvs.k12.mi.us

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DON'T JUST CHOOSE A CLASS ~ CHOOSE A CAREER

DESIGN TECHNOLOGY

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CLASSES CAN MEET THE FOLLOWING GRADUATION REQUIREMENTS:

- Visual and Performing Arts Credit
 - World Language Credit
- Articulation — Earn College Credits

Students successfully completing CTE state approved classes, may be eligible for tuition free credit.

9501/9502 TECHNICAL DESIGN 1A/1B

Grades 9–12

Prerequisite: None.

Students will be introduced to methods of Computer Aided Design (CAD), drafting, free-hand design and electronic digital media to develop professional drawing, design and visualization skills. Students will learn engineering and architecturally-based innovative techniques of free-hand sketching, lettering, measuring, geometric construction, pictorial techniques, orthographic projection and 3D modeling basics. Projects will include a focus on “green” technologies, alternative/renewable energy, and related innovations used by today’s designers, engineers, installation/service technicians, and architects.

1 hour

0.5/0.5 credit

9507/9508 MECHANICAL DESIGN 1A/1B

Grades 10–12

Prerequisite/Recommendation: Technical Design 1A/1B with a 2.0 or higher and teacher/administrative recommendation.

This second-year course continues to develop visualization skills, using digital media, technical design. It also introduces design elements, such as dimensioning, sectioning, auxiliary projection, assemblies, and detailed drawings. This course gives students an in-depth look at the utilization of CAD and drafting related careers as future options. Students are introduced to the concepts of design techniques including 3D parametric modeling, solid modeling, rendering and mechanical assemblies in a mechanical design environment. In addition, students will be introduced to fabrication lab safety through the construction of small design and build projects. This course has been approved to meet the MMC senior year math-related credit requirement.

1 hour

0.5/0.5 credit

9511/9512 ENGINEERING DESIGN 1YA/1YB

9513/9514 ENGINEERING DESIGN 1YC/1YD

Grades 11–12

Prerequisite/Recommendation: Mechanical Design 1A/1B with a 2.0 or higher and teacher/administrative recommendation.

In this third-year course, students take an advanced look at the engineering design profession. Students will learn to apply design concepts, engineering problem solving, and visual graphic techniques while maintaining professional ethics, and responsibility. Students will be introduced to design theory of basic machine elements through the introduction of dies, jigs and other industrial applications. Understanding the theory of detail design procedures will be explained through the latest design methods, technical skills, industrial applications, and practices of mechanical assembly. Topical areas may include: bill of materials, subassemblies, standard parts, fasteners, dimensioning, visualization and advanced 3-dimensional CAD techniques. Students will incorporate rapid prototyping technology for model design, analysis and verification of a fully defined new part. The building of simple projects will be included in the course experience while maintaining personal safety in the fabrication lab. This course has been approved to meet the MMC senior year math-related credit requirement.

1 hour

1 hour

0.5/0.5 credit

9465/9466 RESEARCH AND DEVELOPMENT 1A BC / 1B BC (TAUGHT AT DAKOTA HIGH SCHOOL)

Grade 12

Prerequisite/Recommendation: Engineering Design 1A BC/1B BC with a 2.0 or higher and with teacher/administrative recommendation.

In this fourth-year course students will have the opportunity to design and develop a variety of new products and mechanisms using engineering design techniques. With concept sketching and visualization as a foundation, projects will be designed, engineered, prototyped, fabricated and tested for performance and durability. Students will focus on 3-D solid part design and analysis using various CAD systems. Results from the applications of various digital media may include Photo-Realistic Rendering, Animation, Finite Element Analysis (FEA) and Plastic Rapid Prototyping of 3-D solids. Special emphasis is placed on the Research and Development to fully define new products or improve existing products. Students will use all essential metal, woodworking tools, and automated machines in the DHS fabrication lab to manufacture and assemble their final projects. Students will be required to give a final portfolio presentation of their research and will depart the class with a greater understanding of the development of tangible industry processes, methods, new product development and equipment. This course has been approved to meet the MMC senior year math-related credit requirement.

2 hour

1.0/1.0 credit

4745 TRANSPORTATION TECHNOLOGY

Gr 9-10

Prerequisite/Recommendation: None.

Dive into the fascinating world of transportation technology and discover how it drives movement across land, air, and water! In this hands-on course, students will design, build, and test their own prototypes while exploring the principles of aerodynamics and engineering. Projects vary by semester and may include constructing model planes, hot air balloons, boats, and other exciting creations. If you enjoy working with your hands and solving creative challenges, this course is for you. No prior building experience is required – just bring your curiosity, imagination, and enthusiasm for discovery.

1 hour

0.5 credit

9605/9606 DESIGN INTERNSHIP 1/2

9607/9608 DESIGN INTERNSHIP 1A/1B

Prerequisite: Mechanical Design 1A/1B and concurrently enrolled in Engineering Design 1A BC/1B BC or Research and Development.

This course may be taken for one or two hours. An Individual Educational Training Plan and Training Agreement are developed for each student–trainee detailing his/her specific learning activities. Note: A student who chooses the Internship course for either one or two hours is expected to work 10 hours per week and provide their own transportation.

2 hour

1 hour