ENGINEERING AND OPTICS

PROGRAM OVERVIEW

Engineering Engineers apply the principles of science and mathematics to develop economical solutions to technical problems. Their work is the link between scientific discoveries and the commercial applications that meet societal and consumer needs. Many engineers develop new products by following the steps of the design process with the end result being the solution to the designated problem. Recently added to the Engineering program is a dual credit Optics course in partnership with Monroe Community College. Students will be introduced to technical optics, including terminology, fundamentals and principles, optical instruments and their relation to mechanics and electronics, wave optics, including such developments as lasers, optical processes and testing techniques, and photography and its uses..

CAREER OPPORTUNITIES

- ***Aerospace Engineering***
- ***Agricultural Engineering***
- ***Applied Engineering***
- ***Architectural Engineering***
- ***Biomedical Engineering***
- ***Chemical Engineering***
- ***Civil Engineering***
- ***Computer Engineering***
- ***Environmental Engineering***
- ***Industrial Engineering***
- ***Materials Science Engineering***
- ***Mechanical Engineering***
- ***Mining and Geological Engineering***

POST-SECONDARY EDUCATION OPPORTUNITIES

- ***Monroe Community College:***
  - » ***Engineering Certified Programs***
  - » ***Optics Certified Program***
  - » ***Associates Degrees:***
    - – ***Computer Aided Design and Drafting***
    - – ***Engineering Science***
    - – ***Optical Systems Technology***
    - – ***Mechanical Technology***
- ***Rochester Institute of Technology***
  - » ***Engineering Management Certified Program***
  - » ***Optical Science Certified Program***

PROGRAMS OF STUDY

FOUNDATIONAL COURSES

CTE Foundations: Manufacturing

9th Grade // 1 CTE Credit

Career Research and Exploration

Safety, Tools, and Materials

Basic Manufacturing and Metalworking

Introduction to Integrated Technology

10th Grade // 2 CTE Credits

Rotation of Experiences in Metalworking

Automotive Technology, Advanced

Manufacturing, Engineering and Optical Technology

CAREER MAJOR COURSES

Introduction to Engineering S1

11th Grade // 1 CTE Credits

Introduction to Engineering

Principles of Engineering S2

11th Grade // 1 CTE Credits

Computer Modeling

Real World Examples

Mechanical Engineering S1

12th Grade // 1 CTE Credits

Introduction to how light behaves

Lenses and how they function

Optics S2

12th Grade // 1 CTE Credits

Specific Engineering professions

Real World Examples

Introduction to how light behaves

Lenses and how they function

EMPLOYABILITY PROFILE:

The Proficient Advanced Manufacturing Student will...

- Demonstrate employability skills that will help them get a job and meet employer's professional expectations.
- Demonstrate academic knowledge and skills that meet postsecondary requirements.
- Consistently demonstrate safe practices and healthy relationships.
- Properly select, use, store, and maintain all tools and equipment.
- Effectively read a variety of materials and communicate in a variety of situations.
- Accurately solve mathematical calculations, and apply geometric concepts, in context.
- Accurately measure within industry-standard tolerances.
- Demonstrate GRIT. Persevere through challenges and not give up.
- Follow legal and ethical practices as it relates to engineering.
- Demonstrate knowledge and understanding of each step of the design process.
- Create accurate orthographic engineering drawings.
- Demonstrate and apply Computer Aided Design concepts and terminology.
- Demonstrate proficient use of the West Paint Bridge Design CAD program.
- Demonstrate proficient use of the Computer Aided Design Inventor program.
- Interpret working drawings, specifications, and tolerances.
- The proficient student will consult with clients to ensure projects meet their needs and budget.
- Demonstrate and apply Optical concepts and terminology.
- Properly prepare and maintain a safe and efficient working environment.
- Create accurate isometric engineering drawings